

**CREATING AN AUTHENTIC LEARNING ENVIRONMENT
WITH PROJECT-BASED LEARNING**

by

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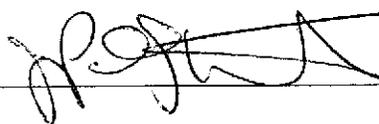
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with Project-Based Learning**

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I returned home one day and simply informed my wife, Jessica, that I had applied for a Masters of Education program at City University of Seattle. From that point on her support of my educational pursuit never wavered and I appreciate her for that. My parents have also continuously encouraged further education and I have greatly appreciated their support.

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Abstract

The future of education in Alberta is being shaped by the need for cross-curricular competencies and 21st-century skills, as outlined in *Inspiring Education* (Alberta Education, 2010), *Ministerial Order on Student Learning* (Alberta Education, 2013), and *Cross-curricular Competencies* (Alberta Regional Consortia, 2013). This paper explores the learning benefits of a project-based learning environment and how a middle school in Central Alberta utilized project-based learning for these benefits. Research details the essential elements of project-based learning and how these elements lead to student achievement. Components such as a challenging problem or question, sustained inquiry, authenticity, student voice and choice, reflection, critique and revision, and public product are explored. While research supports the implementation of project-based learning to create authentic learning environments, future research should focus on measurable outcomes for competencies.

Keywords: Project-based learning, authentic learning, 21st-century skills, cross-curricular competencies

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Creating an Authentic Learning Environment With Project-Based Learning

Chapter 1

Introduction

Learning needs to be authentic—relevant and meaningful—for students to be passionate about the topic and learn to their fullest potential (Barber, King, & Buchanan, 2015). Authentic learning inspires students to learn something because they wanted to learn it, not because they have to learn it. Project-based learning gives students an opportunity to learn in an authentic environment, which researchers have shown increases students' motivation to learn (Larmer, 2014). Larmer defined project-based learning as a way to present students with interesting challenges and help them to set the direction for their own learning. Schwalm and Tylek (2012) described project-based learning as a means of presenting students with real-world, multidisciplinary problems that demand critical thinking, engagement, and collaboration. It is essential for students to learn these skills because Juliani (2015) projected that 65% of grade-school students would work in jobs that have not yet been invented.

Background to the Problem

21st-century skills are essential to enable students to compete in the global workforce, which demands the same skills that project-based learning does: communication, collaboration, critical thinking, problem solving, creativity, and innovation (Tucker, 2014). The belief that performing well in school equates with obtaining good jobs is a misconception (Juliani, 2015). Students must learn real-world skills to be prepared for the shifting global workforce. Juliani predicted that jobs will fall into one of three categories: heuristic, evolving, and contracted. Heuristic jobs require a critical-thinking approach to solve problems, evolving jobs require a

growth mindset to adapt to change, and contracted jobs are temporary and are filled based on skill set. Project-based learning fosters a learning environment that challenges students to develop deeper learning and higher-level thinking skills that are essential for the 21st century (Brusic & Sheerer, 2014).

Statement of the Problem

Alberta Education (2010) released a document called *Inspiring Education* that outlines the future of education in Alberta for the next 20 years. The government recognized the abundance of knowledge to which students have access and made clear that they must be able to manage this knowledge by using innovative and creative means.

The vision of *Inspiring Education* (Alberta Education, 2010) includes three outcomes that educators should strive to instill in every student. The first outcome is engaged thinking. Engaged thinkers are students who use technology to learn, innovate, communicate, and discover and utilize critical thinking. An essential component of engaged thinking is the ability to collaborate with others and adapt to change with optimism. The second outcome is ethicality as citizens who contribute to the community and the world by working with others with respect, empathy, and compassion. The third outcome is the embodiment of entrepreneurial spirits, who create opportunities and achieve goals through hard work (Alberta Education, 2010).

The Alberta government released a document called *Ministerial Order on Student Learning* (Alberta Education, 2013) that furthered the direction that *Inspiring Education* (Alberta Education, 2010) set. It focuses on students' ability to learn and develop skills. Cross-curricular competencies that students should develop are part of the *Ministerial Order on Student Learning*. Cross-curricular competencies (Alberta Regional Consortia, 2013) include knowing how to learn, thinking critically, identifying and solving complex problems, managing information,

innovating, creating opportunities, applying multiple literacies, communicating and cooperating, demonstrating global and cultural understandings, and identifying and applying career and life skills.

Purpose of the Study

The purpose of this study was to develop a method to address the educational needs of a central Alberta school division. Alberta students need support from schools to become engaged thinkers, ethical citizens, and entrepreneurial spirits (Alberta Education, 2010). The main goals of the school division are literacy, inclusion, faith, and technology. Project-based learning is a pedagogy that helps to accomplish the initiatives of the division together rather than by separate means.

