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## **Project-Based Learning and Student Engagement in the Interdisciplinary Secondary Classroom**

James Carlson

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Project-Based Learning and Student Engagement in the Interdisciplinary

Secondary Classroom

By James Carlson

A capstone project submitted in partial fulfillment of the requirements for the

Masters of Arts in Teaching Degree

Hamline University

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## CHAPTER ONE

### Introduction

#### Chapter Overview

You would not be reading this paper right now if it weren't for Project-Based Learning. This paper wouldn't even exist, or better yet, the writer of this paper would not be an aspiring Master's level teacher. Project-Based Learning and the various components that come together to construct it are cornerstones of my personal and professional life. Chapter one of this capstone paper seeks to examine the writer's personal and professional background in relation to Project-Based Learning in schools.

I believe a quality education can be one of the greatest factors in the outcomes of one's life. My own journey in life is riddled with lessons both learned and earned. In chapter one of this capstone paper I will examine many of those lessons. Impactful educators oriented me towards a life I would otherwise have not known, nor been able to achieve without their guidance. I have developed a passion for education in part due to educators who inspired me to see multiple perspectives, collaborate with peers, develop skills, and explore topics of my own interest. All of those skills and experiences were made possible through Project-Based Learning.

Teachers have faced a higher rate of anxiety and burnout than any other profession in recent years (Walker, 2021). This is a problem that I have faced myself. I strive to be a quality educator amidst the struggles of today's classrooms.

Beyond my own struggles, I hope to add to the conversation of best practice for all students in the diverse 21st century classroom. I believe that schools during and after the Covid Pandemic should approach learning in creative ways that meet the needs of

their students. Project-Based Learning could be a cornerstone of engaging, fun, and hands-on education for all.

The majority of students in recent studies claim to be bored in school, if not all of their classes each day (Rush, p. 7). With modern technology at their fingertips, students can be more disengaged from their classes than ever. My own students are begging for choices and real world experiences in the classroom. Test scores are at an all time low for nearly every subject (MDE, 2023). Students in urban environments suffer poor educational outcomes at a higher rate than their suburban peers (Padgett, 2019). I believe that Project-Based Learning gives the time to build authentic relationships, which in turn can create more engaging learning, which can reduce the equity gap.

My purpose is to seek methods of Project-Based Learning implementation that are beneficial for all students and teachers in secondary classrooms. The added focus of this capstone paper is to implement Project-Based Learning within an interdisciplinary secondary school. I hope to create a capstone project that is useful to students in a College and Careers elective class at the middle school level. This project would be a unit guide that is grounded in sound research over a vast breadth of the thesis question's components.

I believe that Project-Based Learning is more effective and memorable than regular teacher led classes. Project-Based Learning can focus on real-world thinking and skills, allowing the whole student to thrive rather than just follow teacher instruction. Project-Based Learning gives ample work time to students with various needs such as; English Language Learners, Newcomers, and special education students. Many special education students or SPED students, as well as English language learners or ELL's may

need additional support but they can thrive with opportunities to prove their abilities in a Project-Based Learning environment. Well designed projects also allow for students to choose what topic interests them the most, increasing engagement through personal enjoyment of the class.

I believe Project-Based Learning can be some of the most beneficial and real world experiences kids will receive in their K-12 education. In turn, well orchestrated projects can allow students to learn in exciting and fun ways. Authentic student centered learning happens in project based classrooms that can stick with kids for their whole lives. I have had some of my most memorable experiences in the social studies classroom as a student, student teacher, and teacher.

In this chapter I will reflect on my personal and professional experiences with Project-Based Learning. I will then examine the rationale of using Project-Based Learning in the classroom. Then I will conclude this chapter and move on to a literature review covering the most important aspects of Project-Based Learning, engagement, interdisciplinary education, and real-world skill development. This capstone paper seeks to answer the question; *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?*

### **Projects as a Student**

My personal and professional experience with Project-Based Learning spans the majority of my life as a student and educator. My early experiences were in middle school history classrooms completing projects. These experiences are some of my fondest memories of school, and they motivated me to become an educator.



When I was a 6th grader, Project-Based Learning had a strong impact on my learning trajectory. I was fairly shy and uncertain of my school or career trajectory. Ancient history quickly became my favorite subject, as my teacher utilized effective and engaging Project-Based Learning strategies the entire year. Project-Based Learning in a history classroom immersed me into passions that have lasted a lifetime. My teacher kept lessons short and interesting, and each day allowed for practical research and application through topics of our choice. I vividly remember building a pyramid, presenting about Roman Emperors, and creating a poster on the Trojan War for the whole class to see. Not only did I learn content, but I grew out of my shell in a transformative period of my life.

Team projects forced me out of my comfort zone to communicate with students from different schools and make new and lasting friendships. I became brave enough to move past simple note taking, then apply my notes and simple sources to create my own understanding of the past. I learned history to a breadth and depth that was not repeated in the rest of my school years. These project experiences fulfilled many of my hopes for history education and inspired me to study ancient history as an undergraduate at the University of Minnesota.

### **Projects as a Professional**

The most recent experiences relate to creating projects for my own students in secondary classrooms. The first of these experiences was as a student teacher in the social studies department at a suburban high school. During that time I worked with amazing students and staff who taught me lessons that will last a lifetime; one of whom will be quoted frequently in the chapter two literature review. At the beginning of the student teaching process, I was informed I would be teaching my dream class, world history, but

also my nightmare, economics. No matter the amount of time put into preparation, it seemed Project-Based learning was the most engaging and popular strategy.

### ***Student Teacher***

In my first world history course we implemented a reenactment simulation. In this project, students acted as representatives for each nation involved in a real world historical event. The simulation was based around the late 19th century scramble for Africa. Students experienced the process of dividing a continent for resources first hand as actors with motives. Immersive competition gave opportunities for personalities to shine, and authentic teamwork for achievable goals to occur. Teachers led students through guided reflection that analyzed the role of the powerful and the powerless in history. Many relatively privileged white students in the class had a genuine moment of empathy for those in the past different from them. They saw beyond the game of bargaining for resources. Students felt, in some small way, how people in a different time, place, and of a different race experienced life. This was an early motivator for me to use immersive projects as a culture deconstructor. I found that simulations and other Project-Based games can build genuine empathetic opportunities in the classroom.

I also experienced teaching a class I had little experience in, and little desire to teach. I felt nervous to teach content heavy and math focused high school economics classes. With proper guidance from mentors, I quickly realized any real life simulation made a typically boring or task oriented lesson memorable. I found that economics could be taught differently than how I learned it. I could use simulations and projects to make economics tangible to students and their interests.

Whether it lasted a day or multiple weeks, each economics simulation was a real world project of its own. I was amazed to see students design their own businesses and apply principles from class so seamlessly. I found myself learning economics from a new lens. I saw student interpretations of the lessons put forth in their projects, and could scaffold to their needs.

Many of my economics students had the opportunity to show off their personal skills like; creating websites, leading class with engaging or funny sales pitches, and exploring dreams of entrepreneurship. I would never have learned so much about those students had I not utilized Project-Based Learning strategies. I would have likely used a textbook and teacher led lessons to cover basic fundamental economic principles instead.

Students begged to enter the economics classroom to explore, create, and practice real life scenarios each day. Many students happily worked with others they may not have normally been friends with outside of the classroom. I found it possible to turn a traditionally boring teacher-led class into a Project-Based model designed for engaging real life simulations. I found that projects can fundamentally transform the perspective of students and teachers alike on even the most boring of topics.

### ***Licensed Teacher***

Since my student teaching experience, I have utilized Project-Based Learning in every course I have taught through four years of full-time licensed teaching. Two of the biggest impacts on my professional career relate to experience in Montessori schools and in creating elective class curriculum. Both of those experiences supplemented my Project-Based Learning in fundamental ways. I strive to implement strategies learned in both experiences into my Project-Based lessons today.

My first teaching job was at a Montessori secondary school in St. Paul. The school's mission was for non-Montessori trained teachers to implement the principles of a licensed Montessori K-5 education into their curriculum within an urban middle school environment. This was a great challenge that many were not prepared for. This setting allowed for projects in any subject area to easily be incorporated. Students were already familiar with student centered lessons, and how to generally organize materials. Each day was an opportunity to design lessons that promoted hands-on and student centered work. The entire classroom space was designed with student led practices in mind. This environment drove students to become independent learners quickly, and forced me to implement choice into my lessons daily. Peers pushed me to create small projects as summative assessments for nearly every unit. This allowed for more engaging assessments. Student choice in the final created product of each unit allowed for assessments to be tailored to students' strengths.

The majority of students in that classroom were first or second generation newcomers to America. Many of those newcomers struggled to read English at a 2nd grade level while in 6th grade. Typically students shied away from reading activities and word heavy assessments. Students found joy in choosing their topics or project product. This joy made work fun, and fun translated to engagement. Engagement slowly translated to higher academic achievement.

Sometimes movement was incorporated to gamify rigorous literacy work. Something as simple as posting short readings around the classroom walls brought smiles to faces that were normally defiant or sleepy amidst a typical reading activity. These simple games could be threaded together to create larger units that built on student

generated products. I learned that the power of movement, student choice, and hands-on work using the Montessori method can improve student engagement and learning outcomes in small ways.

Recently, I have been tasked with designing my own elective courses essentially from scratch in various occupational destinations. I incorporate Project-Based Learning throughout all of my class curriculums because I believe in making student centered, choice driven, and fun lessons. I have seen both engaged students working on career based tasks, and students asleep with their head on a boring worksheet. That is why I strive to implement the best of my teaching background into my classes today.

I pride myself on the fact that I frequently have former students requesting to return to my classroom. Many ask to try other versions of projects and simulations they previously completed. End of year student survey results confirm my suspicions around Project-Based Learning. Students frequently claim that projects, and the process that goes with them, are their favorite part of my classes. These results empower me to be a more confident educator, spark joy in my work, and bring meaning before burnout. These experiences build a strong rationale for me to continue pursuing high quality Project-Based Learning in my own classroom.

