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Students' Perceptions of Life Skill Development in Project-Based Learning Schools

By

Kimberly A. Meyer

This Dissertation is Submitted in Partial Fulfillment

of the Requirements for

the Educational Doctorate Degree

in Educational Leadership

Minnesota State University, Mankato

Mankato, Minnesota

November 2015

Date:

This dissertation has been examined and approved.

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Abstract

This research aimed to examine students' perceptions of their life skills while attending project-based learning (PBL) schools. The study focused on three questions including: 1) What are students' perceptions of their development of life skills in project-based learning schools? 2) In what ways, if any, do students perceive an increase in their life skill development over a one-year period of time? 3) What relationship, if any, is there between grade level and students' perceptions of their life skills? The subjects were 275 6-12 students from 2 project-based learning charter schools in Minnesota. One school was located in a rural location; the other in an urban location. The triangulating data collection methods included a Likert-scale survey, semi-structured interviews, and focus groups. Quantitative analysis using SPSS were used to analyze the survey data. Qualitative analysis methods used were coding and identification of emergent themes. Qualitative results showed perceptions of most improved skills as time management, collaboration, communication, and self-directedness. Quantitative data results showed most improved skills within an academic year as responsibility, problem-solving, self-directedness, and work ethic. Self-directedness was the single skill that was evident in all data results. The results showed students' perceptions of their life skills were positive and that project-based learning helped them develop multiple life skills including, but not limited to communication, collaboration, problem-solving, responsibility, and time management. Implications of this research suggest that project-based learning has a positive influence on students' life skills development across 6-12 grade levels and helps prepare them to be successful in the 21st century global community and economy.

Acknowledgments

I would like to express my deepest gratitude to my committee members, help from friends, and support from my family.

Thank you to my doctoral advisor, Dr. Scott Wurdinger for his excellent guidance and patience, and to Dr. Julie Carlson and Dr. Jeff Biessman who provided me with insights and practical advice throughout the research and writing process. I would also like to thank my good friend, Professor Sheila Willms who was always willing to offer help and encouragement.

Finally, I would like to thank my husband, my three children, and my mother for their ongoing support and love.

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Chapter 1

Introduction

Background of Problem

In an educational era where student achievement and skills are based primarily on standardized assessments, performance-based options are limited due to federal mandates. President Obama, during his first months in office, called for the development of standards and assessments that measure more than memorization of information. He stated that we need to find out whether students possess skills for the 21st century, skills such as problem solving, critical thinking, creativity, and entrepreneurship (Toch, 2011).

There is a problem with basing student achievement and skills solely on quantitative standardized assessments that by their very nature are limited in their ability to measure beyond rote memorization and basic skills. Performance-based assessments, however, may provide a more holistic picture of students' understandings and abilities; this would allow educators to measure the 21st century skills that President Obama spoke of: critical thinking, synthesizing, problem solving, and creativity (Toch, 2011).

Qualitative inquiry is described by John W. Creswell (1998), co-director of the Office of Qualitative and Mixed Methods Research at the University of Nebraska-Lincoln, as multifaceted and one that requires us to reflect on issues by studying various components. Standardized assessments cannot measure those multiple dimensions and the complexity of learning. Quantitative measures of student learning offer only one dimension of their knowledge. According to Tashlik (2010), performance assessments are qualitative measures

that can produce more comprehensive data, which leads to a better understanding of students' abilities and needs.

Formative assessments, in general, are those that provide information about student learning during instruction; with formative assessment, careful planning and deliberation is required to ensure credibility. According to Popham (2008), the criteria for planning formative assessments must include determining what should be measured, how it should be measured, and what adjustments will be made to instruction as teachers continually link assessment to instructional objectives. Formative assessments should be authentic and multidimensional as student performance data is collected in order to know how to tailor instruction that will promote students' abilities and higher level thinking (Peaverini, 2009).

Research in the past decade has pointed to a number of benefits with using formative assessment, in particular, the project-based learning approach. Project-based learning is a constructivist-based instructional approach that uses "projects" to engage learning, encourage student motivation, and provide a method for explaining and demonstrating understanding (Barron & Darling-Hammond, 2008; Savery, 2006). Many educators refer to problem-based or project-based interchangeably (Mitchell, Foulger, Wetzel, & Rathkey, 2009); however, there may be subtle differences in approaches. Yet, project-based learning approaches are similar in that they promote academic rigor, communication, critical thinking, and collaboration (e.g., Trilling & Hood, 1999). Charter schools tend to implement project-based learning more than mainstream public schools because of their freedom in designing curriculum (Wurdinger, Haar, Hugg, & Bezon,

2007). Problem solving is a vital element in project-based learning and stems from a constructivist concept.

Because no two teachers teach project-based learning in the same way, defining and measuring its effectiveness is somewhat difficult. Ravitz (2009) operationally defined project-based learning using a broad approach to instruction as (a) an in-depth inquiry, (b) happening over an extended time, (c) student self-directed to some extent, and (d) requiring a formal presentation of results. Other features that contributed to the effectiveness of project-based learning included scaffolds and technology supports, meaningful group work, integration of multiple subject areas, intentional use of direct instruction, a connection to the local community, and ongoing assessments (Ravitz, 2009).

In a number of studies that have focused on project-based learning, it was found to be as effective as traditional approaches (Strobel & van Barneveld, 2008; Walker & Leary, 2008). Specifically, project-based learning has been shown to enable students to learn how to work in groups, communicate what they have learned, and solve problems. It increases understanding of concepts while increasing the ability to apply that knowledge as measured by standardized tests (Geier et al., 2008). Project-based learning has been effective in improving attitudes and motivation (Boaler, 1997) and has been especially strategic with lower achieving students (Geier et al., 2008; Hickey et al., 1999; Lynch, Kuipers, Pyke, & Szesze, 2005).

Some research suggests that project-based learning develops students' higher-level thinking in areas such as problem-solving skills, planning, and self-monitoring

(Brown & Campione, 1996). Students become proficient in transferring conceptual ideas throughout various learning situations (Brown & Campione, 1996; Scardamalia & Bereiter, 1991). According to Katz (1994), there are positive effects to students' self-esteem and dispositions. Although project-based learning provides enriched authentic learning opportunities and allows students to investigate and apply real-world problems and situations (Mitchell et al., 2009), the traditional teacher-directed pedagogical beliefs are deeply embedded within the public school systems and culture.

Even though there is much resistance to project-base learning, many schools are responding to this challenge by creating smaller learning communities, academies, and charter schools that focus on team teaching and interdisciplinary learning environments (National Association of Secondary School Principals, 2004). Project-based learning is a more holistic instructional strategy (Railsbeck, 2002) that provides for relevant and rigorous learning. It allows students to individualize their own learning through exploration of their interests and strengths.

Project-based learning requires in-depth learning about issues and themes that are directly related to standards in the various content areas. Students develop ownership because they choose personally relevant projects and learn to self-monitor as they identify goals, resources, and timelines that enable them to accomplish their tasks. Teachers take on the roles of advisors, facilitators, and coaches. Although they do not resign their control of the learning, the students take part in the learning situations and teachers are able to better facilitate and differentiate learning for each individual student. Collaboration is a key component. Students learn collaboration skills as they

share ideas and points of view with their instructors, peers, and adults within the community. They continually reflect on their work through portfolios, journals, and evaluation rubrics that are designed to help them reach their personal goals. According to the Buck Institute for Education (2002), project-based learning helps students master both content and process. It emphasizes real-world skills, integrates various disciplines, and meets the needs of a wide range of learning styles. It actively engages students as they delve into more profound levels of learning (Harada, Kirio, & Yamamoto, 2008). Newell (2003) defines project-based learning as emphasizing student interest rather than following a fixed curriculum. It has a broad interdisciplinary application that focuses on data and materials developed by students rather than teachers.

With project-based learning, assessment is authentic. It measures skills that are not measurable through standardized tests. A student's mastery of skills is measured through performance-based assessment including rubrics, self-evaluation, and reflection (Bell, 2010). Through collaboration, solving real-world problems, and inquiry through deep learning and research, students are able to develop critical skills that will help prepare them for 21st century needs.

With the ongoing No Child Left Behind (NCLB) 2001 legislation that promotes teacher accountability and student achievement primarily through high test scores, project-based learning is a different type of learning through critical thinking and problem solving. There is a need to investigate not only students' test scores, but to further explore the development of crucial life skills needed for the 21st century.

Purpose Statement

It is the purpose of the research to examine 6-12 grade students' perceptions of their life skills development at two project-based learning charter schools over a one-year period. This study will explore how students perceive their life skills growth during the 2012-2013 school year at Avalon Charter School in St. Paul, Minnesota, and Minnesota New Country School in Henderson, Minnesota. Specific life skills not determined in advance may surface and will be included in the results. Project-based learning is identified in this study as curriculum that is driven through inquiry, student choice, and individualized learning plans.

Research Questions

The main research questions for this study are:

- What are students' perceptions of their development of life skills in project-based learning schools?
- In what ways, if any, do students perceive an increase in their life skill development over a one-year period of time?
- What relationship, if any, is there between grade level and students' perceptions of their life skills?

Significance of the Research

There is pressure for students to be successful in the current content areas of public education and to demonstrate their achievement and knowledge through standardized testing and evaluations. Teachers are also being pressured to push their students and to show accountability of their teacher effectiveness through their students'

test scores. Although test scores and knowledge of content areas are important for preparation of future careers, college, and other life pursuits, there remain other skills that are essential for preparing students for the next level of life. Critical thinking, problem-solving, work ethic, communication, and teamwork are only a few of the life skills that are necessary to be successful in the 21st century. Charter schools were chosen for this research study because they tend to have more freedom to design curriculum and initiate student interest than mainstream public schools (Wurdinger et al., 2007).

Avalon Charter School and Minnesota New Country School both focus curriculum and instruction on project-based learning that is student-directed, which creates a sense of ownership and collaboration (Wurdinger & Enloe, 2011). Both schools have a curriculum that allows students to create meaningful learning experiences through their projects. Students work individually or in groups to craft plans, solve problems, and generate new ideas (Wurdinger et al. Ed 2007).

It is important to investigate how students in these project-based learning schools are developing life skills and perceive their own development of life skills. This research will add beneficial information to all educational stakeholders including researchers, administrators, teachers, parents, and students concerning how the development of life skills progress through the implementation of project-based learning over time. It will also inform stakeholders as to what types of life skills are being developed. This will benefit administrators and teachers as they continue to explore methods and strategies of curriculum and instruction in both project-based approaches and traditional approaches that enable students to develop their life skills.

Delimitations (and Limitations)

This study is intentionally limited to two EdVisions project-based learning charter schools. Minnesota New Country School is located in rural south central Minnesota and Avalon Charter School is located in urban central Minnesota. Both locations have set parameters in the upper Midwest. Both schools have common core educational values as set forth in the EdVision model in which teachers are allowed to create responsive and innovative programs within their communities (Edvisions, 2012). EdVisions schools have four main design essentials: 1) a self-directed, project-based learning program; 2) a student-centered democratic culture; 3) the use of authentic assessment; 4) teacher ownership and accountability (Wurdinger & Enloe, 2011).

Definitions of Key Terms

Charter schools. Publicly funded schools in the United States which have been freed from some of the rules, regulations, and statutes that apply to other public schools in exchange for some type of accountability for producing certain results which are set forth in each charter school's charter (Wurdinger et al., 2007, p. 160).

Constructivism. A cognitive learning theory proposed by Jean Piaget, who argues that new knowledge is constructed by learners as they interact with new information (Guzdial, 1997; Stager, 2001).

Constructionism. A cognitive learning theory invented by Seymour Papert, professor of learning research at the Media Laboratory of Massachusetts Institute of Technology Constructionism which asserts that when students engage in building and

manipulating objects or making projects by themselves, they are more likely to form new ideas and construct knowledge (Guzdial, 1997).

EdVisions. Created in 1993 and comprised of teachers and other educational professionals who believe teachers should assume new professional roles and create opportunities for direct involvement in owning and operating various educational entities. The cooperative model allows entrepreneurial educators to create responsive, innovative, and efficient educational programs in their own communities. The mission of EdVisions is to create schools that build relevant learning using self-directed opportunities and empower students, parents, and teachers. (EdVisions, 2012).

Life skills. Skills identified by the Secretary of Education's Commission on Achieving Necessary Skills Report (2001) as important life skills needed to be productive members of a work community.

Project-based learning. "A constructivist pedagogy intent on bringing about deep learning by allowing learners to use an inquiry based approach to engage in issues and questions that are real and relevant to their lives" (Wurdinger et al., 2007, p. 160).

Self-Efficacy. A person's beliefs or expectations about his or her ability (Bandura, 1977).

The No Child Left Behind Act (NCLB). A United States federal law enacted in 2001 that reauthorizes a number of federal programs that aim to improve the performance of the United State's schools by increasing the standards of accountability for states, school districts, and schools, as well as providing parents more flexibility in choosing which schools their children will attend. NCLB also promotes an increased focus on

reading and re-authorizes the Elementary and Secondary Act of 1965 (ESEA). NCLB is the most current federal legislation, which enacts the theories of standards-based education reform.

Chapter II

Review of the Literature

In order to understand how project-based learning influences life skill development in middle school and high school students, various socio-cognitive theories have been analyzed. These theories provide a structure for acquiring a deeper understanding of the value of life skill development through project-based learning and students' perceptions of their individual development. Students are increasingly pressured in middle school and high school to prepare themselves academically for either the work force or higher education. However, students are also pressured to be able to self-monitor, problem-solve, and exemplify independent learning skills as they become productive members of society. Project-based learning is based on constructivism and constructionism. Constructivism explains that learners can construct their own knowledge through interactions with their environment. Each learner is unique and constructs new knowledge by building on their individual current knowledge (Piaget, 1969; Vygotsky, 1978; Perkins, 1991). Constructionism explains that learners learn as they construct the artifact or project (Harel & Papert, 1991; Kafai & Resnick, 1996). The review of this literature is organized into sections that examine elements, which provide the framework for this research: constructivism; project-based learning; life skills; self-efficacy.

Constructivism

There are two main theories of constructivism: cognitive constructivism and social constructivism. Both are important for teachers in a constructivist classroom to understand and use in order to be effective.

Jean Piaget's (1953) theory of cognitive constructivism states that ideas are constructed in individuals through a personal process. Piaget's main focus on constructivism deals with how the individual constructs knowledge through a process of assimilation and accommodation as they progress through four different stages of development. Piaget's four stages were: sensorimotor stage (zero to two years old); preoperational stage (two to seven years old); concrete operational stage (seven to eleven years old); and the formal operational stage (eleven years old to adulthood). Although there is criticism concerning the exact stages of development, the overall concept of learning at different ages throughout childhood based on logical progression helps teachers understand the importance of working with individual students based on their need to learn at their own pace.

The social constructivism theory was developed by Lev Vygotsky (1934/1962), who believed that social interaction was an essential part of learning. It is based on the individual's personal thinking process along with classroom social interaction. According to Vygotsky, there are three zones of learning. The frustration zone is apparent when the individual is given a task that is too difficult and frustration resulted, thus, inhibiting learning. The zone of proximal development (ZPD) occurs when a child is given the appropriate amount of assistance in mastering a concept or skill. Once students understand the concept, they are able to do more and their ZPD grows. The zone of actual development (ZAD) occurs when the individual can learn independently without any assistance (Maxim, 2010). Scaffolding is a process that assists students in their learning and supports ZPD. As students receive assistance from peers,

teachers, or other adults and continue to grow in their understanding, they can continue to the next level or scaffold of learning. Cooperative learning is an essential part of social constructivism. Students should work with both teachers and students to help develop a deeper understanding. As students master completion of their tasks in a group, each individual within that group internalizes their knowledge at different rates according to their experiences (Powell & Kalina, 2009). Both theorists agree that the teacher's role should be as facilitator and guide and both views can be incorporated within a constructivist classroom to enhance the individual development of students.

Dewey (1938) emphasized the importance of a sense of community within a school setting and stated that children have a need for sociability and contribution. In his pedagogical creed, Dewey stated that, "all education proceeds by the participation of the individual in the social consciousness of the race" (Dewey, 1938, as cited in Archambault, 1964, p. 427). He believed that education must begin with an insight into the child's habits, interests, and capacities and that education must be conceived as a continuing reconstruction of experience; that the process and the goal of education are one and the same thing" (p. 434). Dewey also stated that the active side of learning precedes the passive and rational and intellectual processes result from action (p. 434). Dewey based much of his philosophy on his work at the experimental school at the University of Chicago in which he asked the question: "How can teachers bring the school into closer relationship with the home and neighborhood life, instead of the school being a place where the child comes solely to learn certain lessons?" (p. 129). Dewey's

methods included investigative projects where students explored their own interests through collaborative learning and dialogue (Maxim, 2010).

Constructivism is a theory in which the building of knowledge increases through establishing connections between what is already known to that which is new. Building new perceptions by altering existing structures is at the center of constructivism (Maxim, 2010). Teachers in constructivist classrooms function as facilitators to assist students as they build their individual learning experiences. According to Maxim, constructivist classrooms support intrinsic motivation for students to learn and be engaged. Factors that motivate student learning include the following: (1) social climate; (2) demands of the learning situation; (3) significance of the learning task; and (4) learning must be pleasurable (p. 36). A supportive social climate where learning is encouraged is a foundation for a positive student learning experience. Students must have challenging, yet achievable goals and tasks. The tasks themselves should also be meaningful and applicable to students' real life experiences. Lastly, as students see their tasks as meaningful and useful to their lives, they are more likely to enjoy the learning experience and be successful in achieving their goals.

According to Maxim (2010), Piaget believed that the motivation of learning is an inner drive to assimilate or accommodate new experiences. As students gain new experiences, they add to their schemata or clusters of information that they have accumulated throughout life. The expansion of schemata is continuously changing and growing more complex. As students encounter new ideas and experiences they adapt to the information. According to Piaget, individuals "assimilate" information as they

attempt to fit new life experiences into their existing schema. They try to connect what they already know to new information. If they are successful in making a meaningful connection, they are in “equilibrium”. However, if individuals cannot make a meaningful connection, they are considered by Piaget to be in “disequilibrium”. Individuals can attempt to create new schema, alter their existing schema, or reject the new information. When individuals create new schema or alter their existing schema, Piaget described this as “accommodation” (Maxim, 2010, p. 313). The constructivist theory supports the idea that cognitive growth continues throughout life as individuals continuously react to new experiences and assimilate and adapt their schemata to maintain mental equilibrium.

In the recent past educators have shown a strong interest in constructivism. Constructivism is a theory of human learning and the main idea of this theory is that learning means creating, inventing, constructing, and developing our own knowledge (Marlowe & Page, 1998). In its educational applications, constructivism supports students as they actively and creatively engage in various learning tasks.

Learning is defined as a self-regulating process as students engage in concrete experiences through collaborative and reflective practices (Brooks & Brooks, 1993). It has been viewed as an alternative to traditional education practices due to its focus on participation in multiple forms of skills, self-reliance, and cooperation.

