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Curriculum Risk Management: Improving student outcomes with a system for risk exploration

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Abstract

This paper explores how a system for exploring risk can be used by decision-makers in the context of the public education system to improve student outcomes. This system, termed the Risk Exploration System ("RES"), is a lean, flexible framework with three main activities: exploration of risk, communication of risk, and organizational support. The author demonstrates how the different stakeholders could engage in each of these three activities.

Introduction

Purpose and Scope

The purpose of this report is to help decision-makers in the public education system better understand curriculum risk and curriculum risk management in order to improve student learning.

Key stakeholders

There are three broad stakeholder groups relevant to the topic of curriculum and curriculum risk management, referred to in this document as outsiders, decision-

makers, and students. Each group of stakeholders is affected directly or indirectly by the success of a curriculum and curriculum risk management. The specific stakeholders within each of the groups may change depending on the public education system.

The first stakeholder group exists outside of the public education system; the majority of their time is not spent in schools, thinking about schools, or engaging in affecting student learning. Parents of children in schools and the

broader general public fall within this stakeholder group. They are affected by curriculum inasmuch as children are affected by curriculum, and the future successes and failures of these children impact the lives of their parents and wider society.

The second stakeholder group exists within the public education system and has the capability and authority to make decisions that affect curriculum risk management activities. This includes a diverse array of individuals, such as: government officials, support staff, and administrators; school leaders (principals and vice-principals) and their support staff; teachers; and, resource staff such as speech-language pathologists, counsellors, and educational assistants. The decisions of these individuals have varying degrees of impact over a student's learning.

The third, final, and most important stakeholder group is the students in the system. While they have the power to make decisions that affect their own learning, they do not have the voice to make or influence decisions that would impact what is taught to them nor curriculum more widely. All risk management activities would ostensibly be oriented around this stakeholder group.

A Brief Foray into Risk as a Concept

Risk, as a concept, is a commonly understood term; however, this understanding can differ wildly between individuals and in different contexts. An

individual's understanding of risk is usually fairly established, although many have difficulty exactly articulating what risk means to them. In risk management activities, it is incredibly important to establish a universal understanding of risk for all individuals within a system, such as the public education system. Broadly speaking, risk can be defined as the likelihood that something good or bad, of uncertain impact, will happen.

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It is important to note that this definition of risk is focused on future outcomes and deals with uncertainty in both likelihood and impact. Without uncertainty, there is no risk – the future outcome would already be known. The level of risk is measured on a continuum, from insignificant to consequential and extremely positive to extremely negative desirability of potential outcomes. The term risk is often associated with negative outcomes; however, where there is risk, there is also potential for positive outcomes. Colloquially, this is expressed as no risk, "no reward."

From this definition of risk, risk management can be understood as the set of intentional activities performed to increase the likelihood and impact of positive outcomes and decrease the likelihood and impact of negative outcomes. Risk management is concerned with managing the trade-offs between the potential positive and negative outcomes, for it is virtually impossible to have all upside and no downside.

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Curriculum & Risk

Like the concept of risk, curriculum is a commonly used term, at least within the educational system. This system benefits when all stakeholders within it share a universal understanding of the term curriculum, similarly to the term risk. In order to more easily align the understanding of stakeholders – particularly those in the decision-maker group – curriculum will be defined here in the broadest possible terms.

Curriculum

Curriculum is defined here as what is being taught to students and how it is taught to said students. There are two dimensions of curriculum, the what and the how. The what dimension can be broken down further into two sub-dimensions, knowledge and skills. Knowledge refers to the subjects and content that are taught in classes. For example, algebra (content) is taught in a Grade 9 math class (subject). Knowledge of algebra concepts from this class form a foundation for further math learning and will also hopefully be useful to students in other subjects. Skills refers to the transferable skills that students learn in the education system. For example, students in a Grade 9 math class learning algebra are

also learning pattern-recognition and problem-solving skills. These skills will also be helpful in future math classes but translate well to other areas of a student's life in ways that are unconscious and intangible.

Curriculum is defined as what is taught to students and how it is taught.

