BUYING INTO LEARNING OUTCOMES

Educational Technology Procurement Policy and Practice in Canada

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Preface:

The Information and Communications Technology Council (ICTC) is a not-for-profit, national centre of expertise for strengthening Canada's digital advantage in a global economy. Through trusted research, practical policy advice, and creative capacity building programs, ICTC fosters globally competitive Canadian industries enabled by innovative and diverse digital talent. In partnership with an expansive network of industry leaders, academic partners, and policy makers from across Canada, ICTC has empowered a robust and inclusive digital economy for over 30 years.

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Abstract:

The number of educational technology or "edtech" purchases that kindergarten to grade 12 (K to 12) schools need to make is growing. Edtech procurement is a complex process that involves identifying a need, researching what the market can provide, selecting a solution, and making a purchase. It may take the form of an informal pilot or trial, direct purchase from a single vendor, or competitive bidding process, such as a request for information (RFI), request for quotations (RFQ), or request for proposals (RFP). Across Canada, provincial, territorial, and regional governments are implementing new processes and policies to ensure effective edtech procurement. At the same time, the growing number of technology purchases is creating new challenges for government and board procurement teams. This study provides an in-depth look at edtech procurement policies and practices across Canada, highlighting commonalities, differences (such as centralized, decentralized, and divisional procurement), challenges, and strengths. It looks at innovative approaches to budgeting, staying on top of the market, procurement, assessment and decision-making, and implementation and process management. It concludes with a policy roadmap for improving edtech procurement in Canada, which suggests striking a balance between centralized, decentralized, and divisional procurement, enabling more collaboration between procurement stakeholders from different regions, and giving procurement teams more time to standardize and systematize their processes.

Key terms: Educational Technology (Edtech), Procurement, Canada, Technology, Education

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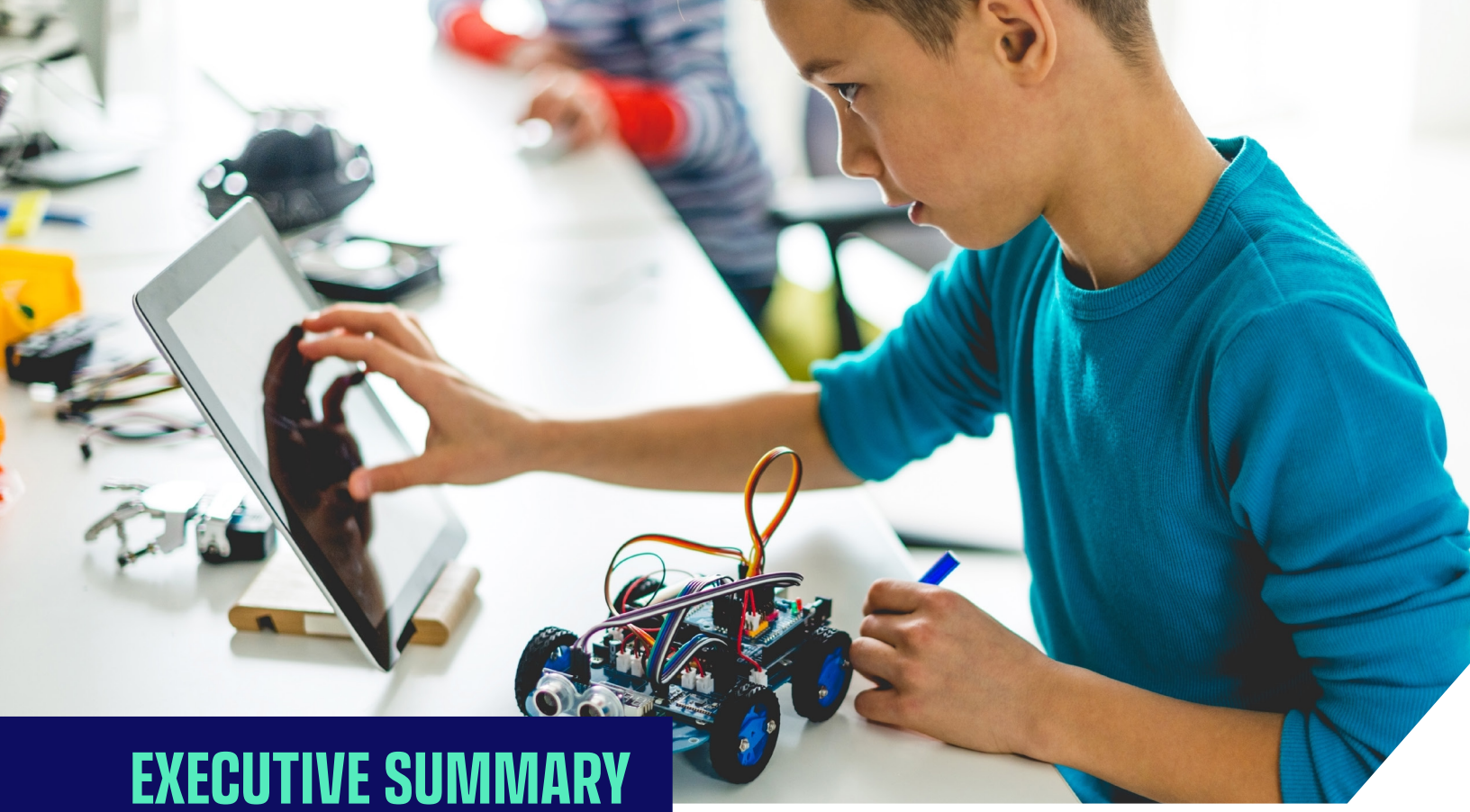