Educational reform has been widespread in many parts of the world. In the United States, school reform was designed initially in the 1960s and 1970s to fix broken parts of schools. Individual reforms such as improved science and math were brought

into the curriculum (Cicchinelli, 1999). Later, in the 1980s, it was realized that there was a need to examine and reform the whole, rather than parts of the system. Reforms such as increased teacher salaries, new teacher standards, and school report cards were introduced, but even these had limited effects (Fuhrman, Elmore, & Massell, 1993). The comprehensive school reform movement began in the 1990s, and called for concurrent integration of all previous reforms and efforts. Likewise, reforms in educational practices related to learning and teaching took a comprehensive and integrative approach. Three agendas of educational reform movements were identified by Bagley and Hunter (1992): (1) a movement towards integration of technology in the school curriculum; (2) a constructivist and cognitive/information processing view of teaching; (3) a push for restructuring schools. For these reforms to be effective, various educational agendas needed to be promoted not only concurrently, but also form a synergistic relationship (Bagley & Hunter, 1992). According to Means and Olson (1995), the challenge of educational reform pushes teachers to alter their practice by implementing high standards for all students; constructivist, student-centered teaching methods; emphasizing high-order skills and increasing instructional uses of computers and other technologies.

Although there is significant literature on project-based learning and on technology-assisted project-based learning, Muniandy, Mohammad, & Fong (2007) examined the effective implementation of constructivism and technology in project-based learning on a school wide basis. The purpose was to investigate how the components were tied together as a coherent whole, and used to achieve a comprehensive instructional reform at the school level. Their theory was that for effective change in educational

practices and learning outcomes to be achieved, learning theory, methodology, and/or technology should be embedded, integrated, and promoted in a comprehensive and simultaneous manner.

The study found that there was a large disparity between project-based learning research-based theories and actual classroom practices. Teachers used their own curricular activities based on their own beliefs and experiences, independent of what the literature advocated. Teachers were also influenced by the school's goals and philosophy to implement project-based learning and used them as a guide for activities and projects. The study concluded that in order to promote the implementation of project-based learning, constructivism, and technology concurrently, these elements should be presented through teacher training and professional development together and not in isolation.

Constructionism

Constructionism, developed by Seymour Papert, professor of learning research at the Media Laboratory of Massachusetts Institute of Technology, is another cognitive learning theory that takes constructivism to the next level (Guzdial, 1997). Constructionism asserts that when students engage in building and manipulating objects or making projects by themselves, they are more likely to form new ideas and construct knowledge (Guzdial, 1997; Hay & Barb, 2001; Paper, 1980, 1984, 1993, 1999; Stager, 2001). This suggests that the best way to ensure cognitive learning is through the active construction of something tangible (Guzdial, 1997; Stager, 2001). Having a constructionist learning environment allows students to benefit from social skill

development through collaboration, discussion, examination, and reflection on the products and artifacts that have been created (Hay & Barab, 2001; Stager, 2001).

In 1999, through the enactment of the National Education Act in Thailand, many schools shifted from teacher-centered to student-centered instruction, which resulted in constructionist learning environments (Petcharuksa, 2001; Tullavantana, 2002). The Darunsikkhalai School was the only full-scale constructionist school that provides a totally project-based learning environment to students in that country. Traditional testing (e.g., true-false, multiple-choice, fill-in, short answer, and essay tests) was found not to be the most appropriate form of evaluating student learning in the constructionism environment. A portfolio assessment of learning was used to provide a more authentic evaluation of student learning. In 2006, a study examined the use of portfolios to assess and compare students' academic (mathematics and Thai) and non-academic (emotional development, adversity handling, technology usage, and moral development) outcomes (Tangdhanakanond & Pitianuwat, 2006). When comparing academic and nonacademic gains, it was found that sizes on academic outcomes were higher than those on nonacademic characteristics. This research was consistent with that of Bereiter and Engelmann (1966, 1968), which suggests that personality is more difficult to change than academic achievement.

Soparat, Arnold, and Klaysom (2015), studied the use of project-based learning using Information in Communication and Technology (ICT) in four different schools in Thailand. The study included 212 students in the classes of eight teachers from four schools. The teachers worked collaboratively to design their own lesson plans by

integrating project-based learning using the ICT approach. The project-based learning approach was used to determine the development of learners' five key competencies determined by the Ministry of Education of Thailand (MoE) as necessary for becoming effective 21st century citizens. The five key competencies were 1) communication capability, 2) thinking capability, 3) problem solving capability, 4) capability in applying life skills, and 5) capability in technological application. The project-based learning approach emphasized meaningful, student-centered activities that were long-term and interdisciplinary. Results of the study showed that through the implementation of the project-based learning approach through ICT, learners were able to develop those five key competencies. Learners' communication capacity was developed in three ways: 1) Perceiving and analyzing the information beyond the classroom; 2) Choosing the information and media to fit the tasks; 3) Using a variety of ways of communication. Learners' higher order thinking was developed through the following: 1) Creative thinking; 2) Analytical thinking; 3) Reasoning and systematic thinking; 4) Synthesis thinking; 5) Critical and reflective thinking. Their problem-solving capacity was developed in three ways: 1) Solving problems in a reasonable way; 2) Inquiry for solving the problems; 3) Effective decision-making. Learners' capacity for applying life skills were developed in five ways: 1) Collaborative learning; 2) Creating potential to overcome difficulties; 3) Learning to set the goal for success; 4) Creating self-confidence; 5) Lifelong learners. Their technological capacity was developed were developed in three ways: 1) Choose and use technologies appropriately to the task; 2) Choose and use technologies as the learning tools; 3) Choose and use technologies in a moral

way. Overall, the study also showed that while using constructionist applications, learners developed their capacity in the five key competencies and had a deeper understanding of the content.

Project-Based Learning

In the early part of the twentieth century within the United States, the idea of “learning by doing” became popular as the need to make school more useful and applicable to the real world. There was a unifying idea that students learn best when “wholeheartedness of purpose is present” (Kilpatrick, 1918). However, over time only a minority of teachers and schools continued the project and problem based approaches due to various reasons such as: large class sizes, lack of appropriate materials, small amount of time to create new curricula, and minimal autonomy due to administrative control. Also noted was the growing pressure of college entrance requirements that became more incompatible with progressive approaches to teaching and learning (Tyack & Cuban, 1995). During the mid-twentieth century, critics dismissed project-based approaches as leading to doing for the sake of doing.

In the 1920’s, project-based learning was adopted as an early childhood teaching strategy in England. Through the philosophies of John Dewey and William Heard Kilpatrick, it was implemented in America’s educational system (Katz & Chard, 1989). Scholars refer to William Heard Kilpatrick, a follower of John Dewey’s educational philosophies, as the implementer of the project-based learning concept. Kilpatrick’s (1941) sociocognitive theory refers to “selfhood” as the process of character development in a social context. This perspective involves a community-based perspective in which

the members of the social community facilitate the child's understanding of play and work through various situations that occur in the surrounding culture. There is an exchange of knowledge and ownership between the teacher and student.

According to Thomas, Mergendoller, and Michaelson (1999), students need to be prepared on how to respect and interpret others' perspectives as they communicate within a team to solve problems and work cooperatively to accomplish tasks and goals. Thomas et al. (1999) views project-based learning as an incorporation of experiential learning. Markham, Larmer, and Ravitz (2003) view project-based learning as an integration of students' needs and drive to learn mixed with an in-depth exploration of authentic topics. Students are given important tools, skills, and technology for learning. They are given opportunities to learn through experience, collaborate with others to solve problems, and are given frequent feedback.

According to Thom Markham, John Larmer, and Jason Louis Ravitz, project-based learning is "a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks" (Behizadeh, 2014). With many project-based learning models the projects are based on students' questions or interests that are related to essential curriculum requirements and/or essential teacher-related questions. The essential questions raised by the teacher are carefully designed to be open-ended, stimulating, and complex. The students engage in a research project that aims to answer the questions. Similar to problem-based learning models, the project-based learning model involves attempting to solve complicated problems that may not

have easy solutions or one answer. The problems tend to be real-world issues that students want to learn more about and resolve. Project-based learning allows students to construct their own understandings similar to other student-centered approaches such as experiential education (Dewey, 1938) and participatory action research.

Freire wrote, in *The Pedagogy of the Oppressed*, “Knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry human beings pursue in the world, with the world, and with each other” (Freire, 1970, p.72). Freire considers problem-posing education as students, teachers, and other members being co-participants in the construction of knowledge. Freire describes the opposite of this method, as the banking model in which teachers pour disengaging and decontextualized information into “empty vessels”. According to cognitive research this approach to learning does not work (Gee, 2008).

Freire proposes that there should be a dialogue of learning between the teacher and the students where problem-posing enacted through project-based learning empowers multiple minds and shifts the teacher to the role of facilitator, listener and co-learner.

Project-based learning advocates for authentic learning, which refers to students being able to connect with meaningful real life experiences. The importance of authentic learning is supported in literacy education and is seen as an effective way to increase student engagement and achievement (Behizadeh, 2014; Dawson, 2009; Newmann, Marks, and Gamoran, 1996; Purcell-Gates, Duke, and Martineau, 2007; Sisserson, Manning, Knepler, and Jolliffe, 2002).

Advocates of project-based learning view the approach as a means of providing students with opportunities to apply their skills while building intrinsic motivation. It can increase social skills, develop self-esteem, and provide some level of success for all students (Katz, 1994; Wolk, 1994). According to the International Society for Technology in Education (1997), students increase their problem-solving ability, their resource-management skills, as well as their research and communication skills as they work on projects. Interaction in a project-based learning classroom can build autonomy and collaboration (Fry & Addington, 1984).

As part of a testimonial research, crucial findings were found that students and teachers showed a preference for the project approach to traditional methods. Teachers observed marked improvements in students' enthusiasm and motivation for learning. (Liu & Chien, 1998; Wolk, 1994). A study conducted by Peck, Peck, Sentz and Zaza (1998) examined project learning in a high school. Through interviews with the students, the research revealed an increase in analytical skills, critical thinking, and interpreting information.

The Ecological, Futures, and Global (EFG) curriculum is a project-based curriculum that is comprehensive and involves essential components of project work that has been proposed by almost a century of research conducted on this method of teaching (Branom, 1919; Katz, 1994; Katz & Chard, 2000; Kilpatrick, 1918; McMurry, 1921; Stevenson, 1921; Stockton, 1920).

A study conducted by Kucharski, Rust, and Ring (2005) compared the EFG curriculum to the traditional curriculum that was used at an elementary school. Teachers

at the elementary school used a traditional Tennessee curriculum model and utilized project instruction a various times in an unstructured manner. The EFG curriculum was more structured and covered the same core skills as the traditional curriculum. Academic achievement was measured using the Terra Nova standardized test. Students and teachers were provided a satisfaction rating scale to evaluate their attitudes towards the project-based curriculum. There was some evidence that was consistent with the previous research (Johnson & Johnson, 1985; Liu & Chien, 1998; Wolk, 1994), which suggested that project-based learning leads to improved student attitudes toward learning.

Teachers influence the successful delivery of the curriculum and have been shown to prefer the project method (Beneke, 2000; Liu & Chien, 1998). Teachers who used the EFG project-based method showed significantly higher satisfaction with the curriculum than did teachers who used the traditional curriculum (Kucharski, Rust, & Ring, 2005).

According to Barron et. al. , Schwartz, Vye, Moore, Petrosino, Zech, Bransford, and The Cognition and Technology Group at Vanderbilt (1998), a major challenge in using project-based curricula is they necessitate concurrent changes in instruction, assessment and curriculum practices. In their study, four design principles were identified as important for implementing these changes: (a) defining learning – appropriate goals that lead to deep understanding; (b) providing scaffolds such as “embedded teaching,” “teaching tools,” sets of “contrasting cases,” and initiating problem-based learning activities before beginning projects; (c) providing multiple experiences for formative assessment and revision; (d) developing social structures that

encourage participation. Each of these principles is intertwined and leads to the acquisition of content and skills and help students become more reflective and responsible for their learning. This process leads to metacognition, which is knowing the goal of learning, self-assessing learning, and understanding the importance of scaffolds, resources, and social arrangements that foster revision of learning.

A key of project-based learning is organizing the project around a well-crafted question that serves to inspire deeper thinking and understanding, which leads to reflective learning and doing. The question must allow for connections between current and future applied knowledge and activities.

The first principle of providing learning goals helps students understand the purpose for the project. The second principle of providing scaffolding allows students to be supported in their learning process and their ability to carry out their task (Wood, Bruner, & Ross, 1976, p. 90). According to Collins, Brown, and Newman (1989), there are three types of scaffolds: (a) a communication process, (b) a coaching process, and (c) and those that provoke articulation. The third principle of providing frequent opportunities for students and teachers to use formative assessment allows them to adapt their learning and teaching. As they self-assess they develop their ability to gain a deeper understanding and change their learning and teaching process as needed (Brown, Bransford, Ferrara, & Campione, 1983; Stiggins, 1995). The fourth principle of social organizations that promote participation and agency is supported in a variety of ways. Small group interactions, peer review, and providing students with opportunities to participate and contribute have been found to be very effective. As students work in

collaborative groups, it is also important to have individual accountability and reflection (Johnson, Johnson, Holubec, & Roy, 1984; Slavin, 1983). This allows the group and the individuals within the group to be more successful.

Glasser (1990) states the significance of creating an environment that encourages meeting students' psychological and physical needs. He supports a classroom environment where students are empowered and motivated. When students are given relevant information that is applicable to the outside world and their lives, they are more likely to connect to the material. As students are given the opportunity to apply their knowledge in a team-based in-depth model over a long-term basis, there will be a connection between power and knowledge (Glasser, 1988).

Project-based learning is embedded in the students' abilities to create projects by bringing their own experiences to the process. This correlates with Dewey's theory of constructing meaning through experience. By allowing students to contribute to curriculum decisions, the teacher can stimulate motivation. Passe (1996), discovered that involvement of students in decision-making can improve student performance in various areas such as autonomy, classroom behavior, student learning, and motivation. Passe states that, "a major goal in our educational system is developing autonomous citizens who are responsible decision makers and who are knowledgeable and contribute to their communities" (p. 23). He also advocates for a curriculum that enables students to make connections with culture and out-of school experiences. The curriculum should focus on meaningful complex problems and instruction should include global tasks.

An important component of project-based learning is cooperative learning in which communication skills are vital to the success of a project. Students are given the opportunity to share decisions and bring their own skills and knowledge to the process. This provides students with a safe environment that increases their confidence (Mee, 2007). Providing a learning environment where students feel safe to voice their opinions increases a sense of community and belonging.

A key component involves teaching responsible behavior and the ability to make responsible choices. Glasser's (1998) concept of choice theory proposes that "all behavior is our constant attempt to satisfy one or more of five basic needs that are written into our genetic structure. None of what we do is caused by a situation or person outside of ourselves" (p. 18). The five basic needs to which he refers are: survival, belonging, having fun, freedom, and power (p. 18). In the application of Glasser's choice theory, he suggests that students will only learn if their needs are being met (p. 18). In his interviews with seventh and eighth grade students, Glasser found that students gained a "sense of competence" and a feeling of importance among their classmates when they participated in group learning projects (Erwin, 2003).

Two essential elements of project-based learning are a student's ability to 1) set goals for himself/herself and 2) become self-motivated to complete these goals (Rafoth, 1999). Most middle and high school students are at Piaget's formal operational level and are metacognitively ready to set goals for themselves and self-monitor their learning. Teachers should be cognizant of their students' ability levels and metacognitive

potential in order to foster independent learning skills. With effective teaching strategies, students become more confident and motivated to successfully meet goals and tasks.

Gerlach (2008) examined middle school students' abilities to self-regulate and their perceptions of self-regulation skills in a project-based learning experience. The study proposed that project-based learning significantly influenced students' self-regulatory skills such as time management, learning strategies, and goal setting. In this study, Gerlach found that during the project-based learning experience, students monitored and differentiated their strategies to complete the project and affect the outcome of the project. Students used strategies of responding to feedback and integrating environmental factors into their goals and project outcomes. This study supports Zimmerman's research (1998), that explains as adolescents acquire self-regulatory skills, they developmentally "change their capability to self-regulate both internal processes and external forces proactively" (p. 274).

The project-based learning approach has been on the up rise in the past decade as a strategy to implement rigorous and relevant learning to diverse learners. Several public schools were early adopters of project-based learning, which infused technology. High Tech High in San Diego County, Southern California has a deliberate intention of preparing high-poverty students for college. It has expanded to 11 public charter schools, from elementary to high school. Another national network known as Expeditionary learning reaches over 50,000 K-12 students. Expeditionary Learning model focuses on strong community-based and service-learning projects (Boss, 2013).

As school districts examine how to help students meet the Common Core State Standards, they are considering implementing project-based learning strategies. The application of learning is a higher need as states transition to the Common Core State Standards. An example of this is the Vail School District in Arizona in which students are assessed based on what they produce or demonstrate rather than a recall of factual information. The Vail School District is beginning to introduce projects at all grade levels in anticipation of the new standards, which is increasing rigor, and relevancy of learning.

Project-based learning methods and performance-based assessments that are associated with them are valuable both for teachers who are advocating for students to demonstrate their proficiency in meaningful ways, as well as students who need to think critically and apply their knowledge (Boss, 2013). With a possible shift toward more project-based teaching and learning within school districts, the question is raised on how these school districts should assess more open-ended learning that involves collaboration and critical thinking, as well as content mastery. Standardized tests that are based on recall of information would somehow need to be changed or replaced by performance-based assessments that ask students to apply and reflect on their learning.

In the summer of 2009, the city of Philadelphia in conjunction with the Public Health Management Corporation (PHMC) introduced project-based learning to a network of over 180 out-of-school-time (OST) programs. By the fall of 2009, there were over 1,700 projects. Projects vary from topics such as community service science exploration, modern media, and Greek mythology. Schwalm and Tylek (2012) analyzed the impact of

system wide implementation of project-based learning on an OST. The study also examined the effect of PBL on students' collaboration skills and confidence in learning.

The model used by PHMC, is that every project begins with an open-ended "driving question" that initiates interdisciplinary student inquiry. At the end of the project students provide their results at a public presentation. This allows students to synthesize and apply what they have learned. The open-ended question should be authentic and relevant to students and provide opportunity for sustained and in-depth inquiry. According to Thomas (2000), project-based learning is an effective way to teach core content while including higher order thinking skills. Students in these types of classrooms perform as well or better than students in traditional classrooms. Walker and Leary (2009) noted that project-based learning was comparable to lecture-based approaches even when the scope is limited to standardized tests of concepts. While some traditional educational methods are dependent on rote memorization and don't develop vital skills such as critical thinking and the ability to reason and argue, project-based learning has been shown to improve non-academic 21st century skills, including collaboration and critical thinking (Barron & Darling-Hammond, 2008; Bransford, Brown & Cockling, 1999).

The project-based learning method capitalizes on OST programs that have smaller teacher-student ratios and informal learning environments. This approach allows afterschool programs an opportunity to incorporate rigorous academic coursework with intentional and planned play and learning experiences (Alexander, 2000). The model supports youth development practices which according to California's Community

Network for Youth Development (2006) lists five key components: safety, relationship building, youth participation, community involvement, and skill building. The MARS study also identified five OST indicators: staff engagement with youth; youth engagement; high quality, challenging activities; quality homework time; and family relationships at pick up time. Project-based learning supports the first three indicators through implementation of engaged learning, student-driven investigations, and collaboration on various levels.

Project-based learning does not prescribe content and can be tailored for particular groups or individuals. Because of its flexibility, it can be implemented system-wide (Schwalm & Tylek 2012). Recommendations for implementing project-based learning system-wide include the following: (1) include direct service-staff along with site directors and agency leaders; (2) implement a pilot program before introducing it to the OST network; (3) set clear expectations for all networks to ensure effective and uniform implementation.

