

DESIGNING AN EDUCATIONAL PROGRAM FOR AT-RISK YOUTH IN TRANSITION
FROM ELEMENTARY TO SECONDARY SCHOOL: COMPARING THE TRADITIONAL
PROBLEM-SOLVING APPROACH TO THE DESIGN THINKING APPROACH

by

KRIS KERNOHAN

B.Sc. (Env.), University of Guelph, 2000

B.Ed., Queen's University, 2001

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Abstract

Youth at-risk are challenged by life circumstances which can have long-term implications. When students move from elementary to secondary school, they encounter social, emotional, and academic challenges in the transition. However, because the factors which define at-risk students are similar to those accentuated by the transition process, the challenges faced by at-risk students are exacerbated, which further impacts their chance of future success. In order to better support students at-risk in transition to secondary school, a program which meets the unique needs of this group should be designed. A review of several definitions and the characteristics of at-risk youth, as well as current literature regarding the challenges presented by the transition to secondary school, is undertaken. Two different approaches to programmatic design for schools are defined and examined—the traditional problem-solving method, and the design thinking method. Each method is then used in a thought experiment in which worked examples of each method are presented. The two approaches are then compared, and the suitability of (1) the decision making processes and (2) the resulting types of programmatic structures is examined in relation to general educational needs and those specific to youth at-risk in transition to secondary school.. A guide for future practice in these domains is offered.

Background

For the past eleven years, I have been a teacher of students who are either in their final years of elementary school, or in the beginning years of secondary school. I have worked in the inner cities of London, England and Toronto, Ontario, and more recently, have taught in New Westminster and Vancouver, British Columbia. In addition, I was fortunate to teach in an alternative, residential setting at a natural science and outdoor education school in Ontario. At this school, mainstream and special populations of upper elementary and lower secondary

students from the Toronto District School Board would spend a week in a natural setting in order to learn about the environment, partake in outdoor pursuits, build social and group work skills, and challenge their physical and mental limits through adventure-based programming, as well as to experience living and working together with their peers and teachers.

Each of these teaching experiences has provided me with new perspectives on factors which shape a student's ability and desire to be successful in the school, such as family and peer influences, mental and physical health, and cultural beliefs. Furthermore, my uniquely varied teaching experiences have caused me to question what is and is not part of the educational process, and the role of the educational system in providing supports for students who struggle, or are at-risk of school failure.

In addition to finding academic, social-emotional, and other aspects of schooling challenging, at-risk students I have taught have said that they found the transition between elementary and secondary school particularly challenging, and it seems that many of the factors that define them as at-risk are the same factors that are accentuated in this transition process. When *any* student graduates from elementary school and moves on to secondary school, many changes can occur which challenge him/her in numerous ways—socially, academically, emotionally, and physically. Tilleczek (2008) noted that during the transition to secondary school, students face difficulties in maintaining who they currently are and all of their existing responsibilities, while developing slowly into adults, and simultaneously seeking a sense of belonging at school, amongst peers, at home, and in other aspects of an adolescent's life. Similarly, in leaving elementary school, my students noted wide-ranging anxieties about the transition such as not knowing their peers and teachers in their new high school, coping with increased homework and responsibility, forming and/or maintaining friendships, being able to

succeed academically, and pressures relating to sexual activity and drug and alcohol use. While teaching in the lower grades of secondary school, students entering high school reported that they struggle with balancing responsibilities between their home, school, and social lives, as well as balancing newfound freedom and responsibility often given to them in a secondary school setting.

However, in my teaching experience, the at-risk students struggled more with the transition to secondary school than those who were not facing additional challenges, perhaps because the difficulties that the at-risk students faced in day-to-day life were the same as those brought about in making the transition. Therefore, the transition for at-risk students can have a compounding deleterious effect on this population. For example, an at-risk student who is experiencing anxiety and depression may find the social transition to secondary school more difficult than a peer who does not experience these mental health issues because his social skills are doubly taxed by the transition as well as his reduced mental health. My students who were already at-risk in elementary school appeared to have an increase in the level of risk and/or risk factors during this transition to secondary school, which, in some cases led to dropout, or in others, an increase in existing risk factors and/or the development of new, additional risk factors such as criminal or gang involvement, drug and alcohol abuse or teen pregnancy. Also, not all of the students whom I have taught have the same resources available to them to promote the development of the skills necessary to navigate the challenges or changes that they confront. Due to life circumstances and other factors as outlined above, at-risk students may have less support in the development of these skills. Therefore, because this population of students face unique challenges, a program which supports youth at-risk in transition from elementary to secondary school needs to be created to increase their chances of school success.

Purpose of Study

In order to determine the key elements of such a program, I will examine the challenges for youth that arise as a result of the transition to secondary school, and how these issues are exacerbated for youth at-risk through a review of definitions and characteristics of this particular population. Next, I will describe the gaps in existing literature to illustrate that a unique educational program needs to be created in order to mitigate the risk factors for youth at-risk in order to increase their potential for school success. After establishing this need, a “thought experiment” in which two methods of programmatic design are employed will ensue. First, the traditionally-used method for program development in education (the “problem-solving approach”) will be defined, followed by a worked example, in order to illustrate the current approach and the programmatic decisions which may result. Then, I will outline an alternative method (the “design thinking approach”) which, until recently, has only been applied outside of the educational context. A worked example of how design thinking could be carried out in a school environment will also be detailed in order to demonstrate this unique process as well as its applicability to the complexities of programming for the at-risk population transitioning to secondary school. Finally, the applicability of each of the two methods to programming for at-risk students and the educational context in general will be examined and the benefits of each approach will be illustrated for use in future educational decision-making.

Challenges for Mainstream and At-risk Learners in Transitioning to

Secondary School: A Literature Review

A typical Canadian kindergarten to Grade 12 schooling structure is subdivided into elementary and secondary school. In some cases, a schooling experience is segmented further into elementary, middle, and secondary components. As a result of this discontinuous structure,

students must make at least one transition—from elementary to secondary school. This transition can present significant challenges to typically developing students, and these are accentuated for at-risk students who face additional obstacles.

Transitioning to Secondary School: Challenges for Mainstream Youth

Research regarding the challenges typically functioning students face and on the risk and protective factors in the transition to secondary school exists, but it is limited in its scope and/or in its acknowledgement of the potential negative impacts of a difficult transition. However, one recent and relevant research study examining challenges in transitioning to high school is currently underway in Ontario. In the literature review to inform this three year study, Tilleczek (2008) highlights three areas in which students struggle with the transition—“being, becoming, and belonging” (p. 68). During the process, students face difficulties in maintaining who they currently are and all of their existing responsibilities, while developing slowly into adults, and simultaneously seeking a sense of belonging at school, amongst peers, at home, and in other aspects of an adolescent’s life.

Although a change such as the transition to high school can afford new opportunities, Tilleczek (2008) stated that it can also be a source of anxiety, particularly around the maintenance of social status, as well as all of the aforementioned concerns and challenges voiced by my own students. Tilleczek (2008) also suggested three levels of factors which can ease transition to high school:

macro (cultural), meso (classes, friends, family), and micro (youth and teachers as individuals). At the macro level, there must be a fit between what youth need and how schools treat them, so that a sense of belonging develops... At the meso level, we need to attend to the everyday practices in schools, homes, and communities (p. 69).

The micro factors include those which are internal to the student.

Although Tilleczeck (2008) referred to these factors as ones which contribute to a successful transition, logically their absence would adversely affect a student's transition to secondary school. In a recent study on student perceptions of social support and adjustment in the transition from elementary school to junior high school, Martinez, Aricak, Graves, Peters-Myszak, and Nellis (2010) examined the significance of social support in this transition. Overall, the authors found that support from peers and teachers was perceived to decrease during the transition. In examining differences by gender, "for girls, perceived total social support, close friend support, and school support decline while perceived school problems increase" (pp. 528-529) during the transition to high school. However, for both boys and girls together, social support and socioemotional functioning that was perceived at the end of elementary school was a predictor of the level of that same indicator for the beginning of junior high school (Martinez et al., 2010).

This particular study illustrates the significance of healthy social support in transitioning to high school, but more research needs to be conducted to determine whether social support and socioemotional functioning impacts upon other transition challenges, such as long term academics, behaviour, and/or mental health.