### **Rationale**

In my experience as a student, Project-Based Learning was fun, memorable, and inspiring compared to regular lessons. Project-Based Learning has improved my experience as a teacher as well. I am regularly surprised by student products, and feel confident in my ability to address student needs in diverse urban settings of 30 or more students. Beyond my personal experiences in Project-Based Learning, there is a deeper

rationale for its uses in classrooms. Some of the problems Project-Based Learning can address are; general student engagement, building real life skills, addressing various student needs, and preventing teacher burnout.

### ***General Engagement***

My experience has led me to believe that Project-Based Learning can be more fun and engaging for students than using traditional lesson formats. Incorporating project choice allows students to be excited for work time (Price, 2019). Activities that have value in the lives of learners are more impactful and engaging (Hammond, p. 108). Hammond goes on to claim that if we can change the mindset of students, we can get them to care about their school work (p. 108). Projects allow for choices that can alter the mindset of students, or give them chances to learn about things they value. In both instances, engagement could be positively increased in the classroom as a positive outlook on academics allows for improved effort and content recall (Hammond, p. 111).

I was trained to use the GANAG lesson plan format. This format utilizes the learning approaches of; goal, access prior knowledge, new information, generalize, and apply in that order. While this may be a comprehensive format for an educator to outline learning outcomes, I believe it is missing the focal point of student engagement. Many of these GANAG lessons focus on a sit and get format that doesn't allow students to be kids. Choice, movement, exploration, and peer to peer communication opportunities can be experienced in a Project-Based Learning setting (Price, 2019). If those experiences are seen as positive to students, then likely their learning outcomes and skill development will be greater (Hammond, 111). Students who once seemed problems for a teacher, can feel motivated and achieve more when engaged in their work (Rush, p. 15).

### ***Skill Building***

Not only do traditional lesson plans hinder engagement, they can prevent real-world skill building. Skills like; creativity, critical thinking, organization, and language development can fall to the wayside to meet national test score expectations.

As a College and Career Readiness teacher, I see the correlation between real-world skills and projects every day. I see the struggle students have with planning their futures, and the difficulty in understanding what it takes to do a job outside of school. Projects allow for opportunities to practice real-world skills. I believe that students can build these skills and still maintain academic progress in a Project-Based setting.

Project-Based Learning could help students build good habits for their future in a hands-on way. Dweck claims that failure is a teacher on the way to success, (p. 33). Project-Based learning can lead students towards confidence as they have multiple opportunities to fail on any given topic, and the opportunity to fix it the next day and move on. Students can see hands-on hard work come to fruition and complete complex tasks made into manageable bits through Project-Based Learning.

Many of my students typically prefer to communicate with their peers rather than work alone. Group projects allow for not only communication, but collaboration practice. Students have a variety of backgrounds, and group work can lead to students feeling more connected to their peers and the content (Hammond, p. 26) If the project allows for it, students can also explore their future goals and the real life skills necessary to complete them.

Students in my classroom have differing levels of self-management and collaboration skills. With appropriate scaffolding during facilitated work time, students can be formatively assessed on their learning in creative ways. Summative assessments can allow for unexpected and impressive work that demonstrates skill growth in an area of their choice. Beyond skill building, projects can also address diverse student needs.

### ***Addressing Student Needs***

Traditional lesson formats tend to be framed around a teacher centric system. Students have needs that can't be addressed by telling them to sit down, listen, then answer questions on a worksheet. Students today have many different needs that can be addressed through Project-Based Learning. Students with language, instructional, or cultural needs can have a differentiated experience in the Project-Based classroom (Padgett, 2019). Projects allow for a teacher to act as facilitator of differentiated experiences, rather than leader of own sole outcome. In these facilitator periods, a teacher can get to know exactly what individual student needs are present and build vital relationships (Padgett, 2019).

Understanding the diverse cultures entering our classrooms can allow us to foster a space and tailor lessons that eliminate the achievement gap between races (Hammond, 21). At a bare minimum, group projects can allow for students to build relationships with peers and work towards goals together. As Hammond claims, we live in a multicultural society that is slowly becoming collectivist (p. 25). This means that students will encounter other cultures, and may learn something from one another's perspective.

Students after Covid shutdowns have needs that educators struggle to address more than ever. Kids are having a tough time regulating between school and home



appropriate behaviors, especially since the COVID pandemic began (Walker, 2021). Frankly, I see many of my own bored students seeking other outlets for fun in class. Some of those outlets end up looking like scrolling on cell-phones if they deem my lessons boring. Rush claims that many teachers wonder if education needs to be fun in order for it to be impactful (p. 29). Whether fun lessons empirically do or do not improve learning outcomes, educators have the choice to make school better than they experienced as students, which makes it their duty to create engaging lessons (Rush, p. 29).

### ***Addressing Teacher Needs***

All of this rationale and experience sounds great, but creating engaging content, building student skills, and addressing student needs is a heavy workload. It is nearly too massive for 21st century teachers to manage. Teachers are burnt out at record high levels. NEAToday claims that teachers were the most likely of any profession to have high anxiety levels and feel burnout, or a lack of passion that leads to quitting (Walker 2021). If we are to combat these statistics, teachers and students need tangible strategies.

Project-Based Learning could be an answer to these woes. In my experience it can make classes easier for the teacher as they can; spend time scaffolding with students, build relationships, create more student-led opportunities, manage an organized space, and manage behaviors as needed for small groups. All of this engaging work can be done by educators rather than managing whole classroom behaviors. Teachers who get burnt out and anxious when dealing with student behaviors during the COVID era need strategies that work (Walker, 2021). I believe Project-Based Learning can lend those strategies by creating a supportive, fun, student centered space for all.

## **Chapter Conclusion**

Clearly America's public school system is begging for solutions to a plethora of issues. I hope my research can make one small difference. I believe that one possible solution could be found in Project-Based Learning. My research seeks to find if this is true, and to what quantitative or qualitative level.

I have found research that shows the impact Project-Based Learning can have on student engagement, real world-skill building, and its effect on diverse student needs. I have applied my research towards interdisciplinary secondary classrooms primarily to narrow down the scope of my results. I have also focused in that area as it best applies to my current teaching setting for the capstone project.

Chapter one began with my own personal and professional experiences. It followed with a brief overview of engagement and academic issues in American classrooms today. The writer's perspective, educational world-view, and current classroom setting were expressed. Afterwards my own personal and professional educational experiences with Project-Based Learning were examined. Finally, opportunities for the development of Project-Based Learning were described.

The rest of this capstone is outlined as follows. Chapter two is a literature review that attempts to examine all facets of Project-Based Learning and the outcomes for students with a balanced lens. Research will be presented in relation to Project-Based Learning and student engagement, impacts on diverse student populations, and how students can acquire and develop real-world skills. Other focal topics include some aspects of International Baccalaureate and Montessori practices, as well as college bound AVID and WICOR reading strategies, as they apply to my capstone project's setting.

Following the in-depth literature review are two chapters relating to the capstone project specifically. Chapter three contains a plan for a curriculum project of my own design that incorporates researched Project-Based Learning methods from the chapter two literature review. Chapter four concludes my work by reflecting on the project and paper writing process. The project connected to this capstone is a curriculum design focused on a single unit plan for my own secondary interdisciplinary College and Career Readiness elective course. This capstone paper seeks to answer the research question, *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?*

## CHAPTER TWO

### Literature Review

#### Chapter Overview

This chapter reviews relevant literature around Project-Based Learning and its impact on student engagement. First, cutting edge Project-Based Learning techniques in the secondary classroom will be examined. Then, student engagement and its relation to Project-Based learning is synthesized. After, research on the impact of Project-Based Learning to various diverse groups of students will be explored. Finally, this literature review concludes by reviewing how Project-Based Learning connects to real world skills in the 21st century. I have used a variety of sources that show multiple perspectives of Project-Based Learning in various classrooms.

#### *Researcher Positionality*

Considering the amount of time put into this literature review, I find it appropriate to have a somewhat lengthy researcher positionality section prior to laying out the information. My own research positionality is an important aspect of this capstone project. Every researcher in education has a position that should be explained so that their academic lens can be justified and understood.

I am a straight, white, midwestern born male. I have lived in the northern Midwest as an educator my entire adult life. I am under thirty years old. I am able bodied. I hold a post-secondary degree. I attempt to assume little about the students who enter my classroom. I strive to build relationships as the foundation of my teaching. This allows me to know students as individuals to best assess their needs and interests. I attempt to

bridge the equity gap through constructivist thinking. I am by trade a social studies teacher who works in various educational departments at the secondary level.

A literature review can become a deep dive down many rabbit holes for answers. I am attempting to synthesize some of the best research, and make connections to my capstone project that is outlined in chapter three. My intentions are to improve the field of education in some way, and hopefully make my own classes more interesting, thought provoking, and democratic.

Project-Based Learning is an ever evolving teaching strategy that can be implemented in a variety of ways. The process of building projects can be seen all around us. People are projects. Any real-life work is a project. Student education can be a project. William Ayers sums up how Project-Based Learning connects to real life in the following quote:

Every human being is unfinished. Every one of us is in process, in motion, in media res-moving from place to place, from here to there, migrating, sometimes patterns, sometimes not, growing, sent into exile on a certain day and on another day returning, learning, changing, seeing old things in surprising new ways, entering strange rooms, coming out, taking right and wrong turns, lost and then found and then lost again, meeting new people, passing through, riding on a bus or a train or a truck or a plane or-best of all, because we move at the speed of human reaction, unencumbered by steel and glass-a bicycle, drawing right and wrong conclusions, finding something, losing something else, practicing, reaching, missing, stretching, going, going, going. This is what we know of

human beings: We are incomplete, and we are aware of our incompleteness. We are on a voyage, on the make and on the move (p. 40).