The incorporation of project-based learning system-wide in PHMC showed positive impact on the rigor and quality of program activities. The benefits included developing students' 21st century skills, offering structured activities that allowed for student investigation and engagement, and improving overall staff development through consistent implementation of practices (Schwalm & Tylek, 2012).

A simple definition of project is an act of creation over time that connects to the two basic concepts of production and complexity (Lenz, 2015). According to David Allen (2001) another definition of a project is any undertaking that involves more than

one-step and is correlated with time. Doing a project is different than project-based learning which is a mindset and a structure for teaching skills and content (Larmer & Mergendoller, 2012). Bob Lenz, the Founder and Chief of Innovation for Envision Education views high-quality project-based learning as including the following key components: 1) an essential student-friendly question that drive learning; 2) a demonstration of key knowledge and skills in which students provide evidence through a performance or product; 3) academic rigor and alignment with standards; 4) a timeline that is short or long depending on the size of the project; 5) an engaging launch that stimulates student interest; 6) applied learning where the students are able to do something new with their skills and knowledge, and 7) an authentic audience which warrants students to take the project seriously and challenges them to give a quality and professional presentation. He views project-based learning not as the goal, but as a particular path to the goal of learning. He sees the practice coexisting with other traditional forms of learning. Many traditional practices can take place within the context of a project. For example, an English teacher at Envision Schools implemented two big projects per year, but also gave quizzes, multiple-choice tests, comprehensive exams, and assigned analysis papers. For project-based learning to take hold it must be repetitive and purposeful, but does not have to be overwhelming or all consuming (Lenz, 2015).

Students and teachers focus on three major goals at Envision Schools: 1) meeting the academic standards (the Common Core); 2) developing critical thinking; communication; collaboration, and completing projects and, 3) preparing for the graduation portfolio and defense. Envision schools embed learning goals and

performance assessments inside high-quality project-based learning by designing a standards-aligned performance assessment system. According to Lenz (2015), to qualify as a performance assessment, what is evaluated must be a product or performance, and an application of a targeted skills or skills. The core of Envision Schools is deeper learning, which culminates in the senior portfolio defense. The portfolio defense brings together four performances: 1) a research paper; 2) an analysis; 3) and inquiry and, 4) a creative expression. The deeper learning framework developed by The William and Flora Hewlett Foundation has been adopted by many school districts and teachers. Supporting students across the education sector as they prepare for the constantly shifting 21st century workforce requires educators to rethink how they can facilitate student learning as they develop skills that go beyond academic content (Kapaker, 2015). Envision Schools have been a member of Hewlett's Deeper Learning Network, which is among several organizations that have advanced the movement of deeper learning in education. The Hewlett Foundation created a list from representative sample groups of educators that provides desired student outcomes in the 21st century: 1) master core academic content; 2) think critically and solve complex problems; 3) work collaboratively; 4) communicate effectively; 5) learn how to learn, and 6) develop academic mindsets. These deeper learning competencies have been incorporated and implemented in Envision School's system of design (Lenz, 2015). The premise of their educational philosophy is in order for organizations to be holonomous, they must be systematically consistent throughout each of their individual parts – self, classroom, school, district, and the community (Costa & Kallick, 1995).

Life Skills

In the earlier part of the 20th century, the Industrial Revolution changed how productivity was regarded and the human factor came to be recognized as critical to productivity. Frederick W. Taylor is considered the father of the American management field. He recognized the limitations of most workers in organizations and emphasized the need for managerial positions, in which the common worker had limited and restricted responsibilities. This thought remained dominant throughout most of the 20th century. With the changing world markets and increasing global demands, there has been a demand to adapt and create flatter organizational structures in which there is more team collaboration and production. Therefore, there is an increase in the need for more entry-level workers who have the ability to adapt, problem solve, collaborate, and self-manage (O'Neil & Baker, 1997).

In 1990, the Secretary of Labor appointed a commission to determine the skills that our young people needed to succeed in the workforce. The purpose of this was to encourage a high-performance economy. The Secretary's Commission on Achieving Necessary Skills (SCANS) was directed by the Secretary of Labor to (a) define the skills needed for employment, (b) develop a dissemination strategy for the nation's schools, businesses, and homes, (c) propose acceptable levels of proficiency, and (d) suggest effective ways to assess proficiency. The Commission identified five competencies based on the first directive: the ability to efficiently use (a) resources, (b) interpersonal skills, (c) information, (d) systems, and (e) technology. These competencies were based

on a three-fold foundation: (a) basic skills, (b) thinking skills, and (c) personal qualities (O'Neil & Baker, 1997).

Transition from the 20th century Industrial Age to the 21st Information Age, has led to an increasing awareness the skills needed to succeed in the 20th century are no longer sufficient to be prosper in the 21st century. This awareness for change in teaching, learning, assessment and work began a movement fueled by technology and information. The Partnership for 21st Century Skills (P21) comprised of participants from private and public organizations was founded in 2002 in the United States. Its mission was to provide technology to all aspects of teaching and learning throughout primary and secondary schools through collaborative partnerships among businesses, education, community and government leaders (Kivunja, 2015). P21 created the Framework for 21st Century Learning (P21, 2011), which states that:

Every 21st century skills implementation requires the development of core academic subject knowledge and an understanding among all students. Within the context of core knowledge instruction, students must also learn the essential skills for success in today's world, such as critical thinking, problem solving, communication and collaboration. Those who can think critically and communicate effectively must build on a base of core academic subject knowledge. (P21, 2009, p. 1)

Trilling and Fadel (2009) reported that in order for students to succeed as individuals, citizens, and workers in the 21st century, they need four skill domains that are the Traditional Core subjects and Skills domain, the Learning and Innovation Skills domain, the Career and Life Skills domain, and the Digital Literacies Skills

domain. These four skill domains encompass a new learning paradigm that is a pedagogical shift meant to ensure students' preparation for the 21st century workplace.

Kivunja (2015) discusses the Career and Life Skills domain (CLS) of the new learning paradigm. The Framework for 21st Century Learning (P21, 2011), identifies five elements that include the CLS domain: 1) Flexibility and adaptability skills; 2) Initiative and self-direction skills; 3) Social and cross-cultural skills; 4) Productivity and accountability skills; and 5) Leadership and responsibility skills.

Flexibility and adaptability skills. P21 accentuates two essential characteristics of the flexibility and adaptability element the ability to adapt to change and being flexible. Due to the fast paced and ever changing working conditions in the 21st century workplace, graduates must be resourceful, adaptable and flexible. These skills enable workers to adjust positively to change and incorporate feedback effectively (Kivunja, 2015).

Initiative and self-direction skills. The second element of the CLS domain is initiative and self-direction skills. These skills are essential for success in the workplace as workers are expected to take initiative to learn and apply new concepts, which increases their effectiveness and productivity. Three strategies outlined in the Framework for 21st Century Skills Learning (P21, 2011), that can be used to teach students initiative and self-direction skills include: 1) How to manage goals and time; 2) How to work independently, and 3) How to be self-directed learners.

In order to effectively manage goals, a person must first learn how to set goals. Peter Drucker proposed a strategy for how to set goals in *The Practice of Management*

(Drucker, 1955). This strategy comprises five steps with the acronym SMART, which stands for Specific, Measurable, Achievable, Realistic, and Timely. When teaching students to set goals, he proposes that they should state their goals clearly and simplistically. When setting measurable goals, students should include a target or a measure in order to use it as evidence of the achievement. Thirdly, setting achievable goals means that students should set goals that are challenging, but not beyond their existing capabilities. Next, when setting realistic goals, students should work towards a relevant goal or outcome, and lastly, students should be taught that their goal needs to be achieved within a certain timeframe or deadline. According to Parkinson's Law of Time Management (Parkinson, 1955), there is a greater chance for a task to be completed on time if the timeline is shorter. There is less opportunity to procrastinate when there is pressure to complete a task.

Working independently represents the ability to take initiative and manage situations without reliance on others. In many workplaces there is little time to wait for responses from managers or supervisors when circumstances change. Working independently is a highly valued quality because it is the ability to manage change. In order for students to learn how to work independently, they should be given opportunities to prioritize tasks and be flexible with minimal supervision. This encourages students to assume responsibility and monitor their own progress. This leads to the third element of becoming self-directed learners. As P21 states:

Self-directed learners go beyond mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise. Demonstrate to learning as a lifelong process. Reflect critically on past experiences in order to inform future progress: (P21, 2009, p. 6)

Students should be taught about the need for persistence, resilience, and motivation. When they are self-directed, mistakes may occur, but as they work through their mistakes, they gain self-confidence. This involves creating opportunities for students to use their higher-order cognitive processes (Bloom, 1956). It also enables them to be proactive rather than reactive to change (Bruner, 1966).

Social and cross-cultural skills. It is important for students to be able to work and learn collaboratively with a diverse range of cultures, religious beliefs, and lifestyles through trust and transparency (Kivunja, 2015). Cooperative learning expert Dr. Spencer Kagan (1994) explains that social skills are necessary for a well-balanced cohabitation among humans; particularly in the workplace. Students need to learn social skills in order to effectively communicate verbally and nonverbally.

Productivity and accountability. Productivity and accountability focus on three components of efficiency, effectiveness and high quality goods and services (Trilling and Fadel, 2009). Teaching students to produce high quality products comprises of teaching them how to: work positively and ethically; manage time and projects effectively; multitask; participate actively, as well as be reliable and punctual; present oneself professionally and with proper etiquette; collaborate and cooperative effectively with teams; respect and appreciate team diversity, and be accountable for results (Trilling & Fadel, 2009, p. 83).

Leadership and responsibility skills. There are many definitions of leadership due to its complexity. However many scholars view it as a combination of factors which include one's personality, the ability to induce compliant followers and exercise

influence, as well as serving as an instrument to achieve goals and effect interactions among others (Bass, 1990). Leadership comprises a high level of interpersonal skills that can be applied to impact the behaviors and actions of others. It is the ability to motivate others to work towards goals that help to build the culture of organizations. Leadership is also interconnected with responsibility because of its potential to influential nature.

Many experts in the field do not view leadership skills as innate or hereditary, but teachable. Students can be taught how to direct activities, use various approaches to motivate others, to find problem-solving strategies and to articulate vision, mission and values (Trilling & Fadel, 2009).

According to Wagner (2008), seven survival skills are needed for the twenty-first century. Critical thinking and problem solving involve having the ability to ask good questions. In Wagner's examination of how businesses and corporations continue to evolve, he found that work is organized by "cross-functional" (p. 15) teams that work on projects and try to find solutions to problems. The next survival skill involves collaboration across networks and leading by influence. With global markets, there is a need to work collaboratively across boundaries including religion, culture and lifestyles. The third survival skill is having agility and adaptability. With the influx of new information and unpredictability of our global environment, employees must be able to adapt to change and be innovative in their flexibility. The next skill involves initiative and entrepreneurialism. The ability to find solutions and be self-directed is an essential skill. The fifth skill is effective oral communication. Having the ability to express oneself clearly and effectively in all situations is vital to success. Accessing and

analyzing information is the sixth category. Data overload is an issue and having the ability to synthesize and analyze information is essential for lifelong learning (p. 37). Curiosity and imagination conclude the seven survival skills. Employees must be able to use analytical skills as well as think creatively as they seek new and innovative possibilities in their work environment. (Wagner, 2008, p. 39)

Lindsey and Mabie's (2015) research examined how a life skills course for black freshmen boys affected academic performance at a racially diverse high school. A speech and debate teacher, Tommie Lindsey created a life skills class specifically for 9th grade African American males that emphasized racial pride and personal insight. The class was built around the Motivational Framework for Culturally Responsive Teaching by Margery Ginsberg and Raymond Wlodkowski and focused on four types of support systems: establishing inclusion, building security, enhancing meaning and engendering competence. The curriculum was both meaningful and relevant for these ninth grade students and they were able to explore issues central to their identity. The class established an inclusive, equitable, and academic space. As a result, reading scores for 9th grade black males improved more than any other demographic in the school. Overall, the study found the life skills class to support stronger academic performance from the students, as well as providing students with a new sense of self-confidence and higher expectations.

Zimmerman (2010) examined a twelfth grade high school social studies curriculum designed and implemented based on constructivist concepts. The purpose of the course was to teach the social studies curriculum by means of linking skill-building

projects that would help prepare high school graduates for life skills needed after graduation. Skills that were enhanced through the project-based learning curriculum included communication, public speaking, analyzing, reasoning, critical thinking, and collaboration with team members. All of which are necessary for the 21st century.

Wurdinger and Enloe (2011) surveyed alumni from Avalon Charter School in St. Paul, Minnesota. Avalon is an EdVisions school that uses project-based learning as its fundamental teaching method. The primary goal of the research was to examine how students were learning important life skills through a project-based learning curriculum. The data collected through surveys indicated that most alumni believed that the project-based learning charter school provided them with life skills that allowed them to be more self-directed learners in higher education. Life skills that were identified were (a) creativity, (b) problem solving, (c) decision-making, (d) time management, (e) finding information, (f) learning how to learn, (g) responsibility, and (h) being a team player. These categories were originally classified by the Secretary's Commission on Achieving Necessary Skills (2001) report as important life skills essential for productive citizens. This study showed that students who graduated from Avalon learned valuable life skills such as time management, problem solving, and creativity; these skills are usually more lacking in traditional school settings.

As U.S. schools seek to define effective schools, there has been an increase in standardized assessments that are useful for measuring students' basic skills and knowledge. However, according to Newell and Van Ryzin (2007), these assessments fail to measure the effectiveness of schools and the ability to create environments that lead to

the development of productive adults. Newell and Van Ryzin promote the concept of focusing on youth development in a school design concept that incorporates a self-perception survey for students. Within the EdVisions school design funded by the Bill and Melinda Gates Foundation, Newell and Van Ryzin continue to create and sustain secondary schools that incorporate student-directed learning and teacher ownership. The EdVisions model perceives adolescent development as a key factor to measuring academic success. In the Yale Child Center Project, Dr. James Comer defined youth development as an effective means of determining school effectiveness. In his study, he outlined the effect of substantial academic growth when administrators and teachers supported the value of basing their work on the principles of child and adolescent development. According to Comer (2005), educational practices that have focused primarily on curriculum, instruction, and assessment, as well as modes of delivery, have been less successful than those practices that focus on child and adolescent development.

As part of the EdVisions model, a school-wide measurement system was constructed to assess each learning community's success in meeting the developmental needs of its students. The original design of the Hope Study was to evaluate how well the EdVisions school model affected positive student outcomes, as compared to other traditional models of a secondary school. In order to assess the educational environment, EdVisions schools measure standardized test scores, academics, and three core areas of adolescent development: autonomy, belongingness, and competence. Students' perceptions of themselves and their attitudes toward school are also important factors in

determining the overall success of the educational environment (Newell & Van Ryzin, 2007).

Wurdinger and Rudolph (2009) conducted a study examining the teaching of life skills through project-based learning at Minnesota New Country School (MNCS) in Henderson, Minnesota. In their study, they focused on the definition of success for students by examining how certain life skills were instilled through various projects. This project-based learning charter school was chosen because of its broad views of student success and emphasis on self-directed learning. In contrast to more traditional schools, MNCS regards life skills as key elements of preparing students to become productive citizens.

For this study, a survey was created specifically for MNCS alumni. After feedback from the alumni was received, the survey was revised for students, staff, and parents.

In the results of the staff survey, 100 percent stated that students in the charter school had an advantage over their peers attending more traditional public schools and were more prepared to reach their goals after graduation. In the parent survey, 100 percent of the parents stated that their child had experiences at the charter school that gave them an advantage over their peers at more traditional schools. Eighty-five percent of parents stated that the charter school prepared their child to reach his/her goals after graduation. Out of all four surveys, 85 percent of participants valued learned life skills as most important, whereas 10 percent of those surveyed recognized academic skills such as math, reading, writing, science, or art as most important.

The charter school alumni stated that their charter school gave them advantages to other college classmates and the school provided needed skills to be successful not only in college, but also in life.

In summary, MNCS promotes student-centered learning that teaches not only academic knowledge necessary for school success, but also important life skills that carry over into all areas beyond the school environment. The significance of this study demonstrates that life skills are perceived as important and essential for success in school and life in general, and that the curriculum and goals of project-based learning schools are critical in facilitating those life skills.

In Dr. Spencer Johnson's book, "Who Moved the Cheese," (1998), he examined the inevitable nature of change and how those who can adapt and adjust their thinking more quickly to the conditions are more likely to take advantage of developing opportunities. In Charlotte, North Carolina, Olympic Community of Schools has adjusted to the changing conditions in the economy and workforce to create a roadmap for students to pursue and find their passion and goals through project-based and experiential learning.

In 2005, Olympic won a grant from the Bill and Melinda Gates Foundation and converted itself into five-themed campus high schools: International Business and Communications Studies; Biotechnology and Health; Global Studies and Economics; Arts and Humanities; and Math, Engineering, Technology and Science. Each high school provides authentic project-based learning strategies and practices. This allows students to delve deep into their prospective career paths while understanding the importance of

mastering content. The students have increased proficiency scores on high-stakes tests by 65 percent and have helped them pursue their career path. Realon (2012) interviewed graduates from Olympic and found that the project-based curriculum provided them with leadership opportunities within the school as well as internship experiences that connected them with businesses and future employers of their chosen fields. In each of the interviews there were common themes that signified the students' experiences at Olympic: (a) relevance of learning and applying skills; (b) opening of opportunity with companies; (c) projects piqued interest and motivation; and (d) practical application of skills and content knowledge.

The project-based learning approach has been on the up rise in the past decade as a strategy to implement rigorous and relevant learning to diverse learners. Several public schools were early adopters of project-based learning, which infused technology. High Tech High in San Diego County, Southern California has a deliberate intention of preparing high-poverty students for college. It has expanded to 11 public charter schools, from elementary to high school. Another national network known as Expeditionary learning reaches over 50,000 K-12 students. Expeditionary Learning model focuses on strong community-based and service-learning projects. (Boss, 2012)

As school districts examine how to help students meet the Common Core State Standards, they are considering implementing project-based learning strategies. The application of learning is a higher need as states transition to the Common Core State Standards. An example of this is the Vail School District in Arizona in which students are assessed based on what they produce or demonstrate rather than a recall of factual

information. The Vail School District is beginning to introduce projects at all grade levels in anticipation of the new standards that are increasing rigor and relevancy of learning.

Project-based learning methods and performance-based assessments that are associated with them are valuable both for teachers who are advocating for students to demonstrate their proficiency in meaningful ways, as well as students who need to think critically and apply their knowledge (Boss, 2012). With a possible shift toward more project-based teaching and learning within school districts, the question is raised on how these school districts should assess more open-ended learning which involves collaboration and critical thinking, as well as content mastery. Standardized test that are based on recall of information would somehow need to be changed or replaced by performance-based assessments that ask students to apply and reflect on their learning.

Performance assessments like the ones at Federal Hocking High School in Stewart, Ohio may become more common in public schools. Students are given a half-day at the end of each semester to demonstrate their projects based on what they have learned in their courses. The Partnership for Assessment of Readiness for College and Career (PARCC) and the Smarter Balanced Assessment Consortium have a federal contract and are developing new assessment systems to measure English language arts and math. These new assessments are expected to be implemented by the 2014-2015 school year.

These new assessments are predicted to have more parallels to the authentic assessments found in project-based learning. PARCC assessments will be for grades 3

through high school and are described as having “rich performance tasks” that will measure students’ readiness for college. Smarter Balanced pilot assessment provided tasks for students in grade 11 to engage independently and collaboratively in posing questions, investigating, and researching topics.

