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PRINCIPALS' PERCEPTIONS OF IMPLEMENTATION LEVELS OF INNOVATIVE
EDUCATION IN NORTH DAKOTA SCHOOLS

by

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A Dissertation

Submitted to the Graduate Faculty

of the

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in partial fulfillment of the requirements

for the degree of


Doctor of Education

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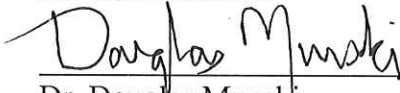
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Degree Doctor of Education

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Timothy Edwin Godfrey
April 5, 2019

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ABSTRACT

The purpose of this quantitative study was to bring awareness to education policy makers and educators in North Dakota (ND) regarding the process of implementing innovative education after the enactment of North Dakota's Senate Bill 2186 (SB 2186) in 2017. For the purpose of this study, innovative education is defined as instruction that incorporates any or all of the 4Cs: communication, collaboration, creativity, and critical thinking. This study analyzed ND principals' perceived levels of implementation of 4Cs instruction, perceived roadblocks and supports to 4Cs implementation, differences in implementation of 4Cs instruction dependent on enrollment, and differences in implementation of 4Cs instruction dependent on type of school.

A survey using Qualtrics web based design software was completed by ND public school principals in elementary, middle, and secondary schools. Principals responded to a 5-point Likert scale measuring their perceptions of levels of implementation, roadblocks, supports, and differences in implementation of 4Cs instruction.

Results identified principals perceived 4Cs instruction was being implemented in their building at some level. Results identified statistically significant supports and roadblocks to levels of implementation of 4Cs instruction. Principals reported school board, parents, students, and teachers as supports to implementation, while reporting funding and North Dakota Department of Public Instruction as roadblocks. The study identified statistically significant differences in levels of implementation of 4Cs

instruction based on school size (enrollment). Principals of schools with enrollment of 1001 to 2000 reported a higher level of implementation of 4Cs instruction than did schools with smaller enrollment (200 or less; 201 to 1000). Results did not identify differences in the levels of implementation of 4Cs instruction based on type of school.

Keywords: 4Cs, Innovative Education, Rural, North Dakota

CHAPTER I

INTRODUCTION

Trends at the time of this study have indicated world economies are moving more towards service and technology sectors, so education needs to provide a means for students to compete in those fields (Zhao, 2012). Manufacturing jobs were once the backbone of the United States economy, allowing families to provide a healthy existence and a solid foundation for their children. This seems to no longer be the case. Many jobs once accomplished by human hands are now accomplished by machines (Zhao, 2012). Innovation has become a primary tool for employment. Traditional education, one that promotes lecture and memorization, does not appear to readily correlate to the needs of the workforce; at least it did not at the time of this study (Soulé & Warrick, 2015).

Every Student Succeeds Act

In December of 2015, President Obama signed into law a reauthorization of the Elementary and Secondary Education Act (ESEA) of 1965. This newer version, titled the Every Student Succeeds Act (ESSA) of 2015, has been a major departure from traditional thinking about education and the standards movement. After President Obama signed this act into law, control over education shifted back to state and local entities, and states were given more authority over how to allocate resources to support their lowest performing student populations (Every Student Succeeds Act, 2015). According to Freeland Fisher and Arnett (2017):

The latest comprehensive federal education law, the Every Student Succeeds Act (ESSA), ushers in an unprecedented opportunity for states to transform K–12 public education. The law gives states the power to revisit the fundamental goals of their education systems and to potentially break free from constraints that have locked school systems into legacy funding, assessment, and accountability models over the past decades. (p. 2)

Another important component found in ESSA has been a move to implement more innovative practices in classrooms. The newer reauthorization duly provides specific language focused on innovative programs. According to the Department of Education, Office of Innovation & Improvement (n.d.):

The Education Innovation and Research (EIR) Program . . . , as amended by Every Student Succeeds Act (ESSA), provides funding to create, develop, implement, replicate, or take to scale entrepreneurial, evidence-based, field-initiated innovations to improve student achievement and attainment for high-need students; and rigorously evaluate such innovations. (para. 3)

To follow suit and provide support for implementation of innovations in education, the state of North Dakota (ND) and the North Dakota Department of Public Education (NDDPI) have taken several steps forward (NDDPI, 2017).

Innovative Education in North Dakota

On April 3, 2017, Governor Burgum of ND signed Senate Bill 2186 (see Appendix A) into law (Innovative Education Program, 2019; Statutes – Waiver, 2019) as one measure for supporting innovative education. Senate Bill 2186 allowed schools or school districts to apply to the ND superintendent of public instruction for waivers of

specified legislation in order to initiate and conduct pilot programs related to innovative learning. Consequently, NDDPI developed administrative rules (Appendix B) for supporting waivers to school districts who are implementing innovative ideas into their education programs (Innovative Education Program, 2018).

Purpose of Study

The purpose of this study was to bring awareness to education policy makers and educators in ND regarding principals' perceptions of levels of implementation of innovative educational practices, specifically through 4Cs instruction: communication, collaboration, creativity, and critical thinking (Couros, 2015). As part of the discussions on innovative practices found in ESSA, and as a result of the adoption of Senate Bill 2186, schools in ND have been encouraged to implement innovative teaching practices which support the acquisition of 21st century skills (Bellanca, 2015; Innovative Education Program, 2019; Taraban, Box, Myers, Pollard, and Bowen, 2007). At the time of this study, these initiatives were new and data pertaining to levels of implementation were not readily available. The researcher anticipated this study would identify perceived levels of implementation of innovative practices in education in PK-12 public schools in ND, roadblocks and supports as possible predictors of successful implementation, and differences in implementation based on school enrollment and type of school (i.e., elementary, middle/junior high, secondary, or combination schools). Data collected will be used to support policy makers, school districts, and principals in their processes of implementing innovative education.

Need for Study

At the time of this study, there were no data pertaining to principals' perceptions on levels of implementation of innovative education in ND. In addition, there was no research focusing on what roadblocks or support mechanisms schools in ND were facing when implementing 4Cs instruction. This study was designed to collect and analyze data that will bring awareness to education policy makers for supporting ND schools as they implement innovative education.

Research Questions

1. What are North Dakota principals' perceptions of the level of implementation of 4Cs instruction in their school buildings?
2. What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?
3. Is level of implementation of 4Cs instruction dependent upon size of school (number of students)?
4. Is level of implementation of 4Cs instruction dependent upon type of school (e.g. elementary; middle/junior high; secondary; or a combination of elementary, middle/junior high, secondary grade levels)?

Null Hypotheses

1. School administrators' perceptions of the level of implementation of 4Cs instruction in their school buildings will be schools are not implementing 4Cs instruction.
2. School boards, parents, students, NDDPI, teachers, and funding are neither roadblocks nor supports to implementation of 4Cs instruction.

3. Level of implementation of 4Cs instruction will not depend on enrollment.
4. Level of implementation of 4Cs instruction will not depend on type of school (e.g. elementary; middle/junior high; secondary; elementary, middle/junior high, secondary combination schools).

Researcher's Background

The researcher earned a Master of Science degree with a major in special education and has taught students in special education for 11 years. The researcher is credentialed in PK-12 ND administration and has been in various administrative positions for the past 10 years including principal and superintendent.

The researcher has been actively engaged in discussion with the ND legislature and the ND Department of Public Instruction and has testified in support of Senate Bill 2186 (2017). The researcher also attended the signing of Senate Bill 2186. At the time of this study, the researcher's former school district was in the process of implementing 4Cs instruction, and the researcher was involved as a mentor guiding the initial stages of implementation. The researcher has served on regional and state level educational boards including: the South East Education Board of Directors, the South Valley Special Education Unit Board of Directors, and the ND Governor's Task Force on Innovative Education. The researcher also had the privilege of presenting twice at a ND AdvancED conference on the topic of innovative education.

Delimitations

Research conducted in this study was limited by the newness of efforts to incorporate innovative education into schools in ND as a result of passing Senate Bill 2186 (2017) into law (Appendix A).

Definitions and Acronyms

21st Century Skills: Skills involving the incorporation of communication, collaboration, creativity, and critical thinking into solving real-world problems.

4Cs: Refers to communication, collaboration, creativity, and critical thinking; used to define innovative education (Wagner & Dintersmith, 2015).

Elementary and Secondary Education Act (ESEA): Federal legislation, signed into law in 1965, to provide equitable funding for educating disadvantaged children in public schools (McGuinn & Hess, 2005).

Every Student Succeeds Act (ESSA): Federal legislation signed into law in 2015 that reauthorized the Elementary and Secondary Education Act of 1965 (Every Student Succeeds Act, 2015).

Inquiry-Based Learning (IBL): “A minimally guided instructional practice that is often used to encompass a large range of teaching practices based in constructivism that focus on the learner constructing new information through active investigation” (Craig, 2015, p. 20).

North Dakota Department of Instruction (NDDPI): Governing body overseeing implementation of state and federal education law and funding in ND.

Partnership for 21st Century Skills (P21): Organization dedicated to building collaboration for 21st century skills instruction.

Principals: Defined as head building level administrators for public schools in ND.

Project Based Learning (PBL): “Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to

investigate and respond to an authentic, engaging, and complex question, problem, or challenge” (Buck Institute for Education, 2019, para. 5).

Qualtrics: Web based survey construction software (acquired through University of North Dakota).

Roadblocks: Roadblocks are things, people, or organizations that get in the way of accomplishing something. Roadblocks sometimes include school boards, parents, students, funding, NDDPI, and teachers when these people or organizations inhibit schools or administrators from implementing programs, policies, or other changes to an educational institution.

Senate Bill 2186 (SB 2186): Supported and promoted innovative education through educational waivers approved by the ND state superintendent of public instruction (SB 2186, 2017).

Soft Skills: Twenty-first (21st) century skills including communication, collaboration, creativity, and critical thinking.

Supports: Anything that enables or assists individuals or organizations in accomplishing something. School boards, parents, students, funding, NDDPI, and teachers can function as supports when they help or assist schools or administrators with implementing programs, policies, or other changes to an educational institution.

Total Population “Purposive” Sampling: Sampling method used when it is more effective to use an entire population and that population is small (Etikan, Musa, and Alkassim, 2015, Section 3.6).

ND AdvancED: organization used for North Dakota public school accreditation.

Organization of the Study

Chapter II includes an examination of literature focusing on the history of public education in the United States, a review of 21st century skills instruction including two methods of 21st century skills instruction, and strategies to incorporate 21st century skills instruction in public schools. Chapter III proposes the methods of the study and includes identifying participants, sampling methods, research design, instrument, and procedures. Chapter IV includes a narrative of the results from analysis of data gathered. Chapter V includes an interpretation of findings, limitations, implications, recommendations, and a summary of the study.

CHAPTER II

LITERATURE REVIEW

Introduction

The purpose of this literature review was to discuss the history of public education in the United States and to examine findings at the time of this study focusing on 21st century skills instruction. The first section of Chapter II includes a discussion pertaining to the history of modern education, governmental influence on public education, and differences between traditional instruction and 21st century skills instruction. The second section reviews literature focusing on 21st century skills in schools and post-secondary education. The third section introduces two instructional formats for implementing 21st century skills instruction. The fourth section presents a need for supporting 21st century skills instruction in schools. These topics support the guiding research questions of this dissertation, which focus on levels of implementation of 4Cs instruction in schools, roadblocks to implementation, supports to implementation, and differences, if any, in level of implementation based on enrollment (number of students) and level of implementation based on school type (i.e., elementary school; middle school; high school; or a combination of elementary, middle, and/or high schools) in North Dakota with the purpose of bring awareness to education policy makers and educators.

Administrators in the field of education have focused on the concept of continuous improvement for several years. The force behind this initiative for continuous improvement has been a push by state and federal entities, through legislation such as the No Child Left Behind Act of 2001 (Levine & Levine, 2012), to require schools and districts to meet accountability measures for student achievement (Cohen-Vogel, Cannata, Rutledge, & Socol, 2016). This effort has led to a vast array of instructional strategies and commercial curricula with aims of supporting increases in student proficiency in math and reading. Many of these methods focus on increasing test scores through traditional instructional approaches such as direct instruction, memorization, and repetition. While these strategies may lend themselves well to supporting rote memory, they do not incorporate into learning programs and student achievements 21st century skills, otherwise known as the 4Cs and described in this study as: critical thinking, creativity, communication, and collaboration (Wagner & Dintersmith, 2015).

Origins of Modern Education

The system of public education in the United States at the time of this study was connected to that of Europe in the late 1800s. During this period of educational borrowing, Horace Mann studied many schools throughout Europe to gain insight for improving the American education system (Kubow & Fossum, 2013). One education system of most interest to Mann was found in Prussia (Bitterman & Hess, 2015).

According to Bitterman and Hess:

The prevailing model of education in the United States derives from the 19-century Prussian education system. Championed as a means for making affordable, quality education available to all Americans, the highly structured

Prussian model emphasizes compliance and conformity as a mode for developing competencies. (p. 87)

Spring (2018) reinforced this observation through his description of the Prussian education system:

Advocating the use of schools for political control, Johann Fichte, a Prussian leader in the early nineteenth century, wanted schools to prepare students for conformity to government regulations by teaching obedience to school rules and developing a sense of loyalty to the school. He argued that students will transfer their obedience to school rules to submission to government laws. . . . The school, according to Fichte, is a miniature community where children learn to adjust their individuality to the requirement of the community. (p. 15)

With the exception of a few attempts to spur reform in our education system, public schools in the U.S. have remained relatively under the same direction since the 19th century (Laats, 2015). The instructional model of preference has focused on preservation of traditional classrooms, inflexible scope and sequences of coursework, and time involved in teacher-led instruction (Laats, 2015).

The Carnegie Unit added to this structure of a 19th century education style (Reigeluth & Karnopp, 2013; Russakoff, 2015). Developed in 1906, the Carnegie Unit was a measurement designed to help regulate preparation of students for entering college (Silva & White, 2015). Created by the Carnegie Foundation, a Unit consisted of “five periods weekly throughout an academic year of preparatory school” (Silva & White, 2015, p. 69). Preparatory school has been equated to what we have known as high school. In order to be considered college ready, applicants needed to accumulate a

minimum of 14 units in high school. Units later became known as credit hours (Silva & White, 2015). As Silva and White posited:

Before long, the Carnegie Unit became the central organizing feature of the American educational enterprise, a common currency enabling countless academic transactions among students, faculty, and administrators at myriad public, non-profit, private, and for profit institutions, as well as between education policy makers at every level of government. It helped structure an undeveloped system that would become the envy of the world. (p. 6)

Reigeluth and Karnopp (2013) explained it differently, “One unit represents 120 hours of class or contact time” (p. 4) and later added, “While it is intended to indicate amount of student learning, it really measures seat time” (Reigeluth & Karnopp, 2013, p. 4).