The how dimension of curriculum includes teaching methodology, tools and resources used to facilitate learning (e.g. textbooks, computer programs), and the sequence in which knowledge and skills are taught. In the Grade 9 math class scenario, the how dimension would include the subjects taught in Grade 8, the teaching methods used in class, and the deliverables used to reinforce and test concepts.

Some decision-makers may argue that curriculum can only include the what dimension, and the how is something else entirely. In theory this may be helpful, but in practice it is impossible to separate the what and the how; they exist together, each influencing the other in subtle ways. The nature of the what and the how for a Grade 7 social studies class is explored here in an attempt to demonstrate this relationship.

The education system's organizing body (i.e. the school board) has set a curriculum for the students, and as part of their curriculum, they assign a textbook and provide one to each member of the class, including the teacher. Already, we can see a synthesis of the what (social studies) and the how

(textbook) of curriculum being considered together.

This point can be further demonstrated by considering the actions of two Grade 7 teachers at different schools. The first teacher, Ms. Logan, decides to take a very systematic approach to instruction. Over the course of the year she works through the chapters in sequence, lecturing to students in class and testing their knowledge with periodic quizzes and projects. The second teacher, Mr. Reyman, takes a decidedly different approach. Each class begins with a discussion of the concepts covered in the previous class and ends with a brief lecture and group work. Students are tested with small, bite-size writing assignments and three big exams throughout the year.

At the end of the school year, both teachers have taught the entire textbook. However, students learned that same textbook in very different ways, and consequently will not bring forward the same knowledge set and skill set into their Grade 8 class. The what of curriculum, set by the organizing body, changed as it was passed through the filter of how it was taught.

Risk

Curriculum Risk

Understanding the goal of a curriculum (what and how) is an important part of the process to define curriculum risk. By understanding the goal of curriculum, we can understand what constitutes a positive outcome and a negative outcome of

curriculum. As the broad definition of risk is focused strongly on potential outcomes, a definition for curriculum risk will take shape.

So what is the goal of curriculum? It may be tempting to think of the goal of curriculum as 'teaching a specific set of concepts', perhaps with a qualifier such as 'as effectively as possible'. Curriculum, as defined as 'what and how students are being taught', certainly emphasizes teaching. However, teaching is not the goal; rather, it is simply a means to an end, that end being student learning. Therefore, the goal of curriculum is best defined as students learning the knowledge set and skill set that they need, now and throughout their life.

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The most extreme positive scenario as a result of the pursuit of this goal is that all students learn all the knowledge and skills that they need. Conversely, the most extreme negative scenario would be that no student learns any of the knowledge and skills that they need. Risk is the likelihood of the outcome of curriculum, its magnitude, and when considered in the context of the established goal of curriculum, the outcome of curriculum is student learning and the magnitude would be the degree to which students learn. Therefore, curriculum risk is defined as the degree to which students learn the

knowledge set and skill set they need, now and throughout their life.

Curriculum risk is the degree to which students learn the knowledge set and skill set that they need.

By this definition, curriculum risk has a high degree of complexity, as the outcome of a student's time in school is dependent on innumerable, interdependent and interrelated factors such as teaching methodology, learning environment, class size, and individual wellness. The influence of these factors on students' learning will also be highly variable across the student population, and across time. Decision-makers must recognize the school environment as a complex system and understand that when managing risk, no solution is a one-size-fits-all solution.

Curriculum Risk Management

Combining the broad definition of risk management with the definition of curriculum risk, curriculum risk management can be defined as the management of students' learning. Curriculum risk management is focused on student learning, not teaching. This is different than the perspective of a curriculum, which is focused on the what and the how of teaching. Consequently, effective curriculum risk management must expand beyond the what and the how of teaching to include the implementation of curriculum and students' capacity to learn.

Curriculum risk management is the management of student learning.

The manner and proficiency in which a curriculum is implemented can affect the amount that students learn through the effectiveness of teachers' time in classrooms, and the coordination of teachers across subjects and grades. Implementation refers to the entire lifespan of a curriculum, from the initial design phase to teaching in schools and ending with its termination and replacement. As such, implementation includes assessment of students learning with tests, projects, and homework, and is frequently used as a proxy for curriculum success. The decision-maker stakeholder group is responsible for successful implementation, directed by the organizing body of the education system.