EXECUTIVE SUMMARY

Education, like many other sectors today, is supported by a growing number of technology devices, software programs, and other tools. Educational technology (or "edtech"), broadly defined as any technology that facilitates learning, is now a regular procurement need, listed alongside janitorial services, transportation, and school supplies. Before technology gets into the hands of a student or teacher or supports learning outcomes, it must be procured—a process that involves identifying a need, researching what the market can provide, selecting a solution, and making a purchase. It may be an informal pilot or trial, a direct purchase involving a single vendor, or a competitive bidding process, such as a request for information (RFI), request for quotations (RFQ), or request for proposals (RFP).

In Canada, the procurement process for education technology varies by province and territory, and often, between school districts and schools. In summary, this study finds that edtech procurement differs by region in the following ways:

Educational organizations involve a variety of public sector professionals and stakeholders outside of governments and the school system in procurement. Often, the number and types of individuals involved in procurement is mediated by a region, district, or school's financial resources and the budget made available to procurement teams. For example, while some districts have specialized funding earmarked for engaging end users, such as teachers, principals, and students, others do not.

In terms of public sector professionals, interviewees in this study highlighted the following roles as being involved in edtech procurement: directors of technology, procurement and purchasing professionals, librarians and other specialized education coordinators, education technology and information technology specialists, advisory committees and boards, principals and senior administrators, teachers, and representatives from provincial, territorial, and federal governments. In terms of stakeholders outside of governments and the school system, interviewees in this study referenced vendors, not-for-profits and charities, third-party researchers and policymakers, and parents and the public.

Edtech procurement in the provinces and territories takes place at either the provincial or territorial, district, or school level, and this varies by region. In this study, these three approaches to procurement are called centralized, divisional, and decentralized purchasing. In a centralized purchasing system, the end user of an edtech solution is not the buyer; instead, edtech purchases are made on behalf of end users by a centralized resource at the provincial or territorial level, such as a shared services IT or procurement department. Similarly, in a divisional purchasing system, edtech solutions are purchased on behalf of end users by a centralized resource at the district or board level, such as an IT or procurement team. Finally, in a decentralized purchasing system, procurement is led by individual schools, principals, or even teachers. While there are some exceptions, edtech procurement in Canada is mainly centralized or divisional: PEI and NU procure edtech through a centralized department while ON, QC, BC, AB, MB, SK, NB, NL, and NWT procure edtech through divisional purchasing teams. YK and NS meanwhile, use a mix of both.

All three approaches to procurement have benefits and challenges. Centralized and divisional procurement allow for standardized procurement processes (e.g., privacy impact assessments), economies of scale, and reduce the costs associated with procurement. Further, having technology purchases pass through a centrally located administrator can help districts keep track of their purchases and avoid duplicate tenders. At the same time, centralized procurement can create red tape, limiting the ability of boards and schools to quickly respond to new procurement needs as they arise. This is particularly relevant in edtech purchasing, as some technologies may fail or become obsolete at a faster rate than other learning materials. Centralized procurement can also reduce the involvement of end users in the procurement process, lead to the overemphasis of efficiency and cost-related needs, and lead to procurement teams that are not familiar with the education system's technology needs. Conversely, decentralized procurement can empower schools to respond quickly to procurement needs and make purchases that are tailored to local contexts. Decentralized procurement is also said to encourage greater acceptance of tech purchases by end users, and in turn, better adoption rates. In terms of challenges, decentralized procurement can lead to duplicate

purchases or purchases that do not integrate well with a school's existing technology infrastructure. Due to a lack of specialization and standardization, it can also increase risks related to data privacy and security. For example, because decentralization relies on school-level personnel, it may be difficult for schools to fund and maintain a position for a staff member who understands tech interoperability, privacy and security, and the fast-changing nature of edtech offerings.

