**Enticing Middle Schoolers to take Ownership of Their Learning by**

**Exploring their Passions and Curiosities through Design Thinking**

by

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Draft 1 of Chapter 1 of Capstone

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# Chapter 1: Introduction

## Introduction

Middle schools are amazing ecosystems, where educators work towards creating environments that meet the unique academic and socio-emotional needs of early adolescents. As a middle school educator, I know that this is a delicate balanc, that takes relationships, patience, kindness, and innovative and engaging learning opportunities.

I imagine myself walking into a middle school, alive with students engrossed in activities where they have been co-creators in both the design and implementation, where their passions and interests have been honoured and are recognized as valid vehicles for demonstrating their learning. Entering classrooms, where learning opportunities allow middle-schoolers to “explore the questions and concerns they have about themselves and the world around them” that have both “personal and social significance” and have not been designed just for fun (D. F. Brown & Knowles, 2007). Exploring environments where students have been provided with opportunities to create using many skills, whilst also being given the choice of the method of expression allowing for “individual identity to dictate the form of the product” (Soleas, 2015, p. 8). Enticing spaces where the ownership of learning results as a function of positive relationships between educators and students, where collaboration has resulted in making curriculum belong to us, thereby encouraging students to approach their learning “as active, critical, thoughtful investigators, rather than as passive receptors (or rejectors)” (Fried, 2001, p. 109). In these classrooms, where students own their learning, “instructional methods used are as important as the classroom conversations teachers and student engage in, where the goal is not inquiry learning but promoting a kind of shared ownership of the learning environment itself. In this space, appropriation of content knowledge becomes a real possibility” (Clayton & Ardito, 2009, p. 74).

By engaging in design thinking, students can participate in their learning in meaningful ways, for design inherently encourages students to not just work through a series of linear steps to produce identical final products. Instead, students, as designers, are encouraged to take risks and work through inevitable mistakes. Educators who allow students “time and support to rethink and revise give students autonomy and the ability to trust themselves to be problem solvers, even if their path to success is different than everyone else’s” (Martinez & Stager, 2019, p. 71). Design thinking enables students to see their learning as a cyclical process, where they can be in control of the questions they need to ask in order to make necessary, timely adjustments their learning. “Through design activities, students learn about planning, collaborating, and building a common vision of success” (Davis, 1999, p. 11). Instead of completing worksheets or passing exams, student designers “need to consider such issues as the needs of the audience, the distribution of work in the group, the management of time and resources, and the deadline” (Hsiao & Liu, 2002, p. 311). Furthermore, design thinking “provides a robust scaffold for divergent problem solving, as it engenders a sense of creative confidence that is both resilient and highly optimistic” (Carroll, 2014, p. 16). Ultimately, the design process better prepares students for the demands of a rapidly changing world where critical thinking, collaboration and creativity are crucial.

## Background Information

[PLACE HOLDER HERE FOR THE CONSTRUCTIVISM and CONSTRUCTIONISM – Piaget, Dewey, Papert, and SCHON – continuous change; PRAXIS MODEL for Design thinking. “taking design thinking to school brings back into focus John Dewey’s vision of schooling as a transformative space for creative and collaborative inquiry” (Goldman & Kabayadondo, 2017, p. 4)]

Real-word designers, engineers, and scientists all engage in deliberate tinkering, prototyping and testing in their fields (Martinez & Stager, 2019). Leaders in these fields know and understand that the design process takes time and that the iterative nature of design is normal and necessary. As such, “what unifies the design disciplines is the transformation of cultural and social life that happens as a result of designing” (Crouch & Pearce, 2012). The world around us has been designed for interaction and adaptation; we are all part of designing how we choose to intermingle within the physical and natural world. As educators, then, design encourages us to develop a new culture in our schools in which “learning focuses on learning through engagement within the world,” as opposed to the “teaching-based approach [which] focuses on teaching us about the world” (Thomas & Brown, 2011, p. 50). We are all designers, as educators, we need to create design opportunities and model design thinking (Johnson, 2017) to empower our students to be active designers in their learning journeys.