Changes in Beliefs on How Individuals Learn Best

As the 20th century progressed, so did our understanding of learning concepts. In 1956, Bloom’s Taxonomy was introduced (Adams, 2015; Forehand, 2010). This was a culmination of work led by Benjamin Bloom. The goal was to create a framework for learning actualization. According to Forehand:

Bloom’s Taxonomy is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to “climb to a higher (level of) thought”. The lowest three levels are: knowledge, comprehension, and application. The highest three levels are: analysis, synthesis, and evaluation. “The taxonomy is hierarchical; [in that] each level is subsumed by the higher levels” (UW Teaching Academy, 2003). (Forehand, 2010, p. 42)

This pedagogical shift gained support through development of Howard Gardner's multiple intelligences theory (Gardner, 1995). According to Gardner, humans have the capacity to understand and make sense of a variety of different types of information in the world. Some are able to interact with one form alone while others are able to understand multiple forms. The main premise is no two people think, understand, or learn the same. Such an approach should lead teachers to focus on individual students' learning strengths and needs. Gardner (1995) described it as such:

Focusing on the child, an "MI approach" entails a careful description of what the child is like intellectually and the planning of an education program appropriate for that child. Focusing on pedagogy, an "MI approach" entails multiple entry points to important concepts so that learning opportunities are maximized for every child. (p. 16)

The pendulum seemed to be swinging in the other direction and leading public education away from the rigidity produced by prior initiatives. Theoretical beliefs, such as those proposed by Bloom (Adams, 2015) and Gardner (Gardner, 1995), redirected approaches on how individuals learn back to philosophies espoused by John Dewey (Waks, 2013). Though technology was virtually non-existent at the time, Dewey's approaches set the stage for educational systems that prepared students to compete and collaborate across oceans and continents (Waks, 2013). Waks confirmed this in his article on *John Dewey and the Challenge of Progressive Education*:

Analogous questions arise today in contemporary global network era, as we again stand witness to a fundamental social and technical transformation. Economic globalization, information technology networks, and postindustrial "knowledge"

workplaces have prompted new trends in education - cooperative, collaborative, and other forms of active learning; interdisciplinary group projects; Internet-based curricula; charter schools, and even virtual schools, school districts, and universities. Some of these have been couched in a language reminiscent of Dewey and even explicitly in terms of continuities with Dewey's progressivism. (p. 74)

Federal Government Involvement

Public education trudged forward in the 20th century with most changes occurring at the state level. Then, in 1954, the U. S. Supreme Court ruled on a court case originating in Topeka, Kansas, *Brown v. Board of Education* (1954). In *Brown v. Board of Education of Topeka*, Chief Justice Earl Warren and the other U.S. Supreme court judges at that time unanimously overturned prior judicial precedence which supported segregation of public schools into white and black facilities. The decision identified that segregation in public schools was a violation of equal protection laws within the Fourteenth Amendment (*Brown v. Board of Education*, 1954). Chief Justice Warren spoke to this disparity in his "Opinion of the Court" report when he quoted an unnamed court in Kansas. According to the Kansas court:

Segregation of white and colored children in public schools has a detrimental effect upon the colored children. The impact is greater when it has the sanction of the law; for the policy of separating the races is usually interpreted as denoting the inferiority of the negro group. A sense of inferiority affects the motivation of a child to learn. Segregation with the sanction of law, therefore, has a tendency to [retard] the educational and mental development of negro children and to deprive

them of some of the benefits they would receive in a racial[ly] integrated school system. (p. 494)

In 1965, the Elementary and Secondary Education Act (ESEA) was signed into law by President Johnson (Elementary and Secondary Education Act, 2001; Jeffrey, 1978; McGuinn & Hess, 2005). The main focus of ESEA was to provide equitable funding to schools and districts serving disadvantaged students (McGuinn & Hess, 2005). Through its Title I component, ESEA became a platform for the war on poverty (Kaestle & Smith, 1982). According to the U.S. Department of Education (2018):

Title I, Part A (Title I) of the Elementary and Secondary Education Act, as amended by the Every Student Succeeds Act (ESSA) provides financial assistance to local educational agencies (LEAs) and schools with high numbers or high percentages of children from low-income families to help ensure that all children meet challenging state academic standards. (para. 1)

The Elementary and Secondary Education Act also became a cornerstone for federal influence and control in public education (McGuinn & Hess, 2005). This control became more apparent with the creation of the Department of Education, and as ESEA evolved, the ushering in of the “standards” movement.

The report, *A Nation at Risk*, (Gardner et al., 1983) was a catalyst for discussion centering on the differences between public education systems nationwide. The report alluded to low achievement levels of students in U.S. schools and outlined several key factors contributing to this decline. With the fear of falling behind most other industrialized nations, the national standards movement began. *A Nation at Risk* “recommended strengthening state and local high school graduation course requirements,

establishing higher academic standards, requiring more student time to be spent in school, improving teacher preparation, and holding elected officials across the nation accountable for making necessary improvements” (Vinovskis, 2009, p. 16). Reauthorizations of ESEA, which followed, sided with this heavy top-down philosophy.

One such reauthorization that supported the adoption of standards and testing was the Improving America’s Schools Act of 1994. The act made a state’s receipt of Title I funding dependent on standards and assessment. According to an article in Education Week (“Summary of the Improving America’s Schools Act,” 1994), “In exchange for Title I grants, states must develop school-improvement plans-with input from local district officials, teachers, parents, and others-that establish high content and performance standards in at least mathematics and reading or language arts” (para. 3). The Improving America’s Schools Act also called for aligning assessments to standards content “between grades 3 and 5, again between grades 6 and 9, and again between grades 10 and 12” (“Summary of the Improving America’s Schools Act,” 1994, para. 4).

The next juncture in reauthorization of ESEA was the No Child Left Behind (NCLB) Act of 2001 (Dee & Jacob, 2011; Levine & Levine, 2012). NCLB was possibly considered the most overreaching federal piece of educational legislation in decades (Levine & Levine, 2012). NCLB has been responsible for creating the concept of adequate yearly progress and mandatory high stakes testing. Dee and Jacob (2011) explained the more prolific mandates of No Child Left behind:

The hallmark features of this legislation compelled states to conduct annual student assessments linked to state standards to identify schools failing to make “adequate yearly progress” (AYP) toward the stated goal of having all students

achieve proficiency in reading and math by 2013–2014 and to institute sanctions and rewards based on each school’s AYP status. (p. 418)

Schools and districts would now be judged on the basis of student achievement and be responsible for showing growth every year with the mandate of reaching 100% proficiency by 2014. Barrett (2009) posited that NCLB even reshaped teacher practices by causing educators to focus on reaching a specific number of state academic standards in a specific period of time therefore inexplicitly “teaching to the test” (p. 1021). Such behaviors may be attributed to a fear of not making AYP, being penalized for having less than desired gains in student growth, and the implementation of teacher evaluation models based on student achievement (Levine & Levine, 2012).

Comparison Between Traditional Instruction and 21st Century Skills Instruction

For decades, educators have pondered the best ways to prepare students for post-school life. In 1906, as a way of formalizing public education, the Carnegie unit was adopted (Silva & White, 2015). This organizational system established specific units of time devoted to instruction in specific content areas. The system was used in high schools to create a sense of continuity across the nation in what was taught and when it was taught. A more formal system of education developed but left some educators feeling more rigidity in the educational system and less flexibility in methods they could use to shape opportunities and experiences that would meet the needs of students (Silva & White, 2015).

Traditional Instruction

One argument against traditional modes of instruction is that they have basically gone unchanged since the educational system at the time of this study was introduced in

the early 1800s by Horace Mann. As mentioned earlier in this chapter, Mann’s system was built on a Prussian educational model in which ages of students were correlated to grade levels and courses and sequenced in a distinct order (“American Public Education: An Origin Story,” 2013). This early form of schooling attempted to instruct students in reading, grammar, and mathematics by using the most fundamental approaches. These approaches focused primarily on lecture and recitation. Currently (at the time of this report), instructional strategies of this type would be found at the lower tiers of Bloom’s taxonomy (Gardner, 1995; Pappas, Pierrakos, & Nagel, 2013) thus promoting skills in rote memorization (Table 1).

Table 1. Bloom's Taxonomy and Traditional and 21st Century Skills Instruction.

Levels of Bloom’s Taxonomy	Examples of Learning by Level	Relation to Traditional Instruction or 21 st Century Skills Instruction
Evaluation (Highest Level)	Make judgements based on criteria	21 st Century Skills Instruction
Synthesis	Compile information by creating new patterns or alternative solutions	
Analysis	Make inferences and find evidence, make generalizations	
Application	Solve problems by applying prior knowledge	
Comprehension	Understand facts, organize, compare, interpret	Traditional Learning
Knowledge (Lowest Level)	Recall facts, terms, basic concepts	

(Information for developing table found in Pappas et al., 2013)

Parker (1920) described the reliance on rote learning during this period:

In memorizing, one device to secure concentration of attention during the process is the use of the method of correct recall. This means that the student, instead of keeping his eyes fixed on the page during each repetition, should begin to look off as soon as it is possible to recall correctly what he has read or what is to come. At first this may be possible with mere snatches of the context, but gradually the parts that can be correctly recalled will become longer and longer, so that eventually only occasional glances at the page will be necessary to get one's bearings or to get some of the more difficult parts. (p. 154)

Traditional education primarily falls in the realm of teacher-centered instruction (Saavedra & Opfer, 2012). This includes direct instruction practices such as lecture and note taking. These methods are controlled by a teacher and achievement is typically measured through the use of standardized testing. Knowledge is gained mostly through rote memory of facts. Many consider this to be an inflexible way to teach children. In a study conducted by Taşoğlu and Bakaç (2010), 46 students were subjected to a pretest-posttest design to “investigate the effects of PBL [Problem Based Learning] and TTM [Traditional Teaching Methods] on students' academic achievements, conceptual developments and scientific process skills” (p. 2410). Taşoğlu and Bakaç indicated that while PBL is superior to traditional teaching methods for building conceptual development, traditional teaching was equal in promoting academic achievement and scientific process skills.

In another study conducted by Yildirim, Ozden, and Aksu (2001), traditional learning was further validated as a reasonable method of teaching. Yildirim et al. used a pretest-posttest design to compare the efficacy of hypermedia learning (experimental

group) and traditional instruction (control group). Thirty-nine 9th grade students were divided into the two groups and were given pre-, post-, and retention tests focusing on “declarative, conditional, and procedural knowledge” (Yildirim et al., 2001, p. 207). No significant difference was noted between either group. These results identified use of traditional teaching methods as being effective.

As noted in examples above, traditional teaching methods have been shown to produce positive results in academic achievement (Taşoğlu & Bakaç, 2010; Yildirim et al., 2001). While traditional teaching may be effective for some students, research favoring traditional instruction typically overlooks instruction in other skills necessary for success in post-school life. Instructional methods incorporating 21st century skills can add to experiences students need to enable them to meet challenges of life after high school, regardless of whether life leads graduates to college or a career. According to Adams (2012), 21st century skills instruction may help support college readiness and better prepare students for emotional and psychological demands of post-secondary education. Soulé and Warrick (2015) explained:

Although skills such as self-direction, creativity, critical thinking, and innovation may not be new to the 21st century, they are newly relevant in an age in which the ability to excel at nonroutine works is not only rewarded, but is expected as a basic requirement for success. (p. 178)

Throughout the high school years, students are often subjected to learning core academic material (Kay & Greenhill, 2013). The majority of their educational experiences involve “sitting and getting.” That means up to 7.5 hours a day primarily taking notes and learning through rote memory. Many educators understand time

constraints make it necessary to filter through information at a higher than desired pace. When traditional forms of teaching are employed, the opportunity to teach 21st century skills falls to the wayside (Wagner & Dintersmith, 2015), and this results in students less prepared for life after high school. In citing a survey of 431 employers, Soulé and Warrick (2015) stated:

Over one half of employers found that at the high school level, new workforce entrants were insufficiently prepared in some of the most important skills they demanded of employees, including oral and written communications, professionalism and work ethic, critical thinking and problem-solving, and creativity and innovation. Although more than 80% of respondents assess the 4C skill areas of communication, collaboration, critical thinking and problem solving, and creativity and innovation as “very important for job success” almost one quarter of respondents found that even 4-year college graduates were deemed deficient in these areas.

(p. 180)

Results such as Soulé and Warrick’s further emphasize benefits of incorporating 4Cs instruction in schools.

Twenty-First Century Skills Instruction

Twenty-first (21st) century skills instruction focusing on the 4C skill areas supports both college readiness and career readiness. “Today’s students need critical thinking and problem-solving skills not just to solve the problems of their current jobs, but to meet the challenges of adapting to our constantly changing workforces” (Ken Kay as cited in National Education Association, n.d., p. 6). When reflecting on the current

state of education, Saavedra and Opfer (2012) mentioned:

The outdated, transmission model of education, through which teachers transmit factual knowledge to students via lectures and textbooks, remains the dominant approach to compulsory education in much of the world (OECD, 2009). Through the transmission model, students can learn information, but typically don't have much practice applying the knowledge to new contexts, communicating it in complex ways, using it to solve problems, or using it as a platform to develop creativity. Therefore, transmission is not the most effective way to teach 21st-century skills. (p. 9)

Saavedra and Opfer (2012) went on to list and define nine key lesson strategies for constructing appropriate learning experiences, for students, through 21st century skills instruction:

- #1. MAKE IT RELEVANT. . . . To make curriculum relevant, teachers must begin with generative topics or topics that have an important place in the disciplinary or interdisciplinary study at hand and that resonate with learners and teachers. (p. 9)
- #2. TEACH THROUGH THE DISCIPLINES. . . . In addition to learning the knowledge of the discipline, students also must learn the skills associated with the production of knowledge within the discipline. (p. 10)
- #3. DEVELOP THINKING SKILLS. Students can and should develop lower- and higher-order thinking skills simultaneously. (p. 10)

- #4. ENCOURAGE LEARNING TRANSFER. Students must apply the skills and knowledge they gain in one discipline to another and what they learn in school to other areas of their lives. (p. 10)
- #5. TEACH STUDENTS HOW TO LEARN. [Build skills in metacognition.] There is a limit to what students can learn through formal schooling. Therefore, educating them for the 21st century requires teaching them how to learn on their own. (p. 10)
- #6. ADDRESS MISUNDERSTANDING DIRECTLY. Learners have many misunderstandings about how the world really works, and they hold onto misconceptions until they have the opportunity to build alternative explanations based on experience. (p. 11)
- #7. TREAT TEAMWORK LIKE AN OUTCOME. The ability to collaborate with others is an important 21st-century skill and an important condition for optimal learning. . . . Teachers can design instruction in many ways so students learn from and with others, developing their ability to work in teams and building other 21st-century skills. (p. 11)
- #8. EXPLOIT TECHNOLOGY TO SUPPORT LEARNING.
Technology also offers the potential to develop students' 21st-century skills by providing them with new ways to develop their problem solving, critical thinking, and communication skills.
Technology can help students practice transferring those skills to different contexts, reflect on their thinking and that of their peers,

practice addressing their misunderstandings, and collaborate with peers. (pp. 11-12)

#9. FOSTER CREATIVITY. Creativity is prized in the economic, civic, and global spheres because it sparks innovations that can create jobs, address challenges, and motivate social and individual progress.