Ayers also states, “Education is always for something, and against something else” (p. 10). I agree with this statement on a deep personal level. I have worked hard to make sure this literature review is balanced, but always democratic in worldview. That being said, my personal beliefs and experiences have drawn a lot of positive conclusions towards Project-Based Learning overall.

One can never know all there is to know about Project-Based Learning, as the field is vast with many various themes. Now that my positionality and aims are clear, the literature review will begin with examining Project-Based Learning essentials.

### **Project-Based Learning Essentials**

A great starting point for this literature review is to explain what effective Project-Based Learning is, and what it looks like in various classrooms. Effective Project-Based Learning occurs when a teacher facilitates and scaffolds an environment in which small groups of students create learning using inquiry and research (Basu Thakur, 2021). Students should be leading the work and teachers should respond to the needs of the students by guiding organization and reflection. This learning should be an active process for students in which they develop skills and practice real-world professionalism (Basu Thakur, 2021). Project-Based Learning can be one of the most beneficial real-world ways to learn for kids in the 21st century. One of the most comprehensive systems for implementing Project-Based Learning in any classroom is the GOLD Standard cycle created by the Buck Intstitute.

### ***The GOLD Standard***

There are many ways to deliver thoughtful and purpose driven Project-Based Learning in any K-12 setting. Some of the most important themes revolving around Project-Based Learning connect to the GOLD Standard Project-Based Learning paradigm (Buck Institute, 2023). GOLD is not an acronym or catchphrase, it is a cyclical continuum of project development and learning. Technically there are two different continuums that can be applied, but this literature review focuses on the student project paradigm for continuity sake. This continuum is as follows; challenging problem, sustained inquiry, authenticity, student voice and choice, reflection, critique and revision, and public product (Buck Institute, 2023). The continuum then repeats as a cycle for improvement and reflection for later project experiences (Buck Institute, 2023).

Rohm claims that the best Project-Based Learning continuums are cyclical and focus on improvement for both student and teacher (2021). Assessments on skills should be used directly, indirectly, and after the project to allow for course alterations to improve later student outcomes (Rohm, 2021). These statements show how structure in project creation is vital for learning to occur and the project to be meaningful.

GOLD Standard cycle allows for repetitive formative assessments. This means teachers will have the opportunity to check student understanding formatively often (Buck Institute, 2023). A lack of formative assessments or check-ins informing students of their progress can hurt their learning and desire to achieve in a classroom (Hanghoj, 2018). Thus for quality Project-Based Learning to be implemented, it is vital for the teacher to structure lessons for students to receive feedback and see their opportunities for growth as well as their individual moments of success. The GOLD Standard does this, and allows for students to reflect on their progress themselves (Buck Institute, 2023).

Project-Based Learning should be a very student focused approach to learning (Padgett, 2019). When teachers practice student-centered work they can let go of the need to be all-knowing in their subject area and allow for students to do the inquiry work as well as have more time to get to know the kids in front of them, in turn making deeper connections and better lessons (Ayers, p. 35) Ayers is describing the same cycle of understanding present in the GOLD Standard. A cycle is generated of student choice and voice, space to study things they care about, opportunities to explore and share their identity further, and so on. This should become the culture of the classroom, as GOLD puts it (Buck Institute, 2023). The idea is that students will learn the expectations and the subject matter in a student centered fashion, and will have agency over their own learning that leads to deeper experiences.

For the next part of this literature review, the seven steps of the GOLD Standard cycle are put into three consumable chunks; challenging problem and sustained inquiry, authenticity and student choice, and reflection, revision, and public product. These chunks were formed to allow for the seven steps to seem cohesive and fall into beginning, middle, and end phase groups.

**Challenging Problem and Sustained Inquiry** Gold Standard claims that in order for a project to be worth a student's time, it must be a challenging enough problem that sustained inquiry is required to solve it (Buck Institute, 2023). Martha Rush concurs with this theory by claiming problem-based questioning to lead to deeper understanding and student engagement than rote memorization activities (p. 79). Many teachers are guilty of having worksheets with simple questions. In fact that tends to be the foundation of learning with new and struggling students (Gosheh, 2021).



Breaking free from tedious work, and diving into inquiry-based learning can be challenging for teachers. Teachers are often crunched on time, and may struggle with managing their classrooms (Gosheh, 2021). There are many diverse students in the room with various needs. Inquiry-based learning should be incorporated into projects in order for them to have value to students (Buck Institute, 2023). In order to further increase engagement, the GOLD standard moves on to authenticity, and student choice.

**Authenticity and Student Choice** Student choice is vital in continuing the Project-Based Learning process according to the Buck Institute. Authenticity is like the stamp of approval from a student, or their own touch that makes work unique (Buck Institute, 2023). Voice and choice are the opportunities given by a teacher for students to learn about topics interesting to them.

Many teachers give opportunities for students to choose their topics. Longer projects, simulations, and discussions allow for out of school authenticity to shine through (Rush, 39). Longer discussions and activities allow for students to explore their own identities within the choices they make (Basu Thakur, 2021). Reflection can supplement these authentic experiences on the back end of a project.

**Reflection, Revision, and Public Product** The final steps of the GOLD Standard cycle for Project-Based Learning are; reflection, revision, and the creation of a public product (Buck Institute, 2023). Reflection and revision go hand in hand on the cycle. Purposeful reflection experiences whether individually or within groups lead to revision. That revision can be seen formatively as growth in both Project-Based settings and typical class structures (Padgett, 2019).

The presentation of a public product is the final stage in the GOLD Standard cycle (Buck Institute, 2023). This is sometimes an overlooked feature of classes. Students create something, or practice a routine, and no peers witness their work. According to Rush, presentation of a public product can be more memorable for students than simply turning work into a bin, and it can help teachers assess understanding in the moment (p. 55).

GOLD is only one example of Project-Based Learning curriculum design, but it seems to be the most comprehensive available continuum. While curriculum design is valuable, it is only the beginning of the Project-Based classroom. The next part of this literature review explains the value of engaging students with fun at the forefront of the learning process.

### **Project-Based Learning and Student Engagement**

Now that Project-Based Learning has been examined, this literature review moves on to a second feature of the research question, student engagement. The central theme of student engagement in this section will continually connect back to Project-Based Learning in minor ways. The subtopics of this section include: student engagement essentials, games and simulations, and student voice and choice. This section will occasionally lean into student backgrounds and motives to fully understand how engagement functions in a classroom.

#### ***Student Engagement Essentials***

Generally students remember more from a lesson when it is engaging or important to their personal and cultural lives (Hammond, p. 42). I would add that most educators also find class more engaging and memorable when the lesson is fun and students enjoy

it. Authentic pedagogy of all kinds offer the opportunity to leave the monotony of regular lesson plans behind, and allow for engaging work that will keep both students and educators engaged and looking forward to the next day (Rush, p. 25 ). Even topics that students may find boring can have a complete reversal for an individual student if the material is presented in a way that allows for creativity, is thought provoking, and engaging (Rush, p. 29).

Hammond defines engagement as happening when “the brain’s attention is captured by positive emotion, physical energy, curiosity or a puzzle” (p.111). This means that fun or interesting things keep the brain active. The Buck Institute continues this thread by claiming, well developed projects allow students to be creative, utilize inquiry skills on topics that interest them, and can be more engaging than a typical lesson plan format with formative assessment (2023). As the GOLD standard explained, teachers can still use formative assessments that relate to a specific part of the seven step cycle.

Engagement can be a tricky topic. It is important to remember that not all students will engage in class work to the level a teacher hopes for, no matter the amount of planning or passion behind the work, because all students have different interests (Rush, p. 29). This means that engagement can be a struggle for educators and students alike, and shouldn’t be taken personally. Rush continues by saying, “Boredom has no barriers-it isn’t limited to certain schools or certain students; it isn’t limited by gender, race, ethnicity, or IQ, or socioeconomic status” (Rush, p. 11) I hope to address the roughly 60% of students that claim to be bored at least some of the time in class on a daily basis (Rush, p. 11).

Although a subjective and mostly qualitative theme, student engagement can be assessed in various ways. One of those ways is by questioning and examining student responses in relation to their interest level for classroom topics (Newell, 2003). If students claim to be passionate about a topic, they will likely find it more fun and engaging to learn about in school, compared to topics they care less about or even resent (Newell, 2003). Hammond furthers this claim by saying students need an education that connects to their personal lives, or they will never fully engage in the work and meet their potential (Hammond, p. 37)

In my next section the importance of different strategies that can be associated with projects of smaller size will be explained. Connections to engagement and the boredom crisis in our schools will be addressed through games and simulations.

### ***Games, Simulations, and Fun in the Classroom***

One of the most direct ways to create engagement in the classroom with secondary students, and primary students as well for that matter, would be making lessons fun. Project-Based Learning allows for many opportunities to do activities inspired by fun. Now simply declaring an activity or topic as fun is definitely subjective and may generate mixed responses depending on the student population, the teacher, the school, and where on planet Earth the question is asked. Generally speaking, fun in the classroom will relate to student mood and motivation with a specific task, especially purposely ridiculous ones (Rush, p. 57). That being said, games and simulations are small sample projects that can improve on engagement outcomes (Price, 2019).

The gamification of class is one strategy that is engagement centered and project focused due to the nature of games. Much like a project; there is a start, an end, tasks to

be completed, they require focus, and you can restart it to improve over and over again. Games and simulations are great measuring sticks for fun and engagement in the classroom as they are literally created to drive fun into the forefront (Price, 2019). A well developed simulation will be not only educational but will be directed at increasing mood and motivation for students, which in turn may lead to higher engagement levels (Rush, p. 29). Most students enjoy playing games of any sort and can develop stronger neural connections than in a typical lesson structure (Hanghoj, 2018). We know that when students can relate to a topic or find it compelling in their own personal lives, that they will make stronger and longer lasting mental connections (Hammond, 2015). So many of our students today play games, whether digital or physical. All of these reasons point to the ease in transition and increase in engagement through gamifying a classroom.