In a more comprehensive, yet older longitudinal study, Barber and Olsen (2004) sought to correlate changes in the school environment with changes in academic, emotional, and social functions of youth in transition. Although many of the study participants were transitioning from grade to grade but not changing schools, the findings are relevant to the process of transitioning in general. Overall, youth in transition perceived a decline in the school environment (such as teacher support), and their academic, social and emotional functioning at each transition point

regardless of gender, religion, or family turmoil. This study also found that in the first transition from the fifth to sixth grade (which involved a change in schools), students reported improved overall functioning including social, academic, and emotional measures. This is in contrast to traditional beliefs that a change in school causes greater decline in perceived functioning (Barber & Olsen, 2004). However, this particular school/grade transition occurs at a younger age than what occurs in the context of my research, in which students are in transition in their early teen years between grades seven and eight, or eleven to thirteen years of age on average, which is two years older than that which was noted in the study by Barber and Olsen (2004).

The notion that large declines in all areas occur in the school/grade transition that occurs in early teen years (similar to that which occurs in the British Columbian school system) was also discussed by Barber and Olsen (2004). They noted that transitions in school and grade are much more challenging for students when they occur at the same time as large physical and developmental changes such as those during early adolescence, although this was not directly researched by the authors.

Barber and Olsen (2004), Martinez et al. (2010), and Tilleczek (2008) all note that a change in school environment, like that which occurs when students transition from elementary school to high school, is challenging academically, socially, and emotionally for all students in general. The way in which schools are structured, whereby a large transition in school environment is required at the very same time as students are undergoing their own “micro” level changes (Tilleczek, 2008), thereby accentuating challenges for students, seems counterproductive.

Although stakeholders in the educational system, including parents, students, and teachers, seem to accept the dominant structure and thinking that students will have difficulty in

making the transition to high school, my research will employ a critical theory approach which critiques structures which oppress (Glesne, 2011) in order to examine how the current school structure could be improved to decrease the challenges students face in transition. As stated by Hargreaves and Earl (1990), “the tragedy of the transition years is not that students experience anxiety on transfer to secondary school. The tragedy is that this anxiety passes so quickly, and that the students adjust so smoothly to the many uncomfortable realities of secondary school life. These realities...can restrict achievement, and depress motivation (especially among the less academic) sowing the seeds for dropout in later years” (p. 214). If these challenges are known to affect all students, and they impact probabilities of school success for all students, then how these issues specifically impact at-risk students needs to be examined, given the pre-existing nature of the factors which further hinder their potential for educational success. However, in order to comprehend how challenges caused by the transition to secondary school specifically impact at-risk youth, the definitions and characteristics of this population must first be understood.

Defining and Delineating the Notion of “At-risk”

In the field of education in general, students who are in danger of school failure are deemed as “at-risk” (Schissel & Wotherspoon, 2001). Many of the students whom I have taught in both mainstream and specialized programs have been labelled as “at-risk.” In my experience, primarily academic factors, such as low grades, the presence of learning disabilities and poor attendance, led to a student being labelled as such. However, other issues stemming from a student’s life circumstances also contributed to this classification. Students who experienced a low socio-economic status, a history of abuse, fetal alcohol syndrome, low educational level of one or both parents, single parenting, and/or ethnic minority status were also characterized as at-

risk. Other at-risk students whom I have taught were labelled as such due to emotional and/or behavioural difficulties, recent immigration, and/or mental health challenges. Because of the large diversity of risk factors, contexts, and circumstances which yield the identification of an at-risk youth, as well as an increase in the usage of the term in society at large, the very definition of “at-risk” has become increasingly unclear due to wider and more colloquial usage (Everett, Chadwell, & McChesney, 2002). This lack of clarity causes me to question how we, as educators, can help to reduce risk factors in and around our students in order to increase their chances of school success if we cannot even agree on the meaning of the term “at-risk.”

Because the commonly used definition of at-risk varied so widely, Tidwell and Corona Garrett (1994) stated that “a term applied too often and too widely loses all meaning. It is necessary either to abandon the use of the term at risk or to attend to the meaning of ‘risk’ as it applies to future probabilities” (p. 444). This notion then restricted the definition of “at-risk” to focus upon behaviours, characteristics, and contexts which could place a youth’s successful *future* at risk.

Stemming from this definition, in combination with a more behaviouralist view, Resnick and Burt (1996) clarified the term further by stating that

the presence of negative antecedent conditions which create vulnerabilities, combined with the presence of specific negative behavior [sic] or experiences that are more likely to lead, in time, to problem behaviors [sic] that will have more serious long-term consequences (p. 174).

Other definitions and characteristics of at-risk youth have been determined using different methods. In examining data collected from youth who left or were at risk of leaving school prior to graduating with a diploma (“early school leavers” also known as “high school

dropouts”), Ferguson, Tilliczek, Boydell, Rummens, and Roth-Edney (2005) clarified the definition of an at-risk learner in an educational context as “one who is unlikely to graduate on schedule with the skills and self-confidence necessary to have meaningful options in the areas of work, leisure, culture, civic affairs, and relationships” (p. 4).

In some cases, educational institutions have also defined the term “at-risk” in order to clarify it for the purpose of designing programs for this population to reduce the impacts of risk factors on relevant students. In 2002, The Ontario Ministry of Education created an At-risk Working Group in order to examine the needs of these students and make recommendations for programmatic and systemic changes to support these learners. In so doing, this working group created a specific list of measurable characteristics based upon provincial reporting standards and metrics to define the parameters of at-risk and disengaged students (Ontario Ministry of Education, At-risk Working Group, 2003). However, this definition is specific to the educational structures and needs present in Ontario at the time.

Like all of the definitions and characteristics of at-risk youth, risk factors are particular to each student’s context and change over time with a student’s circumstances rather than being of a more static nature (Ferguson et al., 2005). Therefore, each iteration of a definition cannot necessarily be validly applied in another environment, place, or time. As such, delineating characteristics of this population is challenging in an educational context.

The very nature of defining certain students as at-risk due to the presence of circumstantial and contextual conditions such as race or family type is rooted in critical and Freirean research theory. In the case of critical theory, the “reality” of these at-risk students has been created and formed by social, political, cultural, economic, ethnic, and gender values (Guba & Lincoln, 1990). Even the mere identification of these risk factors points at inequalities in the

educational system whereby people who experience these risk factors are deemed as being at risk of failure simply due to their status in society through preordained characteristics such as gender and socioeconomic status (Schissel & Wotherspoon, 2001).

Similarly, at-risk youth are oppressed by the very characteristics which define them. In addition, risk factors affecting these youth have been found to be “multidimensional, interactive, and multiplicative, and should be viewed as steps along a continuum” (Schonert-Reichl, 2000, p. 2). As such, Freirean research theory applies to my research about and with at-risk youth because it calls into question that which defines at-risk youth. By examining characteristics which further oppress at-risk youth (such as transitioning to secondary school), my research seeks to problematize the educational system and liberate at-risk youth from negative antecedents so that they may be enabled to overcome social, political, economic and other forces which oppress them and so that they meet with greater educational success. As such, the impacts of the transition to secondary school imposed by the current school structure upon at-risk youth need to be examined in order to determine how best to meet the needs of this population.

Gaps in the Literature—the Connection Between Youth At-risk and the Transition to Secondary School

Characteristics of at-risk youth such as depression, legal involvement, drug and/or alcohol abuse, and school absenteeism are often present during elementary school (Evans, 1995) and students who experience difficulty in elementary school often experience similar challenges in secondary school (Tilleczek, 2008). However, the effects of the transition to secondary school specifically on the at-risk student population are not well understood. Although the current literature helps to define what is meant by “at-risk” and the challenges for mainstream students in making the transition from elementary to secondary school, limited research correlates these

two issues, particularly in examining the specific effects of the transition on this particular population and/or how to mitigate these.

Tilliczek (2008) states that “we need to think about young people who live in risk situations and examine how these risks play out in the classroom” (p. 69). She goes on to say that “[i]t is at this level of social organization where the experience and embodiment of social class, poverty, ethnicity, identity and age are played out” (Tilliczek, 2008, p. 70).

The structure that currently requires students to make a large transition has been illustrated to cause increased anxiety, a decrease in academic achievement, and depressed socioemotional functioning (Tilliczek & Ferguson, 2007), all of which are further increased for youth at-risk (Tilliczek, 2008). Therefore, the current school structure continues to oppress at-risk students because the risk factors that affect them act in concert with the risk factors which are added through the period of transition from elementary to secondary school.