Allison Rowland, a former principal in California who is now an assessment specialist for New Tech Network looks forward to a new generation of assessments that shift measurement and drive students to deeper learning. However, some administrators are concerned about more open-ended assessments because they have been conditioned to focus on standardized test results and are not sure what evidence will be provided by other types of assessments (Boss 2012).

There are two sides to performance assessment: the practice side and the research side. The Buck Institute for Education (BIE) provides a three-day professional development workshop, PBL 101, which provides instructional leaders and teachers across the country with effective assessment strategies such as rubrics used to assess students’ projects through multiple measures. The BIE model offers various formative and summative assessments that measure students’ academic content and 21st century skills. On the research side, Knowledge in Action, designed by researchers at University of Washington is a multiyear study implemented by Advanced Placement teachers in three states. The study showed that advanced placement students’ pass rates increased up to 30% during the 2011-2012 school year when teachers used a project-based curriculum. (Boss, 2012)

According to Boss (2013), educators are searching for new instructional strategies and approaches as they are faced with an urgency to prepare students for 21st Century challenges. While mastery of academic content is important, there is also a need for students to develop process skills such as critical thinking, problem solving, creativity, collaboration and communication. More teachers are turning to project-based learning which places importance on 21st century competencies and academic learning goals. In her writing, Boss focuses on four complex competencies or 4 C's – critical thinking, collaboration, creativity, and communication. In shifting to project-based learning, teachers need to understand how to design projects to meet goals for both content mastery and 21st century learning. They need to be able to ask driving questions that enable students to incorporate learning activities, which support the development of specific competencies.

Self-Efficacy

According to Bandura (1977), self-efficacy is arbitrated by a person's beliefs or expectations about his/her ability to achieve certain tasks successfully or exhibit certain behaviors. Bandura proposes that the expectations determine whether or not a certain behavior or performance will be attempted. These expectations also affect the amount of effort the individual will provide, and how long the individual will continue the behavior when obstacles are encountered. When viewed in relation to careers, self-efficacy expectations refer to a person's beliefs regarding "career-related behaviors, educational and occupational choice, and performance and persistence in the implementation of those choices" (Betz and Hackett, 1997, p. 383). Those behaviors, choices, and tasks are

reflections of the individual's perception of his/her ability. The efficacy expectation has a direct effect on the outcome expectation (Hackett and Betz, 1981).

When individuals have low self-efficacy expectations, it limits their willingness to participate in the task and they are more apt to give up more quickly when the task is viewed as difficult.

Bandura (1997) identifies four conditions in which self-efficacy expectations are acquired and self-efficacy is learned: performance accomplishments, indirect learning, verbal persuasion, and physical/affective status.

The manner of which an individual's accomplishments are received has an influence on self-efficacy expectations and actions. In the classroom, negative assessments of ability, and poor grades can lower self-efficacy beliefs. Negative social reactions, racism, prejudice, and sexism, and discrimination also reinforce low self-efficacy beliefs. According to Swanson and Woitke (1997), the effect of those experiences depends on the individual's perceptions of those barriers and their ability to predict how the environment will react to their behavior in a situation.

Through observation and interpretation of various experiences, an individual is able to reflect and adapt to new situations. An individual often develops beliefs through interpretation and observation of how others model behaviors – vicarious learning. In reflecting on those past experiences an individual is able to create relevant meaning to a new experience. If modeling reflects limitations of certain behaviors, the individual's options and choices are perceived as limited – e.g., lack of economic, gender, cultural, or social class, education choices and opportunities.

An individual's beliefs of self are also influenced by others' verbal messages and persuasion. The amount of encouragement and/or criticism can either reinforce or hinder self-efficacy, which can affect a person's interests, choices, and involvement.

Anxiety and stress can have a negative effect on self-efficacy and learning. According to Caine and Caine (1990, p. 68), "The brain learns optimally when appropriately challenged, but downshifts under perceived threat." Physical environment and the conditions affect the levels of self-efficacy, participation, and expected outcomes.

Azzam's (2012) article examined Daniel Pink's research on the differences between learning goals and performance goals, and compliant behavior vs. engaged behavior. When students are given more autonomy in their work and are trusted to handle it, they are more likely to be engaged in the task. Pink suggests that both in education and the workforce, people rely more on work that requires greater creativity, judgment and discernment. If students are motivated to be creative and use various modes of problem solving vs. being told how to do everything without any room for individual motivation or creativity, then they may be more engaged in their learning.

Contextual learning described by Wienbaum and Rogers (1995), is a process by which "knowledge is socially shared, thinking is shaped by engagement with tools, learning is engaged with objects and events, and learning is situation specific" (p. 5). There is an emphasis on real-life events and problems. As students attempt to understand situations and develop strategies for tackling barriers with which they

encounter, they are able to adapt and learn. Within contextual learning, students are encouraged to engage in leadership, problem solving, teamwork and negotiation.

Connecting and applying learning to real life experiences is the goal of problem-based learning activities. There are no right or wrong answers and it requires students to formulate their own solutions through observation and investigation. Both contextual and problem-based learning allows students to confront and test their ability perceptions and the barriers that may limit their success.

The instructor/teacher's role in problem-based learning is that of a facilitator and coach who models or demonstrates a procedure or behavior to help students understand a concept. Eventually, the responsibility of learning transfers to the student as assistance from the instructor is gradually reduced. When students struggle with a concept, the deficiencies are presented as part of the learning process and not as failures. Brophy (1998) suggests that instructors act more as resources than as judges; focus less on the outcomes than on the actual learning process; react to errors as part of the learning process; emphasize effort rather than ability when providing feedback; and attempt to use strategies that motivate students' efforts intrinsically.

Community-based learning experiences are also forms of contextual learning. These types of experiences include project-based workplace learning, school-directed worksite learning, and apprenticeships or internships. Community-based learning experiences connect students' career goals with their schoolwork. This type of learning allows students to solve real-world issues of the business community.

Contextual, problem-based, and community-based learning offers students opportunities to apply skills and knowledge in real-world experiences. However, reflection is a key component in helping to students build self-efficacy through various types of assessment. Self-assessment, journaling, portfolios, peer reviews, and performance checklists are examples of ways that students can become more empowered and increase their learning and individual growth (ERIC Digest, 1999).

Chapter III

Methodology

The research questions, hypotheses, participants, study design, procedures, and analysis of data will be described in this chapter. The purpose of this mixed-method study was to examine students' perceptions of their life skills in a project-based learning environment.

Project-based learning approaches were identified in this study as curriculum that is driven through inquiry, student choice, and individualized learning plans. See Chapter 2 for in-depth discussion of these instructional approaches.

Primary quantitative and qualitative data was collected and analyzed through student interviews, surveys, and focus groups from a sample of sixth through twelfth grade students in two different schools in Minnesota. The goal of this research was to provide further data that may lead to a better understanding of how to increase student life skills through project-based learning.

This study explored the following research questions:

- What are students' perceptions of their development of life skills in project-based learning schools?
- In what ways, if any, do students perceive an increase in their life skill development over a one-year period of time?
- What relationship, if any, is there between grade level and students' perceptions of their life skills?

Targeted Sites

Subjects were selected using a convenience sampling from two different Minnesota project-based learning charter schools.

Minnesota New Country School (MNCS) was a 6-12 grade rural south-central Minnesota project-based learning charter school. This school used the project-based learning approach to achieve student learning. MNCS had a total enrollment of 113 students. Other student demographics included: 0% receives ELL services, 23% receive Special Education services, and 23% receive free and reduced lunch (SES). The ethnic and heritage distribution in this charter school included 95% White, 2% Black, 1% Hispanic, 1% Asian/Pacific Islander, 1% American Indian (Minnesota Department of Education, 2011).

Avalon School was a 7-12 grade urban central Minnesota project-based learning charter school. Avalon School had a total enrollment of 190 students. Other student demographics included: 2% receive ELL services, 26% receive Special Education services, and 2% receive free and reduced lunch (SES). The ethnic and heritage distribution in this charter school included 71% White, 18% Black, 3% Hispanic, 5% Asian/Pacific Islander, 2% American Indian, 1% Unspecified (Minnesota Department of Education, 2011).

Subjects

In this mixed methods research study, participants were chosen as a convenience sample due to the location of schools, student population, and the types of learning approaches used relative to the purpose of the study. The sample size of the analytical

survey data included a sample of 275 sixth through twelfth grade students from two Minnesota schools. The sample size of the qualitative interviews included a random selection of 26 sixth through twelfth grade students from the two targeted schools. Although 15 students was the intended number of students requested from both Avalon and MNCS, only 12 students from Avalon and 14 students from MNCS chose to participate in the interviews. The intended number of students requested from both Avalon and MNCS for focus groups was six. Six students from Avalon and five students from MNCS chose to participate in the focus group.

Sixth through twelfth grade students in project-based learning schools were chosen for this research for several reasons. There has been significant pedagogical debate concerning the measurement of student success throughout middle school and high school as they prepare to enter the work force or college. According to Bushaw (2007), mainstream U.S. high schools usually measure success based on college entrance exams and acceptance rates to post-secondary institutions. Wurdinger and Rudolph (2009) focused their study on reexamining the definition of success by investigating the teaching of important life skills needed to become beneficial members of society. By focusing on middle and high school students, my intention was to further examine the possible effects of project-based learning on students' life skills and how they perceived those life skills.

Data Collection Procedures

Data was collected and generated from three principle sources: (a) interviews, b) surveys, and (c) focus groups.

Informed consent. All sixth through twelfth grade students at MNCS and Avalon School were informed of the purpose and process of this study through an assent form that they voluntarily chose to read and sign. Their parents/guardians were also given a consent form that explained the purpose and process of this study that they could voluntarily read and sign. Each of the schools in this study provided the assent and consent forms to all students and their parents/guardians. Each of the consent forms are provided in Appendices D, E, F, G, and H.

Additionally, consent information was provided to students before they took the online surveys during the fall and spring semesters. They received a letter informing them of their random selection for participating in either the interviews or the focus group sessions.

Survey data. A total of 275 6-12th grade students from Avalon School and Minnesota New Country School completed a thirty-seven Likert-type survey with one open-ended question during the 2012-2013 school year. Students were asked to complete the same survey once in the fall and once in the spring. The analysis below was conducted to identify significant associations of students' perceptions of life skills with project-based learning. Each of the thirty-four survey questions was categorized into the eight dimensions of life skills. Numerical grade levels were collected from respondents (i.e., 6, 7, 8, 9, 10, 11, 12). Rather than comparing each grade to every other grade, a new variable was coded in which grades were grouped together into the categories of middle school students (grades 6-8), high school underclassmen (grades 9 and 10), and high school upperclassmen (grades 11 and 12). Due to the varied number of students from

each grade level who responded to the survey, it was more reliable and manageable to compare groups rather than individual grade levels. The tables corresponding to descriptive analysis include Tables 4.1 through 4.11.

The survey is provided in Appendix C. The survey was distributed online using Survey Monkey (2012) and was implemented during the fall and spring semester of the 2012-2013 school year. The survey should have taken no longer than 10 minutes to complete.

The first question of the survey asked students how long they had been at the school. The second question asked students their current grade level. A thirty-four Likert-type survey was given to each student, and was used to compute scores of central tendency and spread on eight dimensions. Each question, except 37, was attached to one of eight life skills that included ...list the eight here. The Likert scale consisted of the following: 1 = Poor; 2 = Fair; 3 = Satisfactory; 4 = Good; 5 = Excellent. Question 37 was an open-ended question that asked students what life skills they thought were important to best prepare them for college.

Interview data. Data was collected from a random sampling of 26 sixth through twelfth grade students at both schools throughout the 2012-2013 school year. Semi-structured interview questions for the sixth through twelfth grade students concerning their perceptions of life skills are provided in Appendix A.

The interviews were held at MNCS and Avalon during the 2012-2013 school year. The interviews took place during and after school hours with a random selection of sixth through twelfth grade students from each of the schools. The location of the

interviews took place in a room selected by the lead teacher where there was little distraction and where each student could remain anonymous to other classmates. The interviews were recorded through a computer microphone and a digital tape recorder. The estimated time for each interview was less than thirty minutes. Although 15 students from Avalon were randomly chosen to participate in interviews, only 12 chose to participate. Fifteen students from MNCS were also randomly chosen to participate in interviews, however 14 chose to participate.

Focus group data. A focus group interview and discussion took place at the end of the spring semester of the 2012-2013 school year. A random selection of six students from each school were chosen to take part in a thirty-minute focus group discussion regarding life skills. All six students from Avalon chose to participate and five students from MNCS chose to participate. The focus group questions are included in Appendix B.

Data Analysis

Survey analysis. Survey data was coded in order to find themes and categories within the research. Conceptual mapping linked together various themes through the documentation process. Charts and graphs provided evidence of data results. The Likert survey data was analyzed using SPSS (Statistical Package for the Social Sciences), which provided the mean and median scores of the survey. The mean or average represented the typical score for the set of data points. If the scores were reasonably consistent, the mean and median were used to indicate central tendency. Variability was analyzed by looking at the range and the standard deviation of the scores on the survey. Survey data

was auto-processed and analyzed through SPSS software to cross-reference and compare data across groups of randomly selected students. A paired samples t-test indicated whether students demonstrated higher life skills perceptions in the spring semester when compared to the fall semester. A one-way ANOVA and planned contrasts/post-hoc tests indicated whether students in advanced grades demonstrate higher life skill perceptions than students in lower grades. As mentioned above, an analysis of survey subscales (as indicated by the “Question Key” at the end of the survey) may also provide useful information. A repeated-measures ANOVA and contrasts/post hoc tests indicated, overall, where areas of particular strength and weaknesses may have been. Cross group comparisons could also be used to determine whether certain groups score higher on particular subscales. This information may prove useful in making recommendations for program improvements by identifying areas that students struggled with or performed well in.

Interview analysis. The students’ answers to the interview questions were coded to look for similarities or recurrences in the data as categories were documented in order to find patterns. Consistency of the questions were important to ensure comparability and transferability of the research. Recordings of interviews were saved and secured throughout the study. Undergraduate education students and myself transcribed the recorded interviews. Thematic coding tested relationships between issues, concepts, and themes that may have developed from memos and descriptive and topic coding throughout the interview process. Data from all 26 of the interviews of the randomly selected students were sorted and analyzed.

Focus group analysis. The students' answers during the focus group discussion were digitally recorded and transcribed by undergraduate students and myself. The answers to the questions were thematically coded to examine possible similarities and differences among issues and concepts.

Integrated analysis. Emergent themes of the data were categorized and documented and were compared to the quantitative data from the survey. Transcribed interviews and focus group data was organized by codes and emergent themes and imported into Microsoft Excel. As themes emerged from the qualitative data, comparisons and contrasts to the quantitative data were examined. This comparative analysis of the interview data, survey data, and focus group data provided further evidence in whether the perceptions of students in the sample frame had any correlation to their project-based learning environment or their time span within the environment.

Chapter IV

Findings

This chapter discusses quantitative and qualitative data analysis findings for each of the three research questions: 1) What are students' perceptions of their development of life skills in project-based learning schools; 2) In what ways, if any, do students perceive an increase in their life skill development over a one-year period of time; and 3) What relationship, if any, is there between grade level and students' perceptions of their life skills? Preliminary data processing for each type (quantitative and qualitative) will be discussed along with the study results. This minimizes the chance of researcher bias being embedded in the research method by allowing readers to examine the thought process behind research decisions.

Quantitative Findings

A total of 275 6-12th grade students from Avalon School and Minnesota New Country School completed a thirty-seven Likert-type survey during the 2012-2013 school year. Not all 275 students chose to answer all of the survey questions. The tables corresponding to descriptive analysis include Tables 4.1 through 4.11 and provide evidence of the data from those students who took the survey.

Descriptive Statistics

The first question of the survey asked students how long they had been at the school. The second question asked students their current grade level. The following thirty-four Likert-type questions were asked of each student, which were then used to

compute scores of central tendency and spread on eight dimensions. The scale dimensions were comprised of the following items.

- Time Management: 3, 16, 21, 32
- Responsibility: 9, 13, 22, 28
- Problem Solving: 4, 6, 17, 23, 33
- Self-Directedness: 5, 18, 25, 30
- Collaboration: 7, 8, 10, 15
- Communication: 12, 20, 24, 27, 34
- Creativity: 14, 19, 26
- Work Ethic: 11, 29, 31, 35,
- Overall Improvement: 36

Scale Used: 1 = Poor; 2 = Fair; 3 = Satisfactory; 4 = Good; 5 = Excellent

Question 37 was an open-ended question that asked students what life skills they thought were important to best prepare them for college, and will be discussed at the end of the quantitative section.

Inferential Statistics

Tests of central tendency and variability. Several t tests were conducted in order to compare responses between fall and spring semesters. Dependent samples t tests were not possible due to the fact that cases were not matched across semesters. Independent samples t tests were conducted instead (which introduces greater error into the analysis as a control for individual unmatched differences).

Eight t tests were conducted, one for each of the life skills and, in order to correct for family-wise error resulting from multiple tests, a Bonferroni correction was applied. This means that the standard of level of significance (.05, meaning a 1 in 20 chance of a false positive result) was adjusted, in this case with the formula of $05(.95)^{n-1}$, where n = the number of tests performed. After this correction, a p value (significance level) of $<.035$ was required for a t test to be significant.

Fall and Spring scores from all 275 student survey responses were combined to examine the average overall perceptions for each dimension (see Table 4.1). Overall scores from all 275 student survey responses were also examined to compare Fall and Spring responses (see Table 4.2).

Table 4.1. Combined Fall and Spring Average for Each Dimension

	Years	Time Management	Responsibility	Problem Solving	Self Directed-ness	Collabo-ration	Communication	Creativity	Work Ethic
N	274	275	274	275	274	274	274	274	274
Mean	2.21	3.37	3.67	3.75	3.52	3.60	3.81	3.92	3.45
Std. Deviation	1.35	0.85	0.83	0.72	0.81	0.79	0.72	0.69	0.82
Median	2.00	3.25	3.67	3.80	3.50	3.75	3.83	4.00	3.50
Minimum	1.00	1.25	1.67	1.00	1.00	1.00	1.00	2.00	1.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Range	4.00	3.75	3.33	4.00	4.00	4.00	4.00	3.00	4.00

Table 4.2. Overall Group Statistics Comparing Fall and Spring

	Mean	Std. Deviation	Std. Error Mean
Time Management			
Fall 2012 ^a	3.392	0.805	0.063
Spring 2013 ^b	3.344	0.919	0.086
Responsibility			
Fall 2012 ^a	3.668	0.802	0.063
Spring 2013 ^c	3.676	0.867	0.082
Problem Solving			

Fall 2012 ^a	3.742	0.696	0.055
Spring 2013 ^b	3.769	0.764	0.072
Self Directedness			
Fall 2012 ^a	3.512	0.781	0.061
Spring 2013 ^c	3.525	0.852	0.081
Collaboration			
Fall 2012 ^a	3.617	0.747	0.059
Spring 2013 ^c	3.568	0.860	0.081
Communication			
Fall 2012 ^a	3.811	0.710	0.056
Spring 2013 ^c	3.805	0.744	0.070
Creativity			
Fall 2012 ^a	3.943	0.686	0.054
Spring 2013 ^c	3.884	0.694	0.066
Work Ethic			
Fall 2012 ^a	3.432	0.804	0.063
Spring 2013 ^c	3.481	0.848	0.080

^an = 162

^bn = 113

The Levene's Test for Equality was used to adjust for inequality among groups (see Table 4.3). No *t* tests revealed significant differences between the two semesters.