Simulations are similar to games in theory. The idea is that a real life scenario will be used as a game, and students will simulate that experience in the classroom. According to leading research, simulations are not only more memorable and fun, but also help students develop real-world skills and perceive their peers in a better light (Price, 2019). This means that simulations really do increase the classroom culture and climate as the GOLD Standard assumes. If we understand that simulations are in a sense projects of a different sort, the correlation to improved engagement can be again claimed.

The literature shows that games, simulations, and lessons that are meant to defeat boredom will likely increase levels of perceived fun and in turn bring up engagement levels in the classroom, and again in turn will bring up the academic learning level in the classroom (Hanghoj, 2018). Thus, fun seems to equate to motivation, and motivation seems to equate to engagement. The research seems to state that learning and engagement

form a cycle with one another in classrooms that embrace games and simulations.

Beyond making lessons fun, another way to improve motivation levels in class is with student voice and choice.

### ***Student Choice***

Project-Based Learning is a simple way for educators to integrate student choice within the curriculum. With the proper GOLD Standard design in mind, each choice students have will connect to the learning benchmarks at hand (Buck Institute, 2023). Choice drives student engagement by providing intrinsic motivation which results in greater focus and grit (Tsybulsky, 2022). Sometimes these choices will be very open to interpretation and allow for students to pick from topics very closely related to their interests, and sometimes there will be few choices but they can still feel empowered by picking their own path of learning. GOLD standard as a guide simply requires students to stay on a similar task of the cycle, but does not demand the tasks all be on the exact same topic. This allows the teacher to act as a facilitator of a space for student choices.

Facilitating student voice and choice is critical to connecting with and engaging diverse student populations. When students have choices they are passionate about, they enjoy coming to class and will engage in the work by their own desire (Newell, 2003). It can be challenging for teachers to find or create lessons that engage student interests every day, but giving choice opportunities to the students allows for them to seek out their interests authentically with less teacher stress. If students are given the opportunity to choose to learn about a topic that relates to their personal lives, they will make stronger neural connections, remember what they learned for a longer duration of time, and feel more engaged in their learning (Hammond, p. 42).

While Project-Based Learning is a great choice for student engagement levels, it can occasionally be a challenge to manage the classroom. With student choice comes poor and unexpected choices. As Project-Based Learning is student driven and relatively hands-off for teachers, this increases the overall freedom and individuality in the room, but can make some teachers feel out of sorts (Ayers, p. 9). Teachers will always in some way be a facilitator of knowledge and learning experiences, but in the Project-Based classroom there can be perceived looser boundaries and with the autonomous student work style, greater opportunity for students to lose track or fall behind on steps (Hanghoj, 2018). Teachers may feel nervous when giving more freedom to their students as it is a loss of control and may make them feel less like experts divulging their content knowledge (Ayers, 12).

This is why it is vital to stay committed to a quality Project-Based Learning cycle like the GOLD Standard. The GOLD standard holds students accountable through the seven phases of project building (Buck Institute, 2023). It forces students to see the project building process and in turn hopefully motivates choices that are in line with completion of the project. It can also keep teachers on task during facilitated work time (Buck Institute, 2023).

This literature review seeks to answer the question; *how does Project Based Learning increase student engagement in an interdisciplinary secondary classroom?* The majority of opinions found in this section of the literature review claim that projects can be an improvement on general student engagement. Engagement can be generated in a plethora of ways. Games and simulations are great ways to improve engagement (Hanghoj, 2018). Student voice and choice can also build engagement (Newell, 2003).

Quality projects will utilize the seven principles of the GOLD Standard Project-Based Learning continuum to fully engage students along their journey (Buck Institute, 2023). Next, I will explain how to address various diverse student needs in a Project-Based Learning classroom.

### **How Projects Address Diverse Student Needs**

The goal of this next section in the literature review is to examine multiple different groups of students and their needs. This section will start with Culturally Responsive Teaching, then shift to English Language Learners, and will end with special education needs. Each section will also connect those groups and their needs to Project-Based Learning overall.

For projects to be meaningful, there needs to be a layer of authenticity that connects to students' lives (Buck Institute, 2023). Ayers goes further by saying, teachers must become the greatest learners of their students in order to generate the most openly free and student centered learning (p. 14). If teachers can learn about their students' needs and who they are as individuals, they have a chance at reaching students deeper than the surface level in their academics and go beyond just daily tasks and grades (Ayers, p. 14). The following section delves into how teachers can do just that within the lens of Culturally Responsive Teaching.

### ***Culturally Responsive Teaching and Projects***

One of the most talked about teaching philosophies today is Culturally Responsive Teaching. In many schools around the country, teachers are reading *Culturally Responsive Teaching and the Brain*, by Zaretta Hammond. I would know, as I



have read it twice for two different school districts with vastly different student populations. In both districts the principles applied.

The general principles of Culturally Responsive Teaching center around experiences in classrooms that connect to the backgrounds and experiences of diverse student populations (Hammond, p. 18). She breaks down this teaching philosophy into four main facets; awareness, learning partnerships, information processing, and community building (Hammond, p. 18). I have frequently cited Zaretta Hammond's work on Culturally Responsive Teaching already, and her work will continue to be a centerpiece moving forward. Hammond hypothesizes that diverse student populations need to learn in ways that reflect their home lives and lived experiences, and when they do so their brain makes connections at higher rates due to the ease at which neuroplasticity develops when learning in a style or of a topic that is similar to one's own age, race, or gender (p. 16). I have frequently cited Zaretta Hammond's work on Culturally Responsive Teaching already, and her work will continue to be a centerpiece moving forward as it is seminal to this topic.

Educators who utilize Project-Based Learning give students opportunities to learn about topics relevant to them, communicate with their peers and friends in authentic ways, and lead their own learning (Hammond, p. 17). The brain's Reticular Activating System will allow it to filter out information deemed unnecessary or irrelevant, whereas it will store important information deeper in the memory center, especially information that is relative to one's own personal experiences and beliefs (Hammond, 16). This means that when educators make content relevant to a student's background they allow for authentic focused engagement and in turn easier to generate neural connections. As Project-Based

Learning can allow many students the autonomy to work, think, and communicate their own way in a safe environment, it also improves their retention (Hammond, p. 16). That means Project-Based Learning can be seen as a foundationally Culturally Relevant Pedagogy method.

Culturally Responsive Teaching dictates that the teacher should run their classroom as a facilitator of learning experiences rather than the sole provider of knowledge (Hammond, 2015). This would look like students creating a product on a step-by-step basis, as the teacher monitors and check-in with students (Buck Institute, 2023). Project-Based Learning is possibly the most effective connection to Culturally Responsive Teaching as every instructional strategy in some way results in the classroom teacher facilitating hands-on student lead work in this way (Buck Institute, 2023). Students do not have to sit and get information from a presumably all knowing educator, instead they can feel empowered to generate their own learning based on their own inquiry work in a safe environment.

Some racial and cultural groups enter the predominantly white led classroom with suspicion of the school and educator's intent (AMS, 2023). Students and families may believe that the school is creating a cultural clash with their own background or forcing them to lose their culture as historically that has happened in North America (AMS, 2023). Culturally Responsive, Project-Based Learning allows for students to learn in a safe environment about topics that may differ from mainstream classical white American education, and allow for students to take ownership of their learning. Students can choose their own learning experience that connects authentically to their lives as well (Buck Institute, 2023).

When we go beyond traditional American views, we see another category for Culturally Responsive Teaching, in newcomers. There are millions of refugee students in America today, and many of them struggle to figure out how they fit into their schools and communities (Abraham, p. 34). Choice in the classroom via Project-Based Learning can support students' sense of self and belonging, and in turn can help refugee students no matter their ethnicity or nationality feel at home. Many refugee students come from places with philosophical or religious needs that may be a challenge to meet in all classrooms. That's where a teacher with a Culturally Responsive lens can allow for students to feel pride rather than feel like a problem (Abraham, p. 35).

Students in our classrooms are diverse in their personal beliefs. This can play a major role in their background and development as a person. It is important for educators to address the needs of the students in their room with a lens towards religion. Students may need flexible schedules and teacher expectations in order to meet the demands of their belief systems such as prayer times (Abraham, p. 14). Project-Based Learning is student-centered by nature and will allow for teachers to have the time to communicate with and plan for students needs (Buck Institute, 2023).

Other researchers argue that putting diversity into the spotlight in a Project-Based Learning setting may not directly improve learning outcomes. Sometimes when we focus on the categories of the students in our classrooms, we are missing out on the whole student, it can be wrong to simply label our students and designate who is in need of something or at risk of something before truly trying to get to know students and helping them understand their own identity in their environment (Ayers, p. 35). Ayers seems to be saying that If teachers spend too much time trying to analyze a student's needs based on

their perceived classification of that student, they may miss out on that child's actual interests and opportunities. This could hinder potential, or put a box around students. It is important to remember all students are individuals before we assess what they may want or need. Communication and empathy are key to making these classes run (Buck Institute, 2023).

Students' cultural backgrounds can flow over into different areas of need or strengths in the classroom. As many teachers know, language is one of the most important skills in school and the workplace. Whether a native speaker or not, there is a high precedent placed on literacy in the general education classroom. Next, I will explain how English Language Learners can succeed or fall behind in Project-Based Learning settings.

### ***English Language Learner Needs during a Project***

The odds of having English Language Learners in a typical classroom are on the rise, around 12-15% of students in most classes (MDE, 2023). Project-Based Learning gives students the opportunity to work with one another, and for ELL's that can mean the opportunity to speak with someone who knows their first language (Basu Thakur, 2021). It can also be an opportunity for educators to pair up ELL's strategically to assist in their language development whether it be with scaffolding or purposeful partners and roles (Basu Thakur, 2021). This way students are communicating and working no matter the language used, and English can be reinforced along the way in pieces.