Although a very small amount of research is emerging regarding at-risk students in their transition to secondary school, such as that being conducted in Ontario, no research specific to the British Columbian educational context exists. Furthermore, because much of the existing research is of a qualitative nature, it cannot be generalized to all environments (Glesne, 2011). The educational context of Ontario is different than that found in British Columbia— structures, times of transition, funding, and other factors such as cultural diversity differ, so the transitions made by British Columbian youth, as well as how the notion of “at-risk” is defined will not be comparable. Similarly, because the challenges presented by a transition are unique to each individual (Tilliczek & Ferguson, 2007), research from one population may not be applicable to another population or at the individual student level.

Youth at-risk experience numerous social, institutional, political, and economic factors which can cause negative long term implications. Due to these factors, youth at-risk struggle academically, socially, and emotionally in a school setting and these challenges are further exacerbated when these students transition from elementary to secondary school. Although the definition and characteristics of at-risk youth are varied, and research regarding the effects of such a transition on this population is limited, a specific program designed to meet the needs of these particular students needs to be designed in order to ease this transition and to alleviate risk factors which cause challenges in a school setting and impact upon the future potential of these youth.

Two Approaches to Educational Programmatic Change and Development

In order to determine how best to design a program to mitigate risk factors for this unique population during a particularly vulnerable period in their education, different approaches could be employed. One method, the traditional problem-solving approach, is typically applied in education for the purposes of programmatic and curriculum design. In contrast, the design thinking approach, which has only recently begun to be applied in the educational context, is being shown to have potential to fuel innovation and effect educational change (Benavidez, 2011; Eidos Institute, 2011). Although both reflect systematic approaches to decision-making, each approach has different characteristics which could lead to discrete solutions.

In order to best delineate these approaches, both will be defined, described, and then illustrated. First, the traditional problem-solving approach will be described and a worked example will follow in order to illustrate this method as well as how this approach would address the issues presented by the transitioning of youth at-risk into secondary school. Then, the design

thinking approach will be defined, and a worked example using this approach will follow so that these distinctive methods can be more easily compared.

The Traditional Problem-Solving Approach to Educational Programmatic Change and Development

The problem-solving approach is a linear, rational one (Liedtka & Ogilvie, 2011), which mimics the scientific method where a problem is defined, possible solutions are identified and evaluated *objectively*, and then one is selected which is most supported by the evidence provided in prior steps. The focus is on selecting the “correct” solution which will endure, and the selected solution must have supporting evidence which “proves” that it will work before it is tested. Therefore, the problem-solving method requires that the decision-maker invest substantial time into researching the nature of the problem as well as potential solutions *prior to* testing the proposed solution, unlike the design process, as outlined below.

This approach encourages the decision-maker to seek answers in *similar* problems or solutions; for example, if the problem lies in an educational context, then examples of potential solutions as well as research to support any solution should also be found within the same educational realm, rather than looking to other fields of study. The problem-solving method tries to also locate and quantify each part of the problem using a predominantly deconstructivist approach (whereas the design process allows for both quantitative and qualitative components of a problem, such as emotion, in a process which both constructs and deconstructs). Also, in using the problem-solving methodology *one* final solution is sought, rather than several potential ones as found in design thinking.

Typically, in education, new programs are proposed and created by individual teachers or administrators using the traditional problem-solving process. Using a convergent, linear style of

thinking, a process similar to the scientific method would be employed. In the case of planning a program to support at-risk youth in transition to secondary school, a teacher might see the need for such a program and propose a research topic statement based upon how he/she views the problem. To support the proposal, academic literature which validates the development of the curriculum would be collected. Other similar programs would be sought, and if a similar or parallel program were found to exist, perhaps in another jurisdiction or designed for a different population, then that program might be adapted to serve the needs of the desired population. Then, using “declarative reasoning” in the form of inductive and deductive logic (Martin, 2009), a program and/or curriculum would be created by the teacher based upon three primary sources of information: the findings in the academic literature about the needs of the population, any parallel, existing programs which the designing teacher believes could meet the students’ needs, and the teacher’s perception of the needs of the this student population. In short, the new program would be based upon and supported by existing ideas and research, and the programmatic problem would be solved by existing solutions.

The following worked example illustrates the process and results of following the traditional, problem-solving process for designing a program for at-risk youth in transition to secondary school. First, the purpose and rationale for designing such a program will be outlined. Then, because a program which is related to the issue exists, and the problem-solving approach seeks to improve upon existing solutions (rather than creating entirely new ones), background research about this existing program is given in order to highlight its applicability to the current issue. Next, a related solution is found in the academic literature and evidence pertaining to its application is presented. In seeking a solution to the issue of youth at-risk in transition, two overlapping potential solutions, the creation of school attachment and the adaptation of an

existing educational program, are hypothesized and proposed as methods to enhance the potential for at-risk students to achieve greater school success following the problem-solving approach.

Applying the Traditional Problem-Solving Approach to Educational Programmatic Change and Development to the Issue of Youth At-risk Transitioning to Secondary School: A Worked Example

In my own teaching experience, I have observed that at-risk students often experience greater difficulty in transitioning to secondary school than students not experiencing additional challenges. Additionally, students who exhibit depressed school attachment at the elementary level can experience accentuated detachment during the transition to secondary school. The cumulative effects of these challenges for at-risk students seem to have a substantial impact upon their ability to achieve longer term educational success. Therefore, I propose that a specialized program which follows the principles of Take A Hike, a Vancouver School Board initiative, could mitigate risk factors for at-risk students transitioning from elementary to secondary school by increasing school attachment thereby enhancing their potential for school success.

The Take A Hike program: Background research.

Take a Hike is a district program for students in grades 10 to 12 which operates within the Vancouver School Board in British Columbia. It

is an alternative education program that engages at-risk youth through a unique combination of adventure-based learning, academics, counseling, and community involvement. The ultimate goal of the Take a Hike alternative education program is that barriers to learning are minimized, personal issues are addressed, and students achieve a greater level of social and academic success. The program combines the following four

aspects: Adventure-based Learning (ABL), therapy, academics, and community involvement” (Take a Hike Youth at Risk Foundation, 2011).

Although most of the students are referred to the program by school counsellors or social workers, students can also refer themselves.

Take a Hike has demonstrated success in helping many students in their social, emotional, physical and academic development (Take a Hike Youth at Risk Foundation, 2011). Other similar programs operate for students at-risk in grades 10 to 12 within the Vancouver School Board, but no district programs exist for at-risk students in younger grades which use the same principles as those employed by Take a Hike, despite the success of this particular program.

If programs like Take a Hike are so successful in increasing school attachment and decreasing risk factors for older at-risk youth in grades 10 to 12, and risk factors may be demonstrated in elementary school, a similar program could assist at-risk elementary school students in transitioning to secondary school by increasing school attachment.

Literature review: School attachment theory and its potential for students at-risk and in transition.

Introduction.

Because the problem-solving approach to this issue proposes that creating school attachment will increase the potential for at-risk students to achieve greater school success, research supporting this hypothesis must be found in addition to the literature defining and characterizing at-risk youth and the effects of transitioning to secondary school as above.

Literature review.

In my own teaching practice, I found that students who had strong relationships with their families, their peers, and teachers seemed to be more successful academically. In addition, students who participated in a wide variety of school and community clubs, sports and other extra-curricular activities seemed to demonstrate strong learning skills and enjoy learning. The opposite also seemed to be true—students who were in conflict with peers, teachers, and their family, and who did not choose or did not have the means to participate in extra-curricular activities typically struggled academically, and in many cases were labelled as “at-risk.”

According to Bergin and Bergin (2009), attachment is:

a deep and enduring affectionate bond that connects one person to another across time and space... [and] is not synonymous with dependency; instead, secure attachment liberates children to explore their world. Attachment is also not synonymous with general sociability. Both outgoing and shy children can be securely attached (p. 142).

These researchers also summarized key ideas relating to attachment theory and how it affects people within a school environment. Although attachment may occur between a child and a family member, it can also occur between a student and his/her teacher. In the educational environment, attachment is referred to as either school bonding or school attachment, and, according to Bergin and Bergin (2009), performs two key functions—to allow students to feel secure enough to explore their world, and to teach behaviour and values through socialization. During late childhood and early adolescence, these researchers noted that youth gain feelings of security from attachment so that they may develop independence.

Bergin and Bergin (2009) also described key features of attached children as well as primary attachment figures (AFs), who, in the context of my research are teachers or other adults

working within the educational context. Successful AFs for students in their early adolescence demonstrate a student-focused, positive perspective, sensitivity, warmth, strong communication skills, and responsiveness. As a result, students are typically more successful when they are attached. Conversely, adolescent students who are not attached demonstrate higher levels of anger, avoidance, and/or indifference, may appear hyperactive, depressed, disorganized, anxious, or dependent.