The final dimension, capacity, is just as important as the first three dimensions but is the one most separated from curriculum as it is commonly understood. Everything about a curriculum could be perfectly aligned to maximize student learning – the implementation was thorough, the subject matter is relevant, the teaching methods are evidence-based, and teacher support is abundant – but many students will not learn due to a lack of capacity. A student may be hungry, and therefore unable to focus on school and retain the knowledge presented and incorporate any new skills. Their home life could be filled with abuse and neglect, causing the student to lash out and ignore direction at school. The organizing body is responsible for coordinating the individuals and services

that can support student learning by increasing their capacity to learn.

Curriculum & Risk Management Frameworks

A Brief Foray into Risk Management Frameworks

Risk management frameworks are process tools that provide a structure and flow for risk management. In general, a risk management framework includes risk identification, risk management activities, measurement, and some form of feedback for refinement or development. Frameworks tend to be very process oriented, with a clear flow of how activities should occur. They usually approach risk management as a cyclical or iterative activity, without end. As a tool, frameworks tend to be ambiguous, and are designed to be applied to any industry and any context in which risk management might be pursued.

Frameworks have begun to grow in popularity among organization's looking to establish risk management activities or improve current initiatives. Among the most popular frameworks is the International Standards Organization's ("ISO") 31000 framework and the Committee of Sponsoring Organizations of the Treadway Commission's ("COSO") framework. These two frameworks have evolved recently as the upsides and downsides of risk management have become more well understood.

A Framework for Curriculum Risk Management

Within the context of curriculum risk management, the primary goal of a risk management framework aligns exactly with the goal of curriculum risk management – improve student learning. There are, however, additional goals of any framework that relate more closely to the implementation of curriculum, such as: establishing guiding principles and a structure for communication throughout the education system; establishing checkpoints that guide stakeholders in their risk management activities; and, outlining measurement activities and setting standards for success. Before considering potential frameworks for curriculum risk management, it is necessary to first think of the required elements that a framework needs to be successful within this context. Two framework requirements, simplicity and flexibility, have been identified as important drivers of success.

Simplicity in frameworks is important for two reasons. First, stakeholders throughout the education system need to be able to make sense of the framework and consequently make decisions based on the details within. Complicated frameworks are more difficult to use given the increased learning requirement. Second, a simple framework requires less administration effort to support successful implementation than a complicated framework. Stakeholders working within the education system already are extremely pressed for time, and low administration requirements are therefore quite valuable.

Flexibility in a framework is a necessary criterion as no two schools can be treated as the same; teacher dynamics, the needs of students, location, resources, etc. can vary across institutions and can all affect the success of risk management activities. Therefore, administrators and teachers should be able to adopt a framework in a way that works best for them while maintaining the shared goal of achieving positive student learning outcomes. With increased flexibility comes increased variance across schools, but this is a trade-off worth accepting; low flexibility will provoke pushback and change how a curriculum is adopted, just in a different way.

Recommendation

It is not recommended that stakeholders who are looking to engage in curriculum risk management implement a risk management framework. Instead, they should look to put into action a risk exploration system, or RES. A risk management framework does not satisfy the necessary requirements for stakeholders in the public education system nor does it adequately address the complex nature of curriculum risk management and student learning. Additionally, there is a non-zero probability that the administration of the risk management framework becomes more of a burden and focus than the actual management.

A RES has many of the same qualities of a risk management framework, but it is much

more simple, flexible, and accommodating to the limited capacity of the decision-making stakeholder group. Furthermore, it heavily emphasizes discovering the risk drivers that are affecting student learning instead of attempting to solve student learning with only a surface-level understanding. A system of risk exploration would empower stakeholders to make decisions at the source based on their own experiences and abilities rather than through a set process or procedure. They can also make decisions based on their specific context, whether it be a school (administrator), classroom (teacher), or individual student (teachers and resource staff), with a mindset and culture that translates throughout the system.

A System of Risk Exploration

Overview

There are three major components of the RES: Exploration, Communication, and Organization. Exploration is the main component, and it acts to guide key stakeholders' exploration of factors and conditions that affect student outcomes, positively or negatively. It is based on the Socratic questioning approach to teaching and is very agile, in the sense that it can be applied very formally or informally. The RES does not have an explicit monitoring and measurement system, as this should be covered in exploration if done effectively.