On the other end of the spectrum, ELL's may feel even more lost and uncomfortable during a Project-Based Learning experience than during a typical lesson if they lack the proper scaffolds from their educator (Basu, 2021). They may feel that the

assignment is impossible to complete or to understand and could give up early in the process, especially if the project is reading or writing intensive. That reinforces the need for quality Project-Based Learning curriculum design that aligns with the GOLD standard and allows for the teacher to reflect and reconsider their practices. GOLD gives ample time for teachers to formatively assess students, check in with them, and have them conduct reflections (Buck Institute, 2023). Teachers can create their own version of these check-ins that support students where they are at, whether verbally, written, or in another fashion.

Whether a classroom is filled with ELL's or not doesn't dictate the need for language support. Students can feel as if academic content language itself is another language (Tsybulsky, 2022). Within large projects teachers can and should plan for all student needs. The AVID WICOR system states that writing, inquiry, collaboration, organization, and reading skills are vital to all students no matter their academic success rate if educators wish to push their students towards their highest achievement possibilities (AVID, 2023).

Academic vocabulary is an important part of language and teacher scaffolding can support all students whether ELL's or native English speakers (Basu Thakur, 2021). English language support benefits not only ELL's but if overall WICOR is scaffolded, all students will practice general educational benchmark skills (AVID, 2023). As these skills can go further than just supporting ELL students, I will focus next on supports needed for special education students in a Project-Based Learning environment.

Project-Based Learning naturally integrates multiple disciplines and content specific languages to deepen student learning (Tsybulsky, 2022). This reinforces the

sentiment that Project-Based Learning can be interdisciplinary. Whether interdisciplinary or not, projects take on many different phases that can be hard for students to handle. These phases are especially challenging for students with special education needs.

### ***Special Education Needs during a Project***

Special Education learners or SPED students are also a part of many general education classrooms. Project-Based Learning can motivate students with high needs, and improve their educational outcomes (Padgett, 2019). In high needs schools such as the one I teach at, getting students into the classroom can be half the battle. If they feel like the work is doable and interesting, I will have a better chance of convincing some of them to stay in the room.

There are other special circumstantial learners beyond typical SPED students such as; students on a non-traditional special education plan or 504 plan, students with behavioral concerns, students with case-managers, students who have speech plans, students with auditory deficiencies, or even students who recently moved schools. Project-Based Learning will impact each one of these groups differently, and it is important to remember that all students are individuals before simply categorizing them on the basis of their perceived strengths or areas of need (Ayers, p. 18).

This is one place where the GOLD Standard may be lacking. There are no specific alterations outlined by the Buck institute on adapting projects for students with special needs. That being said, education is a process of reflection, and the GOLD Standard does state that reflection is needed after every project (Buck Institute, 2023). Each time we add to our Project-Based curricula, we have a deeper understanding of student needs, and we have more resources to fall back on as individual teachers.

This literature review seeks to answer the question; *how does Project Based Learning increase student engagement in an interdisciplinary secondary classroom?*

There are many diverse groups of students in our classrooms today. Their needs, strengths, weaknesses, and backgrounds are so large it can be hard to fathom. Sometimes as an educator it can be overwhelming. If teachers take the time to implement thought out Project-Based Learning, the effects on students can be mostly seen as positive (Buck Institute, 2023).

The research in this section pointed towards students with various needs benefiting from Project-Based Learning strategies. Culturally diverse students can grow longer lasting neural connections when they feel their lives are valued (Hammond, p. 16). Students who struggle academically or speak English as a second language will thrive as individuals if given the proper support (Basu Thakur, 2021). Lastly, teachers will have the time to build relationships with students and then get to know what support is needed (Buck Institute, 2023). The last section of this literature review synthesizes research on real-world skill development for students and the Project-Based Learning environment.

### **Real-World Skill Development**

It's important to recognize that what happens in a k-12 classroom does not always correlate to real life scenarios in adulthood. Project-Based Learning gives the opportunities to develop authentic skills that can be used even before a diploma is received (Buck Institute, 2023). In this section I will delve deeper into the importance of real-world skill development in the classroom, and the effects of Project-Based learning on these outcomes for the diverse groups of students in today's secondary classrooms.

This section will explore; literacy, organization, inquiry, and Social Emotional Learning skills as they also directly apply to the capstone project outlined in chapter three.

### ***Literacy***

As I tell my own students, all jobs require some sort of communication skills whether it be listening, reading, writing, typing, speaking or general teamwork to accomplish a certain goal whether large or small. Many of our students with diverse backgrounds thrive socially and emotionally when given opportunities to build learning partnerships with peers (Hammond, p. 19). Our 21st century students tend to be vocal learners, and opportunities to authentically communicate will improve their speaking and listening skills as well as allow for students to feel more comfortable in the classroom and in the workforce as adults (Muhammad, 2021).

Project-Based Learning whether independent or group work, allows for authentic communication and collaboration in the classroom. Whether it be through the sharing of materials, use of space and technology, peer review opportunities, workload differentiation and job roles, or simply getting along with one another in a workspace, project based learning allows for these opportunities to arise more often than a sit and get lesson plan format (Buck Institute, 2023). Quality Project-Based Learning educators will reflect on what works and does not for skill development in their classes, then alter the project for later use (Buck Institute, 2023).

Another way to build real world communication skills is through the creation of a public product (Buck Institute, 2023). That essentially means, students can present or at least have their work seen by others in some way. When students present a public product, their work can be validated beyond a letter grade and they can receive positive



feedback from peers or school staff. This is seen as the final step in the Seven Essential Project Design Elements for Gold Standard Project-Based Learning (Buck Institute, 2023).

Project-Based Learning gives the space for different world-views to be explored via work choice and communication (Muhammad, 2021). When students work with one another and explore each other's work, they can learn to see from multiple perspectives (Muhammad, 2021). That research alludes to the possibility that teachers can also learn and grow from conversations with students. This all correlates to the terms sometimes used interchangeably; teamwork, and collaboration.

Teamwork is a vital 21st century skill for any type of work and workplace (Buck Institute, 2023). Project-Based Learning can be a mode for building the literacy components of teamwork and collaboration skills in the classroom. The International Baccalaureate Organization defines collaboration as “a social process of knowledge building that requires students to work as an interdependent team towards a clear objective resulting in a well-defined final product, consensus, or decision” (IBO, 2023). Hammond explains that social learning can develop deeper connections for many if not all students in our classrooms as well (p. 112). This means that collaboration is better for student learning as well as being a real world skill required for most if not all jobs in the 21st century (Tsybulsky, 2022).

Coaching is another real world communication skill that students can develop in the Project-Based classroom. Students can practice listening skills, apply critical feedback, and give critical feedback to their peers (Buck Institute, 2023). The fundamental part relies on students receiving feedback and handling their recognition as

well as opportunities for growth with a level head (Dweck, p. 16). When utilized appropriately coaching can go further as an all encompassing practice of listening, applying, and then doing the same coaching themselves to others. Students can see the other end of school by posing as a teacher and will understand the goals of the activity and how to spot mistakes that may further their own understanding of the topic at hand (Tsybulsky, 2022).

What constitutes real-world skills changes over time, and it can be tricky for educators to decipher what is required for students to enter various career fields (Rohm, 2021). Thus it is important to educate students with meta skills that can apply to varied fields and prepare them for interpersonal relations in the workplace (Rohm, 2021). Communication is a meta skill that carries over into all fields of work and life in general. A further meta real world skill is organization, and the literature review moves onto that topic next.

### ***Organization***

Organization another real-world skill that can carry over into any workplace or even home environment (Muhammad, 2021). Many adults in the workplace and at home still struggle with organization. For any secondary student it is developing in some way shape or form. Even many of the brightest kids may not possess the ability to manage their time and materials. This may be a factor that dissuades some educators from Project-Based Learning. Since it is student driven, the entire learning process hangs upon the ability for students to keep track of their materials and ideas. If the educator utilizes the GOLD standard process they would have materials and spacing planned out in advance with frequently and conveniently posted non verbal reminders (Buck Institute,

2023). Educators who teach with hands-on learning daily utilize spaces that students know are accessible to them for required materials based on set expectations and room labeling (AMS, 2023).

Beyond materials, pacing can be a challenge for educators to maintain in the classroom. Depending on the school or subject, classes can be held every day or every other day, and anywhere between 30 and 95 minutes. The setting can have a multitude of various classroom layouts and sizes. Project based learning can help students with various needs practice managing their time, space, and materials (Buck Institute, 2023). Students will all work at their own pace and will need varying support to achieve the expected standard whether they work ahead or need additional scaffolding (AMS, 2023).

Project-Based learning puts the onus of organization on the student, while the teacher scaffolds this skill (Buck Institute, 2023). In order to complete multi-stepped tasks that cover many days, teachers can guide kids who have little background in organization with the purpose of it being a part of their grade. Organization can also connect to how a student organizes their questions and answers. The next theme of the literature review revolves around the organization of questions and answers, as inquiry.

### ***Inquiry***

The concept of Inquiry was already touched on in the engagement section, so this portion will be brief. Inquiry work in theory gives students the opportunities to ask questions about a topic, and then research answers to their question. Sometimes the questions that inspire students are on the verge of ridiculous or nearing inappropriate for a general classroom (Rush, p. 57). Martha rush uses discussion questions around

historical topics that are sometimes seen as taboo, because she knows it will get students motivated to speak up and share their opinions (p. 57).

This strategy has another term, Problem-Based Learning. Problem-Based Learning is at the core inquiry put in motion through a project of any sort (Rush, p. 58). This is a system in which students use voice and choice to guide their project building cycle (Buck Institute, 2023).