In their summary of literature on school attachment, Bergin and Bergin note that strong attachment to an AF is linked to academic success. For example, students with stronger attachment to their teacher demonstrated higher test scores, more positive classroom behaviour, an increased perceived ability to focus, and a greater enjoyment of the subject material being taught. Students who demonstrated secure attachment are less likely to use drugs and alcohol, or engage in violence or early sexual activity (Resnick et al., 1997) or drop out of school altogether (Christenson & Thurlow, 2004). However, most notably, the benefits of school attachment are most pronounced in schools with students with low socio-economic status and for students at-risk (Osterman, 2000; Resnick et al., 1997).

Cottrell (2007) also found that students who experienced greater school attachment had lower engagement with risk-taking behaviour. Her particular study is significant because it pertains to a similar age group (sixth and seventh grade students) as occurs within my own research. In particular, Cottrell noted that with particular risk factors, such as engagement in sexual activity and teen pregnancy rates, school attachment and teacher support were correlated to lower risk-taking behaviours, but parental attachment was not a significant factor. Although further investigation is warranted, it could suggest that as students reach the early teen years, and

the age at which they are in transition to secondary school, that they depend more upon school attachment for moral and behavioural guidance.

Program proposal.

The research conducted by Bergin and Bergin (2009) discussed the benefits of school attachment for students in transition from elementary to secondary school, and the strong need for at-risk youth to experience school attachment, but the researchers did not specifically examine how at-risk youth in transition could benefit from school attachment. Also, although Osterman (2000) discusses the notion that creating a sense of belonging is critical to school attachment, her research focuses upon individual student and teacher behaviours as the source of creation of school attachment. However, I believe that rather than depending upon choices made by individual teachers and individual students, particular programmatic choices could be made in order to foster school attachment.

Although the research states that all students benefit from school attachment, due to socio-economic status, behavioural disorders, mental health challenges, ethnicity, or other factors, students at-risk *need* school attachment in order to be successful in school. Because school attachment has been illustrated to decrease risk factors for youth at-risk and ease the transition process for this population, I believe that the creation of school attachment through selective educational programming could remove barriers to long-term success for youth at-risk. However, rather than relying upon individual teachers and students to seek out and form an attachment, I propose that a program which has been shown to be successful in mitigating risk factors for older at-risk youth, called Take a Hike, could potentially be adapted and implemented in order to ease the transition for younger youth at-risk.

Because the Take a Hike program requires students to meet regularly with counselling staff, participate in activities which require students and teachers to work closely together (such as is required in rock climbing), and pursue an individualized academic program, and students can stay within the small program for up to three years (Take a Hike Youth at Risk Foundation, 2011), the Take a Hike program already demonstrates elements of a program designed to create school attachment.

The Traditional Problem-solving Approach as a Linear, Limited-scope Methodology

Using the traditional, problem-solving approach which follows analytical thought processes, it has been demonstrated that a program that creates school attachment by following the principles of Take A Hike could enhance the potential for youth at-risk to achieve greater school success. This solution is well supported through consultation with academic literature and research into existing, parallel programs.

However, although the traditional problem-solving method is typically what is employed in a K-12 educational context, it stems from a scientifically-based paradigm (Jones, 2008). Therefore, this approach requires rational, objective thinking which targets finding one, final solution through a quantitative data-driven process rather than aiming for evolving solutions generated from emotionally-driven insights into users' experiences and needs (Liedtka, 2011) as found in the design thinking approach.

The problem-solving approach is opposite to design thinking in that it is a form of analytical thinking ("Design Thinking," 2012). It is inductive and deductive, but not abductive, and is a form of scientific, linear thought in which pre-existing ideas are further refined or selected from rather than new ideas being developed (Martin, 2009). The traditional problem-solving approach is a form of convergent thinking

which is taking the set of available choices, analysing those choices, and making the best one that then gets implemented. Now that's great for taking an existing world and optimising it. If, on the other hand, you're trying to create new innovations, there's another piece that you need to put in front of that and that is the creation of those choices themselves, because if you're just looking at the same set of choices that everyone else is looking at, you're likely to get to the same innovations that they are. But if, however, you can create new choices, choices that nobody else is looking at, that nobody else has seen there's a pretty strong chance that you can get to an innovation that nobody else has gotten to (Brown, 2010).

Therefore, the design thinking approach could offer an alternative method which could lead to the development of new a program which has not yet been attempted. Because of its unique methodology, the design thinking approach has potential to be more generative and therefore more representative of the needs of at-risk students in transition to secondary school.

The Design Thinking Approach to Educational Programmatic Change and Development

Although the problem-solving method is highly time and human resource efficient, which is often a major hurdle for programmatic change in education, another approach offers several benefits. In addition to the differences previously outlined, the design thinking methodology is humanistic in nature; it is centred around the needs of the end-users (Brown, 2009). Because the particular issue being examined requires meeting the needs of youth at-risk in transition to secondary school, this humanistic approach could positively impact the development of an appropriate program for this population.

Design thinking is “a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success” (IDEO, 2012, “Our Approach: Design Thinking,” para. 1). It is both a style of thinking to solve problems, as well as a resource for organizations to create new ideas (Kimbell, 2011). Design thinking is similar to lateral and/or integrative thinking (Miemis, 2010) because it requires applying a new, creative way of thinking in a familiar environment (education) in order to solve a complex, multi-faceted, or “wicked problem” (Buchanan, 1992) while following a logical but iterative process. It demands that a designer, such as a curriculum designer, understand the needs of users, such as students, teachers, and families, at a deep level so that he/she can gain both concrete and affective insights to guide decision-making and design a user-appropriate solution (Krieger, 2010).

Although the concept of design thinking is often credited to IDEO, an American design consultancy, the notion stems from studies of design methods performed in the 1960s which evolved into research into how designers think (Kimbell, 2011). Rowe (1987) defined key characteristics of design thinking and stated that this style of decision-making incorporates both factual and non-factual information, unlike other methodologies. Cross (1982) also delineated design thinking as being distinct from that which occurs in the sciences or humanities, and Buchanan (1992) illustrated that this style of thinking can solve problems of both a concrete or abstract nature including systems-based issues (Kimbell, 2011). IDEO then began to apply the concept of design thinking in the business environment in order to assist organizations to find creative solutions to their challenges using this unique process (IDEO, 2012). In time, IDEO launched other branches of the organization such as the non-profit IDEO.org in order to support non-business enterprises (IDEO.org, 2012) as well as developing toolkits for specific audiences

such as educators (Riverdale Country School & IDEO, 2011). The latter represents one of the first deliberate applications of design thinking in a K-12 educational context.

Design thinking is a process which turns a “need into demand or need into solution” (Brown, 2010) and is said to be both deductive and abductive in nature such that it brings past knowledge and future envisioning together (Khella, 2009). In its application to business (or other milieus such as education), design thinking causes a paradigmatic shift from traditional methods using the principles of mathematics, economics and psychology to a design and innovation approach employing thought processes borrowed from the disciplines of architecture, design, and anthropology (Jones, 2008).

Description of the design thinking method for programmatic decision-making.

The design thinking process is carried out in stages including Discovery, Interpretation, Ideation, and Experimentation (the Evolution phase is not included because the developed prototype has not yet been tested) as outlined in the Design Thinking for Educators Toolkit (Riverdale Country School & IDEO, 2011). Although other procedural steps to design thinking exist, the essence of the process is the same for all (Krieger, 2010). Using this toolkit specifically designed for use in education, the first stage requires the formation of a design challenge (similar to purpose of study phase in the traditional problem-solving process) including defining an “audience,” which in this case, is youth at-risk. The design challenge is phrased as a “how might we” question, and no potential solution can be given within the question itself. (This stage also recommends establishing a small design team comprised of stakeholders in the problem who will be able to commit to the full challenge, including implementation. However, because of the hypothetical nature of this particular project, no design team was formed. Should this method be actually employed, though, a design team should be created in order to facilitate

the full process and to gain greater insights and a wider variety of ideas and approaches to creating a solution to the problem). The most significant contribution of this stage is the development of empathy for the users through interviews with users, experts, and peers, literature reviews, and observation of users in context.