The secondary Communication and Organization components are very much interrelated, and if functioning correctly, would be perceived to be a single, large

component. The Communication component of the risk exploration system enables the transfer of information among the system's key stakeholders. Exploration of risks can never be effective if knowledge of risk drivers and tools that affect risk are not communicated to the individuals for whom that knowledge has the greatest relevance. The Organization component enables Communication, providing the channels through which information can move. This component also holds all the economic resources in the system and holds final decision-making authority.

Risk Exploration System

Exploration

The principal goal of the Exploration component of the RES is to identify the principal drivers of student learning, whether for positive outcomes or negative outcomes. Decision-makers are encouraged to explore why students are or are not learning the knowledge or skills that they need and acting on the discoveries they make. This exploration would be done in the format of the Socratic method, which starts with a single question, and each answer followed by another

question of 'Why?'. The first question that decision-makers need to ask in risk exploration is 'Are my students learning what they need?'

There are three answers to this initial question: 'yes', 'no', and 'why'. Due to the complex nature of student learning, all three answers of the potential will always be valid, for various reasons. In fact, if decision-makers want to engage in effective risk exploration, they must consider why students are learning what they need, why they are not, and in what ways they cannot answer this question.

Once the initial question has been asked, and answered, decision-makers must then ask 'why?' and continue asking 'why?' until they come across a potential root source of the risk. At this point, decision-makers can act on this information to improve student learning, whether for the collective or an individual. The action taken should depend entirely upon the potential cause identified and the context of the decision-maker and student(s).

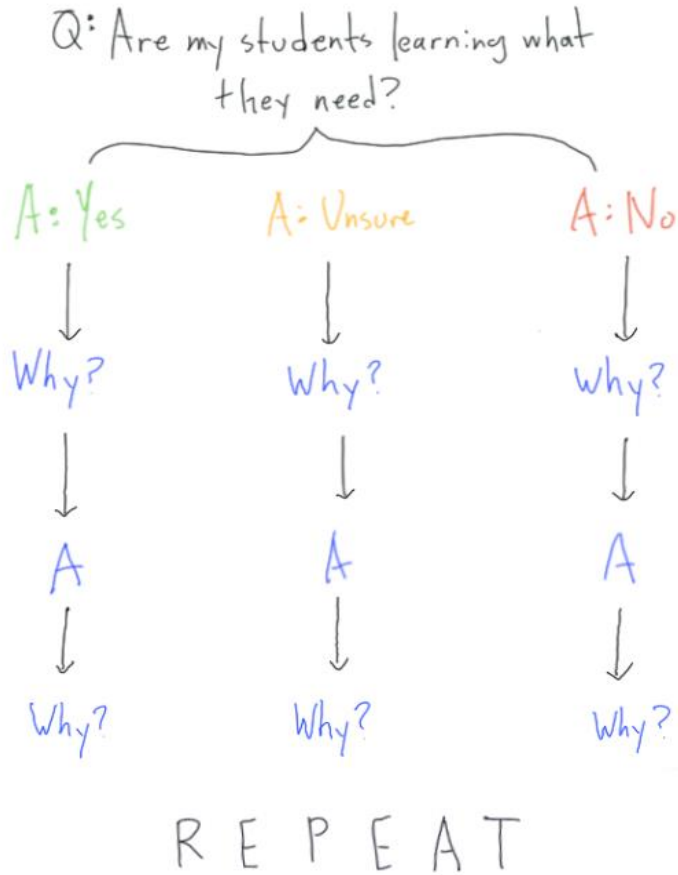


Figure 1: Risk Exploration

This method for risk exploration is very flexible and can be adjusted and reformatted depending on the context. Some examples:

- a. A teacher might recognize that a student in their class is having a particularly hard time keeping up with the material, and start exploring why that is the case;
- b. Another teacher might ask this question after a midterm exam and explore why some students performed well and others not, and in what ways is she unsure if students learned the material that they need to know;

c. A student administrator might look at their school's showing on standardized tests and begin exploring why some students performed well and others did not, and whether or not the standardized test is an accurate reflection of students' learning; or,

d. A government official within the organizing body may ask if the subjects that students are learning are relevant to where society is headed.