The importance of this research was the need to study the effectiveness of project-based learning and how to best implement it in schools to develop the 21st-century skills and cross-curricular competencies (Alberta Regional Consortia, 2013) that students need to become competitive members of the global workforce. The study focused on how to best prepare middle-school staff in a central Alberta middle school to run a project-based learning environment to promote the skills that students need to develop in an authentic learning environment. The researcher witnessed most students' loss of interest in their learning as they progressed through school. Robinson (as cited in Bell, 2015) believed that this is the result of an outdated school system that does not allow students to be creative. Project-based learning is a method that fosters conditions in which students want to learn. Rather than sitting in their desks listening to a teacher all day, with project-based learning, students have a chance to be active and creative and to take ownership of their learning (Bell, 2015).

Research Question of Hypothesis

To provide a clear focus for this research, the researcher asked the main question “How can a central Alberta middle school create a project-based learning environment for students?”

Importance of the Study

The significance of this research is that it helps to support students in an evolving educational environment. The release of *Inspiring Education* (Alberta Education, 2010) and the *Ministerial Order on Student Learning* (Alberta Education, 2013) changed the educational landscape of Alberta.

Alberta Education (2010) defined *engaged thinkers* as students who utilize critical thinking and technology to learn, innovate, communicate, and discover. To answer a driving question and produce high-quality work in project-based learning, students must do more than memorize information: They also need to utilize critical-thinking and problem-solving skills (Larmer & Mergendoller, 2010). An essential component of engaged thinking is the ability to collaborate with others and adapt to change with optimism. Project-based learning promotes collaborative learning, which helps students to learn at a deeper level and develop communication skills (Oakley, Felder, Brent, & Elhadj, 2004).

Alberta Education (2010) defined *ethical citizens* as students who contribute to the community and the world by working with others with respect, empathy, and compassion. Project-based learning gives students opportunities for authentic learning experiences by involving them in and trying to improve their communities (Larmer, 2014; Ruso, 2012). Larmer suggested that projects be localized to make them as relevant as possible for students. Localizing projects increases students’ chances of becoming engaged and seeing meaningful change from their work. They see themselves as ethical citizens when they create positive change in society.

According to Alberta Education (2010), *entrepreneurial spirits* are students who create opportunities and achieve goals through hard work. With project-based learning, students learn about something authentic and relevant that culminates in a public presentation (Schwalm & Tylek, 2012). Having choice helps students to direct their own learning and develop entrepreneurial spirits more than traditional methods do (Larmer & Mergendoller, 2010; Roessingh & Chambers, 2011).

This research is also significant because it addresses the need for students to develop 21st-century skills. The Alberta government outlined 21st-century skills for Alberta students in the *Ministerial Order on Student Learning* (Alberta Education, 2013). Project-based learning is an effective tool for students to learn these essential skills, such as collaboration, critical thinking, and communication (Schwalm & Tylek, 2012).

Definition of Terms

20% Time: Allows students and workers 20% of their time to pursue projects of their choosing.

21st century skills: A collection of concepts, skills, understandings, and habits of mind that are invaluable to all students.

Authentic learning: Learning that is relevant to the real world and meaningful to students' lives and promotes realism, even in a fictitious scenario.

Cross-curricular competencies: An interrelated set of attitudes, skills, and knowledge upon which students can draw and that they can apply to a particular context for successful learning and living (Alberta Regional Consortia, 2013).

Engaged thinkers: Students who learn, innovate, communicate, discover, think critically, and utilize technology.

Entrepreneurial spirits: Students who create opportunities and achieve goals through hard work.

Ethical citizens: Students who contribute to the community and the world by working with others with respect, empathy, and compassion.

Inquiry-based learning: A process in which students formulate questions; investigate to find answers; build new understandings, meanings, and knowledge; and then communicate their learning to others.

Middle school: For the purpose of this study, a school comprised of Grades 6 to 9.

Pedagogy: A method and practice of teaching.

Project-based learning: A systematic teaching method that engages students in learning knowledge and skills in an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks.

Residencies: Professional development sessions that take place in a school. Educators can learn about a subject from a facilitator and the facility itself.

The school: Refers to a central Alberta middle school; usage reflects the overall consensus of the staff and administrators of the central Alberta middle school.

Scope of the Study

Included in this study was research from all grade and subject levels. The primary focus was on the skills that students develop with project-based learning, including 21st-century skills and cross-curricular competencies (Alberta Regional Consortia, 2013). The researcher conducted the methodology of this study in a central Alberta middle school comprised of Grades 6 to 9, with a staff of about 20 teachers and 8 educational assistants.

Summary

Project-based learning is a teaching concept that meets the needs of students in Alberta. During a time in education when the focus is on skills and competencies, project-based learning is a pedagogy that focuses on what is best for students to learn. In *Inspiring Education*, Alberta Education (2010) listed goals for Alberta educators to enable students to become engaged thinkers, ethical citizens, and entrepreneurial spirits. Alberta Education (2013) then released the *Ministerial Order on Student Learning*, which promotes cross-curricular competencies that are essential for students to have to become competitive in the global workforce. Project-based learning is an effective method of addressing the educational needs of Alberta students according to the Alberta government.