The second stage, interpretation, requires that the designers review the information gained in the first phase, and look for “meaningful insights.” Here, both the facts and the emotions gleaned become an impetus for design by creating a particular point of view, and project direction. It is essential that the insights gained from the first phase are what drive the design project, so that the users’ needs are consistently in front of mind and are therefore met. Further questions to guide the next ideation stage are established in order to encourage divergent thinking regarding the needs of the users.

Next, the design team must brainstorm potential answers to the aforementioned questions during the ideation phase. Unrealistic solutions are encouraged in order to diversify potential ideas, as well as a great number and diversity of answers to each question. It is also in this phase that a prototype is constructed as a visual, working representation of a proposed idea. Ideas are then grouped into thematic groups, and promising ideas which excite the designers are selected. If more than one idea emerges, then several prototypes can be built. The prototype is not viewed as a solution, but as a discussion point to gain further information and insights. Therefore, after the initial prototypes are built in order to better understand both the problem and potential solutions, constraints are factored in, new ideas are brainstormed and a new prototype is constructed.

During the experimentation phase, a prototype which can be shared with the users and other stakeholders is established. The purpose of this prototype is to gain feedback from other

people, so it must be interactive. It is also recommended to attempt several different types of prototypes, such as a storyboard, a mock-up, and a role-play, so that more feedback can be gained (Riverdale Country School & IDEO, 2011). Feedback is then sought and documented from a wide variety of people.

Following this, the evolution phase occurs, in which the idea changes over time as a result of the feedback. Change is measured and documented, and the evolution of the prototype continues as more information is gained, and further constraints are established or altered. Then, this evolving prototype is tested in a real-world context, and further change continues to occur.

Although all of the steps above are essential components of the design thinking approach, for the purposes of this project in proposing a program for at-risk youth in transition to secondary school, the latter two phases are omitted such that the final stage that is attained is the prototyping component of the experimentation phase is the last. This was selected as the final stage for the purposes of this project so that the suggested end products of the design thinking method could be compared to that of the problem-solving process. Further research could be conducted by implementing and testing both products and comparing the successes and failures of each, but that is beyond the scope of this particular project.

In order to best illustrate the application of the above design thinking approach in an educational context, a worked example follows which is specific to designing a program for at-risk youth in transition to secondary school.

Applying the Design Thinking Approach to Educational Programmatic Change and Development to the Issue of Youth At-risk Transitioning to Secondary School: A Worked Example

Although my background experiences as a teacher remain the same as those found within the worked example of the problem-solving approach, the way in which an issue is considered is significantly different when employing the design thinking approach. Because it is characteristic of the design thinking process to avoid offering a solution at the outset, the initial guiding question (like the problem and rationale found in the problem-solving approach) does not include the proposal that the Take A Hike program model could create school attachment and therefore increase the potential for youth at-risk to achieve greater school success. Instead, the design thinking method begins by proposing a design challenge question which is more broad, and omits any potential solutions from the initial question.

The design challenge.

If a typically developing student is challenged by the transition from elementary to secondary school, and the challenges faced by at-risk youth can be magnified by this transition, then students at-risk will face even greater difficulty in achieving school success. So, *how might we design a program for at-risk students transitioning from elementary school to secondary school in order to increase their potential for educational success?*

Stage one: Discovery.

In order to build a deep understanding of the needs of at-risk students in transition from elementary to secondary school, inspiration and information was sought from a variety of different sources. I consulted academic literature to explain the needs of at-risk students, as well as the needs of students in transition because this information provides a widely accepted and

refereed source. My research was particularly enhanced by two other sources—stories told to me by an adult who classified himself as being at-risk during his adolescent years, and those of a teacher of at-risk students in transition. Both of these provided insights into the needs of at-risk students and/or at-risk students in transition on both a personal and educational scale. The guiding questions used during the initial stages of discovery were as follows:

- What are the needs of at-risk learners?
- What factors contribute to students being at risk of school failure?
- What are the needs of students in transition from elementary to secondary school?
- Which risk factors are/could be magnified by the transition to secondary school?
- Which practices have been found to be successful in decreasing risk factors for at-risk learners? For students in transition?
- Which practices have been found to be successful in increasing achievement for at-risk learners? For students in transition?
- What services and/or resources are needed by at-risk youth and/or students in transition in order to mitigate risk factors?
- What challenges are there in teaching at-risk youth? The transitional grades (i.e. the last year of elementary school or the first year of secondary school)?

Although the stories of the two aforementioned people were valuable, I feel that many others would have provided insight into programming for this unique population, although this was not feasible. However, it is important to acknowledge the contributions that each group could have made to the programmatic design. Therefore, I will briefly outline potential other sources of information.

Students who are finishing high school and who have self-identified as at-risk would have been valuable sources of insight in order to gain perspective on how these students felt they were put at risk by the transition process, as well as to learn more about their experiences in schooling. At-risk students who were completing elementary school and those who were beginning secondary school (grade seven and eight students in the context of British Columbia) would also have been excellent sources of information as would parents of all of the aforementioned students.

Teachers, support workers, counsellors, administrators, therapists and other educational staff who work with at-risk learners in transition to high school would also have been valuable sources of information, as would staff members of community organizations who serve this same population. Community members, such as police officers and religious leaders, would also have provided unique insights into the needs of this population and would have further deepened my understanding of their needs. Lastly, the staff and users of community and other programs targeted at youth at-risk would also have provided constructive feedback about potential educational programmatic decisions for this population.

Although I have experience in working with youth at-risk in transition from elementary to secondary school, I believe it also would have been helpful to gain insights through mechanisms other than interviewing people and/or reading academic literature. For example, seeking out and participating in programs for adults who dropped out of high school but are attempting to gain equivalency, or adults who experience mental health challenges may have led to further insights into the needs of at-risk students.

The academic research revealed the needs of students on a broader scale, and across many ages and geographic areas, including youth at-risk in other provinces and countries. By

reviewing the literature as earlier cited, the opinions and behaviours of multiple stakeholders were accessed, so the needs of a wider population were able to be included. However, other non-academic research could have served as enlightening sources, particularly works created by at-risk youth or adults who would identify as previously being at-risk youth. Examples of these might include essays, poetry, or artwork.

Finally, inspiration could also have been gained from sources outside of education. For example, seeking out a company or organization where new employees feel welcomed and scaffolding has been established to ease their entry to the new company and position could yield insights into how to encourage a smooth transition. Also, spending time within an immigrant services organization may also provide information about how people can more easily make cultural shifts, just as students make cultural shifts when transitioning from one school to another.

Stage two: Interpretation.

During interviews with the teacher of at-risk youth in transition to secondary school, the adult who classified himself as being an at-risk adolescent, and the literature review process, summary notes were created. These notes took the form of short phrases on Post-it notes that reflected the overall impressions of the interviewer of the sentiments, thoughts, and opinions of the interviewees.

The Post-it note summaries were then grouped into themes. This was done by examining the common threads between the literature and the ideas presented by the two interviewees. Then, titles were created which captured the contents of the groupings, and these were transformed into summary statements which reflected the overarching themes presented by the literature and the interviews. These summary statements are as follows:

- Youth at-risk in transition need to be directly taught social skills, but the set of skills required by a student is particular to each individual.
- Behaviour issues are both *caused by* academic problems and other antecedents, as well as *cause* academic problems.
- Other, non-academic skills are needed by youth at-risk in transition, and these impact academic success.
- Teaching and learning processes used need to meet the unique, individual needs of youth at-risk in transition in order to be successful and effective.
- Academic skills development is needed by this student population.
- Family and community involvement is an essential part of the support network for youth at-risk in transition.
- Staffing and class size impact the success of this population.
- Youth at-risk in transition are concerned about how others perceive them and are impacted by how they feel about themselves.
- A transition system is needed to decrease problems and issues caused by the shift from elementary to high school.
- The antecedents and characteristics of youth at-risk in transition are wide-ranging and particular to an individual student.

After re-examining these statements, they were further grouped into the following broader categories where overlaps occurred:

1. Non-academic skills, such as social skills and behaviour self-management are needed by youth at-risk in transition for school success as well as success beyond the educational environment.

2. The approach to teaching at-risk students in transition needs to be individualized to meet their unique needs as well as teaching underlying learning skills.
3. A transition plan needs to be in place for at-risk youth which accommodates the antecedents for and characteristics of this particular population.
4. Self-perception and the perception of others have a significant impact upon youth at-risk in transition, so positive interactions that cause feelings of attachment with family, peers, community members, and teaching staff need to be created, encouraged and supported.