There are several models of design thinking (R. Brown et al., 2013; T. Brown, 2008; Scheer, Noweski, & Meinel, 2011), but in general they all include stages where individuals are asked to empathize, define, ideate, prototype and test. At its core, design thinking is a human-centered process that “focuses on asking the right questions, challenging assumptions, generating a range of possibilities, and learning through targeted stages of iterative prototyping” (Carroll, 2015, p. 60).

The infusion of design thinking into education has become increasingly popular around the world. In Great Britain in the 1970’s, the Design and Technology was added as a discrete subject in schools (Davis & Littlejohn, 2017). In North America there is a long history of development of design education, the d.school of Stanford, in connection with the Hasslo Plattner Institute, has recently been creating materials for kindergarten to grade twelve teachers, and IDEO, the Palo Alto-based design and education consulting firm, has been creating toolkits to help teachers utilize design thinking in the classroom. Design education in British Columbia’s elementary and secondary schools is a recent addition through the creation and implementation of the Applied Design Skills and Technology (ADST) curriculum, and ideally, should be given the same emphasis as core subjects such as science, literacy, and math. Instead, though, of viewing it as one more subject to teach, the ADST curriculum should instead be viewed as a framework for creating integrative, interdisciplinary learning opportunities in schools. “Design thinking isn’t a subject, topic, or class. It’s more a way of solving problems that encourages positive risk-taking and creativity”(Spencer & Juliani, 2016, p. 52). The ADST curriculum provides an opportunity to create true interdisciplinary learning opportunities in British Columbia schools.

Education and design are both interdisciplinary fields, and in an educational application, the process of designing requires that students must have first internalized information so that they are then able to apply their knowledge, strategize solutions, and finally express their thinking with confidence (Soleas, 2015). “As students become design thinkers, they emerge with significant changes in their approaches to problem solving and to new challenges. They start to develop a sense of resiliency”(Goldman et al., 2012, p. 14). Design thinking, subsequently, encourages students to develop at what Brown (2008) describes as a “design thinker’s personality profile”, which includes characteristics of empathy, integrative thinking, optimism, experimentalism, and collaboration; all skills educators hope to instill in their students (p. 3). Design-based interdisciplinary activities encourage all students, but particularly middle-schoolers, to build confidence, empathy and active problem solving skills, while encouraging students to utilize their imaginations (Carroll et al., 2010). As a result of participating in design tasks, student engagement increases and students are supported in seeing the connections across subject areas (Blakemore, 2018; Bush et al., 2018; Carroll, 2014; Carroll et al., 2010; Scheer et al., 2011); furthermore, utilizing a design thinking framework allows teachers to get more comfortable with taking an interdisciplinary approach to teaching (Jho, Hong, & Song, 2016; Scheer et al., 2011).

When I first saw and read about the ADST curriculum in BC, I saw it less as its own curriculum, but more as a way to frame how we approach traditional tasks in all subject areas. Since it is based around the principles of design thinking, the curriculum itself can be used to create interdisciplinary learning opportunities. It is at the intersection of the design thinking and interdisciplinary teaching that a strong potential for powerful results in student learning and engagement can exist (Bush et al., 2018, p. e2). Students are able to understand that all tasks can be refined and improved upon if they go through an iterative design cycle, that learning does not stop, it is a continuous journey of expanding upon our previous knowledge, skills, and experiences.

## Statement of the Issue

Many students begin to disengage from learning and school during middle school, often demonstrating more negative attitudes towards learning coupled with a decrease in effort (Turner, Christensen, Kackar-Cam, Trucano, & Fulmer, 2014)**.** Therefore, it is important that educators in middle school create an environment that is responsive to the changing needs of young adolescents, with an awareness of the social emotional needs of students during these critical years (D. F. Brown & Knowles, 2007). In middle school, students struggle with a myriad of social, physical, and emotional changes; consequently, teachers need to create learning opportunities that help them engage in and take ownership of their learning. Chan, Graham-Day, Ressa, Peters, & Konrad (2014) note that in order for students to have ownership over their learning, they need to have clear learning targets because these provide clear expectations for performance; furthermore, students need to learn to track their progress, monitoring their own experiences, thus investing themselves in their own achievement and growth. Feedback is a key component of helping students internalize ownership over what to do next and how to do it better, (Chan et al., 2014) and design thinking frameworks and the ADST curriculum, with their built in iteration processes, provide the perfect opportunity for students to establish control over their learning journey.