Outline of the Remainder of the Paper

Chapter 2 outlines the research on the effect of project-based learning on student achievement; it includes current authors and pedagogical thinking for project-based learning. Chapter 3 is a further review of the methodology of project-based learning, and chapter 4 is a review of the successes of project-based learning and areas that require further exploration.

Chapter 2

Review of Literature

This chapter outlines the current research on project-based learning, with a focus on the research behind the eight essential elements of project-based learning that the Buck Institute of Education identified (Larmer & Mergendoller, 2010).

Historical Background

The origins of project-based learning can be found in the work of Aristotle, who modeled questioning, inquiry, and critical thinking (Boss, 2011). John Dewey, a 20th-century American educationalist and philosopher, had many ideas about education that are utilized in project-based learning today (Boss, 2011; Pieratt, 2010). Among these ideas is the belief that schools should tailor the curriculum to create meaningful learning experiences for students (Pieratt, 2010). The educational model that the High Tech Schools in San Diego, California, have utilized since opening in 2000 is based on the work of Dewey (as cited in Pieratt, 2010). The principles of personalization, teacher as designer, adult world connection, and common intellectual mission are directly connected to the work of Dewey and essential elements of the High Tech Schools' model (Pieratt, 2010).

Maria Montessori gained worldwide recognition for her work in education at the beginning of the 20th century when she discovered and touted the importance of learning through engaging experiences (Boss, 2011; Thayer-Bacon, 2012). One of Montessori's largest contributions to project-based learning is the idea that children should have some choice in their work to be able to follow their own interests (Thayer-Bacon, 2012). Juliani (2015) argued that the reason that Montessori's methods have prevailed today is that they promote intellectual curiosity and creativity, which are hallmarks of project-based learning. The ideas of project-

based learning continue to grow and evolve, but the historical influence of Dewey and Montessori are still present in project-based learning today.

McMaster Medical School has utilized project-based learning for the benefit of its medical students and has also influenced current project-based learning practices. Students are able to learn content and skills, but struggle to apply their knowledge to new situations. The goal of project-based learning is to move students from novices to experts. Novices are capable only of repeating patterns that they already know, whereas experts have the ability to react and problem-solve in new and unfamiliar situations (Barber et al., 2015). McMaster Medical School has recognized the importance of its students being able to become experts in their field, and project-based learning is at the forefront of their ability to accomplish this.

Current Research

The Buck Institute of Education created a model for the essential elements of project-based learning (Larmer & Mergendoller, 2010). This model includes an overview of the necessary aspects of project-based learning that research has supported.

Challenging Problem or Question

The first element of project-based learning is the presentation of a challenging problem or question. Effective questions can trigger and maintain student interest in the classroom. When students view a question as important and worth answering, their engagement rises (Marzano, Pickering, & Heflebower, 2011). If students are asked to memorize information and repeat it, they consider the information irrelevant. However, if they are challenged to use the information that they have learned to solve problems, make decisions, conduct investigations, and create hypotheses, they are more likely view it as important (Marzano et al., 2011). Presenting students

with challenging problems or questions for sustained inquiry is an effective method of preparing them for life after school (Juliani, 2015; Larmer & Mergendoller, 2010).

Sustained Inquiry

The importance of sustained inquiry in project-based learning is to ensure that students have enough time to engage in a process that involves questioning, finding and evaluating sources of information, and applying what they have learned (Larmer & Mergendoller, 2010). Without adequate time, they will not be able to participate in one or more components of this process.

A crucial aspect of sustained inquiry is allowing students to fail and learn from their failure. It is important for teachers to guide students in their learning rather than to do the learning for them. Making students aware that failure is part of the learning process and not the end of it is essential in establishing students' growth mindset (Juliani, 2015). When students are allowed to fail and learn from their failures, they develop a healthy attitude towards risks, challenges, mistakes, and failures, which sustains the inquiry (Masters, 2014). A goal of project-based learning is to enable students to see that learning does not start and stop within the walls of the classroom. On the contrary, sustained inquiry can help students to become part of a community of inquiry, which includes connections with adult researchers, academics, and practitioners (Burgh & Nichols, 2012). Students in a single classroom demonstrate a variety of skills and abilities. Conducting a classroom with a growth mindset celebrates all students' growth and achievement.

Authenticity

Research has shown that authenticity is an essential element of project-based learning. Authenticity connects the project to the real world. Therefore, it is crucial in helping students to

understand the importance of what they are doing. Authentic learning might involve students' innovation to solve real-world, complex problems (Strimel, 2014) by designing their own inquiries, planning and making choices about their learning, analyzing and organizing their research, and implementing various learning strategies (Bell, 2010).

Localizing projects is an effective method of making them authentic. It is beneficial for students to have a local understanding of an issue before it can make sense to them on a global scale (Larmer, 2014). Establishing a local connection in a project is a meaningful, yet manageable way for students to extend their learning beyond the classroom and become involved in something relevant to them and their communities.