By combining the previous statements together into broader categories, these four key aspects of possibilities for programmatic design emerged, and seem to represent the information reflected in the original interviews, research, and design question.

Using these four statements, several “how might we” questions were developed for each in order to generate further ideas and possibilities. Each set of questions has been listed below with its correlating statement:

1. Non-academic skills, such as social skills and behaviour self-management are needed by youth at-risk in transition for school success as well as success beyond the educational environment.
 - a. How might we go about teaching the social and behavioural skills necessary for these students?
 - b. How might we determine which skills to teach?
 - c. How might we ensure that a balance of skills is taught such that some reflect skills for school success and some reflect skills for beyond the educational environment?

- d. How might we select skills to teach that fulfill both educational and non-educational needs of students?
2. The approach to teaching at-risk students in transition needs to be individualized to meet their unique academic needs as well as teaching underlying learning skills.
 - a. How might we determine the academic needs of individual students?
 - b. How might we determine the learning skills that each student lacks?
 - c. How might we teach learning and academic skills in a way that suits the needs of the individual students?
 - d. How might we conduct our teaching in a way that is conducive to the unique learning styles of youth at-risk in transition?
3. A transition plan needs to be in place for at-risk youth which accommodates the antecedents for and characteristics of this particular population.
 - a. How might we design a transition plan for at-risk youth that is considerate of any antecedents (pre-existing conditions which impact behaviour, learning, etc.)?
 - b. How might we design a transition plan which decreases the impacts of the antecedents?
 - c. How might we create a transition plan which is tailored to individual needs?
 - d. How might we create a transition plan which suits the needs of the sending and receiving schools (i.e. elementary and secondary schools) and their staffs?
4. Self-perception and the perception of others have a significant impact upon youth at-risk in transition, so positive interactions that cause feelings of attachment with family, peers, community members, and teaching staff need to be created, encouraged and supported.
 - a. How might we design a program to increase self-perception of students?

- b. How might we design a program that increases the chances of positive interactions between students and other people?
- c. How might we design a program that fosters a sense of attachment between students and others within the school (teachers, peers, other staff members) and beyond the school (family, community members)?
- d. How might we design a program which decreases the negative perceptions of youth at-risk in transition?

The above interpretation process may have been more effective, however, if it had been conducted using a team approach as suggested in the Design Thinking Toolkit (Riverdale Country School & IDEO, 2011) with multiple interviewers and interviewees because it allows for a wider range of interpretation. By using a team approach true to the design thinking process, a diversity of people would have shared their impressions of interviews and research conducted, therefore potentially resulting in a greater range of interpretations. Because the understandings gained from the interpretation phase guide the remainder of the project, having a more varied set of insights could lead to greater creativity in later stages of the process, potentially resulting in a more fitting prototype. However, the Design Thinking Toolkit (Riverdale Country School & IDEO, 2011) also suggests that the grouping of information and finding of themes is made simpler by using a smaller group of people, but by choosing a smaller number of people, creativity and diversity in interpretation may be lost in this seeking of efficiency.

Perhaps the most enlightening part of the interpretation phase (which would not have been included if a problem-solving process had been used) was the information revealed by the inclusion of the emotions of the interviewees. For example, the adult who was an at-risk adolescent repeatedly alluded to the idea that a feeling of inclusion and emotional security was

paramount for both academic *and* social learning. Because the design thinking approach validates feelings such as these by using them to guide decisions, the program resulting from it could be dramatically different than that drawn from a problem-solving approach which is more objective. In the context of programming for youth at-risk, and in education in general, a more subjective approach is necessary for programmatic success because of the humanistic needs of this population in education.

Stage three: Ideation.

After examining the underlying issues behind the design challenge by widening and then narrowing the view of the problem, questions which reflected each of the four key statements were selected to guide a brainstorming session. Questions that seemed to be the most significant and weighty in relation to the design challenge were prioritized to ensure that the ideas generated by the brainstorming sessions could serve as relevant, potential aspects of the prototype which reflected the insights gained in the previous steps. The questions selected were as follows:

- How might we ensure that a balance of skills is taught such that some reflect skills for school success and some reflect skills for beyond the educational environment?
- How might we conduct our teaching in a way that is conducive to the unique learning styles of youth at-risk in transition?
- How might we design a transition plan which decreases the impacts of the antecedents?
- How might we create a transition plan which suits the needs of the sending and receiving schools (i.e. elementary and secondary schools) and their staffs?
- How might we design a program that fosters a sense of attachment between students and others within the school (teachers, peers, other staff members) and beyond the school (family, community members)?

Potential solutions were brainstormed for each question separately on Post-it notes. Like ideas were then grouped together even if they had stemmed from different questions. This process revealed key components and approaches to programmatic design for youth at-risk in transition to high school. These were found to be:

1. Reducing the effects of risk factors and the transition
2. Academic programming
3. Life skills (non-academic) programming
4. Ongoing collaborative communication between students, teachers, families, school staff, peers and community members
5. Creating opportunities for shared experiences (between students and their peers, families, teachers, school staff, and community members)
6. Building and maintaining students' relationships with others for the development of students and for the benefit of others
7. Considerations in staffing a program for youth at-risk in transition

The fifth and sixth categories overlapped in that the creation of shared experiences could *contribute to* building and maintaining students' relationships with others, these were subsequently combined together.

During this final grouping and re-grouping process, the overlap between the ideas generated by each of the questions was significant, and as a result, led to greater insight into potential programmatic decisions. For example, notions of communication and collaboration surfaced within most of the groups, but could not be re-grouped into their own separate group because a significant loss of contextual meaning would result. As a result, communication and

collaboration were deemed to be a core element of programmatic design and execution for this population.

Although the Design Toolkit (Riverdale Country School & IDEO, 2011) suggests that only favourite or “promising” ideas be selected, few ideas were excluded at this stage. This was because the results of the brainstorming and re-grouping exercises yielded an incredible number of ideas that could dramatically contribute to the success of a program for this target audience, and reflected the original design challenge. Furthermore, the ideas that remained were plausible given the constraints of the current educational environment in terms of staffing and school structure, so did not need to be excluded for this reason either.

In order to conceptualize these broad elements of the potential program into a more tangible format which could contribute to the formation of a prototype, a schematic diagram which structured the theoretical underpinnings of the program was created (see Appendix). Because collaboration and communication are key to both the philosophy of the program and its execution, the diagram shows these aspects both at the core, as well as enveloping the four programmatic pillars that emerged from the design process: academics, life skills, shared experiences and life skills, and reducing the effects of external forces (including risk factors and the impacts of transition). The outer ring which envelops these pillars indicates the collaborative communication that needs to occur for programmatic success— between school and home, school and the community, elementary and secondary schools, and within the school. By representing the overall categories of ideas that emerged from the ideation process in this way, the foundations of the program design were solidified.

Again, this part of the design thinking process would have been more promising if it had been conducted in a team environment in order to gain energy from each other and to generate a

greater diversity of ideas. Also, each team member would offer differing viewpoints, and an idea from one member could serve as the springboard for another line of thinking by a different team member.

In an educational context, it may be best to require teams to build a representation of the theoretical underpinnings of their project in order to bring these to the forefront and to ensure that the prototype has these philosophies embedded within it. This process could also catalyse a discussion between design team members regarding the purposes of education, and therefore promote greater understanding between educational stakeholders as well as aligning the proposed program's values with those of the stakeholders.

Stage four: Experimentation.

Following the development of the graphical representation of the theoretical underpinnings of the program for at-risk youth in transition from elementary to secondary school, the ideas that were brainstormed in the ideation stage were re-examined. Because the design challenge was “how might we design a program for at-risk students in transition from elementary school to secondary school in order to increase their potential for educational success,” a form of prototype that would clearly illustrate the practical details of the program was essential in order to promote discussion with and elicit feedback from others.

Therefore, a simplistic, physical manifestation was selected—a timeline using stick figures and short phrases. If feedback were to be solicited, reviewers would be able to interact with each component of the timeline. For example, the order of the components could be rearranged, one element could be eliminated, or more components could be added. Also, the symbolic drawings could provide another springboard for feedback, therefore triggering more feedback than what would have been offered by words alone, or by the two other methods of

prototyping. This simple, approachable method could provide more opportunities for feedback and is more easily shared and interacted with than the two previous methods.