Key stakeholders may find it useful to consider risk drivers when engaging in risk exploration. A sample set of risk drivers is presented below, but it is not recommended that these drivers be

adapted by an educational system. Rather, they should be discovered and recorded over time, to ensure that the risk drivers accurately reflect the educational system's context. It is important to note that while drivers are presented as belonging to a

single dimension of curriculum risk management, there is a lot of crossover among dimensions.

Table 1: Examples of Risk Drivers

Dimension	Driver
What	<ul style="list-style-type: none"> ● Subject matter relevance ● Class content ● Skills learned ● Stakeholder consultation
How	<ul style="list-style-type: none"> ● Teacher ability ● Teacher knowledge ● Teacher's physical / mental well-being ● Instruction methodology ● Sequence of subjects
Implementation	<ul style="list-style-type: none"> ● Communication mechanisms ● Support to instructors ● Available resources ● Stakeholder consultation ● Adequacy of assessment tools ● Scope of assessment tools
Capacity	<ul style="list-style-type: none"> ● School / class environment ● Home environment ● Student's physical / mental well-being ● Student's prior knowledge ● Amount of additional resources ● Learning disabilities

Communication

When exploring risk drivers, decision-makers may want or need to communicate with others for several reasons. For example, they may need additional support

to enact change or not have the authority to make the change they believe needs to be made. They may also simply want to share their experiences and knowledge with others who they expect will come

across a similar scenario. To effectively improve the learning of the collective student body (i.e. manage curriculum risk),

all the decision-makers within the system need to have a way to communicate with each other.

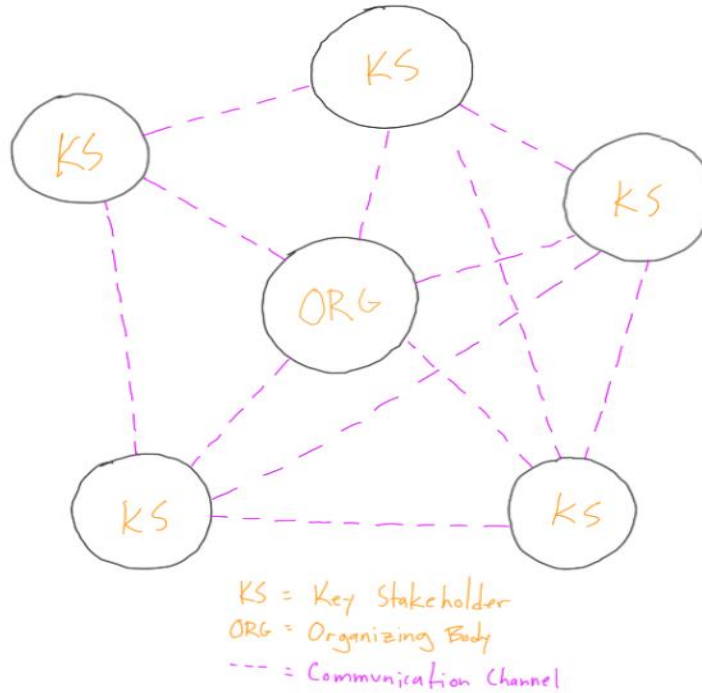


Figure 2: Communication Component

The RES does not identify which methods of communication are best, but it does identify the criteria for effective communication. First, all stakeholders must agree upon the methods of communication, and in which contexts they will be used. By doing so, stakeholders maintain the importance of the agreed-upon channels. It is important to maintain only communication channels that add value, for when they proliferate their importance dilutes. Second, communication channels must be set up so that communications are monitored and responded to. If a stakeholder group finds that they are not heard or responded to through a particular channel, this discourages continued use of

the RES. Third, communication must be supported by the Organization component of the RES. For example, some channels of communication (e.g. conferences) require significant effort to implement and maintain, and would not succeed without support. Other channels may require enforcement by decision-makers in the Organization component to ensure that voices are heard.

Not all stakeholders within the system will have to communicate with each other one-to-one, so channels directly between each stakeholder do not have to be established. However, each stakeholder should be able to communicate in some form with the

organizing body, who can relay messages if needed.