Because project-based learning presents real-world issues and problems to students, it must include authentic interactions with the real world (Schwalm & Tylek, 2012). Involvement with the community promotes the real-world aspect of project-based learning and has a positive impact on the school, the students, and the community itself (Shannon & Bylsma, 2007; Larmer, 2014). For students involved in a project that promotes positive change in their community, the learning is meaningful and relevant. They understand the power that they hold when they put their time and effort into a project that will have a real-world impact.

Students can establish these community connections at any time with project-based learning (Juliani, 2015). Students who start a project in which they explore the problem of world hunger could partake in an entry event led by a local botanist, students in the middle of a project on air and aerodynamics could connect with a flight engineer for guidance and advice, or students at the end of a project on collective rights in Canada could invite a First Nations member to be part of the authentic audience. These real-world connections elevate projects into a more meaningful realm for students.

Encouraging multiple perspectives in projects and activities can help students to connect to what they consider important and what is important in their community. Authentic learning requires that students collaborate with others, because individuals do not solve real-life problems (Strimel, 2014).

Student Voice and Choice

If students do not have voice and choice in a project, they lose motivation in the process. Student commitment to a project greatly correlates to their feeling of ownership of the project (Larmer, 2014). In a project-based learning environment the teacher is still an essential part of the classroom, providing guidance and leadership. Students' ability to have voice and choice in their learning is carefully balanced with flexible instruction from the teacher (Roessingh & Chambers, 2011).

The concept of voice and choice has received attention with the implementation of 20% Time at businesses such as Google. 20% Time allows Google employees the freedom to spend 20% of their working time on something of their choice that will benefit the company. The workers have to present the results of their efforts to their colleagues. The power of this voice and choice is evident in that approximately half of Google's innovations originated during 20% Time (Juliani, 2015). Students are more likely to take responsibility for their own learning when they are able to make choices in their learning (Sahin & Top, 2015). Similarly to Google's 20% Time, classrooms can increase students' productivity and motivation when they have voice and choice in their learning.

Students might struggle with the independence and autonomy of project-based learning, especially if they have not experienced it before (Barber et al., 2015). It is essential then that within teachers' flexible instruction they guide and support their students, even in matters that

involve student voice and choice. Whereas students have the ability to make decisions about their own learning, teachers must also support them with strategies to guide their decision making (Strimel, 2014). This guidance can involve small-group or individual conferencing, whole-class discussion, or guiding reflective questions.

Reflection

Students should reflect on what they are learning, how they are learning, and what they accomplish when they work on a project (Boss, 2011). They can use various methods of reflection to explore their learning on a personal level, whether it is individually, in groups, or in a teacher-led conference. Reflection results in greater student accountability, participation, understanding, and satisfaction of the students who work on a project (Kim, Hong, Bonk, & Lim, 2011). Having time to reflect on their learning helps students to develop their metacognitive abilities, which also helps them to assess what they know and do not know. It is essential that students be able to reflect on and assess their learning to solve future problems successfully (Strimel, 2014).

The growth of technology in the classroom has enabled reflection to become an ongoing, interactive experience for students (Tucker, 2014). Online tools give students an opportunity to write reflections that a worldwide audience can read and then provide feedback or offer insights and support. Although reflections can be independent and private, sharing their reflections is one of the most powerful tools that students can utilize in the classroom (Juliani, 2015). Reflections of any kind help them to contemplate their own learning. Reflections are a low-risk but high-reward component of project-based learning that help students think about what they are learning and how they are learning in ways that they have never considered before.

Critique and Revision

To develop students' growth mindset, it is essential that they have opportunities to critique their own and others' work and have a chance to revise their work to improve their critiques. Mastery is a principle that improves student motivation (Nordgren, 2013; Pink, 2010). Mastery is the personal desire to improve at something that has a purpose. If students are assigned tasks in which they are not interested, they will not exert their best efforts. If they are interested and invested in a task at hand, then they will critique and revise the product until they have mastered it (Nordgren, 2013; Pink, 2010).

Project-based learning and the ability to critique and revise effectively build deep content understanding and increase students' motivation to learn (Soulé & Warrick, 2015). The opportunity to critique and revise one's work is imperative to develop the attitude that failure is part of the learning process rather than the end of it. Critiquing and revising helps teachers to assess students formatively throughout the project and use student growth as valuable data that shows learning (Masters, 2014). An essential aspect of any project plan is a schedule for formative and summative assessment to create critiquing and revising opportunities. The formative assessments will guide students to a mastery level.

Public Product

The eighth essential element that the Buck Institute of Education recognized is *public product* (Larmer & Mergendoller, 2010). The institute changed this element from *public audience* to *public product* with the understanding that students do not always have to make a formal presentation to an audience at the end of a project; however, they should create some sort of product that a public audience will see. Whether student products are formal presentations,

public displays in the community, or presentations on a website, they become more authentic and meaningful to the students (Larmer & Mergendoller, 2010).