Table 4.3. Independent Samples Test

	Levene's Test for EV		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI	
								Lower	Upper
Time Management									
EV assumed	4.722	0.031	0.450	273.000	0.653	0.047	0.105	-0.159	0.253
EV not assumed			0.439	219.976	0.661	0.047	0.107	-0.164	0.258
Responsibility									
EV assumed	0.180	0.671	-0.078	272.000	0.938	-0.008	0.102	-0.208	0.193
EV not assumed			-0.076	226.502	0.939	-0.008	0.103	-0.212	0.196
Problem Solving									
EV assumed	0.121	0.728	-0.303	273.000	0.762	-0.027	0.089	-0.202	0.148
EV not assumed			-0.298	226.522	0.766	-0.027	0.090	-0.205	0.151
Self Directedness									
EV assumed	0.140	0.708	-0.135	272.000	0.893	-0.013	0.100	-0.210	0.183

EV not assumed			-0.133	225.039	0.894	-0.013	0.101	-0.213	0.186
Collaboration									
EV assumed	2.856	0.092	0.502	272.000	0.616	0.049	0.098	-0.143	0.241
EV not assumed			0.489	216.409	0.625	0.049	0.100	-0.149	0.247
Communication									
EV assumed	0.352	0.553	0.070	272.000	0.944	0.006	0.089	-0.169	0.181
EV not assumed			0.070	231.471	0.944	0.006	0.090	-0.171	0.183
Creativity									
EV assumed	0.453	0.502	0.702	272.000	0.483	0.059	0.085	-0.107	0.226
EV not assumed			0.701	236.948	0.484	0.059	0.085	-0.108	0.227
Work Ethic									
EV assumed	0.149	0.700	-0.493	272.000	0.622	-0.050	0.101	-0.249	0.149
EV not assumed			-0.488	230.483	0.626	-0.050	0.102	-0.251	0.151

Note. CI = confidence interval; EV = equal variances.

Combined Fall and Spring averages for each dimension were split by grade groups (middle school student, HS underclassmen, and HS upperclassmen) to examine possible differences between grade groups (see Table 4.4).

Table 4.4. Combined Fall and Spring for Each Dimension by Grade Groups

	N	Mean	Std. Deviation	Std. Error	95% CI for Mean		Minimum	Maximum
					Lower	Upper		
Time Management								
Middle School Student (6-8)	64	3.51	0.90	0.11	3.28	3.73	1.25	5
HS Underclassman (9-10)	91	3.23	0.77	0.08	3.07	3.39	1.25	5
HS Upperclassman (11-12)	118	3.40	0.88	0.08	3.24	3.56	1.25	5
Total	273	3.37	0.85	0.05	3.27	3.47	1.25	5
Responsibility								
Middle School Student (6-8)	63	3.59	0.97	0.12	3.34	3.83	1.67	5

HS Underclassman (9-10)	91	3.49	0.71	0.07	3.35	3.64	1.67	5
HS Upperclassman (11-12)	118	3.85	0.81	0.07	3.70	3.99	1.67	5
Total	272	3.67	0.83	0.05	3.57	3.77	1.67	5
Problem Solving								
Middle School Student (6-8)	64	3.68	0.79	0.10	3.48	3.88	1.60	5
HS Underclassman (9-10)	91	3.68	0.67	0.07	3.54	3.82	1.80	5
HS Upperclassman (11-12)	118	3.85	0.73	0.07	3.71	3.98	1.00	5
Total	273	3.75	0.73	0.04	3.66	3.84	1.00	5
Self Directedness								
Middle School Student (6-8)	63	3.39	0.96	0.12	3.15	3.63	1.00	5
HS Underclassman (9-10)	91	3.48	0.67	0.07	3.34	3.62	1.75	5
HS Upperclassman (11-12)	118	3.60	0.82	0.08	3.45	3.75	1.00	5
Total	272	3.51	0.81	0.05	3.42	3.61	1.00	5
Collaboration								
Middle School Student (6-8)	63	3.56	0.91	0.12	3.33	3.79	1.75	5
HS Underclassman (9-10)	91	3.56	0.61	0.06	3.44	3.69	1.50	5
HS Upperclassman (11-12)	118	3.64	0.86	0.08	3.48	3.80	1.00	5
Total	272	3.60	0.80	0.05	3.50	3.69	1.00	5
Communication								
Middle School Student (6-8)	63	3.70	0.88	0.11	3.48	3.92	1.00	5
HS Underclassman (9-10)	91	3.73	0.60	0.06	3.61	3.86	1.83	5

HS Upperclassman (11-12)	118	3.93	0.71	0.06	3.80	4.05	2.00	5
Total	272	3.81	0.72	0.04	3.72	3.89	1.00	5
Creativity								
Middle School Student (6-8)	63	3.93	0.66	0.08	3.76	4.10	2.50	5
HS Underclassman (9-10)	91	3.86	0.58	0.06	3.74	3.98	2.50	5
HS Upperclassman (11-12)	118	3.95	0.78	0.07	3.81	4.09	2.00	5
Total	272	3.91	0.69	0.04	3.83	4.00	2.00	5
Work Ethic								
Middle School Student (6-8)	63	3.46	0.87	0.11	3.24	3.68	1.50	5
HS Underclassman (9-10)	91	3.35	0.70	0.07	3.20	3.49	1.00	5
HS Upperclassman (11-12)	118	3.53	0.88	0.08	3.37	3.69	1.00	5
Total	272	3.45	0.82	0.05	3.35	3.55	1.00	5

Note. CI = confidence interval

Analysis of variances. One-way analysis of variance (ANOVA) is a statistical test that identifies differences on a continuous dependent variable between groups of a categorical independent variable (when that variable has three or more groups). A significant F ratio (where the p value in the sig. column is less than .05) indicates that a statistically significant difference exists between the groups. Since multiple ANOVAs were conducted, the p value required for statistical significance was adjusted to .033 in order to correct for family-wise error using a Bonferroni correction (the increase of

finding a false significant result due to chance when multiple tests are performed; in this case, correcting for a total of 9 ANOVAs).

Table 4.5. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Time Management					
Between Groups	3.117	2	1.559	2.153	0.118
Within Groups	195.415	270	0.724		
Total	198.532	272			
Responsibility					
Between Groups	7.008	2	3.504	5.270	0.006
Within Groups	178.853	269	0.665		
Total	185.860	271			
Problem Solving					
Between Groups	1.899	2	0.949	1.813	0.165
Within Groups	141.344	270	0.523		
Total	143.242	272			
Self Directedness					
Between Groups	2.002	2	1.001	1.532	0.218
Within Groups	175.841	269	0.654		
Total	177.844	271			
Collaboration					
Between Groups	0.421	2	0.211	0.330	0.719
Within Groups	171.524	269	0.638		
Total	171.945	271			
Communication					
Between Groups	2.917	2	1.458	2.825	0.061
Within Groups	138.883	269	0.516		
Total	141.800	271			
Creativity Dimension					
Between Groups	0.474	2	0.237	0.497	0.609
Within Groups	128.289	269	0.477		
Total	128.763	271			
Work Ethic					
Between Groups	1.726	2	0.863	1.276	0.281
Within Groups	181.918	269	0.676		
Total	183.644	271			

Since there are more than two groups, post-hoc tests were used to determine if there was a significant F -ratio and where the difference or differences existed. F ratios

found in the ANOVA table were adjusted in order to compensate for the violation of the test's assumption of homogeneity of variances. This adjustment was performed by conducting Welch and Brown-Forsythe "Robust Tests of Equality of Means", which provide adjusted F ratios that are more appropriate for interpretation. The Welch Robust Test of Equality showed (Sig. = .003) for responsibility.

Following F ratio adjustments, the Games-Howell post-hoc test was conducted and chosen due to the inequality of variance among the groups and because the sample sizes of the groups were unequal. This test showed that high school underclassmen's scores on *responsibility* were significantly different (lower) than high school upperclassmen's scores: -0.355 ($p = .002$). There were no other significant pairs of scores (see Table 4.6).

Table 4.6. Multiple Comparisons

(I) Grade Group	(J) Grade Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower	Upper
Middle School Student	HS Underclassman	0.095	0.142	0.785	-0.244	0.433
	HS Upperclassman	-0.260	0.142	0.166	-0.599	0.078
HS Underclassman	Middle School Student	-0.095	0.142	0.785	-0.433	0.244
	HS Upperclassman	-0.355*	0.105	0.002	-0.603	-0.107
HS Upperclassman	Middle School Student	0.260	0.142	0.166	-0.078	0.599
	HS Underclassman	.355*	0.105	0.002	0.107	0.603

Note. Dependent Variable = Responsibility. Games-Howell. *Significant at the 0.05 level.

The bar graph of responsibility provided information showing the difference in mean *responsibility* scores between the different grade groups. High school upperclassmen were significantly higher in their *responsibility* score than high school

underclassmen. Although they also scored higher in responsibility than middle school, the difference was not significant (see Figure 1).

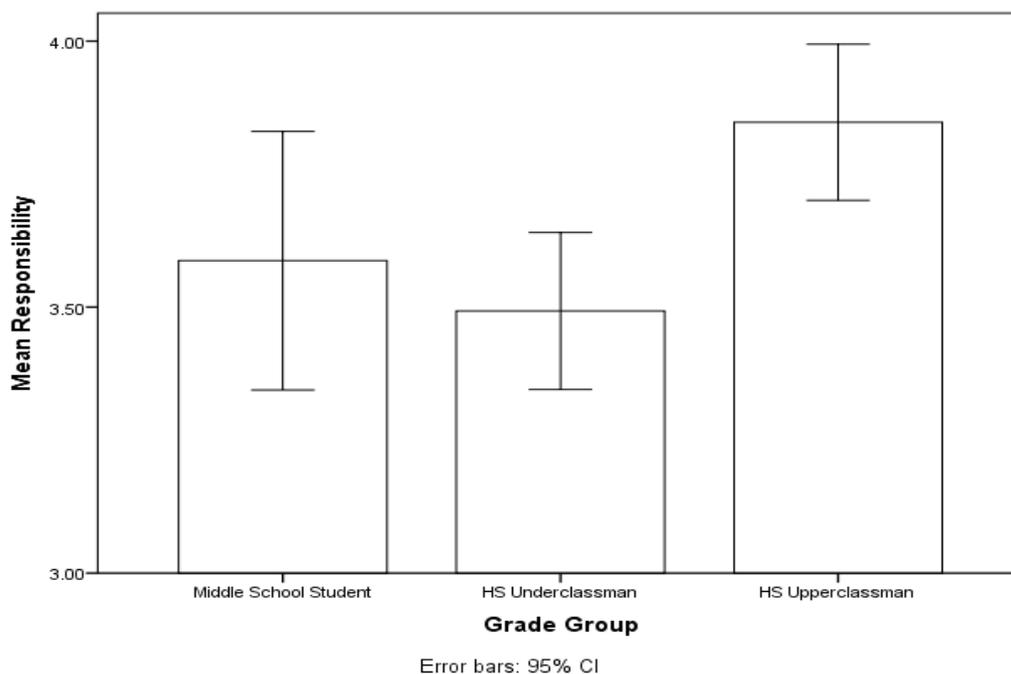


Figure 1: Graph of Responsibility Scores

The average of years that each student group was at the project-based learning school was examined (see Table 4.7). The total average time that all students had been at their particular school was 2.21 years.

Table 4.7. Years at Project-Based Learning Schools

	N	Mean	Std. Deviation	Std. Error	95% CI For Mean		Minimum	Maximum
					Lower	Upper		
Middle School Student	64	1.330	0.778	0.097	1.130	1.520	1	5
HS Underclassman	91	1.740	0.892	0.094	1.550	1.920	1	4
HS Upperclassman	118	3.060	1.410	0.130	2.800	3.320	1	5
Total	273	2.210	1.353	0.082	2.050	2.370	1	5

Pearson's r correlations between years at the school and mean scores on survey item dimensions were computed in order to determine whether scores on these dimensions were related to time spent enrolled at the charter school. The closer the correlation coefficient is to 1 or -1, the stronger the relationship between the variables. The direction of a correlation (whether it is positive or negative) depends on the pattern of scores for each of the variables. If scores on one variable increase along with scores on the other variable decrease, the relationship is negative. The strength and directions of a correlation should be interpreted separately (for example, a correlation of .71 is equally as strong as a correlation of -.71, the relationships simply have different directions). Correlations with a "Sig" (p) value of .05 are traditionally considered statistically significant. However, in order to correct for family-wise error, the value required for significance has been adjusted to .035 using a Bonferroni correction (to correct for computing eight correlations). There were no significant correlations (see Table 4.8).

Table 4.8. Correlations Between Years at School and Survey Item Dimensions

	Pearson Correlation	Sig. (2-tailed)	N
Time Management	-0.054	0.376	272
Responsibility	0.048	0.432	271
Problem Solving	0.038	0.535	272
Self Directedness	-0.061	0.317	271
Collaboration	0.040	0.516	271
Communication	0.030	0.626	271
Creativity	-0.032	0.596	271
Work Ethic	-0.078	0.200	271

The Likert scale survey question 36 was not used in the previous data because it did not fall into any of the eight categories. Question 36 asked how students perceived

improvement of their like skills (see Table 4.9). Students ranked their overall improvement of life skills as good (50.18%). Students ranked their improvement as excellent (27.47%). Data from survey question 36 was also disseminated by each grade level's perceptions of their improved life skills. Only one sixth grade student responded, so that data was not included (see Table 4.10).

Table 4.9. Overall Perceptions of Improved Life Skills

Likert Scale	N	%
Scale 1	4	1.47
Scale 2	10	3.67
Scale 3	47	17.21
Scale 4	137	50.18
Scale 5	75	27.47

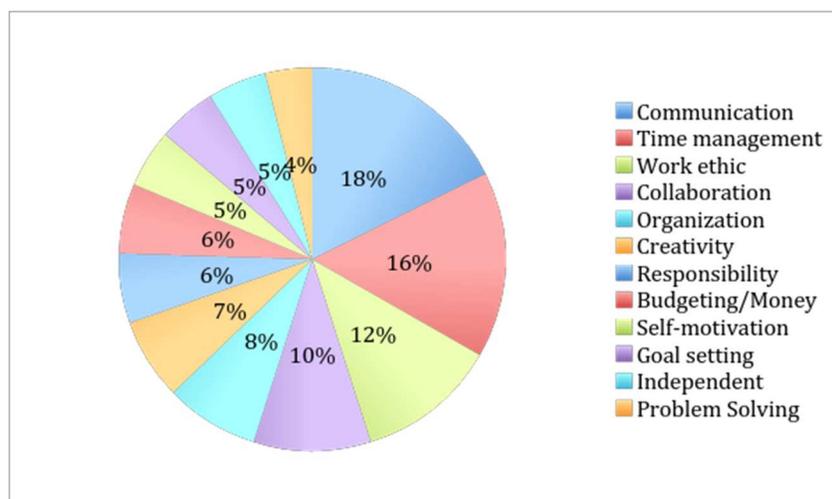
Note. Scale used was 1 to 5; 1 = Poor, 5 = Excellent. Total N = 273.

Table 4.10. Overall Perceptions of Improved Life Skills by Grade Level

Grade Level	Fall		Spring	
	N	Mean	N	Mean
7 th grade	15	4.33	23	3.47
8 th grade	9	3.88	15	4.20
9 th grade	20	4.05	26	3.69
10 th grade	21	4.09	22	3.90
11 th grade	30	3.96	32	4.28
12 th grade	24	4.29	28	3.85

Note. Sixth grade students were not included in this data due to only one-sixth grade student answered the question. Scale Used: 1 = Poor; 2 = Fair; 3 = Satisfactory; 4 = Good; 5 = Excellent

The last section of the survey was composed of one open-ended question providing for a written response. Question 37 asked students which life skills they thought were important to best prepare for college. Only 225 out of 275 students responded to this question (see Figure 2).



n = 225 students who responded to survey question 37

Figure 2: Life skills needed to best prepare for college by Avalon and MNCS students

Qualitative Findings

Semi structured interviews were given to 12 random students at Avalon School and 14 random students at MNCS. These interviews were recorded and transcribed by undergraduate students and myself. Semi structured focus group interviews were given to six random students at Avalon School and five random students at MNCS. These focus group interviews were recorded and transcribed by undergraduate students and myself. The individual interview questions are found in Appendix A and the focus group questions are found in Appendix B. There was a significant overall perception from individual interviewed students that their life skills had improved since enrollment at both schools. All 12 of interviewed Avalon students and all 14 of MNCS students responded that they had improved their life skills.

Avalon School

A significant focus of this research was to better understand what students perceived as important life skills. A total of eighteen students from Avalon grades 7-12 were interviewed, combining individual and focus group sessions. The two perceptions that were higher were *communication* (72%) and *time management* (61%). Although the other categories were lower, they should still be given consideration due to the students' perceptions that those categories were important (see Table 4.11).

Table 4.11. Avalon Students' Perceptions of Important Life Skills

Life Skill	N	%
Time Management	11	61.11
Problem Solving	2	11.11
Self-Directedness/Independence	9	50
Collaboration/Social Skills	9	50
Communication	13	72.22
Creativity	1	5.56
Work Ethic	1	5.56
Organization	4	22.22
Leadership	2	11.11
Finance/Money Skills	2	11.11
Math	3	16.67
Adaptability	1	5.56
Self-Confidence	1	5.56
Knowledge	1	5.56
Spelling/Writing	1	5.56
Ambition	1	5.56

Note. N = Number of times each theme occurred. Total Students = 18.
% = N/18.

Students' perceptions of their most improved life skills while attending Avalon were examined through interviews and the focus group. There was a significant result that 38.89% perceived communication as their most improved life skill, and 33.33%

perceived time management and self-directedness/independence as their most improved life skills (see Table 4.12).

Table 4.12. Avalon Students' Perceptions of Most Improved Life Skills

Life Skills	N	%
Time Management	6	33.33
Communication	7	38.89
Self-Directedness/Independence	6	33.33
Leadership	1	5.56
Reading	1	5.56
Responsibility	2	11.11
Creativity	2	11.11
Work Ethic	1	5.56
Collaboration	3	16.67

Note. N = number of times each theme occurred. Total students = 18. % = N/18

The individual interviews and focus group students were asked if they had any suggestions for improvement at Avalon. The most common response was satisfied with no recommendations. Suggestions that were made by more than one student included improved communication among students and teachers; allow for more creativity, and help students be more responsible (see Table 4.13).

Table 4.13. Avalon Students' Suggestion for Improvement

Suggestion	N	%
Satisfied With No Recommendations	4	22.22
Better Communication Among Teachers and Students	2	11.11
Allow More Creativity	2	11.11
Increase Math Education	1	5.56
Help Students Be More Responsible	2	11.11
Provide More Sports	1	5.56
Provide More Activities For Newer Students	1	5.56
Help Students with Time Management	1	5.56
Provide More Job Skill Classes	1	5.56

Note. N = number of times theme occurred. Total Students = 18. % = N/18

Minnesota New Country School

MNCS students' perceptions of important life skills were also examined. Self-directedness/independence was perceived to be most important, followed by communication/social skills, time management and collaboration (see Table 4.14).