Budgets for education technology procurement are diverse and complex. While some regions provide funding on a per-student basis, others establish a standalone budget to fund new technology purchases. Further, not all regions tie their technology budgets to inflation, which leaves some schools more severely impacted by technology-related supply chain disruptions. Irrespective of their budget structure, schools and school districts can tap into a variety of funding pools when procuring technology: for example, a school district could mix provincial and federal funding sources, supplement existing funding with a school-run fundraiser, or apply for a charity or private sector grant. Fundraising for technology in schools has been shown to occur unevenly across Canada, with schools in high-income neighbourhoods more likely to raise additional funds. Several interviewees in this study stressed the importance of private sector grants in overcoming budget constraints, particularly during the current economic climate. In addition to grants, private sector partners can provide devices like laptops or tablets and assistance developing and delivering curricula, such as cybersecurity or software development modules.

While some regions are better suited to centralized, divisional, or decentralized procurement based on their local contexts, there are numerous strategies for improving procurement outcomes across these types of systems. In decentralized and divisional systems, provinces, territories, and school districts can implement the following strategies to improve procurement outcomes: opt-in group purchasing organizations, collaborative purchasing, capacity building at the board or school level, and standardization tools. In divisional and centralized systems, school boards and districts may also choose to promote collaboration by engaging with end users and other community groups throughout the procurement process, or by building multidisciplinary procurement teams. For instance, in the context of edtech, a multidisciplinary procurement team could include individuals who specialize in pedagogy, curriculum, technology, accessibility, cybersecurity, privacy, interoperability relevance for Indigenous students, digital equity, and diversity and inclusion.

In addition to these broad strategies, education technology and procurement stakeholders can take many small steps to ensure they purchase the best technology for their classrooms and schools.

These small steps are dispersed throughout the procurement process, from their efforts to stay on top of the market, to the point when they launch a procurement process, to assessment and decision-making, and finally, implementation and process management.

Staying on top of the market. While procurement officers can learn about new solutions through a formal RFI, much of their product discovery work happens outside of formal procurement processes. Procurement stakeholders may learn about edtech solutions from end users, from their counterparts in other districts or schools, via their own research, or via cold calls with vendors. In the United States, it is also common for procurement stakeholders to learn about new products at edtech conferences. Edtech conferences in Canada exist, but they often target only certain stakeholders (e.g., academics or senior personnel like CTOs), and may charge high admission fees. Interviewees were not aware of an accessible, multisector conference where they could learn about technologies and learning outcomes research. Some strategies to improve product discovery include:

- Joint training and professional development programs, such as the Apple Distinguished Educators program, which connect individuals from the education sector who are interested in learning more about edtech solutions with stakeholders in the tech sector.

- Educational technology events, such as conferences, are another useful way to build connections between public and private sector professionals, particularly when they involve educators, procurement specialists, technologists, learning outcomes researchers, and the private sector.

- Sandboxes, such as the Digital promise Content and Data Exchange, which provide a low-pressure environment for experimentation with new edtech solutions. Sandboxes can provide educators with hands-on experience using a technology prior to purchasing and can be used by IT teams to test a solution's ability to integrate with existing technology environments.

Launching a procurement process. Once a procurement team decides it wants to procure a particular edtech solution, they must decide which type of procurement process to follow (e.g., a direct purchase, invited competitive process, or open competitive process) and define the scope of work (e.g., the description of the desired product or service that will guide the procurement team). A clearly defined scope of work that clearly articulates the needs of end

users is one way to ensure the procurement process goes well. Challenge-based procurement (which relies on an explanation of the problem or challenge that procurement teams are trying to solve, in place of a detailed description of the desired product) can help procurement teams better articulate their needs when procuring very new or unfamiliar solutions. Alternatively, procurement teams may face challenges if they use an RFP when an RFI is more appropriate, fail to obtain stakeholder alignment, miss key requirements in their scope of work or include unnecessary requirements, fail to dictate the pricing structure, or do not establish an effective way to assess solutions and their prices.