Student Achievement

Project-based learning has a significant impact on students' academic achievement. They learn 21st-century skills and cross-curricular competencies that are essential to working in the global workforce (Juliani, 2015). Standardized tests do not currently measure many of these skills (Bell, 2010). However, components of project-based learning such as hands-on activities, reflections, and presentations demonstrate increased retention of knowledge (Karaçalli & Korur, 2014). Therefore, students engaged in project-based learning outscore traditionally educated students on standardized tests (Bell, 2010).

Conclusion

The essential elements of project-based learning are a variety of components that benefit student learning. Authentic projects that provide students with challenging problems, sustained inquiry, and voice and choice increase students' cross-curricular competencies (Alberta Regional Consortia, 2013) as 21st-century learners. Purposeful reflection and the ability to critique and revise their work further the authenticity of students' work. Chapter 3 documents the implementation of project-based learning in a central Alberta middle school, and chapter 4 presents the summary, conclusion, implications, and recommendations based on the school's transition to a project-based learning environment.

Chapter 3

Methodology

The direction of Alberta Education was the greatest influence in transforming a central Alberta middle school into a project-based learning environment. Alberta Education (2010) released *Inspiring Education*, which identified goals for Alberta educators to enable students to become engaged thinkers, ethical citizens, and entrepreneurial spirits. Alberta Education (2013) then released the *Ministerial Order on Student Learning*, which promotes cross-curricular competencies that are essential to enable students to become competitive in the global workforce. The central Alberta middle school considered project-based learning an effective method of addressing the needs that Alberta Education outlined.

To establish competency in project-based learning, the majority of the school's staff trained in PBL 101, a professional development program that the Buck Institute of Education developed. Initially, 12 staff members were trained in October 2013 and brought their experience and knowledge back to the school. Throughout the year other staff members received the training, and the majority of the staff of approximately 30 teachers were trained in project-based learning.

The school staff ultimately considered the year of implementing projects successful. However, they decided that they needed further professional development to ensure a high level of competency amongst the teachers in developing a project-based learning environment. In September 2014 the staff members sent a proposal to the school division for professional development funds to send a group of teachers to High Tech High in San Diego, California, a system of schools entrenched in project-based learning. The staff of the central Alberta middle school believed that first-hand experience of a project-based learning environment would enable

a group of teachers to develop the understanding, appreciation, and expertise to apply to their own school environment.

The ultimate goal of the proposal to attend High Tech High was to create a project-based learning center in the central Alberta middle school where students could gain skills and knowledge from participating in projects and other teachers from the division and the province could learn about project-based learning. Professional development from organizations such as the Buck Institute of Education was valuable to the staff of the central Alberta middle school; however, it was also clear that learning about project-based learning in an actual environment entrenched in the practice would be valuable to any educator who wanted to learn more about it. Being able to talk to teachers, administrators, educational assistants, and students seemed to be the most valuable tool in learning about any educational system, including one focused on project-based learning.

Driving Question

The staff of the central Alberta middle school used their current experience with project-based learning to write a proposal to attend High Tech High. The first aspect of the proposal was the driving question, the purpose behind the proposal, which centered on how the school could create an authentic learning environment by using a project-based learning model. The driving question remained the basis for the proposal and the desire of the school to become a project-based learning center.

Dream School

The second component of the proposal was an outline of what the staff considered a 'dream school.' This component helped the school to determine the staff and students' ultimate goals with regard to project-based learning. The main vision for a dream school was to become a

project-based learning educational center. Part of this vision included establishing collaboration among the staff members to implement cross-curricular projects at all grade levels. An additional requirement for the dream school was to invite other educators into the project-based learning environment at the school for meaningful professional development.

Timeline

The staff at the central Alberta middle school proposed a timeline of three years to become a project-based learning environment. The main goal for the first year was to provide them with continued meaningful professional development to understand the need for the school to develop a project-based learning environment. In year 1 the staff also educated the parents on what project-based learning is and how it would impact their children. The school staff understood the importance of including parents in this process because project-based learning was an unknown concept to many of them. The staff proposed an Exhibition of Learning during the first year to enable parents to view what their children had created in their classes, because they believed that seeing the final product and being part of an authentic audience to whom the students could present would help the parents to understand the value of project-based learning. Last, an important goal for the first year was to host a professional development session on project-based learning in the school to enable other educators to witness the school's journey and the work that the staff and students had done.

The second year still focused on ongoing professional development on project-based learning for the staff of the central Alberta middle school, as well as continued education for parents. Therefore, the staff decided that a valuable goal for year 2 would be to hold two or three Exhibitions of Learning in which the parents could participate. They also decided that, to help the students to partake in multiple meaningful projects throughout the year, grade teams would

need time to work together to develop cross-curricular projects, in line with Alberta Education's expectations for cross-curricular competencies (Alberta Regional Consortia, 2013). They would need this time to ensure that they developed projects in line with the curriculum. Last, in year 2 it was important to set a goal for at least two professional-development residencies to allow educators from outside the school to come to the school to receive meaningful and relevant professional development on project-based learning. The school wanted to be able to offer the type of hands-on professional development that educators seek from High Tech High.