Additionally, this timeline method, in particular, would allow for more detail to be added at each step. Therefore, the timeline could be used for further prototyping of each stage at a later point, perhaps with a small design team examining one key step at a time. For example, a prototype for the hiring process for teachers could be created as a sublevel to the existing prototype. The design thinking methods could be followed in order to further clarify and detail each component of this proposed process in order to develop each aspect of the program and ensure each meets the needs of the student population, as well as others involved, such as families, community members, and school administrators.

Once the timeline method of prototyping was selected, the diagram illustrating the theoretical underpinnings was re-examined to review the key ideas. Then, the categories of ideas generated during the ideation process were consulted, and action items were sought for each of the categories. For example, in the “life skills” category, several ideas were combined to create a step in the timeline to illustrate the creation of a 50% academic and 50% life skills program, rather than the traditional academic-only program. Some ideas from different categories were blended into other action items. For example, during the step in which consultation with a variety of stakeholders occurs regarding life and academic skills, aspects of the life skills, academic skills, and ongoing communication and collaboration categories were combined together.

As each moment in the timeline was created, and represented on a white card with a drawing and text, it was placed in a time sequence. However, as further cards were created, the timeline was rearranged to produce a logical sequence, including phases that would need to

occur before the beginning of the school year and/or beginning of the program, during the school year, and at the end. Because some of the aspects of each of these phases happen simultaneously rather than sequentially, they were blocked together. For example, program components which would repeat in groups were placed together, such as work experience, academic programming, lesson planning, and selection of teachers by the student by learning/teaching style. These aspects of the program will repeat for each new topic of learning and through different phases over the course of the school year. Elements of program, student, and staff evaluation were also grouped together, but illustrated on separate cards.

The resulting prototype included the following steps (in sequence):

1. Staff selected to work within the program are diverse in interests, gender, teaching styles, ethnicities, etc. This includes counselling staff.
2. A student is referred to the program by anyone (e.g. community, self, teacher, family).
3. A consultation with community member(s), the student, and his/her family and elementary school teacher(s) and other staff occurs regarding the life and academic skills that the student has and needs.
4. Elementary and secondary school teachers meet and discuss student needs, strengths, learning styles and external influences upon them. This is supported by the school board through the provision of release time for these staff members.
5. A transition plan is established collaboratively with the student, his/her elementary and secondary school teachers, family, and community members. This includes a communication plan for use by participants in this planning process.

6. The student transitions to secondary school. (Note: the first week of school does not involve any academic activities, but does include activities to foster teacher-student and student-student relationship building).
7. Ongoing support during the school year.
 - a. Continual work occurs to reduce risk factors including functional behavioural assessments and student self-monitoring.
 - b. Family counselling is available to the student and his/her family. Individual student counselling is a *required* element of the program.
8. Programming for the student.
 - a. Work experience and/or community service is a required part of the student's curriculum and is selected by the student. This experience is tied to an Individualized Education Plan (IEP) and student assessment and evaluation.
 - b. The program is 50% academic and 50% non-academic (e.g. social, behavioural, emotional, and physical development) in order to support the student's long-term growth.
 - c. The student is able to *select* a preferred teaching and learning style for each subject (e.g. artistic, kinesthetic, musical, auditory, etc.).
 - d. Lesson plans are individualized and reflect the 50/50 split emphasis on academic and non-academic skills (all lesson plans contain both).
9. Evaluation.
 - a. A 360 degree evaluation of staff occurs annually. Students, families, community members, and elementary and secondary teachers evaluate each program teacher.

- b. A program evaluation occurs annually by students, families, community members, and elementary and secondary teachers.
- c. Student evaluation is conducted by the student, community members (including those assisting with the community or work experience program), the student's family, and his/her counsellor and program staff.

Although the above statements represent components of the program to be included, some ideas that had been brainstormed during the ideation phase were left aside even though they were promising. Because the purpose of prototyping is to develop a tangible representation of an idea in order to gain feedback, too many ideas or too large or complex a timeline would be overwhelming for others and could reduce the quality and quantity of feedback. However, most of the key ideas were included in the broader themes, and those left aside could be used to brainstorm processes in the future for each individual step of the timeline.

Through the selection and application of the timeline prototype, it became apparent that aspects of the program might not actually appear sequentially. Rather, many components of the program would repeat themselves depending upon the needs of the students, staff, and other stakeholders illustrated in the diagram showing the theoretical underpinnings. For example, a student may demonstrate that she needs further training regarding impulse control during her work experience, and because communication from community members to staff and students is ongoing and repeated, their feedback would alter the program for that particular student to further develop this life skill. An example of the *forward* looping nature of the program design would occur when an elementary teacher is consulted to determine programmatic needs for an incoming student, which would help to establish the academic and life skills needs of the student at a later point in the timeline. Therefore, by creating a timeline following the construction of

the diagram illustrating the theory underlying the program design, the prototyping method highlighted other aspects of the program which would be required for a more successful program design, such as the need for feedback loops.

Lastly, because there were aspects of the program design that did not seem to be reflected in the timeline, a mock calendar for one month was drawn up to illustrate these. Here, program activities which would occur occasionally were indicated so that people providing feedback could imagine what a month in the life of the program might be like, and how it would vary from a more traditional program. Special events which support the theoretical underpinnings could also be indicated on the calendar. For example, a “Challenge Day” is included during the month, in which a student would bring a family member, friend, or community member with whom they wish to further build a relationship, and a unique challenge would be presented that the teams would need to complete within the day, such as a cooking, community service, or physical challenge. This would support the building of relationship through shared experiences element of the program. Other components of the program design illustrated include family counselling, work experience, field trips which contribute to relationship building as well as linking to life and work experience, and community dinners. Also, an element of communication back to the student’s elementary school is included as a monthly event, in order to maintain contact with the student’s referring teacher.

In summary, each element of the program designed by this process for youth at-risk in transition from elementary to secondary school reflects the unique needs of this population, and is directly tied to the philosophical underpinnings established through the empathizing and ideation stages of the design process. The prototypes produced represent both the theory behind the proposed program as well as potential ideas for its execution. Therefore, these represent a

starting point for gaining feedback in the final testing stage of the process, which would involve a variety of stakeholders in the program, such as students, elementary and secondary teachers, families and community members. After feedback is gained and reflected upon, the design would continue to evolve into a program that would better meet the needs of youth at-risk in transition to secondary school in order to increase their potential for educational success.

The Problem-solving Approach and the Design Thinking Approach: A Comparison

Although the problem-solving approach is more efficient, and one teacher or program designer is able to complete the process independently, the design thinking approach offers several benefits. Through personal interviews with the end-users and other stakeholders, as well as first-hand experience in the world of the users, the design thinking approach requires that program designers develop a deep understanding and emotional connection to the end-user and his/her experiences. Therefore, this approach requires that a programmatic decision or change be borne from empathy with the stakeholder(s) in the program, such that the designers need to develop “an understanding of both their emotional and their ‘rational’ needs and wants” (Liedtka & Ogilvie, 2011, p. 5). In this way, the potential solutions found via the design thinking process can be more specific to the needs and desires of an exact population than a solution created through the problem-solving approach.

The design thinking process also seeks to inspire, and to create something new and different from what currently exists, rather than making minor alterations to an existing program or decision. It represents the potential for substantive change because the process starts with the notion of possibility rather than of constraint (like the problem-solving process). It is a *non-linear* approach which focuses on learning about the *evolving* needs of the users rather than on finding the “correct” solution that will stand the test of time. Therefore, even the solution

continually evolves as more information comes to light, such that any decision is dynamic and the evolution of ideas is both expected and welcomed. Furthermore, this process actually seeks a variety of answers and diversity in its solutions to allow for continual evolution.

In addition, this non-linearity embraces messiness, similar to the learning process. One step in the process may lead forward, or it could require a detour if more information is uncovered. Although there is a process to be followed, the design thinking process welcomes ambiguity and uncertainty (Liedtka & Ogilvie, 2011), in that the design thinking structure requires unstructuring, destructuring, and giving up of control. Each step requires taking ideas apart or blending discrete concepts together, or a narrowing of focus after widening it in the previous step, much like one would gain insight into a microorganism's structure by alternating between a wide-angle and pinpointed view. This non-linearity seems an ideal fit for the educational context in which a general structure exists, but detours occur according to the needs of learners, and the very nature of learning itself is messy—no one route to learning material fits all students.