Like intelligence and learning capacity, creativity is not a fixed characteristic that people either have or do not have. Rather, it is incremental, such that students can learn to be more creative. (p. 12)

Twenty-first (21st) century skills instruction places a student at the center of the process. Teachers act as guides and support students as they build understanding focused on a topic of discussion. This partnership between student and teacher enables a student to gain experiences in the 4Cs in a more practical and applicable manner. Martin (2002) described this process through the pedagogical lens of John Dewey:

As he saw it, the meaning of a class session resided in the transaction between production, usually by the teacher at first, and then reception, usually by the students, leading to production by the students and reception by the teacher, and so on in the reflex arc, until the class session or the whole course ended. (p. 258)

As Yildirim et al, (2001) reflected:

Learner control is linked to a variety of positive affective outcomes, such as motivation, increased level of engagement, positive attitudes, and decreased anxiety. When instructional experience is effectively self-

managed, it may add to an individual's sense of competence and self-efficacy, which, in turn, can enhance continuous motivation. (para. 4)

Thus, focusing on 21st century skills instruction in high school may support a student's growth in areas of creativity, collaboration, critical thinking, and communication and establish a correlation to patterns of college enrollment.

Twenty-First Century Skills Instruction in High School

The demands of the global workforce at the time of this study had changed the dynamics of what had been required of most workers of the time. Fewer businesses were looking for individuals to complete mundane and monotonous tasks on a factory assembly line. At the time of this report, businesses were looking for innovators to create an assembly line that might be automated and take very little human input to complete a job. As Kay and Greenhill (2013) claimed:

Fifty years ago, our K-12 system was largely focused on the routine. Memorization and “following instructions” were the order of the day, and they fit nicely into jobs that were routine manufacturing jobs in hierarchical organizations. Those approaches are also well suited for people who would end up in a single career or in just a few jobs in their lifetime. Today's young people will be competing for jobs that require non-routine complex thinking and interactive communication skills. Our education model has not kept pace with these changes. (p. 3)

With these challenges comes a need to change the way students in both high schools and post-secondary schools are taught. Kivunja (2014) declared:

Trilling and Fadel (2009) argue that in order to be effective teachers and equip students with the skills that will enable them to be successful . . . it is essential to teach them not just the traditional core subjects but also the sets of skills most in demand in the 21st century. (p. 40)

These skills are referred to as the 4Cs: critical thinking, communication, creativity, and collaboration (Kay & Greenhill, 2013; Kivunja, 2014; Zhao, 2012).

Critical Thinking

Innovation requires individuals who can conceptualize situations and tasks that involve resolving a conflict or solving a problem. Innovative thinkers must be able to think critically. O'Donnell et al. (2012) defined critical thinking as “being able to tell facts from opinion, to see holes in an argument, to spot illogic, to evaluate evidence and to tell whether cause and effect have been established” (p. 4).

Communication

For information to flow effectively, individuals must possess skills that enable them to communicate efficiently through a variety of mediums. While at one time most of the communication necessary to complete a task happened through traditional means such as face to face and letter writing, current means of communication have expanded to involve digital formats including email, message boards, video conferencing, etc. Regardless of the modality, the goals remain the same: get a clear and concise message across. According to Kivunja (2014), the Partnership for 21st Century Skills (P21, 2009) categorized this goal into five communication skill sets:

They include the ability to articulate thoughts and ideas effectively, both orally and nonverbally, the ability to listen and make sense of what is

being said, the ability to utilize communication effectively, the ability to utilize a wide range of media and related technologies and ability to communicate in different environments. (Kivunja, 2014, p. 43)

Collaboration

The labor force has been dramatically affected by an ever-increasing need to work as a team. P21 (2014) declared, “Fifty years ago, much work was accomplished by individuals working alone, but not today. Much of all significant work is accomplished in teams and in many cases, global teams” (p. 19). Robles (2012) added, “The shift from an industrial economy to an information society and an office economy means that many jobs now place an emphasis on integrity, communication, and flexibility” (p. 453). Such assertions support the necessity to teach skills for building relationships. The University of Strathclyde – Glasgow (n.d.) has been advising people on how to build relationships. Some of the advice the university has been giving includes:

- Give and receive feedback from peers or other team members in order to perform the task.
- Share credit for good ideas with others.
- Acknowledge others’ skill, experience, creativity, and contributions.
- Listen to and acknowledge the feelings, concerns, opinions, and ideas of others. (para. 2).

Kivunja (2014) further reinforced the notion for including instruction in collaboration by stating:

In the 21st century learning and work contexts, collaboration has taken on new dimensions which require people to work effectively with others that

they have never met, don't know or will never meet face to face, but with whom they need to be able to cooperate on a common task or tasks. In the new workplace, collaboration requires that participants be able to take actions, which together with those of others they collaborate with in the Knowledge Age, lead to achievement of objectives that benefit all the collaborators. (p. 44)

Creativity

Creativity may very well be considered the foundation for supporting innovative skills. As stated by Kivunja (2014), "The 21st century Global Economy has an avid appetite for better processes, better products and new services" (p. 45). No longer is it adequate for teachers in both secondary and post-secondary educational systems to provide instruction solely in core subject areas and feel it adequately prepares students for the future challenges of the world they will face. Students must be presented with real-world problems and be allowed to make choices for finding adequate solutions. Zhao (2012) described the change in relationship between teacher and student in a learning environment which promotes creativity:

The teacher no longer serves as the sole source of knowledge or disciplinary authority, but rather as a motivator, a reviewer, a facilitator, and an organizer. The learner becomes owner of their learning and is responsible for seeking and securing the necessary guidance, knowledge, skills, and support to make high-quality products. These changes facilitate the cultivation of creative entrepreneurs. (p. 240)

High school has remained relatively unchanged in the way courses, levels, and time are organized for over a century (Silva & White, 2015; Sullivan & Downey, 2015). Sullivan and Downey reported, “Arguably, the traditional system of teaching has worked well for many students over the last 100 years, but evidence indicates that the industrial era ‘factory-based’ system of education is failing to serve the needs of students in our 21st century society” (p. 6). Sullivan and Downey continued by explaining, “Students are entering a workforce that has dramatically changed from the past. Global economies, rapid technological advances, and a shrinking job market are a reality for today’s graduates” (Sullivan & Downey, 2015, p. 7). Sullivan and Downey described a necessity to teach skills that enable students to become college and career ready and support problem solving, flexibility, and interpersonal skills. This is reinforced through Saavedra and Opfer’s (2012) discussion that:

Employers demand fewer people with basic skill sets and more people with complex thinking and communication skills . . . low levels of civic engagement highlight the recognition that rote learning about government is not a sufficient way for students to learn how and why to be engaged citizens. (p. 8)

When describing the traditional teaching model, Saavedra and Opfer claimed, “Students can learn information, but typically do not have much practice applying the knowledge to new contexts, communicating it in complex ways, using it to solve problems, or using it as a platform to develop creativity” (Saavedra & Opfer, 2012, p. 9).

A high school curriculum focusing on 21st century skills instruction shifts the emphasis from breadth to depth. The focus no longer lies in the amount of information

covered, but rather on the time spent delving deeply into the most important parts of the information. While possibly not all standards or scopes and sequences are touched upon, students are given an opportunity to attain mastery of key principles of the topics they are being taught. When discussing factors and outcomes involved in implementing 21st century skills instruction, Trilling (2015) declared, “The results of these practices—intensively, artfully, and consistently applied for the benefit of all students—are schools that produce high levels of student agency” (p. 182). Trilling (2015) continued by describing the instructional strategies and methodologies that foster this deep thinking enveloped in the 4Cs.

As this paradigm shift in education and the workplace broadens, it is important to note that basic instruction in concepts is not removed from “the formula.” As Zhao (2012) explained, “If the basics are truly basic, that is, essential to functioning in today’s society, they are unavoidable in students’ pursuit of making great products” (p. 250). The purpose of including 21st century skills instruction within high school curriculum is not to minimize the necessity of basic concepts. It is to enhance those concepts and create readily applicable usage of those concepts in a manner that supports preparation for college and/or career readiness (Kay & Greenhill, 2013; Wagner & Dintersmith, 2015).

Twenty-First Century Skills Instruction in Post-Secondary Education

As students transition from high school to college, certain skills are required to independently navigate university systems. As Adams (2012) explained:

Students entering college must be able to manage their own time, get along with roommates, and deal with setbacks. Resiliency and grit, along

with the ability to communicate and advocate are all crucial life skills.

Yet, experts say, many teenagers lack them, and that's hurting college-completion rates. (p. 1)

Because of changing dynamics in the work force, it is important that post-secondary institutions focus efforts on 21st century skills instruction. According to the National Education Association (n.d.), a 2010 study by the American Management Association (AMA), found that “three out of four . . . executives . . . believe these skills and competencies will become more important to their organizations in the next three to five years, particularly as the economy improves and organizations look to grow in a global marketplace” (p. 6). Dutton (2012) clarified the findings of a survey conducted by the Computing Technology Industry Association (CompTIA) which supported this claim. She contended managers from the survey declared there was a “lack of soft skills such as teambuilding, project management, innovation, and analytic abilities” (p. 1) in individuals currently in the workplace at the time of the CompTIA survey and those coming into the workplace from post-secondary institutions also lacked soft skills.

Beard, Schwieger, and Surendran (2008) described results from the Job Outlook 2008 Survey which surveyed 276 employers on qualities they sought at that time in prospective workers. Worker qualities were rated on a five-point scale with 1 being *not important* and 5 being *extremely important*. Skills we might consider important that support a need for 4Cs education included, among others: communication, teamwork, and problem-solving skills. Such skills are necessary for workers to keep and hold jobs and perform required duties found in most positions in the workforce. As Kivunja (2014) described it:

Skills that they need to succeed in their lives after college, or any other institution of higher learning, are 21st century skills rather than 20th century skills. . . . Unfortunately, those skills are not yet included in many of the learning outcomes prescribed by most education jurisdictions or required to be assessed in high-stakes state and national examinations. (p. 37)

Soulé and Warrick (2015) argued that a large portion of students graduating from college do not possess necessary 21st century skills to fulfill requirements dictated by employers. When referring to a survey conducted by P21 of “431 employers representing a combined workforce over 2 million employees” (Soulé & Warrick, 2015, p. 180), Soulé and Warrick claimed “almost one quarter of respondents found that even 4-year college graduates were deemed deficient in these areas” (p. 180). Soulé and Warrick went on to reference another study coordinated by the American Management Association. In this study . . .

. . . 2115 managers and other executives identified similar gaps, finding that the new workplace requires employees to be able to think critically, solve problems, innovate, collaborate, and communicate more effectively at every level within the organization. (p. 180)

As colleges and universities realize that students must possess 21st century skills to be competitive in the workforce, many are adapting programs to incorporate instruction in these soft skills. As Heckman and Kautz (2012) affirmed, “Soft skills predict success in life. . . . They produce that success and . . . programs that enhance soft skills have an important place in an effective portfolio of public policies” (p. 451). This

includes defining, and especially, assessing these soft skills (Beard et al., 2008; Ingols & Shapiro, 2014; Maruyama, 2012). Maruyama argued that college readiness is a worthy measure for attainment of soft skills. He stated, “Viewed from an educational attainment process perspective, *college readiness* represents an accumulation of knowledge and experiences that prepare students for college” (Maruyama, 2012, p. 253). When discussing assessment of college readiness, Maruyama (2012) claimed, “To more comprehensively assess college readiness, factors related to college success would need to go beyond the measures described above and include variables such as intellectual skills, motivation, background, and other ‘noncognitive’ and ‘soft’ skills” (p. 258).

As these demands for soft skills become more apparent, post-secondary institutions are taking note. Beard et al. (2008) described initiatives taking place at Southeast Missouri State University to support 21st century skills instruction. They claimed, “The development of soft skills has been integrated into classroom activities and assessments of student performance into an array of activities including case studies, special projects, group work, and oral and written presentations” (p. 232). Beard et al. (2008) further explained, “Another campus-wide initiative taken at our institution that has had implications for soft skills development and assessment has been focused on experiential learning” (p. 233). The activities Beard et al. described involved internships and self-assessment.

As the literature at the time of this study suggested, 21st century skills instruction is becoming an important part of educational systems in both high school and post-secondary institutions. Much of this discussion on 21st century skills is based on the needs of the workforce and a shift in dynamics of labor demands. Many menial tasks are

now completed through automation. Labor market demands new innovations to improve that automation and continuously work towards perfecting automation processes rather than providing workers to perform a process.

Two Methods of 21st Century Skills Instruction

For the purpose of providing a greater understanding of 21st century skills instruction, two specific approaches to instruction are addressed next in this chapter: project based learning (PBL) and inquiry based learning (IBL). The researcher will shed light on implications of a 21st century skills instruction program infusing details and description of the 4Cs throughout each approach.

Project Based Learning (PBL)

PBL is gaining recognition as an approach for teaching 21st century skills (Duke, Halvorsen, & Strachan, 2016). “Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge” (Buck Institute for Education, 2019, para. 5). Students become responsible for finding information and applying it to circumstances they are relatively familiar with and may encounter in “real-world” situations. Rather than dictating how and what is to be learned, a teacher acts as a guide or “coach” to assist students in their process of inquiry when needed. Carter (2016) explained, “The process of project-based learning has its roots in constructivist theory, which posits learners take an active part in generating meaning and constructing their own understanding” (p. 27). This approach shifts the focus of learning from teacher centered to student centered and supports a student’s individual understanding of information rather than confining that

understanding to prescribed meaning. Students build personal perceptions about information and incorporate those perceptions into their own knowledge base to use in a manner that is consistent with their environmental needs.

The uniqueness of PBL lies in its focus on depth of understanding and reliance on inquiry (Bell, 2010; Chu, Tse, Loh, & Chow, 2011; Iwamoto, Hargis, & Vuong, 2016). Rather than attempting to cover a scope and sequence of academic standards in a specified amount of time, PBL concentrates on critical standards and diving deep into information concerning those standards to build a firm understanding. This allows students to generalize and apply their knowledge in a variety of environments. Deitering (2016) reinforced this concept when describing Larmer, Mergendoller, and Boss's (2015) eight elements of project based learning:

- **Key Knowledge, Understanding, and Success Skills** – The project is focused on student learning goals, including standards-based content and skills such as critical thinking/problem solving, collaboration, and self-management.
- **Challenging Problem or Question** – The project is framed by a meaningful problem to solve or a question to answer, at the appropriate level of challenge.
- **Sustained Inquiry** – Students engage in a rigorous, extended process of asking questions, finding resources, and applying information.

- **Authenticity** – The project features real-world context, tasks and tools, quality standards, or impact – or speaks to students’ personal concerns, interests, and issues in their lives.
- **Student Voice & Choice** – Students make some decisions about the project, including how they work and what they create.
- **Reflection** – Students and teachers reflect on learning, the effectiveness of their inquiry and project activities, the quality of student work, obstacles and how to overcome them.
- **Critique & Revision** – Students give, receive, and use feedback to improve their process and products.
- **Public Product** – Students make their project work public by explaining and/or presenting it to people beyond the classroom. (Deitering, 2016, p. 3)

Greater retention of information is another implication that strongly supports the use of PBL for 21st century skills instruction. Bell (2010) suggested that students taught in a PBL environment remember information in a readily useable manner much longer than students taught in a traditional learning environment. PBL has also been shown to support increased student learning in K-12 when reviewing scores on standardized tests (Craig, 2015).