Table 4.14. MNCS Students' Perceptions of Important Life Skills

Life Skills	N	%
Time Management	8	42.11
Responsibility	5	26.32
Problem Solving	2	10.53
Self-Directedness/Independence	13	68.42
Collaboration/Social Skills	8	42.11
Communication	11	57.89
Creativity	4	21.05
Work Ethic	4	21.05
Organization	5	26.32
Leadership	2	10.53
Finance/Money Skills	4	21.05
Math	5	26.32
Shopping	1	5.26

Note. N = number of times each theme occurred. Total Students = 19. % = N/19

Communication, collaboration, and self-directedness/independence were perceived by students at MNCS to be the life skills that they had most improved on while attending MNCS. Communication was the highest, followed by collaboration, and self-directedness/independence (see Table 4.15).

Table 4.15. MNCS Students' Perceptions of Most Improved Life Skills

	N	%
Time Management	1	5.26
Communication	6	31.58
Self-Directedness/Independence	3	15.79
Leadership	1	5.26
Reading	1	5.26
Self-Confidence	1	5.26
Creativity	1	5.26

Work Ethic	1	5.26
Collaboration	5	26.32
Math	1	5.26

Note. N = number of times each theme occurred. Total students = 19. % = N/19

The individual interviews and focus group students were asked if they had any suggestions for improvement at MNCS. The most common responses included needing more direction and assistance with projects, allowing more creativity, increased math education, and a more rigid structure (see Table 4.16).

Table 4.16. MNCS Students' Suggestions for Improvement

	N	%
Satisfied With No Recommendations	0	0
Better Communication Among Teachers and Students	1	5.26
Allow More Creativity	2	10.53
Increase Math Education	2	10.53
Increased Reading Education	1	5.26
Better Technology	1	5.26
People Getting Along	1	5.26
More Rigid Structure	2	10.53
More Direction and Assistance with Projects	3	15.79
Job Skill Classes	1	5.26

Note. N = number of times each theme occurred. Total Students = 19. % = N/19

Combined Focus Groups

Both focus groups at Avalon and MNCS were asked six questions in a semi-structured interview (see Appendix B). These questions addressed students' perceptions of the importance and improvement of their life skills and how they related those skills to project-based learning. In analyzing their collective responses to all of the questions, various themes occurred through students' answers. These themes were goal setting, self-directedness/independence, collaboration, communication, time management and

creativity. Qualitative findings are provided and supported in the following quotes from those focus group interviews.

Goal setting. Several students identified *goal setting* as a part of their life skill development. The projects they complete at their schools require plans that included setting learning-oriented goals as well as task-oriented and time-oriented goals. Some of their responses were,

I think setting your own goals and being really independent is a big one.

Setting realistic goals. I tend to get really excited at the beginning of the project.

I definitely think I need to work on being able to set realistic goals at the beginning.

Self-directedness/Independence. Students identified *self-directedness/independence* as a part of their life skill development. Students felt that they had opportunities to create unique projects, learn and grow through their mistakes, and develop more independence in their work.

The idea behind project-based learning is that the student designs everything on their own and that means all failures are because of them, and it's much easier to learn from your own failures than others'.

I feel project-based learning is very unique and really, really facilitates those personal growths and aspects.

My independent learning has grown since I started coming here.

I think the fact that you're learning through yourself here is really good.

It's really helped me work independently.

For me, it's self-awareness. I came here in 8th grade and it's just been a slow climb to really understand how I work; in academics, but also as a person;

emotionally, intellectually, spiritually, and physically. I think it really helps you to be self-aware and to help you get your tasks in order.

You can decide and try to figure out what you want to do with your life after high school.

Collaboration. Students talked about how their social skills had improved while attending their project-based schools. Through daily conversations and discussions with their teacher/advisors and other peers, students were able to develop *collaborative/social skills*.

I work with people a lot better than I used to.

I would definitely say my social skills and just being able to look at life and say, you know what, its all going to be okay. Everyone treats you with respect.

Communication. Students identified *communication* as an important skill that was necessary to be successful in project-based learning schools. They felt that it was important to communicate with their teachers/advisors. They felt encouraged to participate in conversations and developed listening and speaking skills.

My listening skills and communication skills, and my leadership skills I think have improved.

I really think my communication skills have gotten a lot better.

The communication aspect has improved, and will benefit me, and my further exploration of my career down the line.

In project-based learning you have an absolute need to communicate with your advisor and you have to talk to them. I feel much more confident in myself because of that.

Coming here, you get to do projects with students and they really encourage you to partner up during class work, and I think that really helped me with communication and my social life.

Mine would be vocational skills because not only am I quiet, I'm very shy around people and I want to be able, when I'm in college to be able to communicate with my professors.

If I was still in a traditional school, I don't think I would have developed my listening skills, or my communication skills.

Time management. An important skill that was identified was *time management*. Students needed to be organized and set deadlines for completing projects. Students also seemed to understand that *time management* is important not only to be successful in their current project-based learning school, but also for life after graduation.

I think this is better for the developing life skills because you have to force yourself to get things done.

Time management, most definitely. I really need to work on setting my own deadlines.

I think organization for me.

My motivation has improved. I came here in 9th grade and I'm a junior now. I think my motivation and organization has really improved.

I think time management is a really big thing for me, and it's going to be huge once you get out of high school.

Creativity. *Creativity* was also identified as an important life skill. Students felt freedom to create original projects around topics they were interested in. This also increased their motivation to complete the projects and enjoy the learning process.

It helped me be more creative with what I do. Here you really create everything for yourself.

When you come here, it's open. You can have time to create yourself basically. I think it helps you to be more creative in what you do in the future. It's not cookie cutter. You can do the subject you want to do.

You can choose a project that you want to do. You can learn skills along the way while enjoying something that you like to do.

Chapter V

Discussion

This mixed methods study was designed to explore project-based learning and address the following questions: 1) What are students' perceptions of their development of life skills in project-based learning schools; 2) In what ways, if any, do students perceive an increase in their life skill development over a one-year period of time; and 3) What relationship, if any, is there between grade level and students' perceptions of their life skills? This chapter presents essential findings and places them in a larger context using extant literature. Suggestions for theory, methodology, and practice are presented. Finally, limitations and conclusions are explained.

First Research Question

The first question of this research study examined students' perceptions of their life skill development in project-based learning schools. Avalon and Minnesota New Country School were the two project-based schools chosen for this study. Avalon School is a 7-12 grade urban central Minnesota project-based learning charter school. At the time of this study, Avalon School had a total enrollment of 190 students. Minnesota New Country School (MNCS) is a 6-12 grade rural south-central Minnesota project-based learning charter school and at the time of this study had a total enrollment of 113 students. The data collected from this research study shows that students from both schools perceive life skills as important and perceive their life skill development in a variety of ways. Students are learning important life skills and perceive an increase in life skills while attending their project-based learning schools.

The quantitative data from the survey shows that there is a strong correlation among students' perceptions of important life skills at both schools. Avalon students perceive communication, time management, self-directedness, and collaboration as the four most important life skills (see Table 4.11). MNCS students perceive self-directedness, communication, and time management as the three most important life skills (see Table 4.14).

When both focus groups at Avalon and MNCS were asked about what particular life skills are important, common themes that occurred included time management, communication, creativity, self-directedness/independence, goal setting and collaboration.

Wurdinger and Rudolph (2009) found that students from Minnesota New Country School ranked their own level of life skills extremely high. Creativity, finding information, learning how to learn, and problem solving were near or above 90% with good and excellent rankings. In Wurdinger and Enloe's (2011) research study, Avalon alumni had very similar good and excellent rankings in their survey, with the exception of the life skill (being a team player). When asked if the charter school gave them advantages over peers at more traditional public schools, several alumni stated that they learned more because they were given freedom to create their own projects. This provided relevancy and meaning to the project and learning process. This research study found correlating quantitative and qualitative data with Wurdinger and Rudolph's study that students at both MNCS and Avalon schools have a positive perception of many of their life skills.

Second Research Question

The second question of this research study examined students' perceptions of improved life skills over a one-year period of time. Fall and spring scores from all 275 student survey responses were combined to examine the average overall perceptions for each dimension (see Table 4.2). There was an increase in four of the dimensions from fall to spring. Those skills that increased were responsibility, problem solving, self-directedness, and work ethic. The work ethic dimension increased the most from 3.43 in the fall, to 3.48 in the spring. Three dimensions decreased from fall to spring. Those skills included time management, collaboration, communication, and creativity. Creativity was shown to decrease the most from 3.94 in the fall to 3.88 in the spring. This data should be viewed cautiously to not make a general assumption that all students increased or decreased over a one-year period of time. The Levene's Test for Equality, an independent samples test, was used to adjust for inequality among groups and time management was significant at .031, t-tests found no significant differences between the two semesters. It would be valuable to compare each group to themselves from fall to spring and individual grade level perceptions from fall to spring on each of the eight dimensions, but the inequality of groups and grade levels made it difficult. This data would be more indicative of specific increases and/or decreases in perceptions from fall to spring.

Question 36 in the survey asked 275 students to rank their perception of overall improvement of life skills. Evidence that 50.18% of students from both schools perceived improvement in their life skills as good, and 27.473% of students perceived

their improvement in their life skills as excellent. Only 1.465% of students perceived their improvement of life skills as poor. This provides insights into how satisfied students feel about their life skills while attending Avalon or MNCS. Although there were students who perceived the improvement of the life skills as poor while attending either Avalon or MNCS, the majority of students in this study perceived a positive improvement of their life skills (see Table 4.9)

Examining further into perceptions of improvement of life skills, this study also looked at grade level mean scores and compared those scores from Fall to Spring. Only one sixth grade student answered the question, so this score was not included in the results (see Table 4.10). This table compares the mean scores of students' perceptions from Fall to Spring on a Likert scale ranking from 1 (poor), 2 (fair), 3 (satisfactory), 4 (good), and 5 (excellent). Seventh grade students' scores went down from 4.33 (good) in the Fall to 3.47 (satisfactory) in the Spring. Eighth grade students went up from 3.88 (satisfactory) in the Fall to 4.2 (good) in the Spring. Ninth grade students went down from 4.05 (good) in the Fall to 3.69 (satisfactory) in the Spring. Tenth grade students went down from 4.09 (good) in the Fall to 3.9 (satisfactory) in the Spring. Eleventh grade students went up from 3.96 (satisfactory) in the Fall to 4.28 (good) in the Spring. Twelfth grade students went down from 4.29 (good) in the Fall to 3.85 (satisfactory) in the Spring.

The change in perceptions from Fall to Spring could be due to many factors including work-load, stress, classroom environment, home life, expectations, graduation requirements, etc. Interestingly, only the eighth grade and eleventh grade students'

perceptions increased from Fall to Spring. However, overall perceptions from each grade group were either good or satisfactory. So why did eighth grade and eleventh grade students' perceptions increase over time? One reason may be from having a sense of accomplishment with their projects and progress towards moving toward freshmen and senior status. Further research could be conducted to examine factors that may provide insights into each grade level's perceptions. These factors may include the amount of time students have attended the school, types of projects they have prepared, teacher-student relationships, content area strengths and weaknesses that affect outcomes.

During interviews and focus groups, common themes of life skills students' perceived as having improved on the most during their time at Avalon and MNCS emerged. Communication was ranked highest, followed by self-directedness/independence, then collaboration. These three life skills were ranked highly in both categories of important life skills, and life skills that students felt they had improved upon. Those same life skills that students perceived as important were also shown to be skills they felt they had improved on while attending Avalon and MNCS.

Interestingly, students from both project-based learning schools stated that project-based learning facilitates personal growth, because students design everything on their own which helps them learn from their own failures. They stated that they had learned to work better with others as well as become more self-aware and independent. Their motivation and organization improved while attending Avalon and MNCS because they had to set their own deadlines in order to complete their work and succeed.

Certain aspects of project-based learning that students' perceived to influence their life skill development included a variety of factors. One student stated that his self-confidence level increased because of the need to communicate effectively with his advisor. Another student felt that because students are given opportunities to work in groups or with partners, it helped with communication and social/collaboration skills.

Third Research Question

The third question of this research examined the possible relationship between grade level and students' perceptions of their life skills. Combined Fall and Spring averages for each dimension was split by grade groups (middle school student, HS underclassmen, and HS upperclassmen) to examine possible differences between grade groups (see Table 4.4). High school upperclassmen averaged the highest on perceptions of their own life skills in 7 out of 8 dimensions, which included responsibility, problem-solving, self-directedness, collaboration, communication, creativity, and work ethic. The only dimension that they did not have the highest average was time management. The middle school students had the highest average for time management and the high school underclassmen had the lowest in that dimension. High school underclassmen scored the lowest in three dimensions were responsibility, creativity, and work ethic. The high school underclassmen had the same average as the middle school students in problem-solving, and collaboration. It is not surprising that high school upperclassmen had the highest averages in most of the dimensions. The average time that these high school upperclassmen had been at their prospective project-based learning schools was 3.06 years. The average time that high school underclassmen and middle school students had

been the project-based learning schools was very similar. High school underclassmen averaged at the time of the survey 1.74 years and middle school students averaged 1.33 years. The dimension that stood out was time management. Middle school students' average was the highest at 3.51, followed by high school upperclassmen at 3.4, and high school underclassmen at 3.23.

The ANOVA test showed the significance of responsibility between grade groups at .006 (see Table 4.5). Robust Tests of Equality of Measures using the Welch and Brown-Forsythe Test of Equality were used in order to further explore the reliability of the ANOVA results from error checking. These tests show that ratios found in the ANOVA table were adjusted in order to compensate for the violation of the test's assumption of homogeneity of variances. The Welch Test of Equality also found a significance of responsibility between grade groups at .003. The use of these tests show that both the ANOVA and the Welch Test of Equality found a significance of responsibility between grade groups.

The Games-Howell post-hoc test was chosen due to the inequality of variance among the groups and because the samples sizes of the groups were unequal. This test reveals that high school underclassmen's scores on responsibility were significantly different (lower) than high school upperclassmen's scores ($p = .002$). High school upperclassmen also scored higher than the middle school grade group, but the score was not significant (see Table 4.6)

Because the ANOVA and the Welch Test of Equality tests both showed responsibility between grade groups to be the most significant, it seems that the grade

groups may have different perceptions of their own responsibility life skill. The fact that the Games-Howell post hoc test showed high school upperclassmen scoring the highest on responsibility is not surprising due to the many projects and expectations they have to accomplish in order to graduate. As high school upperclassmen, many of them have been at the project-based school for at least two or more years and understand the significance of completing projects, communicating with their advisors, being self-motivated and responsible for their work. They are also preparing for life after high school whether it is work or college.

In the focus group, one student commented that she was quiet and shy, but that she needs to be able to communicate with professors and that she is trying to improve those skills. Another student commented that the school helps him to be more creative with what he wants to do in the future. The fact that it is not a “cookie-cutter” school allows him to enjoy subjects he prefers.

Data from this research clearly indicates that students are learning important life skills and perceive that they are improving various life skills while attending the project-based learning schools. The curriculum and culture of both schools provides students with opportunities to develop their life skills through a semi-guided process, which allows students freedom in their choices of projects. Advisors are assigned to students to help keep them accountable and provide guidance as needed. Students are responsible for choosing their projects and completing each project through various modes of research, communication and collaboration with advisors, and at times with partners or groups. Ultimately, each student is responsible for the completion of his own work.

Those life skills that are perceived by students to be most important include responsibility, self-directedness, collaboration, communication, creativity, and work ethic. Life skills that students perceived to have improved on the most while attending either MNCS or Avalon included but were not limited to communication, self-directedness/independence, and collaboration. There is a correlation between those life skills that students perceive as most important to life skills they perceive to have improved on. This correlation may be due to various factors which include: (1) expectations of the project-based learning schools for students; (2) expectations of the students on themselves; (3) types of projects students choose; (4) culture of teaching and learning; (5) social expectations such as family, community, and peers. Each of these factors could be researched more in-depth to better understand the possible correlations.

Suggestions for Improvement

Another part of this research was asking students if they had any suggestions for ways that Avalon or MNCS could improve (see Table 4.13 and Table 4.15). This data shows 22% of Avalon students were satisfied with no recommendations. Eleven percent of students suggested having better communication among students and teachers, allowing for more creativity, and helping students be more responsible. Five percent of students suggested increasing math education, providing more sports, providing more activities for newer students, helping students with time management, and providing more job skills classes. Interestingly, 0 out of 19 MNCS students answered satisfied with no recommendations. Suggestions that they offered included: (1) Having more direction and assistance with projects (15.79%); (2) Allowing for more creativity, increasing math

education, and having a more rigid structure (10,53%); (3) Better communication among teachers and students, increased reading education, better technology, and more job skill classes (5.26%). This information may be useful for each of the schools to take into consideration as they continue to evaluate their programs and curriculum. However, this information was taken from only a small random percentage of the student population. It may be valuable to survey the students in each of the schools to elicit their suggestions.

Limitations and Suggestions for Future Research

Limitations included possible bias related to the author's presence during the interviews and focus groups, the scope of the study, the time frame of the study, and tracking individual survey responses.

Students were chosen randomly for interviews and focus groups. Interviews took place in a private room provided by the school. Focus groups took place in a semi-private room provided by the school. All interviews and focus groups were recorded with the knowledge and approval from all interviewees. Questions were asked in a semi-structured format and the author was professional using a calm voice when asking questions. However, the author's presence during the interviews and focus groups may have fostered anxiety for some students that may or may not have hindered their responses.

The scope of the study was also limited to two project-based learning charter schools in rural and urban Minnesota. In order to further examine students' life skill development, other project-based learning schools should be researched throughout the United States and/or other countries. This would provide more in-depth data from a

larger student population and give more insights into various types of project-based learning schools and student perceptions of their life skills within those environments.

The time frame of the study took place over a one-year period of time during the school year. In order to examine and compare students' life skill progress over a longer period of time, a suggestion would be to conduct an extended case study that follows students from the time they enter a project-based learning school until graduation. This would require extended research time and resources.

The same survey was conducted in the fall and in the spring of the same year in order to examine any changes or improvements in students' perceptions of life skills. One limitation of the survey was that the author was unable to track individual student responses. This made it difficult to examine individual perceptions of students over a one-year time frame. One suggestion for future research is to ensure that each student be given a code or number to track responses.

The varied number of students from each grade level from the two institutions made it difficult to compare individual grade levels (6, 7, 8, 9, 10, 11, 12). For this reason, the grade levels were grouped into the three categories of middle school (grades 6 through 8), high school underclassmen (grades 9 through 10), and high school upperclassmen (grades 11 through 12). This enabled the author to compare data among the three groups, but hindered a closer look at each grade level's perceptions.

In addition, future research could compare teachers' and students' perceptions of life skills in project-based learning schools and traditional public schools. This research would be insightful as comparisons are made not only among teachers and students, but

also in two types of school that offer different curriculum and pedagogy systems and techniques.

Conclusion

Students will face unique challenges in the future, and to help them prepare, schools need to incorporate authentic avenues of learning that allow students to develop both academic and life skills. There is, "...a general consensus among educators, business, and other interested parties that a significant gap exists between the knowledge and skills needed for success in life and the current state of education in primary and secondary schools..."(Moylan, 2008 p. 289)

Corcoran and Silander (2009) researched instructional practices in American schools, and indicated that educators need to vary the nature of their instruction in order to adapt to students' instructional needs, as well as their various aptitudes, experiences, dispositions and motivation.

Project-based learning allows students the flexibility and freedom to pursue their learning through meaningful and authentic methods of learning. This freedom increases intrinsic motivation because students are researching and learning about topics that they are interested in. Students are meeting the curriculum standards through authentic measures. They are accountable for their learning and also develop life skills needed to be successful academically and socially.