Another feature of the design process which is different than that of the problem-solving approach is that it is a more collaborative methodology. Not only does it engage multiple stakeholders, but it also *requires* a team of designers for decision-making (Riverdale Country School & IDEO, 2011), rather than one designer being responsible for determining a solution as found in the problem-solving process. By employing this team approach, a wider view of the problem as well as potential solutions is possible, and creativity in decision-making is enhanced. Furthermore, as collaboration between educators is increasingly encouraged, the design thinking method seems more appropriate to today's school climate.

As well as employing a multi-stakeholder approach to determining users' needs, the design thinking process continues to engage stakeholders throughout the design process to gain further insights. As a result, the final design will be more representative of the users' needs and wants than that created through a problem-solving approach because stakeholders are involved throughout the process, rather than only in the initial stages. In an educational context, the programmatic solution has the potential, then, to be more engaging for the student user because it better represents his/her needs. The student-user may also be more engaged by the programming because he/she feels ownership in the program as a result of involvement in the process; therefore, the design thinking process has greater potential for buy-in by the end users.

The purposes served by the end products created by the two processes also differ. In the design thinking process, once potential ideas are proposed in response to the understanding of the users' needs, physical prototypes of the idea are created and tested. That which is created in design thinking is not a finalized product; it is a suggestion which serves as a talking point for the stakeholders. In the case of the problem-solving model, the prototype might not be something physical with which stakeholders can interact, and it likely is a completed product. In design thinking, the prototype serves an important, yet *temporary* purpose—as a physical representation of an idea with which others can interact and therefore provide feedback and ask questions. The prototype, in this case, is not a final, end product, but simply another part of the process, unlike the terminal nature of the prototype in the problem-solving methodology. The design thinking process acknowledges that the “solution” that is found will constantly shift based upon the users, their circumstances, and the resources available to them, which is parallel to the continual shifting which occurs in the educational context, such as changes in students, funding, policies, and philosophies. Therefore, the dynamic and subjective nature of the

solutions found by the design process are more fitting with the educational context than the static ones determine by the more traditional problem solving process.

As is represented by the conception of the prototype, design thinking is cyclical and each stage of the process encourages re-consideration of and feedback to earlier steps. For example, the discussion of the prototype often leads to new understanding of the users' needs, so causes the design team to cycle back to an earlier stage of the process, and rework their thinking, only to prototype again. Again, this mimics education—as the needs of the student are illuminated, programmatic shifting occurs. Therefore, the design process seems well-suited to an educational context.

Unique to the design process, each stage does not need to be perfected before the next stage can be attempted, and prototyping can occur before all of the “facts” are known. For example, by creating and testing a prototype earlier than what would be considered in the problem- solving process, more timely feedback can be obtained from stakeholders participating in the process. Furthermore, because the prototyping yields feedback, and the process itself is cyclical, more feedback is obtained because several iterations of the prototype are constructed and discussed. As a result of these features, the design process has the potential to gain more timely feedback from stakeholders as well as a greater quantity and diversity of feedback, thus resulting in a final product that better reflects the needs of the end users.

The Suitability of Decision-making Processes for Programming for Youth At-risk in Transition from Elementary to Secondary School

Although the problem solving process is more time and resource efficient, the design thinking process better represents the needs of the end users, and is strongly compatible with educational programmatic change and development. In particular, this process is well-suited to

designing a program which supports youth at-risk in transition from elementary to secondary school in order to increase their chances of school success. Because students themselves could be included as either part of the design team, and in the interview phases (initially and following the development of the prototype), students may feel a greater sense of ownership of the program, and be more likely to participate fully in the program because they played a role in its creation. As a result of this increased participation, the students could experience greater school success. As well, the design team would have a greater understanding of the wants and needs of the student-users gained through the empathizing stage of the process. Therefore, the programmatic choices made will be more likely to reflect the *actual* needs and desires of the students, rather than simply those perceived or prescribed by a single teacher as would be found in the problem-solving process.

Furthermore, because other stakeholders in the education of students (such as parents, community members, administrators, and staff from the social services sector like therapists and police officers) could be invited to form part of the design team, they would be able to provide input to programmatic decisions that would provide a different perspective on youth perceived as being at-risk than that provided only by a teacher, as would occur in the problem-solving process. The prototypes that would be created and tested by this design team could potentially provide a broader curriculum and structure which is better suited to at-risk youth in transition because of its multi-disciplinary nature and broadened perspectives. As well, stakeholders involved in the decision-making process could serve as wrap-around supports for the at-risk population, further widening the support structures for the students and potentially enhancing their chances of educational success.

Rather than adapting an already existing program for this unique population, an entirely new program could be created which meets the needs of the *current* students. As the needs of the students change, this process also allows for a continual evolution of the program through repeated prototyping and feedback phases, thus increasing the potential for overall programmatic success because the program is continually created and re-created with the needs of the student-users as central in decision-making.

The very nature of at-risk students is constantly changing, and by definition, their lives are framed by uncertainty. As a result of the transition from elementary to secondary school, this uncertainty is further magnified by the destabilization caused by the transition. Therefore, because the design thinking process embraces and welcomes ambiguity, it seems a particularly fitting process to use in making programmatic decisions for this population. Because the characteristics of the design thinking process parallel the characteristics of at-risk learners in transition from elementary to secondary school, it is better suited to programmatic decision-making for this population than that provided by the problem-solving approach.

Conclusions: Using the Design Thinking Process in an Educational Context

Although the problem-solving approach to decision-making is commonly used in an educational context, the design thinking approach offers several advantages, and is well suited to this environment because of its humanistic approach and cyclical nature. This process also allows the educational decision-maker to develop small projects from big ideas, and helps to ensure that the needs of the end user (often students) are kept front of mind throughout the process.

However, several challenges exist in implementing this process in an educational context. Primarily, each phase is more time-consuming than those employed in the problem-solving

method. For example, selecting and interviewing a diverse group of people, reading relevant literature, and finding other methods to develop empathy may require more time than typical educators may have. Similarly, using a team approach can be challenging because of the busy nature of a school environment. If a particular design challenge suggests that non-educators (such as parents or community members) become members of the design team, then finding an appropriate time to meet might become even more challenging because of varying schedules.

In an educational environment, students should often form part of the design team because they will often be the end users of the design process. Because students are typically minors and teachers hold positions of authority over them, ethical issues may result. Although permission can be gained from a parent or guardian for a child to participate in a design process, a student may not be willing to fully divulge their thoughts and feelings on educational challenges because of the powerful relationship between student and teacher. Likewise, parents and guardians may also fear repercussions of sharing their opinions about education in terms of the educational opportunities provided to their child.

In the context of this particular example of a programming challenge, the design team should be comprised of the stakeholders who need to be involved in the support network of the student, including family and community members. However, many of the factors which impact at-risk youth are also factors which could prevent or deter family and community members from becoming part of the design process. For example, a single parent may not have time to participate, and a family member who feels uncomfortable in an educational setting due to his/her own past experiences or lack of educational attainment may also not choose to participate. Similarly, newly landed immigrants who face cultural and language barriers may also prefer not to participate. Nevertheless, these are the very people that *need* to be involved in

the design process in order to best reflect the needs of the students. Therefore, a methodology for attracting and retaining marginalized family and community members into an educational design process needs to be determined.

Despite the above shortcomings of the design process, there are many benefits to using this decision-making process in education. By eliciting opinions of stakeholders as well as searching relevant academic literature, and other non-conventional resources, this process incorporates a wide diversity of sources of information which could promote a deeper understanding of the needs of the end users.

The design thinking process also requires that decision-makers repeatedly widen their thinking and then narrow it. It demands conceptualizing and re-conceptualizing, and the organizing and reorganizing of ideas. Therefore, it prevents the decision-makers from making assumptions about a problem or fixating upon a solution before all aspects of the issue have been explored. This can provide deeper insights than by using the problem-solving method (which typically seeks to narrow in a linear fashion) because it causes team members to think about the problem from multiple perspectives, which could lead to a more creative and appropriate solution for the end users.

Education is a non-linear process which requires repeated feedback, re-working and re-designing with the needs of the students in mind. Design thinking offers a process through which educational decision-makers can empathize, interpret, ideate, and experiment with other stakeholders in order to design a program that best meets the needs of the users, whether they are students, teachers, or parents, and then encourage its continual evolution. In particular, this process is well-suited to programmatic decision-making for at-risk youth because it invites them into the process of developing a program to meet *their* unique needs, while being supported by

other educational stakeholders. This could further engage these students in their own education and result in a program in which at-risk youth could more easily transition to secondary school and have a greater potential for educational success.

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Appendix

Schematic diagram which structures the theoretical underpinnings of the program.