Problem-Based projects are Interdisciplinary by nature as they can span into various student interests that expand past the typical boundaries of a subject area (Tsybulsky, 2022). Some of the best interdisciplinary experiences happen when students ask and get authentic answers to their “why” and “what’s in it for me?” questions (Buck Institute, 2023). If lessons become personally meaningful in some way, then it can be more meaningful in the long run outside of school (Rush, p. 162). This way educators can intrinsically motivate students no matter the topic or their interest level.

### ***Social Emotional Skills***

Much like Culturally Responsive teaching, SEL, or Social Emotional Learning skills are a focal point in education today. Teachers who utilize Project-Based Learning can imbed opportunities for various themes of SEL. When using the GOLD system, a teacher has time to formatively grade student participation, or better yet, have the students grade their own participation (Buck Institute, 2023). In an International Baccalaureate project setting teachers have the responsibility of actively teaching students how to manage themselves in their workspace via rubrics with expectations (IBO, 2023).

Students who practice Mindful Reflection techniques will likely go on to be in better control of their emotions and have a happier outcome in their personal lives (Hammond, p. 110). This requires teacher feedback, and explicit goals and class culture (Hammond, p. 110).

Dealing with positive and negative SEL skills is a feature of Project-Based Learning that correlates to real-world workplace skills like reflection on the progress of a project (Tsybulsky, 2022). Students must manage their emotions as they work in teams or receive coaching feedback from a peer or instructor (Buck Institute, 2023). A quality Project-Based Learning environment will be planned and facilitated to manage such experiences (Buck Institute, 2023). These practices can be carried into real life work situations that many adults face. Once a student has participated in a project, it is important to reflect on their experience and see how they and the others in the classroom could improve next time (Buck Institute, 2023).

This literature review seeks to answer the question; *how does Project Based Learning increase student engagement in an interdisciplinary secondary classroom?*

This section of the literature review examined how Project-Based Learning affects student skill acquisition. Students can improve on their communication abilities, organization skills, inquiry research experience, and self-reflection based interpersonal skills in a Project-Based Learning setting (Buck Institute, 2023). Students are also more likely to pursue their own business ventures and other career paths they may have never deemed possible when engaging in the rigorous skill development of Project-Based Learning (Muhammad, 2021).

## **Chapter Conclusion**

Student engagement is defined by positive emotions, physical energy, and curiosity in complex work (Hammond, p. 111). That being said, comprehensive Project-Based Learning plays a role in each of those things (Buck Institute, 2023). Quality projects can be both complicated to solve, and give out positive emotions and energy. These things can be tough to assess, but the assessment of student learning can point a teacher in the right direction. The main skill assessment categories explored in this chapter were; literacy, organization, inquiry, and social emotional learning.

Chapter two focused on research regarding Project-Based Learning, student engagement, and real-world skill building in the classroom. All of these sections connect directly to the capstone project that will be outlined in chapter 3. For chapter three I will explain my capstone project goals and how they relate back to this research. These chapters continue to seek an answer to the research question, *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?*

## CHAPTER THREE

### Capstone Project Description

#### Chapter Overview

The following chapter will explain the capstone project outline. This project connects to personal experiences from chapter one, as well as research found in chapter two, in order to design a project that addresses the question; *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?* This capstone project will be an interdisciplinary Project-Based Learning unit for a College and Career Readiness course at a suburban International Baccalaureate (IB) school for the fall 2023. The project will not only address college and career readiness standards, but will also connect to broader science or STEAM related careers.

Chapter three will begin with further description of the capstone project and all curricular resources that will be created. The next section will connect to some of the most prominent research related to Project-Based Learning in relation to the unit plan. After, the school setting will be described by student population and class structure. Then the particular audience for this capstone project will be briefly addressed. An estimated timeline for the project's creation and utilization will be outlined. Then assessment categories in the International Baccalaureate schools as well as Minnesota state college and career readiness benchmarks will conclude chapter 3.

#### Project Description

This capstone project is a Culturally Responsive unit plan for an International Baccalaureate middle school College and Career Readiness class. The digital components of the project will consist of; a series of teacher lesson plans with outlines, slideshows,

student materials, reflection sheets, and IB centered grading rubrics. Learning categories will consist of academic benchmarks in fields consistent with IB standards for College and Career Readiness such as; literacy, inquiry, and organization. Approaches to Learning, otherwise known as ATL skills, will connect to student behavior and collaboration, which are also deemed necessary by the International Baccalaureate standards. All of which will be backwards designed as it proves the knowledge students should learn will be planned out from end result to the beginning (Wiggins, p. 14).

All content will be centered around student choices in an interdisciplinary STEAM focused career project. The STEAM focus will align with modern science, technology, engineering, general arts, and math fields that are highly sought after in today's job market. Students will start by researching the background, skills, and costs/benefits of various STEAM jobs. Then they will explain how those jobs may relate to a conflict or issue in our world today, and they will analyze solutions to world problems from the world-view lens of their chosen job. Students should be well versed in basic STEAM vocabulary as well as have some general background in the STEAM field as this project will be near the end of the semester in which we will study STEAM career basics.

This project is intended to be engaging, choice-driven, topical to the world today, and emphasizes on real-world skill acquisition throughout the process. All students will be graded on IB rubrics that are visible in the room and accessible digitally. These rubrics will have clear examples of mastery for each category and level. Students will also reflect on their own progress through ATL reflections on self-management and collaborative behavior. These reflections will serve in part as formative assessments of student



behavior and progress. The overall goal is to guide students in creating their own understanding of a real-world problem they may face, and how to solve it with professionalism in mind. This will be a fairly in depth undertaking that will require a well researched approach.

### **Research Alignment**

Some of the world's leading education researchers focus on how Project-Based Learning can benefit students' skill and knowledge acquisition, have a fun and engaging experience in the classroom, and connect to real world simulations and careers. One of those researchers is very close to my home in Minnesota, as well as my personal teaching background, Martha Rush. Her work on simulations, games, and real world projects concludes that many students do best in any content area when engaging in complex, project-like learning (Rush, p. 17). Rush explains throughout her book how she uses various multi-step projects of all kinds to generate deeper thinking, fun, and engagement in her own classes. She not only uses data and life experiences to support her claims, she utilizes student voices too. Students themselves claim to have more fun and find classes that may be typically boring or rote, exciting and memorable (Rush, p. 18). I have referenced her work often in my literature review as it connects to my work, goals, and experiences on a personal level.

Chapter two's literature review also provides research on Project-Based Learning from many culturally and linguistically diverse scholars. One of the most notable being Zaretta Hammond. Hammond claims that class work which connects to a students interests, goals, and home life will be more impactful and engaging to them no matter their background (p. 111). Hammond's research purports that well designed

Project-Based Learning is culturally responsive and appropriate for developing learners' minds in diverse urban settings (p. 42). These experiences will not only be more engaging but will also be more memorable depending on the mindset of the learner (Hammond, p. 112). Thus, Hammond theorizes that teaching strategies which connect to a student's personal life will make stronger neural connections than a classical approach (p. 42).

Both Zaretta Hammond and Martha Rush make connections to the value of engaging students with real-world skills, experiences, and college or career outlooks. This STEAM focused project will not only align with my other curriculum goals and interests, but it will allow students to research college and career opportunities in valuable STEAM fields and apply those skills to a real-world situation they may face in their own future. This will allow for my curriculum to be more engaging, connect to more students no matter their background, and make stronger neural connections for the students in my class than with a typical lesson structure and design.

The final notable resource from chapter two's literature review that aligns with this project is Buck Institute's GOLD standard Project-Based Learning system. Their cyclical system of research, process, creation, and reflection gives all project participants a clearly defined role and route in the learning process (Buck Institute, 2023). I believe that this system utilizes both Rush and Hammonds ideas on a well designed curriculum, and therefore all three are intersectional in theory.

### **Setting**

This interdisciplinary unit will be designed for a diverse urban middle school in the North/Northeast Minneapolis area. This school is also an International Baccalaureate school that uses the world wide IB standards framework for curriculum design. This

framework is expected to be used for overall classroom and lesson structure as previously described in the chapter two literature review. The physical space, IB framework, and the people within the building can sometimes be at odds with one another. Thus, the setting has been split into two subtopics for added clarity. These subtopics are student population, and class structure.

### ***Student Population***

The Minnesota Department of education (MDE) and The National Center for Education Statistics (NCES) were used to gather the following data. The secondary school which will host the curriculum design has a diverse student population that fluctuates around 800 pupils. The student to teacher ratio is 17:1 which is average for the state of Minnesota (MDE database). Roughly 66% of this school's student population is enrolled in a free or reduced lunch program, which is a common factor used in assuming socio-economic insecurity (data base). Around 13% of students at this school are English Language Learners or ELLs, which is average for the state of Minnesota (database). Although many students speak another language at home, there are few ELL support staff in the building.

The special education department, or SPED team, pushes 68% of SPED students into general education classes (MDE data). This high percentage can lead to students lacking in access to appropriate SPED supports. Less than 40% of this school's students are meeting the recommended reading, math, and science standards (MDE database). There is a significant and also unspecified number of students with an IEP or 504 plan at this school. Thus, the curriculum design will incorporate additional literacy and behavior scaffolds to support various SPED students' needs.

The majority of students at this school identify as students of color, roughly 74%, which is nearly double the state average (MDE, 2023). Around 43% of students at this school identify as black. There is a sizable Latin American population of around 17% of the school (MDE, 2023). Roughly 9% of the student population identifies as two or more races (MDE, 2023). About 6% of the student population identifies as Asian (MDE, 2023). There is a large population of first, second, and third generation immigrants at this school. Many of these newcomers come from East and West Africa. Some are a part of Asian cultural groups like the Hmong, Karen, or various Latin American cultures.