This idea of having a meaningful and authentic learning experience is best described by a student who was interviewed during this research study.

I feel like here versus a traditional school, you're gaining more of the real skills. In a traditional school, you're just kind of learning it, but it's more

robotic. After you're done with the test, you're never going to remember it in two years, but when you come here and you do a project, it's actually going to stick because something is going to be memorable about every project that you do.

The two project-based learning charter schools enable students to pursue their interests while meeting local, state, and national standards. Through experimentation, research, collaboration, and presentations, students are taught the importance of self-regulation, self-confidence, and self-motivation. Wagner (2008) acknowledged the achievement gap in our education system and suggested that schools need to focus their curriculum around problem solving, critical thinking, and skill building, and less on memorization of facts and multiple choice testing. He also asserted that there was a disconnect between what students were learning in schools and what skills were needed beyond high school. Wagner (2008) stated that "our world has changed and our schools have not. Our schools are not failing, they are just obsolete" (p. 9).

Literature shows the successes of project-based learning, but there needs to be a continued effort to provide more data for schools, businesses, and government entities. In this time of standardized testing, quantitative data is deemed in many circles, more credible than qualitative data due to the assimilation of facts and figures. Project-based learning is also viewed by some as a new method and difficult to implement and assess. The various forms and applications of project-based learning methods can also be a factor in choosing whether to change curriculum models and programs. Although the foundational ideas of constructivism and cognitive development were established as early as the late 1800s and early 1900s, there has been little change from the traditional methods of teaching. Project-based learning is rooted in the historical theories and

research of constructivism and cognitive development. Theories of cognitive development emphasize how individuals interpret knowledge and their reasoning ability (Powell, 2004). Vygotsky (1978) delved further with his theory of social constructivism. He believed that there were social variables that affected how individuals learned. These variables included social interaction, culture and language (Powell, 2004). John Dewey, a proponent of “learning by doing” believed that actual experience of learning that was hands-on and experimental provided students with more engaging and realistic opportunities of learning (Shulman and Wilson, 2004 and Dewey, 1938). His educational constructivist theory led to the pioneering of a “laboratory school” as part of his creation of the Department of Pedagogy, Philosophy and Psychology at the University of Chicago in the late 1890’s. Learning techniques that were rooted in his educational philosophy of experimental education are still used today. Dewey’s belief was that learning should be realistic to life and more of a social activity where students would learn skills to help them become better citizens.

Project-based learning is based on the foundation of Dewey’s (1938) educational philosophy in which students are involved in creating their own projects and therefore have an interest in the content and activities of their learning experiences. It also combines Piaget’s (1953) theory of individual knowledge acquisition with Vygotsky’s (1978) model of social constructivism and interactive learning. These concepts and theories were catalysts for project-based teaching techniques where students are individually and socially involved in their learning.

Twenty first century societal expectations requires students to procure both academic and life skills that will ensure their success as citizens in a global economy. The implementation of project-based learning provides opportunities for students to explore and pursue their interests while attaining necessary skills. There is evidence that this type of teaching and learning can be applied in a variety of ways throughout a school's curriculum or in an individual classroom. Project-based learning is a means for schools to enable students to explore their interests and develop meaningful academic and real-life skills. The continuation of project-based learning research and its influence on students' success in the classroom and life skills development will provide insights on the potential pathways that teachers and schools can choose for their students.

References

- Alexander, D. (2000). *The learning that lies between play and academics in afterschool programs*. Retrieved from <http://www.niost.org/Publications/papers>.
- Allen, D. (2001). *Getting things done: The art of stress-free productivity*. New York, NY: Penguin Books.
- Archambault, R. (1964). *John Dewey on education*. Chicago: Random House, Inc.
- Azzam, A. (2014). Motivated to learn: A Conversation with Daniel Pink. *Educational Leadership, 72, 12-17*.
- Bagley, C., & Hunter, B. (1992). Restructuring constructivism and technology: Forging a new relationship. *Education Technology, 32(7), 22-27*.
- Barron, B., & Darling-Hammond, L. (2008). *Teaching for meaningful learning: A review of research on inquiry-based and cooperative learning*. Retrieved from <http://www.edutopia.org/pdfs/edutopia-teaching-for-meaningful-learning.pdf>
- Barron, B., Schwartz, D., Vye, N., Moore, please insert initial here, Petrosino, A., Zech, L., & Bransford, J. (1998). Doing with understanding: Lessons from research on problem-solving and project-based learning. *The Journal of the Learning Sciences, 7(3&4), 271-311*.
- Bass, B. M. (Ed.). (1990). *Bass and Stogdill's Handbook of Leadership: Theory, Research, and Managerial Applications*. New York, NY: The Free Press.
- Behizadeh, N. (2014). Adolescent perspectives on authentic writing instruction. *Journal of Language and Literacy Education, 10, 27-44*. Web.

- Behizadeh, N. (2014). Enacting problem-posing education through project-based learning
English Journal, 104, 99-104.
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *Clearing House*, 83(2), 39-43. doi:10.1080/00098650903505415
- Beneke, S. (2000). Implementing the project approach in part-time early childhood education programs. *Early Childhood Research & Practice*, 2, please insert page numbers here. Retrieved from <http://ecrp.uiuc.edu/v2nl/beneke.html>.
- Bereiter, C., & Engelmann, S. (1966). *Teaching disadvantaged children in the preschool*. Englewood Cliffs, NJ: Prentice Hall.
- Bereiter, C., & Engelmann, S. (1968). An academically oriented preschool for disadvantaged children: Results from the initial experimental group. In D. W. Brison & J. Hill (Eds.), *Psychology and early childhood education* (pp. 17-36). Upper Saddle River, NJ: Merrill/Prentice Hall, Canada: Ontario Institute for Studies in Education.
- Bloom, B. H. (1956). *Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain*. Philadelphia, PA: David Mackay
- Boaler, J. (1999). Mathematics for the moment, or the millennium? *Education Week*, 17(29), 30-34.
- Boss, S. (2012). The challenge of assessing project-based learning. *District Administration*, please insert volume number here, 46-52.
- Boss, S. (2013). *PBL for 21st Century Success*. Novato, CA: Buck Institute for Education.
- Branom, M. E. (1919). *The project method in education*. Boston: Gorham Press.

- Bransford, J. D. Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: Brain, mind, experience and school*. Washington, DC: National Research Council.
- Brooks, J. G. & Brooks, M. G. (1993). *The case of the constructivist classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Brophy, J. E., & ERIC Clearinghouse on Elementary and Early Childhood Education. (1998). *Failure syndrome students* (ERIC digest, EDO-PS-98-2; ERIC digest (Urbana, Ill.), EDO-PS-98-2). Champaign, IL: ERIC Clearinghouse on Elementary and Early Childhood Education, University of Illinois. Retrieved from <http://purl.access.gpo.gov/GPO/LPS26481>
- Brown, A. L., Bransford, J. D., Ferrara, R. & Campione, J. (1983). Learning, remembering and understanding. In J. H. Flavell & E. M. Markman (Eds.), *Similarity and analogical reasoning*, (pp. 77-166). New York, NY: Wiley.
- Brown, A. L., & Campione, J. C. (1996). Psychological theory and the design of innovative learning environments: On procedures, principles, and systems. In L. Schauble & R. Glaser (Eds.), *Innovation in learning: New environments for education*, (pp. 289-335). Mahwah, NJ: Erlbaum.
- Bruner, J. S. (1966). *Toward a theory of instruction*. Cambridge, MA: Harvard University Press.
- Buck Institute for Education. (2007). *Project-based learning handbook*. Retrieved from <http://www.bie.org/pbl/pblhandbook/intro>
- Caine, R. N., & Caine, G. Understanding a brain-based approach to learning and teaching. *Educational Leadership*, 48(2), 311-326.

- Collins, A., Brown, J., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 453-494). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Comer, J. P. (2005, June). Child and adolescent development: The critical missing focus in school reform. *Phi Delta Kappan*, 86(10), 757-758.
- Community Network for Youth Development. (2006). *Framework for youth development*. Retrieved from <http://www.cnyd.org/framework/index.php>.
- Corcoran, T. & Silander, M. (2009). Instruction in high schools: The evidence and the challenge. *Future of Children*, 19(1), 157-183. Retrieved from <http://web.ebscohost.com>
- Costa, A. L., & Kallick, B. (1995). Systems thinking: Interactive assessment in holonomous organizations. In A. L. Colta & B. Kallick (Eds.), *Assessment in the learning organizations: Shifting the paradigm* (pp. 3-7). Alexandria, VA: Association for Supervision and Curriculum Development.
- Creswell, J. W. (1998). *Qualitative inquiry and research design*. California: Sage Publication
- Dawson, C. M. (2009). Beyond checklists and rubrics: Engaging students in authentic conversations about their writing. *English Journal*, 98(5), 66-71.
- Dewey, J. (1938). *Experience & education*. New York, NY: MacMillan Publishing.
- Drucker, P. (1955). *The practice of management*. New York, NY: Harper & Row.

- Education Resources Information Center. (1999). *Self-efficacy beliefs and career development*. ERIC Digest, 205, 1-8. Retrieved from <http://ericacve.org/digests.asp>
- Freire, Paulo. (1970). *Pedagogy of the oppressed*. (M. B. Ramos, Trans.) New York, NY: Continuum.
- Fry, P. S., & Addington, J. (1984). Comparison of social problem solving of children from open and traditional classrooms: A two-year longitudinal study. *Journal of Educational Psychology*, 76, 318-329.
- Furhman, S., Elmore, R. & Massell, D. (1993). School reform in the United States; Putting it into context. In S. Jacobsen & R. Berne. (Eds.). *Reforming education: The emerging systemic approach* (pp. 3-27). Thousand Oaks, CA: Corwin Press.
- Gee, J. (2008). A sociocultural perspective on opportunity to learn. In insert editors here (Eds.), *Assessment, equity, and opportunity to learn* (pp. 76-108). Cambridge, MA: Cambridge University Press.
- J. C. (2003). Giving students what they need. *Educational Leadership*, 19-23.
- Geier, R., Blumenfeld, P. C., Marx R. W., Karjick, J. S., Fishman, B., & Soloway, E. (2008). Standardized test outcomes for students engaged in inquiry-based science curriculum in on text of urban reform. *Journal of Research in Science Teaching*, 45, 922-939.
- Gerlach, D. L. (2008). *Project-based learning as a facilitator of self-regulation in a middle school curriculum* (Doctoral dissertation). University of Pittsburgh.

Retrieved from ProQuest Dissertations and Theses database.

<http://etd.library.pitt.edu/ETD/available/etd-05092008-114934/>

Glasser, W. (1988). *Choice theory in the classroom*. New York: Harper Collins

Glasser, W. (1990). *The quality school: Managing students without coercion*.

New York: Harper Collins.

Glasser, W. (1998). *The quality school teacher*. New York: Harper Collins.

Guzdial, M. (1997). *Constructivism vs. constructionism*. Retrieved from

<http://www.Guzdial.cc.gatech.edu/commentary/construct.html>.

Harada, V., Kirio, C., & Yamamoto, S. (2008). Collaborating for project-based learning in grades 9-12. *Library Media Connection*, 26(6), 14-16.

Harel, I. & Papert, S. (Eds.) (1991). *Constructionism*. Norwood, NJ: Ablex.

Hay, K. E., & Barab, S. A. (2001). Constructivism in practice: A comparison and contrast of apprenticeship and constructionist learning environments. *Journal of the Learning Sciences*, 10(3), 281-322.

Hickey, D., Kindfeld, A., Horwitz, P., & Christie, M. (1999). Advancing educational theory by enhancing practice in a technology-supported genetics learning environment. *Journal of Education*, 181, 25-55.

International Society for Technology in Education. (1997). *The road ahead: Project-based learning*. Retrieved from <http://www.iste.org/research/roadahead.pbl.html>.

Justo, S. S., & DiBiasio, D. (2006). Experiential learning environments: Do they prepare our students to be self-directed, life-long learners? *Journal of Engineering Education*, 95(3), 195-204.

- Johnson, D. W., Johnson, R. T., Holubeck, E. J., & Roy, P. (1984). *Circles of learning: Cooperation in the classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Kabaker, J. (2015, June 5). Deeper learning in practice [Web log post]. Retrieved from <http://www.edutopia.org/blog/deeper-learning-in-practice-jennifer-kabaker>.
- Kafai, Y. & Resnick, M. (1996). *Constructionism in practice: Designing, thinking and learning in a digital world*. Mahwah, NJ: Lawrence Erlbaum.
- Kagan, S. (1994). *Cooperative Learning*. San Clemente, CA: Resources for Teachers, Inc.
- Katz, L. (1994). The project approach. *ERIC Digest*. Champaign, IL: Clearinghouse on Elementary and Early Childhood Education. Retrieved from <http://ceep.crd.uiuc/eecarchive/digests/1994/lk-pro94.html>.
- Katz, L. G. & Chard, S. C. (1989). *Engaging children's minds: The project approach*. Norwood, NJ: Ablex Publishing Corporation.
- Kilpatrick, W. H. (1918). The project method. *Teacher College Record*, 19, 319-335.
- Kilpatrick, W. H. (1941). *Selfhood and civilization*. New York: The Macmillan Co.
- Kivunja, C. (2015). Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education*, 4(1), 1-11.
- Kucharski, G., Rust, J., & Ring, T. (2005). Evaluation of the ecological, futures, and global (EFG) curriculum: A project-based approach. *Education*, 125(4), 652-668.
- Lenz, B. (2015). *Transforming Schools*. San Francisco, CA: John Wiley & Sons.

- Lindsey, T. Jr. & Mabie, B. (2012, February). Life skills yield stronger academic performance. *Phi Delta Kappan*, 93(5), 33-36. Retrieved from <http://web.b.ebscohost.com/ehost/detail/detail?vid=4&sid=298da474-d54f-4067-9ae403ffb94d3d75%40sessionmgr198&hid=105&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#AN=EJ985074&db=eric>
- Liu, K. & Chien, C.Y. (1998). Project approach and parental involvement in Taiwan. *Childhood Education*, 74, 213-220.
- Markham, T., Larmer, J., & Ravitz, J. (2003). *Project-based learning handbook: A guide to standards-focused project-based learning for middle and high school teachers*. Novato, CA: Buck Institute for Learning.
- Marlowe, B. A. & Page, M. S. (1998). *Creating and sustaining the constructivist classroom*. Thousand Oaks, CA: Corwin Press.
- Maxim, G. (2010). *Dynamic social studies for constructivist classrooms*. Boston, MA: Allyn & Bacon.
- McMurry, C. A. (1921). *Teaching by projects: A basis for purposeful study*. New York, NY: Macmillan.
- Means, B. & Olson, K. (1995). *Technology's role within constructivist classrooms*. (ERIC Publication No. ED 383283). Retrieved from <http://web.b.ebscohost.com/ehost/detail/detail?vid=8&sid=298da474-d54f-4067-9ae403ffb94d3d75%40sessionmgr198&hid=105&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#AN=ED383283&db=eric>
- Mee, M. (2007). Enough about you, let's talk about me: Student voice in the

- classroom. *Middle Ground*, 10(3), 37-38.
- Mergendoller, J. R., Maxwell, N., & Bellisimo, Y. (2007). The effectiveness of problem based instruction: A comparative study of instructional methods and student characteristics. *Interdisciplinary Journal of Problem-Based Learning*, 1(2), 49-69.
- Mid-Continent Regional Educational Lab, A. C. (1999). *Noteworthy perspectives on comprehensive school reform*. Aurora: CO: MCREL
- Minnesota Department of Education. (2011). *School Report Card*. Retrieved from <http://education.state.mn.us/ReportCard2005/index.do>
- Mitchell, S., Foulger, T., Wetzell, K., & Rathkey, C. (2009). The negotiated project approach: Project-based learning without leaving the standards behind. *Early Childhood Education Journal*, 36(4), 339-346. doi:10.1007/s10643-008-0295-7
- Moylan, W. (2008). Learning by project: Developing essential 21st century skills using student team projects. *International Journal of Learning*, 15(9), 287-292.
Retrieved from <http://web.ebscohost.com>
- Muniandy, B., Mohammad, R., & Fong, S. (2007). Synergizing pedagogy, learning theory and technology in instruction: How can it be done? *US-China Education Review*, 4(9), 46-53.
- Newell, R. (2003). *Passion for learning: How project-based learning meets the needs of 21st-century students*. Lanham, MD: The Scarecrow Press.
- Newell, R. J., & Van Ryzin, M. J. (2007, January). Growing hope as a determinant of school effectiveness. *Phi Delta Kappan*, 88(6), 465-471. Retrieved from <http://search.proquest.com/docview/218520996?accountid=40957>

- Newmann, F.M., Marks, H. M., & Gamoran, A. (1996). Authentic pedagogy and student performance. *American Journal of Education*, 104(4), 280-312.
- O'Neil, H., Allred, K., & Baker, E. (1997). *Review of workforce readiness theoretical frameworks in workforce readiness: Competencies and assessments*. Mahwah, NJ: Lawrence Erlbaum Associates.
- P21. (2009). P21 Framework Definitions. Partnership for 21st Century Skills (P21), December 2009. Retrieved from <http://www.21stcenturyskills.org>
- P21. (2011). Partnership for 21st Century Skills (P21). Framework for 21st Century Learning. Retrieved from <http://www.P21.org>
- Papert, S. (1980). *Mindstorms: Children, computer and powerful ideas*. New York, NY: BasicBooks.
- Papert, S. (1984). New theories for new learning. *School Psychology Review*, 3(4), 422-428.
- Papert, S. (1993). *The children's machine: Rethinking school in the age of the computer*. New York, NY: BasicBooks.
- Papert, S. (1999). What is constructionism? Retrieved from <http://lynx.dac.neu.edu/k/krudwall/constructionism.htm>
- Parkinson, C. N. (1955, November 19). Work expands to fill the time available for its completion. *The Economist*. Retrieved from <http://www.economist.com/node/14116121>
- Passe, J. (1996). *When students choose content*. Thousand Oaks, CA: Corwin Press, Inc.

- Peck, J. K., Peck W., Sentz, J. & Zaza, R. (1998). Students' perceptions of literacy learning in a project-based curriculum. *Literacy and Community: The twentieth yearbook: A peer reviewed publication of the College Reading Association*, (pp. 94-100). Carrollton, GA: Beacon. Retrieved from <http://internationaljournalofresearch.org>
- Perkins, N. (1991). What constructivism demands of the learner. *Educational Technology*, 31, 18-23.
- Peverini, S. (2009). The value of teacher expertise and good judgment: Recent inspiring reading about assessment. *Language Arts*, 86(5), 398-402.
- Piaget, J. (1953). *The origins of intelligence in children*. New York, NY: Basic Books.
- Piaget, J. (1969). *Science of education and the psychology of the child*. New York, NY: Viking.
- Popham, W. J. (2008). *Transformative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Powell, K. C., & Kalina, C. J. (2004). Cognitive and social constructivism: Developing tools for an effective classroom. *Education*, 130(2), 241-250.
- Purcell-Gates, V., Duke, N. K., & Martineau, J. A.. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly*, 42, 8-45.
- Rafoth, M. A. (1999). *Inspiring independent learning: Successful classroom strategies*. Washington, DC: National Education Association of the United States.