In a study conducted by Craig (2015), a statistical comparison examining first year grade point averages for college freshmen was completed. Groups compared were Texas public high school students who attended a New Tech school and Texas public high school students who attended all other high schools in the state. New Tech schools

are STEM-based schools in Texas that have implemented PBL. The two schools in the study were New Tech High School in Coppell, Texas, and Manor New Technology High in Manor, Texas. One research question of interest was: “How do college enrollment rates and first-year college GPA distributions differ between New Tech schools and compare with state and national averages” (Craig, 2015, p. 57). The results of the grade point average comparison found a statistical difference between the two groups. Those who attended the PBL schools maintained a GPA of 2.0 or higher at a higher rate than students who attended traditional public schools (Table 2). Inquiry based learning (IBL) is a similar method that incorporated 4Cs instruction.

Table 2. Craig’s Comparison of First Year College Student GPAs Between Students Graduating From PBL Schools and Those From Traditional High Schools.

School Type	Percentage
Students receiving 2.0 GPA or higher from traditional	66%
Students receiving 2.0 GPA or higher from Tech at Coppell	78%
Students receiving 2.0 GPA or higher from Manor New Tech HS	83%

(Information for developing table found in Craig, 2015)

Inquiry Based Learning (IBL)

Inquiry based learning is another instructional method that incorporates 21st century skills instruction. As defined by Craig (2015), “Inquiry-Based Learning (IBL) is a minimally guided instructional practice that is often used to encompass a large range of teaching practices based in constructivism that focus on the learner constructing new information through active investigation” (p. 20). IBL relies on students’ development of higher level questions and their inquiry process for answering those questions. Because of the hands-on, activity based approach of IBL, learning is often assessed across

achievement levels (Kang, DeChenne, & Smith, 2012). As explained by Kang et al. , when low achieving students were taught within an inquiry based instruction model, they “improved almost twice as much as high-achieving students in their measures of inquiry capacity” (p. 149).

IBL instruction enlists various levels of structure and independence. Blanchard et al. (2010) described three levels of inquiry based instruction (Table 3). Each level involves varying degrees of student independence and teacher guidance.

Table 3. Three Levels of Inquiry Instruction.

Level	Student Responsibility
1	A teacher provides students with a question, a method to answer the question, and students are responsible for interpreting results.
2	A teacher provides students with a question, but students determine a method to answer the question, and are responsible for interpreting results.
3	Students generate a question as well as a method to answer the question, and are responsible for interpreting results.

Adapted from “Is Inquiry Possible in Light of Accountability?: A Quantitative Comparison of the Relative Effectiveness of Guided Inquiry and Verification laboratory Instruction,” by M. R. Blanchard et al., 2010, *Science Education*, 94(4), 577-616. Copyright 2010 by Wiley Periodicals, Inc.

As Table 3 suggests, the process of question development shifts from a teacher to a student as the student’s skill level increases. Eventually, the entire process from developing questions to interpretation of results rests with the student. This example of 21st century skills instruction relies on students’ use of critical thinking, creativity, collaboration, and communication as they move through the process of problem solving involving questions related to real-world circumstances. Instruction such as IBL, which incorporates the 4Cs, may support increases in student engagement as well.

Blanchard et al. (2010) described one study “often cited as evidence that inquiry-based instruction is less effective than direct instruction” (p. 582) because a group of students receiving direct instruction in this study learned their objective better than a group of students receiving inquiry based instruction. According to Klahr and Nigam (2004), “Many more children learned from direct instruction than from discovery learning” (p. 661). However, the Klahr and Nigam study was refuted in a follow-up study by Dean and Kuhn (2006) who observed three groups of students given an inquiry based learning assignment focusing on forecasting earthquakes. Group 1 conducted a Level 3 inquiry; Group 2 conducted a Level 2 inquiry; and Group 3 conducted a Level 1 inquiry (received direct instruction with little to no independent discovery). Results found that, over time, students in Group 1 scored higher than students in Groups 2 and 3. Unlike Groups 2 and 3, Group 1 received no direct instruction prior, during, or after the task. Another result found students in Group 1 spent much more time on task, whereas students in Groups 2 and 3 were sometimes “off task.” Group 1 students remained engaged in the activity for greater sustained periods of time as compared to the other two groups (Dean & Kuhn, 2006).

Supporting 21st Century Skills Instruction

After analyzing the literature, it can be concluded that empirical data exists (Craig, 2015; Bell, 2010) that supports the incorporation of 21st century skills instruction in high schools. As high school seniors graduate and move on to college or careers, research (Adams, 2012) has affirmed graduates are becoming less and less prepared for life lacking the skills needed such as critical thinking, creativity, collaboration, and communication. New college freshmen have unrealistic expectations pertaining to

navigating their college system (Adams, 2012). They are often unaware of where to seek assistance, how to maintain a schedule, and how to maintain new and diverse relationships.

Likewise, graduating college seniors are less prepared for demands of the workforce than in the past. As labor demands have shifted from industry-centered to service-oriented, there is very little need for completing repetitious mundane tasks such as are found on assembly lines. According to Soulé and Warrick (2015), “Over the last several decades, the industrial economy based on manufacturing has shifted to a service economy driven by information, knowledge, innovation, and creativity, and this has reshaped workplaces and the nature of work” (p. 179). At the time of this study, a need for innovation in the workplace trumped monotonous everyday tasks. Employers were seeking candidates who could problem-solve, take initiative, work in a team environment, and communicate with a diverse group of individuals through a variety of communication tools. As Soulé and Warrick (2015) declared, employers have found that both high school and college graduates are largely deficient in these skills.

Accordingly, there has been a steep deficiency in critical soft skills in students entering and exiting college (Flores, Matkin, Burbach, Quinn, & Harding, 2012; Kennedy & Purdie, 2013). Neither high schools nor colleges are preparing students for demands of the workforce and teaching students the necessary skills employers seek. As Kennedy and Purdie (2013) posited, “Employers now expect entry-level employees also to have soft skills and knowledge including communication, teamwork, networking, critical thinking, global understanding, perspective, organizational culture, and project management” (p. 26). Such skills do not evolve in isolation. They must be fostered and

allowed to develop by providing opportunities and experiences to students that support 21st century skills learning. Kennedy and Purdie (2013) continued by emphasizing, “We need to engage students and increase the frequency and depth to which they reflect on their experiences, integrate that with what they already know, and apply their new knowledge” (p. 28).

To reinforce the notion of this deficiency in soft skills, Flores et al. (2012) maintained, “As we have developed into a knowledge society, with global, ethical, and moral problems unprecedented in their scope and nature, the goal of simply imparting knowledge may no longer serve society well” (p. 220). Flores et al. (2012) attributed the deficiency in soft skills to continued use of traditional instructional methods. As they reported, evidence shows that these methods are not correlated to supporting critical thinking, student engagement, or self-reflection. On the contrary, Miri, David, and Uri (2007) found “if teachers purposely and persistently practice higher order thinking strategies . . . , there is a good chance for a consequent development of critical thinking capabilities” (p. 353). Commenting on Miri et al.’s study, Flores et al. (2012) stated, “Higher order thinking skills led to enhanced critical thinking” (p. 221).

Research has suggested that inclusion of 21st century skills instruction has a positive effect on college enrollment (Craig, 2015; Yang, Zeiser, and Siman, 2016). In a study comparing college enrollment rates between two New Tech schools to traditional schools in Texas, Craig (2015) found that students attending the project based learning schools were, on average, 25% more likely to enroll in college after graduating than students attending traditional schools. The study determined a statistical significance of $\chi^2(4, N = 180) = 9.89, p = 0.04$.

Yang et al. (2016) found similar results when conducting a study examining the effects of schools that incorporate deeper learning instruction and college enrollment. Deeper learning is defined as “mastery of core content knowledge and of the skills that help students communicate their ideas effectively, think creatively, work collaboratively, and manage their own learning” (Yang et al., 2016, p. 1). In the study, 13 high schools in California and New York affiliated with networks promoting deeper learning skills were included. For comparison purposes, a matched school that did not incorporate these instructional techniques was chosen for each network school. Yang et al. (2016) concluded, “Students who attended network high schools were significantly more likely to enroll in college than were students in non-network high schools” (p. 4). They further posited, “The effect of attending a network high school on overall college enrollment, as well as the effect on enrollment in four-year institutions, was positive and significant for students who entered high school with below-average achievement test scores” (p. 5).

Stakeholders in Education

Individuals impacted by any educational model include a variety of stakeholders. For this study, school boards, parents, students, and teachers are identified as stakeholders in education. Leithwood, Seashore Louis, Anderson, and Wahlstrom (2004) discussed the influence principals have over these stakeholders as it relates to student learning. Leithwood et al. (2004) described the process of affective change as starting in the relationship building process and the focus of authority. “School boards are often among the key instigators for reform” (Leithwood et al., 2004, p. 44). Leithwood et al. (2004) also declared, “Evidence is quite strong in identifying . . . relationships with parents . . . as potentially powerful determinants of students learning” (p. 13).

Teachers are important members of the stakeholder group. As Leithwood et al. (2004) acknowledged, “Successful leaders develop and count on contributions from many others in their organizations. Principals typically count on key teachers for such leadership” (p. 7). Perhaps the most critical component of the stakeholder group is students. Zion (2009) posited, “As central stakeholders and beneficiaries of the educational system, students should be considered essential participants to any effort to reform educational systems” (p. 133). Unfortunately, students are often not taken into account when making educational decisions that affect them. According to Ingman, Lohmiller, Cutforth, Borley, & Belansky (2017), “Curriculum in the United States has grown increasingly standardized-developed for national audiences without the recognition of the unique contexts of students and teachers” (p. 10).

Summary

The importance of preparing students for the demands of college, career, or life in general is evident through the literature search encompassed within this study. Traditional methods of instruction have been discussed and shown to be less effective than teaching methods that include instruction in soft skills for preparing students for the challenges they will face when attending college or entering the workforce. Research at the time of this study has indicated students lack essential 21st century skills, described as 4Cs, needed to navigate college systems. Some research has suggested programs incorporating 21st century skills instruction in high school correlates to higher success rates in meeting and overcoming those lack of soft skills challenges.

Chapter III presents methods used in this study. Factors include participants, sampling methods, research design, instrument, and procedures. Chapter IV presents

results from the analysis of data gathered. Chapter V includes an interpretation of the findings, limitations of the study, implications, recommendations, and a short summary of the study.

CHAPTER III

METHODOLOGY

The purpose of this study was to bring awareness to education policy makers and educators in ND for supporting schools in the process of implementing innovative education after enactment of Senate Bill 2186 (2017). Information gained will hopefully support principals and school districts in the process of implementing innovative education. Chapter III describes procedures used in this study, selection of participants, research plan design, instruments used to collect data, data collection, analysis of data, and a summary. Research questions that guided this dissertation were:

1. What are North Dakota principals' perceptions of the level of implementation of 4Cs instruction in their school buildings?
2. What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?

3. Is level of implementation of 4Cs instruction dependent upon size of school (number of students)?
4. Is level of implementation of 4Cs instruction dependent upon type of school (e.g. elementary, middle/junior high; secondary; or a combination of elementary, middle/junior high, secondary grade levels)?

Population

ND principals from 172 public elementary, 24 public middle/junior high, 36 public secondary schools, and 131 public elementary, middle/junior high, secondary combination schools (NDDPI, 2017) across the state of North Dakota were invited to complete a survey to solicit answers to research questions contained in this study. The goal was to have a response rate of 33.3% or 121 principals responding. Schools were categorized by level and enrollment. Type of school was categorized as:

- Elementary (prekindergarten through fifth grade)
- Middle (sixth grade through eighth grade)
- Secondary (ninth grade through twelfth grade)
- Elementary, middle/junior high, secondary combination schools (any combination of grades between prekindergarten through twelfth grade)

School enrollment was categorized in the following manner:

- Less than 200 students
- 201 to 1000 students

- 1001 to 2000 students
- Over 2000 students

Due to convenience, a simple, nonprobability, total population purposive sampling model was used. This sampling method was used to gain as much data and insight as possible from head principals in 363 ND public schools. Because a form of total population sampling was used, *all* public school principals in ND were given an opportunity to participate in completing the survey in this study. The plan was to support a more succinct extrapolation of population perceptions by attempting to obtain a higher number of completed surveys than if only a sample of the population had been invited to participate. The theory is the more individuals a researcher invites to respond to a survey, the more responses the researcher is likely to get. All surveys were anonymous so as not to influence responses.

Research Design

A quantitative non-experimental, design was used to measure frequencies of responses and correlations between variables within the study and to seek data necessary to influence development of policy designed to support schools in their implementation of innovative education (Warner, 2008). The research was accomplished using a cross sectional approach through a survey design model. Due to the nature of this study and the projected outcome, quantitative statistics was the most logical approach to use.

Instrument

A survey (Appendix C) was administered using UND’s Qualtrics (2018) web based survey design software. The survey instrument used a 5-point Likert-type scale to gauge strength of perceptions in respondents (Table 4).

Table 4. Five-Point Likert Scale.

1	2	3	4	5
<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neither Agree Nor Disagree</i>	<i>Agree</i>	<i>Strongly Agree</i>

Statements within the survey focused on perceived levels of implementation of 4Cs instruction, perceived factors that support 4Cs implementation and perceived roadblocks, and differences in perceived levels of implementation compared to school size and school grade levels. The researcher developed the survey instrument using modified measures adopted from *Measures for Clinical Practice and Research, Volume 1: Couples, Families, and Children* (Corcoran & Fischer, 2013). A five-point scale allowed for statistical analysis of data collected.

Procedures

Principals were emailed a link to the survey, using the ND elementary principal listserv and the ND secondary principal listserv, and that link directed participants to the Qualtrics survey instrument. Middle school principals were listed within the two ND listserves. Respondents were given 5 days to complete the survey. A reminder email was sent on the sixth day to prompt those who had not completed the survey to do so as soon as possible. The survey requested no identifying information and afforded no risk for respondents. Completion of the survey implied consent to participate in the study.

Data Analysis

A codebook was used to keep data organized (Appendix D). Once the survey window closed, data was transmitted into the Statistical Package for the Social Sciences (SPSS). SPSS “is a computer program that performs statistical calculations, and is widely available on college campuses” (Gravetter & Wallnau, 2017, p. 683).

In order to answer Research Question 1 (What are North Dakota principals’ perceptions of the level of implementation of 4Cs instruction in their school buildings?), descriptive statistics were performed using the survey instrument to analyze central tendency and variability. Resulting data was placed into Table 8. Next, a frequency calculation was conducted to determine if there was a normal distribution. Data was also placed into Table 8 and a histogram was created. According to Warner (2008), “Visual examination of the histogram is a way to evaluate whether the distribution in shape is reasonably close to normal or to identify the shape of a distribution if it is quite different from normal” (p. 141).

In order to answer Research Question 2 (What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?), internal consistency was analyzed using Cronbach’s Alpha. Six constructs – school board, parents, teachers, students, funding, and NDDPI – were established. Several statements on the survey were developed to study each construct, and respondents were asked to indicate their level of agreement or disagreement with each statement (Table 5).

To answer Research Question 3 (Is level of implementation of 4Cs instruction dependent upon size of school (number of students)?), an ANOVA was conducted. According to Gravetter and Wallnau (2017), “*Analysis of variance (ANOVA)* is a hypothesis-testing procedure that is used to evaluate mean differences between two or

more treatments (or populations)” (p. 366). Although t tests serve a similar purpose, more than two groups were measured so ANOVA tests were the appropriate choice to maintain a Type I error rate of 5%.