### ***Class Structure***

Class periods are typically 42 minutes long, and students attend this elective class every other day for a semester. While this class is technically within the elective department, it is a mandatory class for nearly all students at some point in their middle school years. This class will be taught to all grades 5th-8th, and adjustments will be made to the project in order to scaffold all ages and skill levels.

There will be nearly 400 students per semester taking this course, so the project will be conducted in groups of the students choosing. Groups will allow for students to build collaboration skills, and student choice will allow for social and emotional comfort. Groups will also minimize teacher organizational needs for the plethora of students involved.

Students will have access to both technology tools and the physical space around them. As for technology, students have access to school issued Chromebooks that are infrequently used and may be in various states of repair. Working in groups ensures that most students will have some sort of access to a school issued device. The relatively

small physical classroom space is filled with 15-35 students per hour. This space has tables with chairs that face each other. The teacher has access to a large whiteboard, BENQ TV screen for presenting, and labeled Montessori guided materials. The Montessori guided materials are general student resources. Students are trained to utilize these for their own needs throughout daily classroom activities.

There are no other teachers in the college and career readiness specific subject department. Any adjustments to the project design will be made via meetings with other department's staff members. Further research may be conducted in areas of needed improvement via reflection after the fall semester.

### **Audience**

This unit plan is intended to be used by College and Career readiness teachers at the middle school level. It will be specifically used at the IB school defined in the setting section of chapter three. The general STEAM themes may be an attractive outlet for science teachers in need of career based curriculum.

There are many other modifications that could be made to this unit plan for use in various educational spaces. The rubrics could be modified for other IB Project-Based Learning units in any class fitting the categories of; literacy, organization, inquiry, self-management, and collaboration. This college and career readiness unit may also be adapted for use at the high school level. The general research alignment may be a useful framework for secondary teachers of any subject. This Project-Based Learning unit could fit into many curriculum designs for educators of all backgrounds who wish to bring real world skills in a student centered fashion to their classrooms.

This project seeks to empower any elective, science, social studies, or interdisciplinary teacher to create engaging classroom experiences. This unit plan is an opportunity for educators to rethink how to connect various themes in a way that is student centered and career focused. This process is intended for teachers who are seeking a democratic method of teaching toward diverse students' futures in an impactful way.

### **Project Timeline**

This capstone project will be completed by August, 2023. The project will be utilized in a College and Career Readiness classroom in the fall of 2023. Reflection and adjustments will be made for the spring of 2024. The project and all curriculum resources will be created over a 3-4 week period during the summer of 2023.

The Project-Based Curriculum itself will last 4-5 weeks depending on the class and grade level. This project will be the fourth and final unit assessment at the end of the semester. Prior to this project students will study an introductory IB focused unit centered around identity. In the second unit students will apply their identity based interests towards general career field research. The third unit will focus primarily on STEAM career fields such as science, technology, engineering, the arts, and math. These three prior units will give students a base knowledge to support their understanding of STEAM field options they may wish to pursue. Students will also have some small practice in Project-Based Learning methods over the first three units. This capstone project is focusing on an interdisciplinary approach more than being a semester cumulative performance, but students will still rely on some skills and knowledge from the previous three units.

This unit will be similar in format to the previous 3 units for the majority of 6th-8th grade students. Additional scaffolds will be made to assist 5th graders who may struggle with independent work and the overall concept of finding a career that suits them. 5th and 6th graders may struggle to see themselves as adults in a career field, whereas many 7th and 8th graders have a clearer vision.

Students will receive an introductory set of lessons as well as digital slideshow resources that include rubrics, classroom expectations, and more important information at the beginning of the unit. These materials will be given to students at designated times based on a created calendar outline for the project.

The project will have formative grades that occur throughout the 4-5 week process for students to see their performance and reflect based on the Buck Institute's GOLD standard cycle. This project will follow common IB grading standards for both approaches to learning and academic progress. As it is a summative assessment, the project will end with a relatively informal opportunity for presentation via open gallery walk. This gallery walk will include positive feedback cards that promote Social Emotional Learning and Culturally Responsive experiences from peers. Students will receive a summative grade at the end of the unit in each IB gradebook category, along with several prior formative check-ins and reflections.

### **Project Assessment**

The assessment of this Project-Based Curriculum will be done in the International Baccalaureate format as this is designed for an IB middle school environment. The project will be backwards designed starting from the assessment categories. This reverse engineering of the unit curriculum will allow the teacher to be certain the project and

feedback opportunities are aligned directly with the IB standards (Wiggins, p.14). The grading criteria for this project that align best with the accredited standards in the College and Career Readiness IB framework would include; literacy, inquiry, and organization, as well as approaches to learning skills such as collaboration and self-management. All five of those grading criteria connect to the real-world skills examined in the chapter three literature review as engaging and valuable for students in today's world.

All student generated academic work will be placed in the IB 8 point scale. The 8 point scale directly connects to the IB approved E/M/P/D scale for approaches to learning as in student reflections, and teacher observations of participation respectively. Both scales are connected to the explicitly stated expectations in International Baccalaureate schools of exceeds, meets, partially meets, and does not meet standards (IBO, 2023). A score of M is what the majority of students are striving for to prove they meet the expected standard or benchmark for their grade level. Students are able to reflect on their own learning and effort for each category and explain which they believe they fit into.

All assessment categories will generally be connected to the Minnesota Domains and Competencies for College and Career Readiness. The domains focused on will be; career exploration, critical thinking, problem solving, collaboration, and communication. Critical thinking and problem solving will directly connect to the IB inquiry category. Communication directly connects to the IB literacy category. Collaboration is the same as the IB collaboration category. And finally, career exploration can be generally laid into self-management reflections. Thus both Minnesota standards and IB standards relate to the rubrics in which students will be assessed for this project.



As far as logistics of assessment criteria, all rubrics will be created in advance, shown in class, and digitally located for student access. This easy access to rubric criteria will set the standard for student centered reflection of project completion. This process is a relatively familiar school wide expectation set by administration. Opportunities to redo or turn in work late will be accepted as the student learning process far outweighs set deadlines in a culturally responsive classroom. Students will see their daily ATL scores via digital updates sent through the school-wide internet grading website. The teacher will also conduct informal in person check-ins and scheduled conferences for coaching and editing advice. Final scores on organization of ideas, inquiry related research, and general literacy understanding will be posted after final student submission and gallery walk presentation.

### **Chapter Conclusion**

Chapter three described the Capstone Project as a unit for an interdisciplinary college and career readiness middle school class. This chapter also laid out a detailed approach for incorporating key components from the chapter two literature review in support of the overall unit plan. This project's setting was described as both participants and physical space. The potential audience of this capstone project has been addressed as well as given potential alternative uses for chapters two and three. An estimated timeline was created for the creation of the project and the process of utilizing it with students. IB Assessment categories and Minnesota state benchmarks were given for this project's specific setting. Chapter four will conclude this capstone thesis and give reflections on the curriculum design project in the hopes of answering the research question, *how does*

*Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?*

## CHAPTER FOUR

### Conclusion

#### Chapter Overview

Chapter four is a conclusion of the overall project and paper writing experience. This capstone paper seeks to answer the question, *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?* The Project-Based Learning curriculum that has been created gave way to several new learnings and conclusions.

Chapter four will conclude this capstone project with several reflections. The reflections are focused primarily on the capstone project described in chapter three, as well as connections to chapter two's literature review. This chapter specifically contains sections on; major learnings, a revisit of the literature review, implications, limitations of the project with possible adaptations, benefits to the profession of education, and one final summary.

#### Major Learnings

This capstone project was a major undertaking done in part by many minds. There were new perspectives, sources, ideas, and continual personal reflection that occurred over the nearly nine month span this project took to complete. Some of the major takeaways are related to my own personal experiences as a writer, teacher, and person. As this was a major written undertaking, I will begin with my growth as a writer.

#### *Writer*

To be completely honest, academic writing is not my strong suit. I came into this project thinking it would be easy, but it is not. This paper was a work of many hours and

revisions. I am forever grateful to my dedicated peers and professors who took the time to review my work. They not only edited my work but also gave me ideas on how to continually improve my writing technique so I did not require as much spoon feeding of edits and opinions throughout the process. I also learned how to properly format academic work using the APA system thanks to reviewers.

The literature review allowed me to examine not only great educational principles, but also see how to write cohesively in an academic setting. The act of academic writing may not be something that I continually use, but understanding it is vital to my own growth as an educator and the skills I can instill within my students. I found myself occasionally stuck using only one researcher, then on the other hand lost with limitless resources.

The act of writing out lesson plans can be tedious, but I investigated several dozen examples of quality lesson plan formats. These gave me the confidence to create my own that would not require constant additions or fixes, that also connects to modern research. I believe I have created a comprehensive lesson plan format.

### ***Teacher***

I not only grew as a writer, but also as a teacher overall. I came into this process a believer in the strengths of Project-Based Learning. I enjoyed project opportunities in my own k-12 and post-secondary experiences. I had used many of Project-Based Learning's key components in my own classes as a teacher. That being said, I found a nearly limitless supply of new information relating to improving Project-Based Learning today.

So much of the research I found has been created since my graduation from secondary education in 2012. I realized that much of the systems I used in the past were

outdated and not comprehensive in their structure. I was simply doing what most teachers did in my classes as a student. While maybe great for their time, these strategies weren't done for quality, but mostly for convenience. There are well formed systems such as GOLD Standard Project-Based Learning, that guide educators towards creating better projects after every unit through reflection and revision. I will proudly use the unit plan I have created this school year, and likely edit it for future use based on reflections.

Rarely have I been afforded the opportunity to revisit old units, reflect, and revise them. Now I crave the opportunity to do so with a variety of projects and lessons from the past, and with new ideas to come. I am grateful for the lessons this process has taught me about creating educational content that is up to date and comprehensive. I also understand that the goal of creating perfect education for all is a never ending process.