The first goal of the third year of the proposal timeline was to ensure that any staff members new to the central Alberta middle school would receive professional development on and training in project-based learning. It was essential that all staff members, including new hires, remain current on the beliefs about and philosophy behind a project-based learning environment. Another important goal in the third year was to continue to share knowledge on project-based learning through Exhibitions of Learning and professional-development workshops, as well as to begin the process of merging Career and Technology Foundation option classes with core subject areas to utilize school resources for cross-curricular projects. The final goal for year 3 was to begin to organize teachers' and students' schedules around the projects so that the teachers could create them according to their own passions and students could learn through choosing their own projects.

Positive Structures in Place

The staff believed that the proposal was a worthwhile endeavor because many positive structures were already in place in the central Alberta middle school. The majority of the staff already knew about project-based learning, and many had already received training through PBL 101, which the Buck Institute of Education developed. Many staff members had already

attempted projects in their classes, seen some success, and understood the value of it. Prior to the staff's submission of the proposal, the school had a robust professional-development committee that was committed to developing a positive learning environment for the staff and students.

The school scheduled common times during the school day to allow teachers, administrators, and educational assistants to meet and collaborate. Teachers who taught the same group of students and those who taught the same subject met periodically during the school day to discuss best practices and plan their classes, which they considered valuable time to plan their cross-curricular projects.

The school's supportive staff and administrators were also willing to take risks to ensure that their students received the best education possible.

Chapter 4

Summary, Conclusion, Implications, and Recommendations

Summary

Project-based learning offers 21st-century learners an effective educational environment. Larmer (2014), Schwalm and Tylek (2012), and Juliani (2015) stressed the effectiveness of project-based learning in creating authentic, meaningful experiences for students that will prepare them for the global workforce. High Tech High schools in San Diego, California, have demonstrated the success of a project-based learning environment in that 98% of the graduates go on to postsecondary education, equipped with the necessary skills and attributes to survive in the global workforce (High Tech High, 2016). Alberta Education (2010) emphasized the importance of authentic learning when it released *Inspiring Education* and the *Ministerial Order on Student Learning* (Alberta Education, 2013). These documents highlight the necessity for Alberta students to learn cross-curricular competencies (Alberta Regional Consortia, 2013) and become engaged thinkers, entrepreneurial spirits, and ethical citizens.

The staff of a middle school in central Alberta decided to meet the needs of their students by creating a project-based learning environment. To achieve this goal, they had to ensure that all of the staff understood the benefits of this type of environment to the students. Therefore, they participated in professional development on project-based learning to understand what project-based learning is and why it would benefit the students. Learning about the goals of *Inspiring Education* (Alberta Education, 2010) and the *Ministerial Order on Student Learning* (Alberta Education, 2013) and developing competence in project-based learning helped the staff to make a connection between project-based learning and the Alberta government's requirements for students' learning.

The school staff worked together to develop a system conducive to project-based learning for teachers, students, and parents. The teachers needed time to collaborate on developing cross-curricular projects and spent time brainstorming new class schedules, including length of classes that would better fit the project-based learning model. They also considered the layout of the classrooms and the school itself and kept project-based learning at the forefront of their collaborative planning.

Conclusions

Approaching school staff with the idea of change, big or small, requires convincing. Using a schoolwide approach to change the way that staff expect their students to learn affects all students and teachers and has the potential for opposition to the change. However, with positive supports and time, encouragement, and professional development for the staff, a school can change for the better.

The most important factor in creating a project-based learning environment in a middle school in central Alberta was the belief that it was the right decision for student learning. Once the staff concurred, it made the idea of becoming a project-based learning center a possibility. To continue the journey, the staff required support for their beliefs and ideas to come to fruition, including time to work together to make the difference that they envisioned and professional development to continue to grow and learn, just as their students did.

It became clear that project-based learning could benefit every lesson rather than just projects. The project-based learning model is part of the larger scope of authentic learning, which is more manageable for teachers than project-based learning. They can use elements such as student voice and choice, critique and revision, and reflection within a more traditional lesson or activity. In recognizing that they could use elements of project-based learning every day, the

staff of the central Alberta middle school understood that students do not always have to participate in projects because project fatigue is possible and that a balance between working on projects and experiencing authentic learning within a more traditional environment is beneficial.

Implications

At the end of the first year of the original proposal, the central Alberta middle school had already accomplished what it set out to do in the first three years, which gave the staff an opportunity to examine critically the successes and failures of the project-based learning implementation. Among the successes was the positive change in the school's atmosphere. Many of the walls in the hallways were now adorned with projects that students had meticulously constructed and presented. Parent-teacher interviews or after-school sports created opportunities for parents and other guests to observe and enjoy the remarkable work that the students had done.

The full year of project-based learning also allowed the school to open its doors more often to parents, guardians, and other family members during Exhibition of Learning days and nights. These exhibitions were opportunities for families to connect to the school on a level that most parents had not previously done when their children were in middle school. Parents and other community members who became guest speakers and critics created a more involved atmosphere.