For this calculation, the dependent variable was *level of implementation* and the independent variable was *school size* (enrollment size). A SPSS SPLIT FILE command was conducted to compare descriptive statistics of each group within the independent variable. Resulting data was placed into Table 12 for analysis. If normality was assumed based on descriptive statistics, a one-way ANOVA was conducted. Data was also placed into Table 12 for analysis. Using $p < .05$, if the ANOVA p -value was significant, post-hoc t tests using a Tukey test were conducted to analyze where differences exist.

Table 5. Constructs With Corresponding Survey Statements.

School Board	Parents	Teachers	Students	Funding	NDDPI
The school board works hard to meet the changing demands of the world	Parents want their children to get real-world experiences	Teachers support administrative decisions	Students work hard to learn skills to be successful in life	Changing the curriculum costs too much	NDDPI has not given enough direction for innovative education
The school board does not support administration in attempts to implement change	Parents always complain	Teachers are resistant to change	Change is hard for students	Our budget is just enough to fund what we do now	NDDPI provides adequate resources for innovative education
The school board will not approve new curriculum	Parents don't like the education we are providing children	Teachers will not implement change on their own	Students believe they receive a great education	It's hard to budget for new ideas	NDDPI has not thought through how to support innovation
The school board is proactive in finding new ways to make education better	Parents believe students receive a great education	Teachers will always try new things	Students are excited with school work that is authentic		NDDPI provides multiple opportunities for PD in innovative education
The school board supports administrators' decisions	Parents ask the school to be more innovative	Teachers believe students need 21 st century skills to be successful in life	Students focus on success in life		There are not enough resources from NDDPI to implement innovative education

Table 5. cont.

School Board	Parents	Teachers	Students	Funding	NDDPI
The school board doesn't take administrators' ideas seriously	Parents are highly supportive of new ideas	Teachers would rather lecture, give quizzes, and give tests	Students ask for more opportunities to learn		NDDPI has done a great job of giving districts information and direction about innovative education
The school board does not want to change	Parents work hard to provide opportunities for their children to solve problems on their own	Teachers are always trying new things on their own	Students do not put in an effort to learn new things		
51 The school board is negative when discussing anything new	Parents complain whenever something changes at school		Students would rather write notes and take tests		
The school board does not give administration or staff enough autonomy	Parents feel the most important thing is for their children to be prepared for the 21 st century				
The district is willing to spend whatever it takes to implement innovative education					

To answer Research Question 4 (Is level of implementation of 4Cs instruction dependent upon type of school (e.g. elementary, middle/junior high; secondary; or a combination of elementary, middle/junior high, secondary grade levels)?), an ANOVA was conducted. More than two groups were tested. In this case, ANOVA was the appropriate choice to maintain a Type I error rate of 5%.

For the purpose of this calculation, the dependent variable was *level of implementation* and the independent variable was *school type*. A SPSS SPLIT FILE command was conducted to compare descriptive statistics of each group within the independent variable. Resulting data was placed into Table 13 for analysis. If normality was assumed based on descriptive statistics, a one-way ANOVA was conducted. Data was also placed into Table 13 for analysis. Using $p < .05$, if the ANOVA p -value was significant, post-hoc t tests using a Tukey test were conducted to analyze where differences exist.

Summary

Chapter IV includes results from analysis of data gathered. Chapter V includes an interpretation of findings, limitations, implications, recommendations, and a summary of the study.

CHAPTER IV

RESULTS

This chapter presents results of research conducted of principals' perceptions of implementation levels of innovative education in North Dakota schools. The purpose of this study was to bring awareness to education policy makers and educators in ND by ascertaining perceived levels of implementation of innovative educational practices, specifically 4Cs instruction: communication, collaboration, creativity, and critical thinking (Couros, 2015) and possible supports or roadblocks to implementing 4Cs instruction. This chapter is divided into sections consisting of: information on the research population, analyses on each of the four research questions, and a summary.

The following research questions were used to guide the study:

1. What are North Dakota principals' perceptions of the level of implementation of 4Cs instruction in their school buildings?
2. What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?
3. Is level of implementation of 4Cs instruction dependent upon size of school (number of students)?
4. Is level of implementation of 4Cs instruction dependent upon type of school (e.g. elementary, middle/junior high; secondary; or a combination of elementary, middle/junior high, secondary grade levels)?

Research Population

ND principals from 172 public elementary, 24 public middle/junior high, 36 public secondary schools, and 131 public elementary, middle/junior high, secondary combination schools (NDDPI, 2017) across the state of North Dakota received an email (Appendix E), including a link to the survey developed for this study, soliciting answers to survey questions designed to answer research questions (Appendix F) in this study. Of a possible 363 principals, 98 (27%) responded to the survey with 82 (23%) completing every item. Sixteen respondents were not included in the analysis of data due to their only answering one survey item or not answering any at all. Table 6 and Figure 1 identify the distribution, by type of school, of respondents who completed every item.

Table 6. Number of Respondents According to Type of School.

Type of School	Number (Percentage) Responding
Elementary (PK-5)	23 (13%)
Middle School / Junior High (6-8)	5 (21%)
Secondary (9-12)	22 (61%)
Elementary, Middle/Junior High, and/or Secondary Combination (PK-12)	32 (24%)

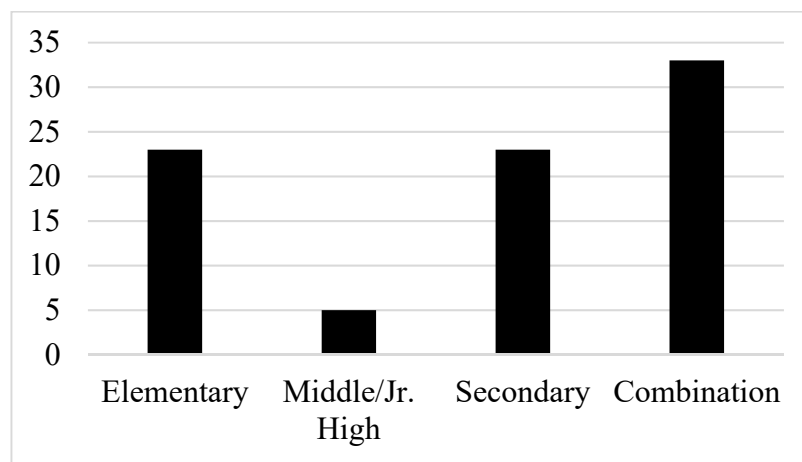


Figure 1. Respondents According to School Type.

ND Principals were also asked to categorize their school according to enrollment. School size was separated into four constructs: less than 200 students, 201 to 1000 students, 1001 to 2000 students, and over 2000 students. There were no respondents for enrollment size over 2000 students. Table 7 and Figure 2 identify the distribution, by size of school, of respondents who completed every item.

Table 7. Number of Respondents According to Size of School.

Size of School	Number (Percentage) Responding
Less Than 200 Students	44 (54%)
201 to 1000 Students	34 (41%)
1001 to 2000 Students	4 (5%)
Over 2000 Students	0 (0%)

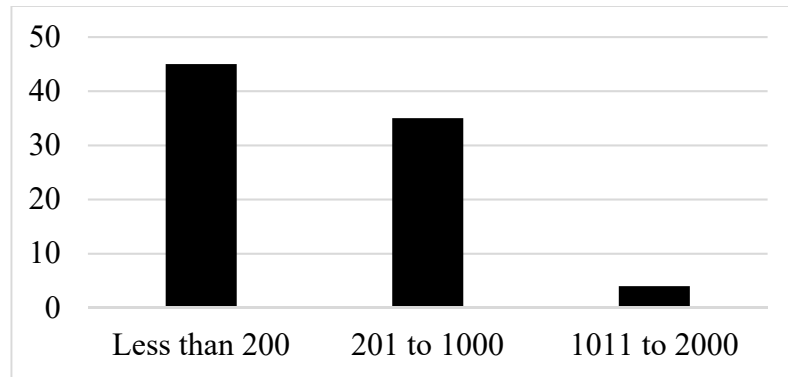


Figure 2. Respondents According to School Size (Enrollment).

This was new research and literature related to this study was limited at the time of this study. The mean of the null hypothesis for Research Questions 1 and 2 was used as a standard comparison for means resulting from data analysis because there was no hypothesized mean available from prior research to compare to. For Research Question 1, the mean of the null hypothesis is 1 = "Our school will not implement 4Cs instruction"

meaning the school has made a decision to not implement innovative instruction. For Research Question 2, the mean of the null hypothesis is 3 = "Neutral" meaning principals perceive school boards, parents, students, funding, NDDPI, and teachers as neither a roadblock or a support.

Perceptions on Levels of Implementation

Research Question 1 (What are North Dakota principals' perceptions of the level of implementation of 4Cs instruction in their school buildings?) was assessed using a One Sample *t*-Test. This test assessed level of implementation of 4Cs instruction indicated by the code *implement_lvl* and measured on a five-point Likert scale (1 = *Will Not*, 5 = *Has Implemented*). Descriptive statistics were conducted to assess data for a central tendency; and frequency of responses was assessed to examine distribution of responses.

“Skewness is the degree of distortion from the symmetrical bell curve . . . in a set of data” (Chen, 2018, para. 1). To determine amount of skewness in data for level of 4Cs implementation, the following equation was used.

$$2 * \text{Standard Error of Skewness} = \text{Amount of Skewness} \quad (1)$$

Equation 1 sets the range considered okay for value of skewness. Any value between a positive “Amount of Skewness” and a negative “Amount of Skewness” would be acceptable. In this case, two multiplied by the Standard Error of Skewness equaled 0.532. According to a frequency table generated by SPSS (Table 8), the item *implement_lvl* had a skewness value of 0.292. Since +0.292 is less than +0.532 and greater than -0.532, data did not demonstrate significant signs of skewness.

Kurtosis describes “the sharpness of the peak of a frequency-distribution curve” (“Kurtosis,” 2019, para. 1). To determine amount of kurtosis, the following was used.

$$2 * \text{Standard Error of Kurtosis} = \text{Amount of Kurtosis} \quad (2)$$

Like Equation 1, Equation 2 sets the range for an acceptable value for kurtosis. In this case, two multiplied by the Standard Error of Kurtosis equaled 1.052. Any value between a +1.052 and a -1.052 would be considered normal kurtosis, a normal peak in the data. According to data contained in a frequency table generated by SPSS (Table 8), the item *implement_lvl* had a kurtosis value of -1.237. Since -1.237 is slightly outside the acceptable range (-1.237 < -1.052), data showed signs of slight kurtosis. Figure 3 contains a histogram showing distribution of data for the item *implement_lvl*.

Table 8. Principal’s Perceptions of Implementation Levels of 4Cs Instruction.

		1	2	3	4	5
implement_lvl		<i>Will Not</i>	<i>Has Discussed</i>	<i>Is Planning</i>	<i>In Process</i>	<i>Has Implemented</i>
<i>N</i>	Valid	82				
	Missing	16				
	Mean	2.67				
	Std. Deviation	1.36				
	Skewness	.292				
	Std. Error of Skewness	.266				
	Kurtosis	-1.237				
	Std. Error of Kurtosis	.526				
	Minimum	1				
	Maximum	5				
	Frequency	24%	29%	12%	23%	11%

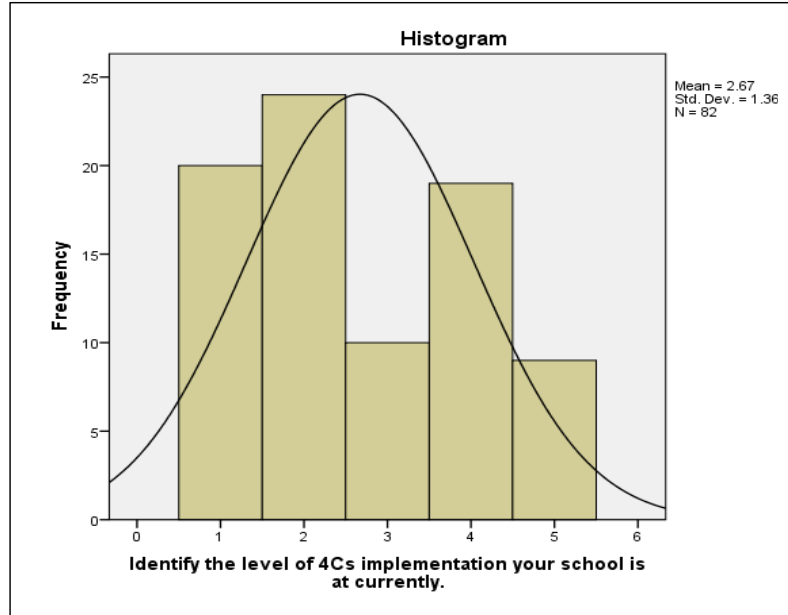


Figure 3. Distribution of Responses to Levels of 4Cs Instruction Being Implemented. According to an analysis of data using descriptive statistics, the most frequently occurring response was a 2 (*Has Discussed*) and the least frequently occurring response was a 5 (*Has Implemented*). Frequency of responses for the hypothesized mean ($M = 1$) equaled 20.

A One Sample *t*-Test (Table 9) was conducted to determine whether or not a statistical difference existed between the sample mean and the hypothesized mean ($M = 1$) of the null hypothesis.

Table 9. One Sample *t*-Test for Principals' Perceptions of Implementation Levels of 4Cs Instruction.

Independent Variable	<i>n</i>	<i>M</i> (<i>SD</i>)	Mean Diff.	<i>t</i>	<i>df</i>	<i>p</i>
Principals' perceived levels of implementation of 4Cs instruction	82	2.67(1.36)	1.67	11.11	81	.000*

* $p < .05$

The mean of responses of principals' perceptions of implementation of 4Cs instruction in their buildings was significantly higher than the hypothesized mean ($M = 1$) based on a significance level of 95% ($p < .05$). Taking frequency and significance into account, the null hypothesis can be rejected. The null hypothesis in this case was, "School administrators' perceptions of the level of implementation of 4Cs instruction in their school buildings will be schools are not implementing 4Cs instruction." Since the null hypothesis is rejected, the researcher concludes, administrators' perceptions of level of implementation of 4Cs instruction in their school buildings was there is some level of implementation occurring.

Perceived Roadblocks and Supports

Prior to conducting a statistical analysis on data for Research Question 2 (What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?), six constructs were established – school board, parents, students, funding, NDDPI, and teachers. Several statements on the survey instrument were developed to study each construct, and respondents were asked to indicate their level of agreement or disagreement with each statement. Each scale associated with each construct was averaged, and Cronbach's alpha was used to test reliability of each construct's set of survey instrument statements through a measurement of internal consistency for each set of statements, each scale (Table 10).

Table 10. Results of Tests on Averaged Scales of Potential Supports or Roadblocks.

Construct Being Tested	Number of Survey Statements	α	M	SD	Actual Range
School Board	9	.86	3.79	.53	2.33-4.89
Parents	9	.63	3.37	.36	2.22-4.22
Students	9	.78	3.35	.51	1.78-4.67
Funding	7	.76	2.78	.63	1.14-4.00
NDDPI	6	.89	2.77	.72	1.00-4.00
Teachers	9	.82	3.20	.53	2.11-4.33

* Anchors of Positive Statements: 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree Nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*

* Anchors of Negatively Worded Statements: 1 = *Strongly Agree*, 2 = *Agree*, 3 = *Neither Agree Nor Disagree*, 4 = *Disagree*, 5 = *Strongly Disagree*

“Cronbach’s alpha is a measure of internal consistency, that is, how closely related a set of items are as a group” (“What Does Cronbach’s Alpha Mean,” 2019, para. 1). Each survey statement was measured using a five-point Likert scale (1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neither Agree Nor Disagree*, 4 = *Agree*, 5 = *Strongly Agree*).