Assessment and decision-making. There are countless factors to consider when assessing an edtech solution: alignment with local curriculum, interoperability and integration with existing IT infrastructure, ease of use for educators and students, etc. Undoubtedly, choosing the right solution for a specific school or district is a difficult task, but a number of strategies can be used to improve assessment and decision-making by procurement teams:

- Reviewing existing research about edtech solutions, their learning outcomes, and educational priorities like accessibility
- Making decisions collaboratively with other departments and end users
- Using proof-of-concepts or walk-throughs to ensure a product is suitable and compatible with existing IT systems
- Using pilots or trials to gauge interest among end users and obtain feedback
- Treating assessment as a constant, iterative process

Unfortunately, there is often a lack of empirical evidence for edtech learning outcomes. In the U.S., there have been efforts to develop policies that require research and evidence of positive learning outcomes for schools to access funding for new solutions. While these resources (such as What Works Clearinghouse, Evidence for Every Student Succeeds Act [ESSA], and Regional Educational Laboratories) make evaluation more accessible, there are criticized for extending timeliness for updates and for requiring administrators to develop the expertise to thoroughly evaluate studies provided by edtech companies.

Given the range of stakeholders in edtech procurement (whether teachers, administrators, IT support staff or others), there is a clear need for collaboration in the decision-making process. The engagement of end users and multidisciplinary teams in assessment and decision-making can be done in many ways. This could involve establishing basic forms or chats to solicit suggestions before the process is passed to IT or procurement teams for

further consideration. Other districts created multidisciplinary teams with representatives from curriculum development, IT, finance, and procurement. In larger districts, there may be a centrally assigned teacher working as a lead with their corporate team on a full-time basis to provide input on procurement decisions. Ensuring user engagement in the decision-making process can take time and cost money but invaluably improves procurement outcomes. Failing to involve educators in the decision-making process often leads to purchases that do not meet classroom needs. Furthermore, not engaging teachers during the procurement process can lead to low buy-in after implementation.

Implementation and process management. On the tail end of the procurement process, vendors, IT teams, procurement professionals, and end users work together to implement new solutions and develop processes around their use. This period of implementation and process management is highly impacted by prior procurement decisions, such as whether to include end users in product discovery, defining the scope of work, or assessment and decision-making. Many edtech solutions are met with poor adoption by end users, but generally, educators are more likely to adopt a solution when it solves a clear problem in their classroom, makes teaching more enjoyable, and does not require an extensive change to their personal teaching methods. Additionally, schools and districts can encourage more successful implementation by including a large enough professional development budget in their technology purchases, and by hiring technology integration specialists to work with educators and other school staff and find out what implementation supports they need. Alternatively, adoption rates may be negatively impacted by "top-down" implementation strategies, such as mandates.

One of the core weaknesses and threats and central to nearly all discussions on edtech procurement is budget and resourcing.

While there are many useful strategies to improve procurement outcomes, not all districts apply the same strategies and best practices when purchasing edtech solutions. In part, this is because these strategies require well-resourced procurement budgets and teams, and not all districts receive the same level of funding. Beyond more funding for edtech procurement and personnel, the following measures constitute a policy roadmap for improving edtech procurement in Canada:

1. **Where possible, strike a balance between centralized, decentralized, and divisional procurement.** While some regions may be better suited to centralized, decentralized, or divisional procurement, it is important to strike a balance between these approaches and take steps to minimize their drawbacks.

2. **Enable more collaboration between procurement stakeholders from different regions—for instance, enable more collaborative purchasing by districts from different provinces or territories but with similar contexts and procurement needs.** Procurement stakeholders in Canada need more opportunities to meet, share best practices, and discover or vet solutions. This applies to both the public and private sector, and to individuals directly involved in procurement who do not normally engage with other governments, districts, or schools. More collaboration between the public and private sector can help districts overcome budget challenges and deliver high-tech curricula, such as cybersecurity modules.

3. **Give people working in procurement more time to standardize and systematize their processes, creating improved cost savings and educational outcomes in the long run.** Procurement teams need more time and staffing to create systems that will help them keep up with edtech procurement needs now and in the future. Examples include formal teacher feedback programs and automatic usage data; standardized processes for teacher requests; inventories of existing solutions and warranties; privacy, accessibility, or diversity clauses; time to research the learning impacts of edtech solutions; and time and funding for more technology-related professional development.

4. **Adopt a total cost of ownership approach in procurement decision-making.** The true price of a technology solution includes training and professional development for user (often educators), repairs, privacy, security, and considerations like warranty, interoperability, and obsolescence. Point number three (giving procurement staff more time to standardize and systematize their processes) supports decisions made based on total cost of ownership.

Ultimately, however, many districts are experiencing staff reductions and/or stagnant funding in an era of inflation and expanded e-learning. While all of the ways forward posited in this section may help edtech stakeholders improve outcomes in their schools, only so much can be done without additional funding and staff to support technology procurement and integration across jurisdictions in Canada.