Many students, especially those who had struggled with engagement in the past, found projects that were highly interesting to them, and they were able to reach a high level of achievement. Even students who initially struggled with elements of project-based learning such as collaboration and presentation improved throughout the year as they participated in more projects.

The efforts of the school had an impact divisionwide. The school held multiday professional-development sessions periodically that gave other educators in the division a foundational knowledge and understanding of project-based learning while they observed classes and students who were in the midst of projects.

The students in Grades 6 and 9 in this central Alberta middle school wrote the Alberta Provincial Achievement Tests in language arts, social studies, mathematics, and science. However, the standardized test results at the end of the year did not improve from the previous year, which the staff expected, because of the drastic shift in instruction and learning that had taken place. The teachers focused less on test preparation throughout the year as a result of shifting expectations and spent the majority of their time working with their colleagues to create new projects and developing their skills as teachers in a project-based learning environment.

Aside from the standardized test scores, the students improved in the learning areas that the Alberta government had specified in *Inspiring Education* (Alberta Education, 2010) and the *Ministerial Order on Student Learning* (Alberta Education, 2013). They demonstrated more aptitude in collaboration and communication, and the project-based learning structure allowed the students to work with a wide variety of abilities of their classmates.

The students experienced failure and learned from it. The Grade 7 students in the central Alberta middle school participated in a project that challenged them to create various bridge structures from pasta noodles, with the goal of creating a structure that would support a certain weight. Students whose structures did not pass the weight test still participated in the Exhibition of Learning and explained what went wrong with their structure and what changes they would make the next time. The opportunity to fail and to learn from it was never so prevalent at the school before.

Most important, student inquiry at the school has increased. When students have an opportunity to choose a direction for a project or to problem-solve in a variety of ways, they demonstrate more passion, interest, and engagement in learning.

Recommendations

Project-based learning cannot occur alone, which is evident in this central Alberta middle school. If only a single educator or a small group of educators create project-based learning environments in their classrooms, then students will not receive the utmost benefit of project-based learning. A team effort is required to create a truly collaborative, cross-curricular learning environment. Collaboration amongst staff results in the molding of project-based learning to the school's current situation. This type of model will be different in every school and every school division depending on their size, the number of students, the ages of their students, and the curriculum expectations. The group of educators who received professional development from High Tech High in San Diego, California, found it difficult to translate the projects that they observed the Californian students creating into the types of projects that they wanted their Albertan students to make. It required a great deal of collaboration amongst the Central Alberta school staff to learn how to develop projects based on both passion and government-mandated curriculum.

The staff at the central Alberta middle school began the second year of project-based learning with the ability to analyze the Provincial Achievement Test results from the previous year. Although they were not surprised by the results, they began the year realizing that they needed to make some changes to achieve better results. The staff collaborated at the beginning of the new school year to create a flexible daily schedule that would strike a balance between highly structured time and project-based learning time. The structured time focuses on gradual release,

in which the teachers demonstrate a skill and the students practice the skill in pairs or small groups and then independently. This time also allows the teachers to conduct individual or small group conferences and interventions to ensure that the students acquire the necessary foundational skills. The flexible schedule gives the grade teams an opportunity to create their own schedules based on what works best for them and the students and to prepare more for tests while they retain time for project-based learning.

Standardized testing will remain an element of education in Alberta in the foreseeable future. Therefore, it is essential that schools create opportunities for students to learn how to write tests. Just as the central Alberta school has utilized project-based learning to teach students necessary skills such as thinking, communicating, and reflecting, they must also learn how to write tests.

The researcher recommends that schools address authentic learning in a project-based learning environment and implement a system of measurement to determine whether project-based learning has had the desired effect. The central Alberta middle school's measurement system at first centered on increasing the quantity of project-based learning and then transitioned into improving the quality of project-based learning.

References

- Alberta Education. (2010). *Inspiring education: A dialogue with Albertans: The Steering Committee Report to the Honorable Dave Hancock, Minister of Education, Government of Alberta*. Retrieved from <https://education.alberta.ca/media/7145083/inspiringeducationsteeringcommitteereport.pdf>
- Alberta Education. (2013). *Ministerial order on student learning*. Retrieved from <https://archive.education.alberta.ca/department/policy/standards/goals/>
- Alberta Regional Consortia. (2013). *Cross-curricular competencies*. Retrieved from http://erlc.ca/resources/resources/cross_curricular_competencies_overview/documents/cross_curricular_comptencies_overview.pdf
- Barber, W., King, S., & Buchanan, S. (2015). Problem based learning and authentic assessment in digital pedagogy: Embracing the role of collaborative communities. *Electronic Journal of e-Learning*, 13(2), 59-67. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=102020645&site=ehost-live&scope=site>
- Bell, J. (2015). Sir Ken Robinson, international education leader. *State Legislatures*, 41(3), 32-33. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=101511106&site=ehost-live&scope=site>
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *Clearing House*, 83(2), 39-43. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=47735088&site=ehost-live&scope=site>