Negatively-worded statements were reverse coded (5 = *Strongly Disagree*, 1 = *Strongly Agree*) so for each of the statements a high score indicated a support and a low score indicated a roadblock. No statement was removed due to inter-item correlations or alpha levels. Alpha levels appeared satisfactory. The *parents* scale ($\alpha = .63$) was the only scale below the target of $\alpha = .70$. High alpha levels, alpha levels above .70, indicate internal consistency or reliability of survey statements for measuring constructs is acceptable (Ullah, 2018).

A One Sample *t*-Test (Table 11) was conducted to determine whether or not any statistical differences existed between sample means and the hypothesized mean ($M = 3$)

of the null hypothesis. Significant differences existed between means of each of the averaged scales and the hypothesized mean ($M = 3$).

Table 11. One Sample t -Test for Constructs of Perceived Supports and Roadblocks to Implementation of 4Cs Instruction.

Construct (Independent Variable)	n	M (SD)	Mean Diff.	t	df	p
School Board	67	3.79 (.53)	.79	12.13	66	.000*
Parents	70	3.37 (.36)	.37	8.58	69	.000*
Students	71	3.35 (.51)	.35	5.67	67	.000*
Funding	71	2.68 (.63)	-.32	-4.23	70	.000*
NDDPI	68	2.77 (.72)	-.23	-2.74	67	.008*
Teachers	68	3.20 (.53)	.20	5.67	67	.003*

* $p < .05$

Results indicated some principals perceived (a) funding ($M = 2.68$, $SD = .63$), $t(70) = -4.23$, $p = .000$, and (b) the NDDPI ($M = 2.77$, $SD = .72$), $t(67) = -2.74$, $p = .008$ as roadblocks. Results also indicated many ND principal respondents perceived school board, parents, students, and teachers as supports to implementation of innovative education. The null hypothesis in this case was, “School boards, parents, students, NDDPI, teachers, and funding are neither roadblocks nor supports to implementation of 4Cs instruction.” In this case, the null hypothesis is rejected because tests indicated respondents perceived funding and the NDDPI as roadblocks, and respondents perceived school boards, parents, students, and teachers as supports to implementing 4Cs instruction.

Enrollment and Level of Implementation of 4Cs Instruction

A one-way ANOVA (Table 12) was conducted to answer Research Question 3 (Is level of implementation of 4Cs instruction dependent upon size of school?). Results

indicated differences existed in principals' perceptions of level of implementation of innovative education based on size of school (number of students enrolled).

Table 12. One-Way ANOVA Table Testing Effect of Enrollment on Perceived Levels of Implementation of 4Cs Instruction.

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>n</i> ²
Between Groups	11.21	2	5.60	3.19	.047*	.075
Within Groups	138.90	79	1.76			

* $p < .05$

In an ANOVA (analysis of variance) test, “the null hypothesis for ANOVA is that the mean (average value of the dependent variable) is the same for all groups” (Creech, 2003-2019, para. 5). The null hypothesis for this research question was, “Level of implementation of 4Cs instruction will not depend on enrollment.” According to SPSS Tutorials (2018), “Something is ‘statistically significant’ if $p < 0.05$ ” (ANOVA – Statistical Significance section, para. 2). Based on a resulting significance level of $p = .047$ (which is less than .05 and statistically significant), the null hypothesis can be rejected and the researcher concludes that principals' perceptions regarding level of implementation of 4Cs instruction in North Dakota at the time of this study was level of 4Cs instruction did depend on size of school (enrollment).

A post-hoc *t*-test using a Tukey alpha adjustment revealed schools with enrollment levels between 1001 and 2000 ($M = 4.00$, $SD = 1.41$) had a greater effect on principals' perceptions of level of innovative education implementation than schools with enrollment levels of less than 200 ($M = 2.41$, $SD = 1.20$) and schools with enrollment levels between 201 and 1000 ($M = 2.85$, $SD = 1.46$). No principals from schools with enrollment levels over 2000 completed the survey, and so were not included in this study.

School Type and Level of Implementation of 4Cs Instruction

A one-way ANOVA (Table 13) was conducted to answer Research Question 4 (Is level of implementation of 4Cs instruction dependent upon type of school?). Results indicated no differences existed in principals’ perceptions of level of implementation of innovative education based on type of school.

Table 13. One-Way ANOVA Table Testing Effect of School Type on Perceived Levels of Implementation of 4Cs Instruction.

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>n</i> ²
Between Groups	9.34	3	3.11	1.72	.169*	.062
Within Groups	140.78	78	1.81			

* $p < .05$

According to SPSS Tutorials (2018), “Something is ‘statistically significant’ if $p < 0.05$ ” (ANOVA – Statistical Significance section, para. 2). Based on a resulting significance level of $p = .169$ (which is greater than $.05$), we fail to reject the null. The null hypothesis for Research Question 4 was, “Level of implementation of 4Cs instruction will not depend on type of school.” Elementary schools ($M = 2.96, SD = 1.36$); middle/Jr. high schools ($M = 3.00, SD = 1.58$); secondary schools ($M = 2.91, SD = 1.444$); and combination elementary, middle/Jr. high, and/or secondary schools ($M = 2.25, SD = 1.22$) showed no significant effect on principals’ perceptions regarding level of innovative education implementation in their schools.

Summary

In this chapter, results of analyses examining principals’ perceptions regarding levels of implementation of innovative education in their schools, principals’ perceptions of supports and roadblocks to implementation of 4Cs instruction, differences in

implementation levels based on school size (number of students enrolled), and differences in implementation levels based on school type were discussed. Null Hypothesis 4, “Level of implementation of 4Cs instruction will not depend on type of school (e.g. elementary; middle/junior high; secondary; elementary, middle/junior high, secondary combination schools)” was supported by the data. A significant difference was determined to exist between the sample mean and a hypothesized mean in Research Question 1, thus rejecting Null Hypothesis 1, “School administrators’ perceptions of the level of implementation of 4Cs instruction in their school buildings will be schools are not implementing 4Cs instruction.”

A significant difference between sample mean and hypothesized mean existed for perceived supports and roadblocks in Research Question 2 rejecting the null hypothesis, “School boards, parents, students, NDDPI, teachers, and funding are neither roadblocks nor supports to implementation of 4Cs instruction”. Respondents indicated funding and the NDDPI acted as roadblocks, and respondents perceived school boards, parents, students, and teachers acted as supports to implementing 4Cs instruction. A significant relationship was determined to exist between school enrollment size and level of implementation of 4Cs instruction in Research Question 3. The null hypothesis, “Level of implementation of 4Cs instruction will not depend on enrollment” was rejected.

Results are discussed further in Chapter V. Implications for ND education policy makers and educators are discussed as well. Limitations of this study and suggestions for further research are also included in Chapter V.

CHAPTER V

DISCUSSION

The purpose of this quantitative study was to bring awareness to education policy makers and educators in ND for supporting principals in the process of implementing innovative education after the enactment of Senate Bill 2186 (SB 2186) in 2017. Chapter V provides discussion related to findings from this research study pertaining to public school principals' perceptions of the level of innovative education implementation in their schools, possible supports and roadblocks to implementation, and any differences in the level of implementation based on school enrollment and school type. Connections to and implications associated with Senate Bill 2186 are discussed as well. Chapter V concludes with a discussion of limitations, recommendations for future research, and a summary.

Chapter V contains discussion to help answer the research questions:

1. What are North Dakota principals' perceptions of the level of implementation of 4Cs instruction in their school buildings?
2. What do North Dakota principals view as perceived roadblocks and supports to 4Cs instruction implementation?
3. Is level of implementation of 4Cs instruction dependent upon size of school (number of students)?

4. Is level of implementation of 4Cs instruction dependent upon type of school (e.g., elementary, middle/junior high; secondary; or a combination of elementary, middle/junior high, secondary grade levels)?

Principals most frequently perceived innovative education as being in the discussion phase. The least occurring response among participants was that of being already implemented in their schools. If a numerical value was assigned to responses and the values were averaged, the mean value of level of implementation would put average level of implementation somewhere between being discussed and being planned.

A variety of supports for implementing innovative education were identified and included school boards, parents, students, and teachers. Consequently, principals perceived the NDDPI and funding as potential roadblocks to the process of implementing innovative education, at least at the time of this study. Research findings demonstrated there were differences in implementation based on school enrollment (number of students) but not based on type of school (elementary; middle/junior high; secondary; elementary, middle/junior high, secondary combination schools).

Interpretation of Findings

The Every Student Succeeds Act of 2015 was signed into law in December of 2015. ESSA created an opportunity for states and public schools to implement innovative ways for education to be delivered to students. Innovative education, through a variety of methods, has proven to be beneficial in preparing students to be successful in their future (Carter, 2016; Craig, 2015; Kang et al., 2012). For the purpose of this study, innovative education has been defined as instruction incorporating any of the 4Cs:

communication, collaboration, creativity, and critical thinking (Wagner & Dintersmith, 2015).

Following the enactment of ESSA, ND took steps to support implementation of innovative education with the creation of Senate Bill 2186 (2017). Senate Bill 2186 allowed schools to create and implement innovative education plans not confined by state curriculum guidelines and required concentrated time be spent during instruction in each content area (“Burgum, Baesler Applaud Innovative Education Bill,” 2017). As of July 2018, out of 363 ND schools, only four have submitted such waivers (Gerhardt, 2018).

Principals’ Perceptions on Levels of Implementation of Innovative Education

Principals’ responses to items related to levels of innovative education implementation varied on a continuum from *will not implement* to *have already implemented*. More than 75% of responses from the 82 principals that fully completed the survey were associated with some level of implementation. There was no readily apparent reason for this high perception of some level of implementation occurring, but it does run counter to Senate Bill 2186 (2017) and may relate to why only four schools have submitted waivers to implement innovative programs (Gerhardt, 2018). This study's results indicated principals believe instruction in the 4Cs has already been occurring in their schools. Thus, it is reasonable to suggest they believe there is no valid reason for completing and submitting the lengthy application required for requesting a waiver.

Perceived Supports and Roadblocks to Implementation

Six categories or constructs were delineated as possible supports or roadblocks to implementation of innovative education. These constructs included: school board, parents, students, funding, NDDPI, and teachers. Principals perceived school board,

parents, students, and teachers as supports to implementation of innovative education. Interestingly, these categories comprise the major stakeholders involved in the education process at the local level and ones which the principal has most contact with and control over (Leithwood et al., 2004). Principals are able to communicate on a regular and consistent basis with these stakeholders and have the opportunity to provide influence in both positive and negative ways.

Principals identified funding and the NDDPI as potential roadblocks to implementation of innovative education. A possible reason for funding being perceived as a roadblock is the minimal control principals have over it. Funding flows from state to district to school. Outside of grants for special projects, principals have very little extra funding for implementing new programs. Although research suggests incorporating innovative education can be affordable (Saavedra & Opfer, 2012; Kang et al., 2012; Yildirim et al, 2001), principal perceptions in this study construed cost to be an issue. Likewise, principal perceptions pointed to the NDDPI as somewhat of a hindrance in implementation of innovative education. While no specific reasons were evident at the time of this study, the process for applying for permission to develop and implement an innovative education program, as described in the ND Administrative Code (Appendix B), may itself be part of that negative perception.

How School Size Affects Level of Implementation

This study concluded that a statistical significance existed in implementation level of 4Cs instruction based on enrollment at the time of this research. Principals of schools with enrollments between 1001 to 2000 students (i.e., larger schools) perceived their schools were at higher levels of implementation than smaller schools. Interestingly,

while schools with enrollments between 201 to 1000 students and schools with 200 or less students exhibited some influence on levels of implementation, their means fell well below that of the highest group. Of the four schools that have submitted educational waivers under Senate Bill 2186 (2017), three were in the category 201 to 1000 students and one was in the category 1001 to 2000 students. Reviewed literature pertaining to this research question (Blanchard et al., 2010; Carter, 2016; Craig, 2015; Kang et al., 2012), centered on schools with enrollments between 360-2400 students. These findings may suggest that administrators of smaller schools perceive more prominent roadblocks to implementation of innovative education than administrators of larger schools. Smaller schools tend to have less flexibility within their budgetary expenditures due to lower funding, which may relate to analysis from this study signifying funding as a roadblock to implementation.

How School Type Affects Level of Implementation

This study's results suggested no statistical difference existed in implementation levels of 4Cs instruction based on school type. In the study, principals of 23 elementary schools participated, 5 principals from middle/Jr. high schools participated, 22 principals from secondary schools participated, and 32 principals from elementary, middle/Jr. high, and/or secondary combination schools participated. Analysis of data showed no difference in the relationship between type of school and level of implementation of innovative education. Literature reviewed for this study focusing specifically on school type (Blanchard et al., 2010; Carter, 2016; Craig, 2015; Kang et al., 2012) concentrated discussion on middle and high schools. It was surprising that inferential analysis did not show a relationship due to flexibility in curriculum delivery found at certain levels. The

researcher expected elementary and middle schools to show some significance in connection with implementation level because they have not been bound by structure and seat time (Bitterman & Hess, 2015; Laats, 2015; Reigeluth & Karnopp, 2013; Silva & White, 2015; Spring, 2018) to the degree high schools have been.

Implications

This study has important implications for ND education policy focusing on innovative education. Senate Bill 2186 (2017) gave schools latitude in implementing educational practices incorporating innovative strategies and techniques that support building students' proficiencies in the 4Cs. Employers have claimed the highest qualities needed in employees entering the workforce are communication, teamwork, and problem-solving skills (Beard et al., 2008). Research indicates students leaving high school have needed, but are deficient in, these skills necessary to navigate college environments or compete in the labor force (Adams, 2012; Dutton, 2012; Soulé & Warrick, 2015).

Principals in this study indicated school boards, parents, students, and teachers support implementation of 4Cs instruction but funding and the NDDPI tend to be roadblocks to the process. This may suggest that principals believe they have very little control over these two components (funding and the NDDPI). It may be an effective strategy for state officials wishing to encourage implementation of 4Cs instruction to communicate directly with school principals wishing to implement innovative education in their buildings to more effectively assist principals in implementing 4Cs programs. It may also be helpful to streamline the application process, defined in the ND Administrative Code CH 67-19-03 (Appendix B), so as to remove any angst principals

may experience in the process or to simplify an over complicated process. Perhaps, schools, some of which barely support the year to year management of their school systems, that prove adopting educational practices incorporating the 4Cs is cost effective and will not overburden their budgets could be provided with more resources to implement innovative education.

Findings from this study also indicated there was a relationship between size of school and level of implementation of 4Cs instruction but differences in level of implementation of 4Cs instruction were not related to type of school (elementary; middle/junior high; secondary; or a combination of elementary, middle/junior high, and/or secondary schools). Principals of schools with enrollments between 1001 to 2000 students perceived their schools were at higher levels of implementation of innovative education than principals of smaller schools perceived their schools to be. Part of the reason may again pertain to perceptions on funding. Smaller schools, such as those with enrollments of 200 students or less, typically have only enough funding to sustain expenses for operating the building and paying salaries and benefits. Smaller budgets can make principals' perceptions of their objectives to add new programs or revise existing programs to be out of reach. With a perception that funding is a roadblock to implementing a form of innovative education, principals may believe it would be too costly to take on such a task.