- Railsbeck, J. (2002). *Project-based instruction: Creating excitement for learning*. Portland, OR: Northwest Regional Educational Laboratory.
- Ravitz, J. (2010). Beyond changing culture in small high schools: Reform models and changing instruction with project-based learning. *Peabody Journal of Education*, 85(3), 290-312. doi:10.1080/0161956X.2010.491432 -68
- Savery, J. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), 9-20. Retrieved from <http://docs.lib.purdue.edu/ijpbl/vol1/iss1/3>
- Survey Monkey. (2011). Retrieved from <http://try.surveymonkey.com/?gclid=CLmz4f2C8awCFUHRKgodI0izJg>
- Scardamalia, M., & Bereiter, C. (1991). Higher levels of agency for children in knowledge building: A challenge for the design of new knowledge media. *Journal of the Learning Sciences*, 1, 37. doi: 10.1207/s15327809jls0101_3
- Shulman, L. S., & Wilson, S. M. (2004). *The wisdom of practice: Essays on teaching, learning, and learning to teach*. San Francisco, CA: Jossey-Bass.
- Schwalm, J. & Tylek, K. (2012). System-wide implementation of project-based learning: The Philadelphia approach. *Afterschool Matters*, 15, 1-8.
- Slaven, R. E. (1983). *Cooperative learning*. New York, NY: Longman.
- Sisserson, K., Manning, C. K., Knepler, A., & Jolliffe, D. A. (2002). Authentic intellectual achievement in writing. *English Journal*, 91(6), 63-69.
- Soparat, S., Arnold, S., & Klaysom, S. (2015). The development of Thai learners' key competencies by project-based learning using ICT. *International Journal of*

Research in Education and Science 1, 11-22. doi:

<http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED548501>

Stager, G. S. (2001, July). *Constructionism as a high-tech intervention strategy for at risk learners*. Paper presented at the National Education Computing Conference, Chicago, IL.

Stevenson, J. A. (1921). *The project method of teaching*. New York, NY: MacMillan.

Stiggins, R. J. (1995, insert month here). Assessment literacy for the 21st century. *Phi Delta Kappan*, insert volume(issue) number here, 238-245.

Stockton, J. L. (1920). *Project work in education*. Cambridge: Riverside Press.

Strobel, J., & van Barneveld, A. (2008). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *Interdisciplinary Journal of Problem-based Learning*, 3, 44-58.

Survey Monkey. (2011). Retrieved from

<http://try.surveymonkey.com/?gclid=CLmz4f2C8awCFUHRKgodI0izJg>

Swanson, J. L., & Woitke, M. B. (1997). Theory into practice in career assessment for women: Assessment and interventions regarding perceived career barriers. *Journal of Career Assessment*, 5(4), 443-462.

Tangdhanakanond, K., Pitiyanuwat, S., & Archwamety, T. (2006). Assessment of achievement and personal qualities under constructionist learning environment. *Education*, 126(3), 495-503.

Tashlik, P. (2010, insert month here). Changing the national conversation on assessment. *Phi Delta Kappan*, 91(6), 55-9.

- Thomas, J. W. (2000). *A review of research on PBL*. Retrieved from http://www.bobperalman.org/BestPracticesPBL_Research.pdf
- Thomas, J. W. (2000). *A review of project-based learning*. San Rafael, CA: Autodesk Foundation.
- Thomas, J. W., Mergendoller, J. R., & Michaelson, A. (1999). *Buck Institute for Learning: Project-based learning handbook for middle and high school teachers*. Novato, CA: Buck Institute for Education.
- Toch, T. (2011, insert month here). Beyond basic skills. *Phi Delta Kappan*, 92(6), 72-3.
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass, San Francisco, CA.
- Trilling, B., & Hood, P. (1999). Learning technology and educator reform in the knowledge age or “we’re wired, webbed and windowed, now what?” *Educational Technology*, 39(3), 5-18.
- Tullavantana, R. (2002). *The strategic development of organizing instructional system based on constructionism of Thai higher education institution*. (Unpublished doctoral dissertation). Chulalongkorn University, Bangkok, Thailand.
- Tyack, D., & Cuban, L. (1995). *Tinkering toward Utopia: A century of public school reform*. Cambridge, MA: Harvard University Press..
- U.S. Department of Education. (2010). *Assessment: Measure what matters*. Retrieved from <http://www.ed.gov/Technology/netp-2010/assessment-measure-what>
- Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press.

- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University.
- Wagner, T. (2008). *The global achievement gap*. New York: Basic Books.
- Walker, A., & Leary, H. (2008). A problem based learning meta-analysis: Differences across problem types, implementation types, disciplines and assessment levels. *Interdisciplinary Journal of Problem Based Learning*, 3(1), 12-43.
- Weinbaum, A., & Rogers, A. M. (1999). *Contextual Learning: A critical aspect of school-to-work transition programs*. Washington, DC: National Institute for Work and Learning.
- Wolk, S. (1994). Project-based learning: Pursuits with a purpose. *Educational Leadership*, 52, 42-45.
- Wood, D., Bruner, J., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100.
- Wurdinger, S., & Enloe, W. (2011). Cultivating life skills at a project-based charter school. *Improving Schools*, 14(1), 84-96. doi: 10.1177/1365480211399749
- Wurdinger, S., Haar, J., Hugg, R., & Bezon, J. (2007). A qualitative study using project-based learning in a mainstream middle school. *Improving Schools*, 10(2), 150-161. doi: 10.1177/1365480207078048
- Wurdinger S., & Rudolph, J. (2009). A different type of success: Teaching important life skills through project-based learning. *Improving Schools*, 12(2), 117-132.

Zimmerman, B. J. (1998). *Developing self-fulfilling cycles of academic regulation: An analysis of exemplary instructional models*. In Schunk, D. H., & Zimmerman, B. J. (pp.1-27). Greenwich, CT: Information Age Publishing.

Zimmerman, D.C. (2010). *Project-based learning for life skill building in 12th grade social studies classrooms: A case study (Master's thesis)*. Retrieved from <http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED510590>

Appendix A

Semi-Structured Interview Questions for Students

Interview questions:

1. What do you think life skills are?
2. What life skills do you think are important?
3. What types of life skills do you think your school helps you with?
4. Do you think this school has helped you improve your life skills?
5. Can you give specific examples of projects you have accomplished when you used life skills?
6. What areas of life skills have you improved on the most?
7. Are there life skills that you would like to improve on and why?
8. Overall, do you see improvement in your life skills in the past year?
9. Do you feel that this school is helping you improve your life skills for the future? Why or why not?
10. Are there any areas of life skills that you would like to see more emphasis on and why?

Appendix B
Focus Group Questions

Focus Group Questions:

1. What particular skills do you think are important to have for life? Why?

2. Do you think project-based learning helps you improve those life skills? If so, please explain.

3. Which of your life skills have improved since you have been at this school?

4. Which of your life skills do you feel need more improvement?

5. Are there certain aspects of project-based learning that have influenced your life skill development? If so, what aspects?

6. Do you feel project-based learning is helping to prepare you for life beyond high school? If so, why?

Appendix C

Survey Questions for Students

Survey:

Please mark the answer that best describes you:

1. How long have you been a student at this school?

0-1 year

2 years

3 years

4 years

5 + years

2. What grade level are you currently?

6th grade

7th grade

8th grade

9th grade

10th grade

11th grade

12th grade

Please rank the following:

1	2	3	4	5
Poor	Fair	Satisfactory	Good	Excellent

3. How do you rank yourself at completing projects on time?

1 2 3 4 5

4. How do you rank yourself as a problem solver?

1 2 3 4 5

5. How do you rank yourself at setting goals?

1 2 3 4 5

6. How do you rank yourself at finding new solutions to problems?

1 2 3 4 5

7. How well do you share your ideas with others?

1 2 3 4 5

8. How well do you work with others?

1 2 3 4 5

9. How do you rank yourself at following through with commitments?

1 2 3 4 5

10. How well do you work as a team member?

1 2 3 4 5

11. How much do you challenge yourself to try new things or approach areas where you might be weak/less knowledgeable?

1 2 3 4 5

12. How well do you listen to others?

1 2 3 4 5

13. How do you rank yourself as a person others can count on?

1 2 3 4 5

14. At what level do you rank your creativity?

1 2 3 4 5

15. How well do you help others make decisions?

1 2 3 4 5

16. How well do you complete things you have started?

1 2 3 4 5

17. How well do you look at various options before making decisions?

1 2 3 4 5

18. How do you rank yourself as motivated to complete your goals?

1 2 3 4 5

19. How well do you find different or original ideas in your work?

1 2 3 4 5

20. How well do you communicate with others?

1 2 3 4 5

21. How well do you finish things without help from others?

1 2 3 4 5

22. How dependable are you?

1 2 3 4 5

23. How do you rank yourself at making good choices?

1 2 3 4 5

24. How well do you listen to others?

1 2 3 4 5

25. How well do you make plans for yourself?

1 2 3 4 5

26. How do you rank yourself as a creative thinker?

1 2 3 4 5

27. How do you rank yourself as a person others can come and talk to?

1 2 3 4 5

28. How well do you take responsibility for your actions?

1 2 3 4 5

29. How do you rank your work ethic?

1 2 3 4 5

30. How good are you at making adjustments to your projects while working to complete them?

1 2 3 4 5

31. How do you rank yourself at working hard to achieve your goals?

1 2 3 4 5

32. How well do you finish things on time?

1 2 3 4 5

33. How well can you figure out how things should work?

1 2 3 4 5

34. How do you rank your communication skills?

1 2 3 4 5

35. How well do you continue working even when circumstances are difficult?

1 2 3 4 5

36. How well have your life skills improved to this point in time?

1 2 3 4 5

Explain:

37. What life skills do you think are important to best prepare you for after graduation?

Question Key:

- Time Management: 3, 16, 21, 32
- Responsibility: 9, 13, 22, 28
- Problem Solving: 4, 6, 17, 23, 33
- Self-Directedness: 5, 18, 25, 30
- Collaboration: 7, 8, 10, 15
- Communication: 12, 20, 24, 27, 34
- Creativity: 14, 19, 26
- Work Ethic: 11, 29, 31, 35,
- Overall Improvement: 36

Scale Used: 1 = Poor; 2 = Fair; 3 = Satisfactory; 4 = Good; 5 = Excellent

Appendix D

Avalon Parent/Guardian Consent Form

Please print CLEARLY

Name of parent or guardian: _____

I am the legal guardian of _____.

I consent for her or him to participate in a research project on students' perspectives of their educational experiences at Avalon School. I understand that Kim Meyer, a doctoral student from the Educational Leadership Department at Minnesota State University, Mankato (MSU) is director of the project. Dr. Scott Wurdinger at MSU will be supervising the overall research project. I understand that participation in this study includes the following commitment for my child and me. Read and sign this consent form.

1. My child will complete a 10 minute online survey at the beginning of the school year and at the end of the school year about his/her experience at Avalon School. The survey will be completed during one of my child's regularly scheduled classes.
2. My child may be randomly selected for a ten-question interview about his/her experience at Avalon School which will take about 30 minutes to complete. The interview will be given at a time that least interferes with his/her scheduled classes. The interview will be recorded and transcribed for the purpose of this research.
3. My child may be randomly selected to participate in a 30 minute focus group at the end of the school year. This focus group will consist of six questions about his/her experience at Avalon School and will take place during a time that least interferes with his/her scheduled classes. The focus group discussion will be recorded and transcribed for the purpose of this research.

Procedures

I understand that my child will be asked questions about his or her educational experiences. I can contact Kim Meyer at 507-317-0410 about any concerns I have about this research project. I understand that I also may contact the MSU Institutional Review Board Administrator, Barry Ries, at 389-2321 or barry.ries@mnsu.edu with any questions about research with human participants at MSU.

Confidentiality

All information obtained in this project will be kept private by the staff of this research project. All information will be stored in a locked file cabinet. Only authorized research staff members can view it. I understand that no information about my child will be released and no names will be recorded other than the consent forms. All surveys, taped

interviews, and discussions will be deleted and destroyed at the completion of the research and will be purged no longer than three years.

All authorized research staff include Dr. Scott Wurdinger, Assistant Professor Kimberly Meyer, Dr. Julie Carlson, and Dr. Jeffrey Biessman.

Risks and Benefits

I understand that the risks of participating in this study are minimal. I understand that participating in this study will help the researcher better understand the educational experiences at Avalon School. I understand that I can request a copy of the study, which would be mailed to me after the end of the study. I understand that participation in this project is voluntary and my child and I have the right to stop at any time.

Date: _____

Signed: _____

Appendix E

Assent Form

I would like to ask you some questions about **Life Skills**. There will be a ten minute survey that you will take during a class time set aside by your teacher/s. This survey will be given once at the beginning of the school year and again at the end of the school year. There is also a ten-question interview that you may be selected for. The interviews will be recorded and transcribed for the purpose of this research. At the end of the school year, there will be one focus group discussion based on six questions about life skills. You may be randomly selected to participate in the group discussion. The discussion will also be recorded and transcribed. All taped interviews and discussions will be destroyed at the completion of the research and will be purged no longer than three years.

Your name or other information that lets people know that the information is about you will not be used. Your answers will not be shared with your parents or anyone else, unless you are in danger of being hurt or hurting someone. If you have any questions about this project, you can ask them at any time.

You can refuse to be in the study and neither your parents nor the research staff will be upset. You can stop answering questions at any time and no longer be in the study just by letting me know you want to quit.

If you are unhappy about how you or other students have been treated in this research, tell your teacher or parent(s).

Date: _____

Signed: _____

___ copy provided to student

Appendix F

Avalon Online Participant Consent Form

Dear Research Participants

You are being asked to participate in research that will be supervised by Kim Meyer on students' educational experiences at Avalon School. This survey will be given once at the beginning of the school year and again at the end of the school year. The survey should take about 10 minutes to complete. Participation is voluntary and even though your parent/guardian(s) signed a consent form, it does not mean that you are obligated to take this survey. Your responses will be kept anonymous. However, whenever one works with email/the Internet there is always the risk of compromising privacy, confidentiality, and/or anonymity. Despite this possibility, the risks to your physical, emotional, social, professional, or financial well-being are considered to be 'less than minimal'.

You have the option to not respond to any questions that you choose. Participation or nonparticipation will not impact your relationship with Avalon School or Minnesota State University, Mankato. Submission of the completed survey will be interpreted as your informed consent to participate.

If you have any questions about the research, please contact Kim Meyer via email at meyerki@waldorf.edu. If you have questions about the treatment of human subjects, contact Dr. Barry Ries, IRB Administrator, at barry.ries@mnsu.edu. If you would like more information about the specific privacy and anonymity risks posed by online surveys, please contact the Minnesota State University, Mankato Information and Technology Services Help Desk (507-389-6654) and ask to speak to the Information Security Manager.

Appendix G

Minnesota New Country School Online Participant Consent Form

Dear Research Participants

You are being asked to participate in research that will be supervised by Kim Meyer on students' educational experiences at Minnesota New Country School. This survey will be given once at the beginning of the school year and again at the end of the school year. The survey should take about 10 minutes to complete. Participation is voluntary and even though your parent/guardian(s) signed a consent form, it does not mean that you are obligated to take this survey. Your responses will be kept anonymous. However, whenever one works with email/the Internet there is always the risk of compromising privacy, confidentiality, and/or anonymity. Despite this possibility, the risks to your physical, emotional, social, professional, or financial well-being are considered to be 'less than minimal'.

You have the option to not respond to any questions that you choose. Participation or nonparticipation will not impact your relationship with Minnesota New Country School or Minnesota State University, Mankato. Submission of the completed survey will be interpreted as your informed consent to participate.

If you have any questions about the research, please contact Kim Meyer via email at kim.meyer@mnsu.edu. If you have questions about the treatment of human subjects, contact Dr. Barry Ries, IRB Administrator, at barry.ries@mnsu.edu. If you would like more information about the specific privacy and anonymity risks posed by online surveys, please contact the Minnesota State University, Mankato Information and Technology Services Help Desk (507-389-6654) and ask to speak to the Information Security Manager.

Appendix H

Minnesota New Country School Parent/Guardian Consent Form

Please print CLEARLY

Name of parent or guardian: _____

I am the legal guardian of _____.

I consent for her or him to participate in a research project on students' perspectives of their educational experiences at Minnesota New Country School. I understand that Kim Meyer, a doctoral student from the Educational Leadership Department at Minnesota State University, Mankato (MSU) is director of the project. Dr. Scott Wurdinger at MSU will be supervising the overall research project. I understand that participation in this study includes the following commitment for my child and me:

1. Read and sign this consent form.
2. My child will complete a 10 minute online survey at the beginning of the school year and at the end of the school year about his/her experience at Minnesota New Country School. The survey will be completed during one of my child's regularly scheduled classes.
3. My child may be randomly selected for a ten-question interview about his/her experience at Minnesota New Country School, which will take about 30 minutes to complete. The interview will be given at a time that least interferes with his/her scheduled classes. The interview will be recorded and transcribed for the purpose of this research.
4. My child may be randomly selected to participate in a 30 minute focus group at the end of the school year. This focus group will consist of six questions about his/her experience at Minnesota New Country School and will take place during a time that least interferes with his/her scheduled classes. The focus group discussion will be recorded and transcribed for the purpose of this research.

Procedures

I understand that my child will be asked questions about his or her educational experiences. I can contact Kim Meyer at 641-585-8487 or kim.meyer@mnsu.edu or Dr. Scott Wurdinger at 507-389-2919 or scott.wurdinger@mnsu.edu about any concerns I have about this research project. I understand that I also may contact the MSU Institutional Review Board Administrator, Barry Ries, at 389-2321 or barry.ries@mnsu.edu with any questions about research with human participants at MSU.

Confidentiality

All information obtained in this project will be kept private by the staff of this research project. All consent forms will be stored in a locked file cabinet accessible only by Kim Meyer and Dr. Scott Wurdinger. I understand that no information about my child will be released and no names will be recorded other than on the consent forms. All consent

forms and other research documents will be permanently deleted or shredded three years after the completion of the study.

Risks and Benefits

I understand that participating in this study will help the researcher better understand the educational experiences at Minnesota New Country School. I understand that I can request a copy of the study, which would be mailed to me after the end of the study. I understand that participation in this project is voluntary and my child and I have the right to stop at any time. My child does not have to answer any questions he or she does not want to. I understand that withdrawing from the study will not affect my child's relationship with Minnesota New Country School or with Minnesota State University, Mankato.

Date: _____

Signed: _____

Please return this form to your school office.

Appendix I

Student Interview Letter

Dear Student,

Earlier this school year, you and your parent/guardian agreed that you could participate in my research study about students' perspectives of their educational experiences. As a part of my study, you completed an online survey. As another part of this same study, you have been randomly selected to participate in an interview about life skills. This is a ten question interview and should take no longer than thirty minutes. You will be notified by your teacher of the time and date of the interview. We appreciate your willingness to be a part of this important research and look forward to working with you.

Sincerely,

Kimberly Meyer, Ed.S, Doctoral student at Minnesota State University, Mankato
kim.meyer@mnsu.edu

Appendix J

Student Focus Group Letter

Dear Student,

Earlier this school year, you and your parent/guardian agreed that you could participate in my research study about students' perspectives of their educational experiences. As a part of my study, you completed an online survey. As another part of this same study, you have been randomly selected to participate in the focus group about life skills. This discussion should take no longer than thirty minutes. You will be notified by your teacher of the time and date of the focus group. We appreciate your willingness to be a part of this important research and look forward to working with you.

Sincerely,

Kimberly Meyer, Ed.S, Doctoral student at Minnesota State University, Mankato
kim.meyer@mnsu.edu