- Boss, S. (2011). Project-based learning: A short history. *Edutopia*. Retrieved from <http://www.edutopia.org/project-based-learning-history>
- Brusic, S. A., & Shearer, K. L. (2014). The ABCs of 21st-century skills. *Children's Technology & Engineering*, 18(4), 6-10. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=96000869&site=ehost-live&scope=site>
- Burgh, G., & Nichols, K. (2012). The parallels between philosophical inquiry and scientific inquiry: Implications for science education. *Educational Philosophy and Theory*, 44(10), 1045-1059.
- High Tech High. (2016). *Results*. Retrieved from <http://www.hightechhigh.org/about/results.php>
- Juliani, A. J. (2015). *Inquiry and innovation in the classroom: Using 20% Time, Genius Hour, and PBL to drive student success*. New York, NY: Routledge.
- Karaçalli, S., & Korur, F. (2014). The effects of project-based learning on students' academic achievement, attitude, and retention of knowledge: The subject of 'electricity in our lives.' *School Science & Mathematics*, 114(5), 224-235. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=95967879&site=ehost-live&scope=site>
- Kim, P., Hong, J., Bonk, C., & Lim, G. (2011). Effects of group reflection variations in project-based learning integrated in a Web 2.0 learning space. *Interactive Learning Environments*, 19(4), 333-349.
- Larmer, J. (2014). Boosting the power of projects. *Educational Leadership*, 72 (1), 42-46. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=98177509&site=ehost-live&scope=site>

Larmer, J., & Mergendoller, J. R. (2010). *The main course, not dessert: How are students reaching 21st century goals with 21st century project based learning?* Retrieved from

http://bie.org/object/document/main_course_not_dessert

Marzano, R. J., Pickering, D., & Heflebower, T. (2011). *The highly engaged classroom.*

Bloomington, IN: Marzano Research.

Masters, G. N. (2014). Towards a growth mindset in assessment. *Practically Primary*, 19(2), 4-7.

Nordgren, R. D. (2013). Pink's "Motivation 3.0" and student centered schooling: Creating life-long learners for the 21st century. *Journal of Research in Innovative Teaching*, 6(1), 3.

Oakley, B., Felder, R. M., Brent, R., & Elhajj, I. (2004). Turning student groups into effective teams. *Journal of Student Centered Learning*, 2, 9-34. Retrieved from

http://bie.org/object/document/turning_student_groups_into_effective_teams

Pieratt, J. (2010). Advancing the ideas of John Dewey: A look at the High Tech schools.

Education and Culture, 26(2), 52-64. Retrieved from <http://docs.lib.purdue.edu/eandc/s/vol26/iss2/art6/>

Pink, D. (2010, April 1). RSA animate - *drive: the surprising truth about what motivates us.*

[Video file]. Retrieved from <http://www.youtube.com/watch?v=lqM90eQi5-M>

Roessingh, H., & Chambers, W. (2011). Project-based learning and pedagogy in teacher

preparation: Staking out the theoretical mid-ground. *International Journal of Teaching and Learning in Higher Education*, 23(1), 60-71. Retrieved from <http://proxy.cityu.edu>

[/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ938579&site=ehost-live&scope=site](http://login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ938579&site=ehost-live&scope=site)

- Ruso, N. (2012). The role of technology: Community based service projects on ethical development. *Turkish Online Journal of Educational Technology*, 11(3), 375-385.
Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=83660193&site=ehost-live&scope=site>
- Sahin, A., & Top, N. (2015). STEM students on the stage (SOS): Promoting student voice and choice in STEM education through an interdisciplinary, standards-focused, project based learning approach. *Journal Of STEM Education: Innovations & Research*, 16(3), 24-33.
Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=110317029&site=ehost-live&scope=site>
- Schwalm, J., & Tylek, K. S. (2012). Systemwide implementation of project based learning: The Philadelphia approach. *Afterschool Matters*, (15), 1-8. Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ980187&site=ehost-live&scope=site>
- Shannon, G. S., & Bylsma, P. (2007). *The nine characteristics of high-performing schools: A research-based resource for schools and districts to assist with improving student learning* (2nd ed.). Olympia, WA: Office of the Superintendent of Public Instruction.
- Soulé, H., & Warrick, T. (2015). Defining 21st century readiness for all students: What we know and how to get there. *Psychology of Aesthetics, Creativity, and the Arts*, 9(2), 178-186.
- Strimel, G. (2014). Authentic education. *Technology & Engineering Teacher*, 73(7), 8-18.
Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=95262932&site=ehost-live&scope=site>

Thayer-Bacon, B. J. (2012). Maria Montessori, John Dewey, and William H. Kilpatrick.

Education and Culture, 28(1), Article 3. Retrieved from <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1284&context=eandc>

Tucker, S. Y. (2014). Transforming pedagogies: Integrating 21st century skills and Web 2.0

technology. *Turkish Online Journal of Distance Education (TOJDE)*, 15(1), 166-173.

Retrieved from <http://proxy.cityu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=94938168&site=ehost-live&scope=site>