Limitations

There are limitations involved in this study that should be taken into consideration. One such limitation may be the newness of Senate Bill 2186 (2017) and the newness of the trend to incorporate innovative education in schools. Although

research has supported the benefits of innovative education and teaching of the 4Cs (Saavedra & Opfer, 2012; Soulé & Warrick, 2015), this newness may create a conflict with traditional pedagogical beliefs of learning development (Silva & White, 2015; Yildirim et al., 2001) resulting in many administrators continuing to support traditional ways of teaching. Time may be the variable that changes these perceptions.

Recommendations

On the basis of this study's results, recommendations for policy makers, school districts, principals, and educators in implementing innovative education are as follows.

- Forums should be conducted with all stakeholders, including principals, for discussing innovative education. Such forums should include descriptions of a variety of innovative education practices, benefits of implementing innovative education in ND public schools, steps involved in the implementation of such practices, and methods to evaluate the feasibility of implementing innovative education in a school regardless of type of school or size of enrollment.
- Principals have identified the NDDPI as a roadblock to implementation of innovative education. It is recommended that the NDDPI develop a plan for better informing principals about the benefits of how innovative education provides for student engagement and achievement. The NDDPI could develop discussion panels comprised of principals who are implementing innovative education practices and conduct listening tours to bring current information to those principals who may be skeptical. Even though data indicated the NDDPI to be a hindrance, this researcher believes NDDPI is ultimately responsible to the

state-wide education community for communicating new and relevant trends in education that focus on the best interests of students and promote their future success.

- Principals have identified funding as a roadblock to implementation of innovative education. It is recommended that the NDDPI, the North Dakota School Board Association (NDSBA), and Regional Education Agencies (REA) provide links on their websites to resources for supporting implementation of innovative education. Links should include access to state, regional, and federal grants; examples of innovative education with sample lesson plans; and projected associated costs.
- Principals, as instructional leaders of their schools, should be responsible for creating strategic plans focused on the implementation of innovative education. Principals should develop such plans in partnership with a variety of stakeholders to include teachers, students, parents, community members, and community business leaders.
- It is also recommended that superintendents, as educational leaders of school districts, add a line item to their annual budgets designated for funding innovative education.

Future Research

Future research should consider perceptions of all stakeholders involved in education and comparisons should be drawn between those other stakeholders and ND school principals. Research should also be conducted that analyzes principals' understandings of 4Cs instruction and their level of knowledge pertaining to the

relevance and importance of innovative education to today's and the future's workforce. Qualitative analysis should be conducted to include more in-depth discussion focusing on why these perceptions exist. Themes developed from this data could support the creation of a more viable strategy for supporting principals in their implementation of innovative education. Focus groups could be constructed to generate richer responses based on defined and specific scopes and objectives.

Summary

This dissertation examined ND principals' perceptions pertaining to level of implementation of 4Cs instruction in their schools. Results suggested many ND principals surveyed believed innovative education was either in the process of being implemented or had been implemented in their schools. There was a large fraction of respondents ($n = 20$, 24%), though, that did not think they would implement 4Cs instruction.

Perceived supports and roadblocks to implementation were also examined. Findings suggested school boards, parents, students, and teachers were perceived as supports in the implementation of innovative education but funding and the NDDPI were acting somewhat like roadblocks. Differences in level of implementation of 4Cs instruction existed based on school enrollment but did not exist when type of school was taken into account.

This study should be used as a starting point for literature reviews related to implementing innovative education in ND and serve as an impetus for providing needed support to principals interested in incorporating 4Cs instruction into their schools and completing educational waivers allowed under Senate Bill 2186 (2017).

APPENDICES

Appendix A

NDCC § 15.1-06-08.1 and 15.1-06-08.2 (SB 2186, 65th Legislative Assembly, 2017)

15.1-06-08.1. Statutes - Waiver.

1. The superintendent of public instruction may not waive any statute, in whole or in part, except as provided for in this section.
2. A school or school district may apply to the superintendent of public instruction for a waiver of chapters 15-20.1, 15.1-06, 15.1-18, 15.1-20, 15.1-21, 15.1-22, 15.1-25, 15.1-32, and 15.1-38, or any associated rules, if the waiver:
 - a. Improves the delivery of education;
 - b. Improves the administration of education;
 - c. Provides increased educational opportunities for students; or
 - d. Improves the academic success of students.
3. The initial waiver must be for a specific period of time but may not exceed one year. The school district may apply for extensions of the waiver. The first extension may not exceed a period of one year. Additional extensions may not exceed periods of two years.
4. If the superintendent of public instruction, after receipt and consideration of an application for a waiver under this section, approves the waiver, the superintendent shall file a report with the legislative management. The report must provide a detailed account of the reasons for which the waiver was granted and the specific time period for the waiver. If the superintendent of public instruction denies an application for a waiver under this section, the superintendent shall file a notice of denial with the legislative management. If requested, the superintendent shall appear and respond to questions regarding the approval or denial of any application for a waiver under this section.
5. The superintendent of public instruction shall adopt rules governing the submission and evaluation of applications and the monitoring of any school or school district that receives a waiver under this section.

15.1-06-08.2. Innovative education program – Participation – Reports to legislative management.

1. The superintendent of public instruction shall adopt rules to administer this section and develop criteria for the submission, approval, and evaluation of the proposals and plans under this section.
2. The superintendent of public instruction may accept a proposal from any public or nonpublic school, upon approval by the school board or governing

board, for participation in an innovative education program. The proposal must include evaluation criteria and specify the innovations to be pursued at the school or school district level and the manner in which the proposal will:

- a. Improve the delivery of education;
 - b. Improve the administration of education;
 - c. Provide increased educational opportunities for students; or
 - d. Improve the academic success of students.
3. The superintendent of public instruction may approve the proposal, reject the proposal, or work with the submitting school to modify the proposal.
 4. During the school's initial year of participation in the innovative education program, the school shall develop a comprehensive implementation plan and work with the superintendent of public instruction to ensure the long-term viability of the proposal.
 5. The superintendent of public instruction may approve the comprehensive implementation plan developed under subsection 4 for a period of up to five years. If, due to a change in circumstances, there is a determination by either the school or the superintendent of public instruction that modifications to the comprehensive implementation plan are necessary, the school and the superintendent of public instruction shall work with each other to achieve the necessary modifications.
 6. The superintendent of public instruction may revoke any waiver granted under section 15.1-06-08.1 if the superintendent of public instruction determines the school has failed to perform in accordance with the agreed upon terms of the program or failed to meet the requirements of this section.
 7. Any school participating in the program shall provide program evaluation data to the superintendent of public instruction at the time and in the manner requested by the superintendent of public instruction.
 8. The superintendent of public instruction shall provide annual reports to the legislative management regarding the innovative education program, including:
 - a. The status of the implementation plan;
 - b. A summary of any waived statutes or rules; and
 - c. A review of evaluation data results.

Appendix B
NDDPI Administrative Rules for Innovative Education
(ND Administrative Code § 67-19-03)

CHAPTER 67-19-03
INNOVATIVE EDUCATION PROGRAM

Section

67-19-13-01	Definitions
67-19-03-02	Participation
67-19-03-03	Planning Proposal - Innovative Education Program
67-19-03-04	Implementation Proposal - Innovative Education Program
67-19-03-05	Waiver

67-19-03-01. Definitions.

As used in this section:

1. "Board" means the school board of a public school district.
2. "Governing board" means the board or governing body of a nonpublic school.
3. "Superintendent" means the superintendent of public instruction.

History: Effective January 1, 2018.

General Authority: NDCC 28-32-02

Law Implemented: NDCC 15.1-06-08.2

67-19-03-02. Participation.

Any public school or school district or any nonpublic school may apply to the superintendent for participation in an innovative education program.

History: Effective January 1, 2018.

General Authority: NDCC 15.1-06-08.2, 28-32-02

Law Implemented: NDCC 15.1-06-08.2

67-19-03-03. Planning proposal – Innovative education program.

To be considered, the planning proposal at a minimum must include:

1. Rationale and vision.

- a. Provide justification for implementation of an innovative education program. Cite research, evidence-based, or best practice information.
 - b. Describe how the innovative education program will:
 - (1) Improve the delivery of education;
 - (2) Improve the administration of education;
 - (3) Provide increased educational opportunities for students; or
 - (4) Improve the academic success for students.
2. Stakeholder engagement. Describe how the planning process included stakeholders. Stakeholders should include district and school leaders, teachers and teacher leaders, students, parents, school district board or school governing board members, community and business leaders, and institutions of higher learning where appropriate.
 3. Public school district board and nonpublic school governing board – Approval. The board or governing board must approve the innovative education program planning proposal. Documentation of approval must include:
 - a. In the case of a public school, approved minutes of the meeting at which the innovative education program planning proposal was discussed and approved by the district board and signed by the president of the board and the superintendent; or
 - b. In the case of a nonpublic school, approved minutes or an official statement indicating when the innovative education program planning proposal was discussed and approved by the governing board and signed by the chair of the governing board and the chief executive officer.
 4. Professional development. Establish and describe a professional development plan aligned to the innovative education program.
 5. Application process.
 - a. Schools, school districts, and nonpublic schools are encouraged to submit an innovative education program planning proposal by November first.
 - b. No specific form is required.

- c. Innovative education program planning proposals should be mailed or emailed to the director, office of school approval and opportunity.

History: Effective January 1, 2018.

General Authority: NDCC 15.1-06-08.2, 28-32-02

Law Implemented: NDCC 15.1-06-08.2

67-19-03-04. Implementation proposal – Innovative education program.

To be considered, the implementation proposal at a minimum must include:

1. A copy of the approved innovative education program planning proposal along with evidence of one year of planning.
2. Stakeholder engagement. Describe how the innovative education program implementation proposal planning process included stakeholders. Stakeholders should include district and school leaders, teachers and teacher leaders, students, parents, school district board or governing board members, community and business leaders, and institutions of higher learning where appropriate.
3. Implementation plan. The innovative education program implementation proposal must:
 - a. Describe how the implementation proposal aligns with the school's vision for teaching and learning.
 - b. Describe the plan to initiate the implementation plan.
 - c. Include measurable goals and objectives, timelines, and action plan, including parties responsible for completion of activities.
 - d. Provide information on how the implementation plan is expected to:
 - (1) Improve the delivery of education;
 - (2) Improve the administration of education;
 - (3) Provide increased education opportunities for students; or
 - (4) Improve the academic success of students.
4. Public school district board and nonpublic school governing board – Approval. The board or governing board must approve the innovative

education program implementation proposal. Documentation of approval must include:

- a. In the case of a public school, approved minutes of the meeting at which the innovative education program implementation proposal was discussed and approved by the district board and signed by the president of the board and the superintendent; or
 - b. In the case of a nonpublic school, approved minutes or an official statement indicating when the innovative education program implementation proposal was discussed and approved by the governing board and signed by the chair of the governing board and the chief executive officer.
5. Professional development. Establish and describe a professional development plan aligned to the innovative education program.
6. Continuous improvement.
- a. Provide documentation of commitment made to a continuous improvement process that will guide schools toward the vision created by the innovative education program planning proposal.
 - b. Describe how the use of data will guide the innovative education program implementation proposal.
7. Evaluation criteria.
- a. Describe the evaluation measures to monitor the progress of innovative education program implementation as well as the measures to be used to evaluate how the program has:
 - (1) Improved the delivery of education;
 - (2) Improved the administration of education;
 - (3) Provided increased education opportunities for students; or
 - (4) Improved the academic success of students.
 - b. The evaluation plan must include multiple measures, such as quantitative and qualitative indicators, short-term and long-term goals, academic, school climate, and timelines.

- c. Early stages of evaluation must include measures, such as attendance, disciplinary incidents, student engagement, student voice, student and parent surveys, and evidence of improved instructional practices.
 - d. Mid-stages and later stages of evaluation must include measures of student performance, including academic content skills, performance indicators, as well as proficiency and growth measures.
8. Sustainability. Describe a sustainability plan designed to ensure the plan is embedded in future planning giving consideration to possible changes to school and district leaders, building administration, the district superintendent, the governing board or the chief executive officer.
9. Application process.
- a. Schools, school districts, and nonpublic schools are encouraged to submit an innovative education program implementation proposal by March first. Proposals may be submitted throughout the school year with the knowledge that implementation will begin after the proposal has been approved.
 - b. No specific form is required.
 - c. Innovative education program implementation proposals should be mailed or emailed to the director, office of school approval and opportunity.

History: Effective January 1, 2018.

General Authority: NDCC 15.1-06-08.2, 28-32-02

Law Implemented: NDCC 15.1-06-08.2

67-19-03-05. Waiver.

When deemed appropriate and necessary to implement the innovative education program implementation proposal, the superintendent may grant a waiver of all or part of statute as provided in subsection 2 of North Dakota Century Code section 15.1-06-08.1.

History: Effective January 1, 2018.

General Authority: NDCC 15.1-06-08.1, 28-32-02

Law Implemented: NDCC 15.1-06-08.1

Appendix C

4Cs Implementation Survey

UNIVERSITY OF NORTH DAKOTA
Institutional Review Board
Informed Consent Statement

Title of Project: North Dakota School Principals' Perceptions of Innovative Education Implementation Levels and Predictors

Principal Investigator: Tim Godfrey, 907-317-2289, tim.godfrey@ndus.edu

Advisor: Dr. Sherry Houdek, 701-777-3577, sherryl.houdek@und.edu

Purpose of the Study:

The purpose of this study is to influence education policy in ND by ascertaining the perceived level of implementation of innovative educational practices.

Procedures to be followed:

You will be asked to answer forty-eight questions on a survey.

Risks:

There are no known risks in participating in this research beyond those experienced in everyday life.

Benefits:

The data collected from this study will be used to support school districts and principals in the process of implementing innovative education.

Duration:

The survey will take you approximately 10 minutes to complete.

Statement of Confidentiality:

The survey does not ask for any information that would identify who the responses belong to. Therefore, your responses are recorded anonymously. If this research is published, no information that would identify you will be included since your name is in no way linked to your responses.

All survey responses that we receive will be treated confidentially. However, given that the surveys can be completed from any computer (e.g., personal, work, school), we are unable to guarantee the security of the computer on which you choose to enter your responses. As a participant in our study, we want you to be aware that certain "key logging" software programs exist that can be used to track or capture data that you enter and/or websites that you visit.

Right to Ask Questions:

Researcher: Tim Godfrey, 907-317-2289, tim.godfrey@ndus.edu

Advisor: Dr. Sherry Houdek, 701-777-3577, sherryl.houdek@und.edu

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279. You may also call this number with problems, complaints, or concerns about the research. Please call this number if you cannot reach research staff, or you wish to talk with someone who is an informed individual who is independent of the research team.

General information about being a research subject can be found on the Institutional Review Board website “Information for Research Participants”

<http://und.edu/research/resources/human-subjects/research-participants.cfm>

Compensation:

You will not receive compensation for your participation.