Jho, Hong, & Song (2016) argue that teachers need time and support to feel comfortable and confident in implementing interdisciplinary lessons in their classroom. The ADST curriculum has been rolled out in British Columbia, but the direct in-service opportunities have been limited; subsequently, many teachers have struggled with how to implement the ADST curriculum confidently. As a result, they do ‘cookie-cutter’ assignments because there is a lack of mentoring and support on how to create true design opportunities. Teachers need to feel confident in producing meaningful learning opportunities that “empower children to see the whole picture and not feel like they are just following steps handed to them” (Martinez & Stager, 2013, p. 53).

## Purpose

The purpose of this paper is to examine the current landscape of design thinking in education and how it can positively impact learning in middle schools. Furthermore, I intend to provide relevant, practical ways in which middle school educators can implement design thinking activities for students in their schools.

## Inquiry Thesis

The interdisciplinary nature of design allows for students to participate in authentic learning opportunities that incorporate their passions and curiosities, which leads to my capstone inquiry:

Does design thinking, with built-in iteration and collaboration, entice middle-schoolers to take ownership of their learning?

## Significance of the Study

In our rapidly changing world, it has become more important than ever to ensure that the education system engages students in learning experiences that will be transferable into their futures. The significance of this paper is multifaceted for design thinking allows teachers and education leaders to rethink the way we present learning opportunities to middle school children. From my research, I believe that practical ways to implement exciting learning opportunities for middle school student will emerge. Through the utilization of design thinking, all stakeholders, including teachers, leaders, parents, and students, in the education system can see that through a simple reframing of how we view traditional tasks, students can become agents of their own learning. Ultimately, I hope that design thinking can become a common language in our schools from kindergarten to grade twelve. My hope is that students will understand that all tasks can be refined and improved upon if they go through a design cycle, and that learning does not stop at the end of a unit; we are always learning. The research I will present shows that the effectiveness of design thinking comes from establishing environments where students are comfortable with exercising their creativity whilst being encouraged to preserve when they encounter complications. Classrooms where the process is as important, if not more imperative than the product.

## Outline of the Remainder of the Paper

In the subsequent sections of this paper I will outline the theory and history of design thinking and its permeation into educational settings. I will begin with defining key terms in design thinking as well as terminology around student ownership of learning. An extensive literature review will be completed, which will include looking at the history of the intersection of design thinking and education. Studies where design thinking has been implemented in middle and high school settings will be examined and discussed. Furthermore, literature around engagement and ownership of learning in a middle school context will be investigated. Finally, I will propose ways in educators can implement innovative, impactful design thinking activities in middle school.

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Nadine, this is outstanding work! Not only is this chapter close to being completed but you have also done great work in mapping out the scope of your entire project. Your review of material here in the introduction, by way of background and significance, is excellent. Each section here is comprehensive and complete, save for the additions you wish to add. You are off to a great project. Full marks for this chapter: 30/30.

Your class presentation was also outstanding in content, depth and creativity. And your website is perhaps the best I’ve seen created by a student for class purposes, either here or at SFU; the sheer size of the site already is beyond impressive! While I realize the site houses more than the scope of the 511 course, I really like how you have consolidated everything into one site. Obviously, the site is serving you well.

You clearly deserve full marks for *all* the work you have done in the course, so a 4.0 is really the only appropriate assessment, numerically speaking. And I want also to laud your generous and kind spirit in helping your classmates; this is the mark of true humanity. Finally, you brought a delicious wit and humor to the class, always welcome in any organization! It has been both a pleasure and an honour working with you! Please feel free to keep in touch should you have any questions or just wish for an ear to listen. –Charles