### ***Person***

I believe this research and project have made me a more empathetic person. The opportunity to purposefully seek out the viewpoints of people who differ from my background was not taken lightly. I fought to find sources that gave voice to multiple perspectives as there are many in my own classroom. Ethnically and racially diverse educational practices were at the forefront of my research and lesson design. This was done on a deeper level than I have ever done before, and as much as this is a high quality educational practice, this connected to my own personal beliefs more than my career goals.

I truly believe in creating an educational experience that is more democratic and just than what I came into. I have been bolstered in my belief that well designed Project-Based Learning can do so. I have very little background in STEAM education. I

found the confidence to create an interdisciplinary curriculum that supports environmental, social, and health activism in small ways that may inspire students to create change in their futures.

I found that in lesson planning I frequently give space for students to choose their own path and work in teams as a democratic value driven classroom management strategy. This practice connected directly to my background in Montessori and International Baccalaureate schools. While these practices and philosophies are democratic ideals I strive for in public education, I rarely communicate the purpose or goals of these teaching strategies to my students. I will continue to seek new ways to explain the meta of educational practices and daily life to my classes. Thus contributing not only to an arduous curriculum design, but reaching students on a personal level and hopefully making a bigger impact on their personal lives. I hope to inspire them to create a more just and democratic world for themselves.

### **Revisiting the Literature Review**

The literature review conducted in chapter two attempts to set forth a comprehensive review of Project-Based Learning. The main researchers focused on were Martha Rush, Zaretta Hammond, and Buck Institute's GOLD Standard.

Martha Rush's work around creating engaging scenarios in class is personally and professionally important to me. Her book, *Beat Boredom*, partially inspired this work. I learned that boredom is the biggest barrier to students applying themselves in a traditional classroom, and that teachers have the power to break those barriers.

Zaretta Hammond's famous work around Culturally Responsive Teaching informed my writing and guided my project outline. Her book, *Culturally Responsive*

*Teaching and the Brain*, is regularly used in professional developments at my workplace. I am proud to have used the Ignite, Chunk, Chew, Review lesson plan format for my project as I believe it to aid in closing the equity gap in schools.

Finally, the GOLD Standard by Buck Institute helped me visualize how to create a quality project for my students. Prior to seeing this continuum, I simply went with what I had experienced as a student. It sounds naive, but sometimes borrowing from your best teachers is a quality strategy. Well, GOLD Standard is my new standard for projects, and I love how universal the seven step system is. I can apply it to any subject or grade level.

### **Implications, Limitations, and Future Research Recommendations**

This project has a vast array of conclusions that could be drawn out from either perusing it or using it in one's classroom. There are several implications, limitations, and recommendations that I have discovered while creating this capstone project. Some implications I have discovered revolve around building better projects and incorporating student voice. Several limitations have been identified such as; technology resources, time constraints, and practical use in general classrooms. Finally, I will describe future research recommendations that address the needs of the scope and demographics of my project.

#### ***Implications***

The main implications of this project for me connect to continual growth, and student voice. I believe those two things to be intertwined as well. I could research this topic forever, and edit my work nonstop, but there is a deadline. Much like making lessons for class each day. There are edits to be made throughout the day, mistakes, typos, and missing parts. I believe one of the most valuable lessons learned from this whole

project is in the relentless pursuit of perfection. I could go on and on forever, and someone would find another way to improve it.

Which leads me to my final implication, student voice. Typically the loudest voice on whether a lesson was impactful or not, and likely the most important, is that of the students in my classroom. I found myself quite disengaged from this work time to time, and it was hard to explain exactly why, until now. It was the lack of student voice. The thing that makes this entire project meaningful and meaningless is student voice. Until I hear their feedback on the project I have created for them, it isn't really completed, and I am sort of disengaged myself.

### ***Limitations***

There are several limitations to the use of this capstone project outside of a theoretical academic world. One of those limitations would be technology resources. Access to technology can look vastly different between schools around the world. Depending on the technology at hand, some of this project may be inhibited or even impractical for educators working with less. There is a general assumption made that students will have at least one device to complete their daily in-class work, and another device to complete work at home if they are behind.

Another limitation to this project is time restraints. This capstone project was specifically designed for a classroom that runs 47-55 minutes long. Not all schools follow such a structure. This may seem like an easy fix, but there would need to be a general tailoring of the lesson plans that could become a complex drama of tasks. It may require creating more ignite and reflection pieces, or a decision on which parts to cut out completely.



The last limitation is in the practical use within general education classrooms. There is an assumption of prior knowledge at the beginning of this project. Without previous learning of overall career fields and STEAM basics, this project would go nowhere. Students need a firm grip of what these careers look like before they can choose one to explore specifically. This could be a simple fix as these careers would be presented briefly in a series of lessons before, or explored during the brainstorming phase.

Another limitation to practical use may be found in the systems of assessment. This project directly aligns with the International Baccalaureate standards system for College and Career Readiness middle school students. If used outside of an IB school, the four point scale and categories may seem confusing to students and staff. These systems are not necessarily foreign to all educators, but an assumption is made that the rubrics can be deciphered by a typical student no matter their demographic.

### ***Future Research Recommendations***

I will start this section by examining my focal research group. I would recommend any further research be done outside of Martha Rush and Zaretta Hammond. On the other hand, I believe the Buck Institute has more to offer in their GOLD Standard websites. Those three definitely molded my views the most in the literature review. There are so many different articles from around the world pertaining to Project-Based Learning, that I would start with smaller journals and see their results if attempting to find other voices.

I would recommend more research be completed around how Project-Based Learning should be used and adapted in various settings. I believe the design, results, and reflections of Project-Based Learning would look very different depending on the setting.

Some examples of settings to be researched are; adult learning centers, special education specific classrooms, and classes from various countries. There are likely assumptions made throughout this paper that do not relate to what Project-Based Learning would and should look like in those settings.

Another area of future research related to Project-Based Learning would be in relation to differing grade levels. This project was specifically designed for late middle schoolers in the 7th to 8th grade range. It is applied in practice to 5th and 6th graders as well, but with modifications and cuts. It would be interesting and likely impactful for a career based project like this one to be given to high school students of any age. 9th and 10th graders may benefit the most from a project like this one as it could be rationalized better by young adults and would still give time for them to make course corrections to their secondary education before graduation based on their new found interests and goals.

### **Project Use and Benefits to the Profession**

There are several ways this project could be used in various content areas and classrooms around the world. As stated in the last section, this project could be a benefit to any secondary classroom 5th-12th grade. The lessons could easily be modified for a high school setting. There would be varied benefits for each grade level that could range from new student interests and passions discovered, to goal setting opportunities at a young age, or gaining skills acquired for reaching said goals.

I believe this paper and the capstone project that follows it, serves as a model for any educator seeking ways to increase student engagement in their classrooms. The literature review points towards Project-Based Learning as a tool for improving student agency in learning. Inherently that agency along with student voice and choice creates a

space that allows for authentic engagement, or a classroom that honors student backgrounds and is led by their world view. It may be a long process that can be easily ridden with flaws, but the GOLD Standard model gives clear directions on how to reflect and improve on both student and teacher work in such a setting.

This project is a great overall outline for how to implement a Project-Based Learning unit in any class. The lesson plans could be cleaned out and what would be left is the barebones CRT framework along with GOLD Standard principles. Those could lead any unit for any subject area to be Project-Based Learning driven. This could be applied to nearly any grade level or subject area without major tweaks.

Teachers who are seeking intersectional work or teach in a college and careers based setting may find this project useful as well. This specific unit plan is intricately designed to connect STEAM career opportunities with general life skills. Science, technology, engineering, art, math, and general social emotional life planning are all implemented in this project. Those fields are in demand today, and life skills are a staple of nearly all classrooms in some way.

## **Conclusion**

This Project was a massive undertaking that required time, patience, and support from my loving family and friends. Over the course of this past year I watched my daughter grow, saw the birth of my twin boys, and celebrated five years of marriage to my beautiful wife. I also worked two jobs and balanced everyday obligations with long hours of writing and researching. Juggling so many career and family objectives was definitely a struggle, but finally completing the MAT program at Hamline is a huge relief.

I am proud of myself and my growing family for meeting this once in a lifetime milestone!

I believe the project I have assembled is in some way a benefit to the field of education. It works as a comprehensive outline for a project that could be utilized in virtually any classroom. This curriculum guide is similar in structure to the lessons that fueled my passion for learning, which were examined in chapter one of this paper. My lesson plan structure and curriculum outline are backed by up-to-date research found in the chapter two literature review. The project is similar overall to the plan I set forth in chapter three. And all things considered, I believe the majority of future modifications to this project would be in beautification and further digital resources that any teacher can use their own judgment to incorporate. Looking back, I am proud of the project I have assembled, and impressed by the professional growth I have earned through this process.

As for my initial research question, *how does Project-Based Learning increase student engagement in an interdisciplinary secondary classroom?* I believe there can be no singular definitive quantitative answer. Qualitative research may suggest what I have interpreted, that Project-Based Learning does improve engagement and in turn student outcomes. I have found a great amount of research that shows how student choice, hands-on inquiry work, and real life skill building can lead to improved engagement in most classroom settings. That being said, further research into limitations, varying demographics, and other environmental factors may claim otherwise. I am confident in my current assumptions and learnings that Project-Based Learning is overall a benefit to student engagement, and I will continue using it as a mode of learning in my own interdisciplinary secondary classrooms.

Whether a successful capstone project or not, I have learned one major lesson from this experience that I will take with me forever. I have learned that there is no end to the process of revision. I could write for another year or more and feel there are places to improve my work. I could alter my Project-Based Learning curriculum design for ages to come. This new knowledge may seem obvious or naive coming from a young educator, but it feels true. There is no point where a paper, a unit plan, or a person is complete. As William Ayers claims, it is the goal of the person working on a project to continue their process, to gradually improve the end result of their work, to make a project out of their passions, and then circle back to the beginning to edit some more (p. 40).

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