Voluntary Participation:

You do not have to participate in this research. You can stop your participation at any time. You may refuse to participate or choose to discontinue participation at any time without losing any benefits to which you are otherwise entitled.

You do not have to answer any questions you do not want to answer.

You must be 18 years of age or older to consent to participate in this research study.

Completion of the survey implies that you have read the information in this form and consent to participate in the research.

Please keep this form for your records or future reference.

Innovative Education includes focusing on any or all of the 4Cs: communication, collaboration, creativity, and/or critical thinking.

Innovative Education Survey

Please answer the following statements as they best fit the implementation of innovative education at your school

School type

- Elementary (PK-5)
- Middle school/Jr. high (6-8)
- Secondary (9-12)
- Elementary, middle/Jr. high, secondary combination (PK-12)

School enrollment

- Less than 200 students
- 201 to 1000 students
- 1001 to 2000 students
- Over 2000 students

Identify the level of 4Cs implementation your school is at currently.

- Our school will not implement 4Cs instruction.
- Our school has discussed implementing 4Cs instruction.
- Our school is planning to implement 4Cs instruction.
- Our school is in the process of implementing 4Cs instruction
- Our school has implemented 4Cs instruction.

Rate your agreement for implementation of each of the 4Cs.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critical Thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please select whether each choice is a support or roadblock to the implementation of 4Cs instruction at your school.

	Roadblock	Somewhat Roadblock	Neutral	Somewhat Support	Support
School Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDDPI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you perceive any other roadblocks?

- Yes
 No

If you responded yes, please explain.

Block 2

Read the following statements and rate your agreement or disagreement.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The school board works hard to meet the changing demands of the world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents want their children to get real-world experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents always complain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers support administrative decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changing the curriculum costs too much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students work hard to learn skills to be successful in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change is hard for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students believe they receive a great education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students are excited with school work that is authentic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents don't like the education we are providing children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board will not approve new curriculum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Teachers are resistant to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents feel students receive a great education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board is proactive in finding new ways to make education better	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board supports principal's decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board doesn't take principal's ideas seriously	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDDPI has not given enough direction for innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board does not want to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents ask the school to be more innovative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students focus on success in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents are highly supportive of new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers will not implement change on their own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers will always try new things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board is negative when discussing anything new	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
NDDPI provides lots of resources for innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our budget is just enough to fund what we do now	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It's hard to find money in the budget for new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents work hard to provide opportunities for their children to solve problems on their own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students ask for more opportunities to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students do not put in an effort to learn new things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board does not give administration or staff autonomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDDPI has not thought through how to support innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers believe students need 21st century skills to be successful in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDDPI provides multiple opportunities for PD in innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students would rather write notes and take tests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents complain whenever something changes at school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are not enough resources from NDDPI to implement innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Teachers are always trying new things on their own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The district is willing to spend whatever it takes to implement innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents feel the most important thing is for their children to be prepared for the 21st century	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NDDPI has done a great job of giving districts information and direction about innovative education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The school board does not support principals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students complain when they have to do something different	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We are always able to find funding when necessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We manage to fund new initiatives with no problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our district is in great financial shape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers embrace change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers lead the effort to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teachers complain constantly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix D
Survey Instrument Code Book

Questionnaire Summary:

Scale/measure	Items
School information	2
Implementation	5
Supports and Roadblocks	45
Total	52

School Type and Size

Please mark accordingly.

type	Please choose your school level. <input type="checkbox"/> (1) Elementary (PK-5) <input type="checkbox"/> (2) Middle School/Jr. high (6-8) <input type="checkbox"/> (3) Secondary (9-12) <input type="checkbox"/> (4) Elementary, middle/Jr. high, secondary combination schools (PK-12)
size	Please choose your school enrollment. <input type="checkbox"/> (1) Less than 200 students <input type="checkbox"/> (2) 201 to 1000 students <input type="checkbox"/> (3) 1001 to 2000 students <input type="checkbox"/> (4) Over 2000 students

Perceived Level of Implementation

The following statements indicate the level of implementation of innovative education based on any or all 4Cs.

1=Will Not, 2=Has Discussed, 3=Is Planning, 4=In Process, 5=Has Implemented

implement_lvl	Perceived level of 4Cs implementation
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Perceive Level of Each Individual 4C

The following statements indicate the level of implementation for each individual 4C.

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

4c_comm	Communication
4c_coll	Collaboration
4c_crea	Creativity
4c_crit	Critical Thinking

Types of Supports and Roadblocks

Select the degree that each of the following can be considered either a roadblock or a support.

1=Roadblock, 2=Somewhat a Roadblock, 3=Neutral, 4=Somewhat a Support, 5=Support

typesuproad_sb	School Board
typesuproad_p	Parents
typesuproad_s	Students
typesuproad_f	Funding
typesuproad_nddpi	NDDPI
typesuproad_t	Teachers

Do you perceive any other roadblocks?

otherrb_1	Yes
otherrb_2	No

If you respond yes, please explain.

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Perceived Supports and Roadblocks

The following list of statements pertain to supports and roadblocks in the implementation of innovative education.

School Board

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproadb_1	The school board works hard to meet the changing demands of the world
suproadb_2	The school board does not support principals
suproadb_3	The school board will not approve new curriculum
suproadb_4	The school board is proactive in finding new ways to make education better
suproadb_5	The school board supports principal's decisions
suproadb_6	The school board doesn't take principal's ideas seriously
suproadb_7	The school board does not want to change
suproadb_8	The school board is negative when discussing anything new
suproadb_9	The school board does not give administration or staff autonomy

Parents

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproadp_1	Parents want their children to get real-world experiences
suproadp_2	Parents always complain
suproadp_3	Parents don't like the education we are providing children
suproadp_4	Parents feel students receive a great education
suproadp_5	Parents ask the school to be more innovative
suproadp_6	Parents are highly supportive of new ideas
suproadp_7	Parents work hard to provide opportunities for their children to solve problems on their own
suproadp_8	Parents complain whenever something changes at the school
suproadp_9	Parents feel the most important thing is for their children to be prepared for the 21st century

Students

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproads_1	Students work hard to learn skills to be successful in life
suproads_2	Change is hard for students
suproads_3	Students believe they receive a great education
suproads_4	Students are excited with school work that is authentic
suproads_5	Students focus on success in life
suproads_6	Students ask for more opportunities to learn
suproads_7	Students do not put in an effort to learn new things
suproads_8	Students complain when they have to do something different
suproads_9	Students would rather write notes and take tests

Funding

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproadf_1	Changing the curriculum costs too much
suproadf_2	Our budget is just enough to fund what we do now
suproadf_3	It's hard to find money in the budget for new ideas
suproadf_4	The district is willing to spend whatever it takes to implement innovative education
suproadf_5	We manage to fund new initiatives with no problem
suproadf_6	Our district is in great financial shape
suproadf_7	We are always able to find funding when necessary

NDDPI

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproadn_1	NDDPI has not given us enough direction for innovative education
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suproadn_2	NDDPI provides lots of resources for innovative education
suproadn_3	NDDPI has not thought through how to support innovation
suproadn_4	NDDPI provides multiple opportunities for PD in innovative instruction
suproadn_5	There are not enough resources from NDDPI to implement innovative education
suproadn_6	NDDPI has done a great job of giving us information and direction about innovative education

Teachers

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

suproadt_1	Teachers support administrative decisions
suproadt_2	Teachers are resistant to change
suproadt_3	Teachers embrace change
suproadt_4	Teachers will always try new things
suproadt_5	Teachers lead the effort to change
suproadt_6	Teachers complain constantly
suproadt_7	Teachers will not implement change on their own
suproadt_8	Teachers believe students need 21st century skills to be successful in life
suproadt_9	Teachers are always trying new things on their own

Appendix E

Emails

Initial Email:

Dear Colleagues,

My name is Tim Godfrey and I serve in the special education department at Central Cass Public School. I am also a doctoral student at the University of North Dakota. I am conducting research on the implementation of innovative education in North Dakota public schools. I am reaching out to you in hopes of receiving your assistance in completing a survey discussing the levels of innovative education implementation and possible roadblocks and supports. If you would be so willing, I ask that you take 10 minutes to complete the survey found at the link below.

What we will learn from this survey and research could be beneficial to supporting principals in implementing innovative education. The survey requests no identifying information and all participants will remain anonymous.

Thank you, in advance, for the consideration to assist in this request. I greatly appreciate it.

[Innovative Education Survey Link](#)

Respectfully Yours,
Tim Godfrey

Follow Up Email:

Dear Colleagues,

For those of you who completed the survey on implementation of innovative education, you have my utmost thanks. I appreciate your support in this endeavor and look forward to compiling that data. If you have not yet completed the survey, I again ask for your assistance. If you will, please take 10 minutes to complete the survey found at the link below. Again, the survey asks for no identifying information and all participants will remain completely anonymous. Thank you for your participation and support.

[Innovative Education Survey Link](#)

Respectfully Yours,
Tim Godfrey

Appendix F
Frequency Tables for Construct Statements with Agree and Strongly Agree Responses

Frequency Table for Agree and Strongly Agree School Board Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproadb_1: The school board works hard to meet the changing demands of the world	3.54	.842	-.852	.360	1	5	41.8%	4.1%
suproadb_2: The school board does not support principals	1.87	.679	.734	1.450	1	4	2.0%	0%
suproadb_3: The school board will not approve new curriculum	2.00	.742	.657	.722	1	4	3.1%	0%
suproadb_4: The school board is proactive in finding new ways to make education better	3.11	.838	-.218	-.787	1	5	25.5%	1.0%
suproadb_5: The school board supports principal's decisions	3.92	.732	-.767	1.070	2	5	45.9%	12.2%
suproadb_6: The school board doesn't take principal's ideas seriously	2.04	.783	.661	.472	1	4	4.1%	0%
suproadb_7: The school board does not want to change	2.35	.891	.601	.242	1	5	7.1%	1.0%
suproadb_8: The school board is negative when discussing anything new	2.09	.737	.533	.477	1	4	3.1%	0%
suproadb_9: The school board does not give administration or staff autonomy	2.17	.810	.672	.317	1	4	6.1%	0%

Frequency Table for Agree and Strongly Agree Parents Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproadp_1: Parents want their children to get real- world experiences	2.93	.617	-.710	1.916	2	5	51.0%	9.2%
suproadp_2: Parents always complain	2.59	.904	.436	.172	1	5	8.2%	2.0%
suproadp_3: Parents don't like the education we are providing children	2.21	.735	.531	.416	1	4	4.1%	0%
suproadp_4: Parents feel students receive a great education	3.63	.543	-1.095	.208	2	4	46.9%	0%
suproadp_5: Parents ask the school to be more innovative	2.75	.823	.033	-.738	1	4	14.3%	0%
suproadp_6: Parents are highly supportive of new ideas	3.31	.664	-.432	-.721	2	4	30.6%	0%
suproadp_7: Parents work hard to provide opportunities for their children to solve problems on their own	2.80	.749	-.079	-.410	1	4	12.2%	0%
suproadp_8: Parents complain whenever something changes at the school	2.65	.858	.882	.019	1	5	11.2%	2.0%
suproadp_9: Parents feel the most important thing is for their children to be prepared for the 21st century	3.21	.754	-.168	-.809	2	5	26.5%	1.0%

Frequency Table for Agree and Strongly Agree Students Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproads_1: Students work hard to learn skills to be successful in life	3.48	.808	-.598	-.488	2	5	39.8%	3.1%
suproads_2: Change is hard for students	3.13	.985	-.261	-1.162	1	5	31.6%	2.0%
suproads_3: Students believe they receive a great education	3.49	.630	-.503	-.241	2	5	37.8%	1.0%
suproads_4: Students are excited with school work that is authentic	3.93	.662	-.837	1.855	2	5	50.0%	10.2%
suproads_5: Students focus on success in life	3.32	.789	-.292	-.744	2	5	31.6%	2.0%
suproads_6: Students ask for more opportunities to learn	2.77	.898	.100	-1.141	1	4	19.4%	0%
suproads_7: Students do not put in an effort to learn new things	2.57	.848	.980	.605	1	5	8.2%	2.0%
suproads_8: Students complain when they have to do something different	2.90	.950	.413	-.871	1	5	18.4%	3.1%
suproads_9: Students would rather write notes and take tests	2.39	.978	.730	.143	1	5	9.2%	2.0%

Frequency Table for Agree and Strongly Agree Funding Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproadf_1: Changing the curriculum costs too much	2.90	1.058	.053	-.993	1	5	22.4%	3.1%
suproadf_2: Our budget is just enough to fund what we do now	3.35	1.030	-.357	-.750	1	5	31.6%	7.1%
suproadf_3: It's hard to find money in the budget for new ideas	3.51	.924	-.301	-.786	2	5	33.7%	8.2%
suproadf_4: The district is willing to spend whatever it takes to implement innovative education	2.72	.929	-.062	-.936	1	4	17.3%	0%
suproadf_5: We manage to fund new initiatives with no problem	2.56	.906	-.075	-.731	1	4	11.2%	0%
suproadf_6: Our district is in great financial shape	2.49	1.054	-.056	-1.186	1	4	14.3%	0%
suproadf_7: We are always able to find funding when necessary	2.77	.944	-.262	-.835	1	4	18.4%	0%

Frequency Table for Agree and Strongly Agree NDDPI Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproadn_1: NDDPI has not given us enough direction for innovative education	3.15	1.051	-.091	-.525	1	5	20.4%	7.1%
suproadn_2: NDDPI provides lots of resources for innovative education	2.75	.874	-.269	-.550	1	4	14.3%	0%
suproadn_3: NDDPI has not thought through how to support innovation	3.18	.850	.353	-.397	2	5	18.4%	5.1%
suproadn_4: NDDPI provides multiple opportunities for PD in innovative instruction	2.82	.915	-.199	-.879	1	4	19.4%	0%
suproadn_5: There are not enough resources from NDDPI to implement innovative education	3.28	.944	.030	-.546	1	5	22.4%	7.1%
suproadn_6: NDDPI has done a great job of giving us information and direction about innovative education	2.65	.776	-.230	-.212	1	4	8.2%	0%

Frequency Table for Agree and Strongly Agree Teachers Construct Statements

	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Min	Max	Frequency for 4: Agree	Frequency for 5: Strongly Agree
suproadt_1: Teachers support administrative decisions	3.61	.708	-.797	.346	2	5	43.9%	3.1%
suproadt_2: Teachers are resistant to change	3.36	.954	-.167	-.602	1	5	26.5%	7.1%
suproadt_3: Teachers embrace change	2.85	.799	-.056	-.746	1	4	16.3%	0%
suproadt_4: Teachers will always try new things	2.93	.811	-.034	-1.097	1	4	20.4%	0%
suproadt_5: Teachers lead the effort to change	3.00	.872	-.393	-.746	1	4	24.5%	0%
suproadt_6: Teachers complain constantly	2.53	.855	.675	.706	1	5	6.1%	2.0
suproadt_7: Teachers will not implement change on their own	2.97	.993	.146	-1.066	1	5	23.5%	3.1%
suproadt_8: Teachers believe students need 21st century skills to be successful in life	3.92	.671	-.194	.043	2	5	42.9%	12.2%
suproadt_9: Teachers are always trying new things on their own	3.24	.836	-.179	-1.006	2	5	29.6%	2.0%

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