Organization

The Organization component of the RES is driven by the actions of the organizing body. They are the decision-making authority of the entire system and it is therefore their responsibility to ensure successful implementation and usage of the RES. Primary responsibilities specific to successful implementation of the RES include supporting communication channels between stakeholders (including themselves) using the discoveries found through risk exploration to improve student learning (i.e. manage curriculum risk).

The organizing body may wish to create risk management tools or reference documents to support implementation of the RES. These tools can be used as platforms for understanding and communicating risk, risk management and risk drivers. For example, a RES reference

document could be used to educate stakeholders on how to engage in risk exploration, and where to go for support should they need it. Another recommended tool for RES implementation and risk exploration is a risk dashboard.

Risk dashboards are a visual representation of the estimated likelihood and impact of the ten or fifteen most relevant risk drivers (see Figure 3). Typically, each risk driver is assessed on a simple five- or ten-point scale placed on a two-axis grid. Varying the size of the risk driver on the grid is used to communicate uncertainty; large circles represent risk drivers where the assessment of likelihood or magnitude is uncertain. Risk dashboards should be created by a large, diverse team to reduce the impact of groupthink and individual subjectivity. Once completed, a risk dashboard can be communicated to all stakeholders so that there is a common understanding of risk drivers and their significance. Dashboards should be updated on a periodic basis.

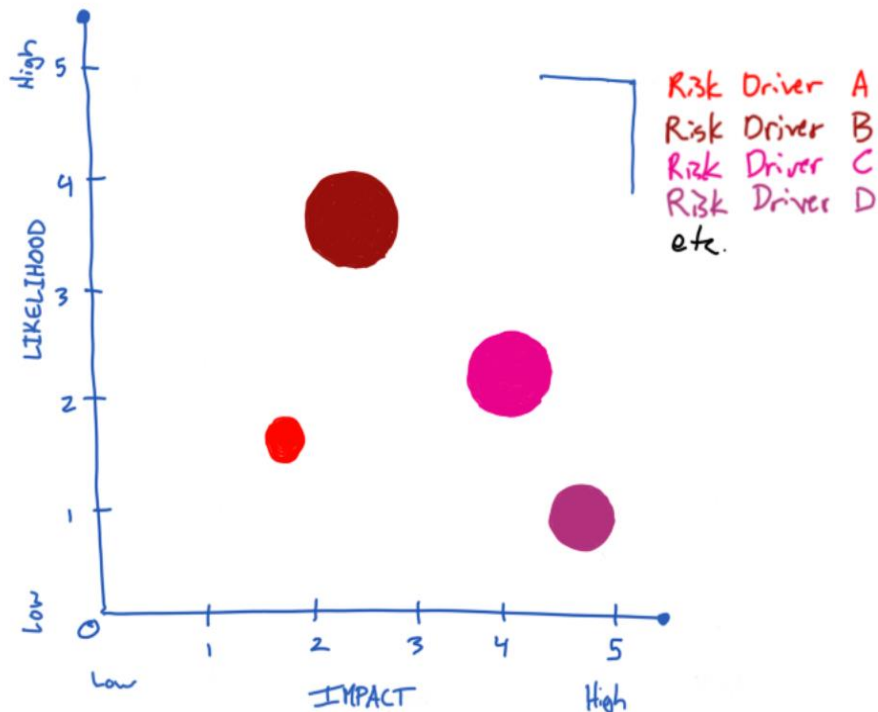


Figure 3: Risk Dashboard Example

While the organizing body has massive influence on the what and how of curriculum, the Organization component of the RES is the smallest of the three. It does not direct how the organizing body should be structured, should function, or what activities it should pursue for its general mandate. Rather, it is only focused on making sure the RES receives the minimal amount of support necessary to operate. Once the RES has been well established, the Organization component will be essentially integrated into the organizing body's general operations.

Conclusion

Curriculum risk, or student learning, can be effectively managed in an education system with a risk exploration system, or RES. It is simple, flexible, and accommodating of

complexity and allows the educational system to identify both problems and solutions at their root and quickly make changes. This allows the educational system to achieve the ultimate goal of their curriculum – students learning the knowledge set and skill set they need, now and in the future.