BACKGROUND

Education looks very different today than it did 20 years ago; yet for many of us, the education system stopped evolving the minute we graduated school. Depending on when that was, it could very well be that our enduring understanding of education is one where students do not have access to iPads or Chromebooks, course work is not managed using a learning management system, parent-teacher interviewees are not done via video call, and coding is not part of the core curriculum. For many educators and administrators, however, the reality is that for the past 20 years they have been adopting wave after wave of new technology, leading to schools and classrooms that is very technologically enabled.

Today, spending on education technology is significant. The global edtech market has been estimated to be as large as $237.6B (USD) in 2021 and is expected to grow at a compound annual growth rate of 17.3% until 2030.[1] In the United States, edtech spending is estimated to be about US $36 billion dollars per year.[2] While there is no technology-specific estimate for Canada, in 2018–19, capital spending on all goods and services accounted for about 9% of education spending, totalling $6.5 billion that year.[3] In the four years prior, capital spending increased at a faster rate than

[1] "Education Technology Market Is Expected to Reach $998.4 Billion by 2030, says P&S Intelligence," PRNewswire, Apr 18, 2022: Education Technology Market Is Expected To Reach $998.4 Billion by 2030, says P&S Intelligence (prnewswire.com)
[2] "Overview: U.S. K-12 Public Education Technology Spending," Edtech Evidence Exchange, March 2021: https://docs.google.com/presentation/d/1Fc_Q5yp-DFHM6f7A-czFhdFhAKLnjnT1WtmPuPjBmRk/edit#slide=id.p1,
[3] Paige Macpherson, Joel Emes, and Nathaniel Li, "Education Spending in Public Schools in Canada Fall 2021," *Fraser Institute,* 2021, https://www.fraserinstitute.org/sites/default/files/education-spending-in-public-schools-in-canada-fall-2021.pdf

any other type of education spending, including employee wages, salaries, benefits, and pensions.[4] Most recently, in 2020, schools across Canada moved online in response to the COVID-19 pandemic, leading to a rapid increase in education technology budgets.

As spending on education technology grows, schools, school districts, and provincial and territorial governments across Canada are implementing new processes to procure technology effectively. The education technology procurement landscape in Canada is diverse: some districts have full-fledged information technology (IT) departments that co-lead technology purchases with procurement teams, while others have a single IT lead or outsourced advisor for procurement staff to consult. Similarly, there are stark differences in the way procurement is structured in each province and territory—whether it is centralized at the provincial or territorial level or decentralized and in the hands of districts or schools—and in the way districts approach market intelligence, vendor assessment, user feedback and engagement, and the use of pilots and trials.

This study investigates the current status of tech procurement policy in K-12 school systems across Canada and identifies best practices and challenges. It primarily draws from semi-structured interviews with procurement-related personnel, as well as a public and private sector policy roundtable. Section I provides an introduction to education technology procurement, including what types of technology schools purchase, who in education is involved in technology purchases, and the benefits and challenges associated with centralized, decentralized, and divisional procurement. Section II looks at each stage of the procurement process in greater detail. It highlights various approaches to staying on top of the edtech market, launching a procurement process, assessing vendors and making procurement decisions, and implementation and process management. Finally, Section III assesses strengths, weaknesses, opportunities, and threats in Canadian edtech procurement from the perspectives of the public and private sectors, before turning to a set of strategies for enhancing K-12 edtech procurement.

[4] Paige Macpherson, Joel Emes, and Nathaniel Li, "Education Spending in Public Schools in Canada Fall 2021," *Fraser Institute,* 2021, https://www.fraserinstitute.org/sites/default/files/education-spending-in-public-schools-in-canada-fall-2021.pdf

SECTION I

INTRODUCTION TO EDTECH PROCUREMENT

Before an edtech solution can get into the hands of a student, it must be procured: this process can involve researching and identifying a product, holding a competitive bidding process, reviewing privacy requirements, and soliciting teacher feedback for future. Like education, edtech procurement looks different across Canada. Budgets, specific policies, and who is involved in decision-making differ substantially by province, territory, and school district, as do the types of technology purchases. Edtech procurement combines the challenges of public procurement goals for transparency and accountability, with the added complexities of ensuring positive outcomes for students in an environment with rapidly changing technologies.

Procurement policy and process may seem removed from classroom learning but is, in fact, crucial to education. Procurement processes help evaluate products and determine whether they are a risky purchase. This endeavour is both essential and complex in the context of public spending, which can face high scrutiny. In an industry where thousands of solutions exist, a procurement professional is also unlikely to have the time and capacity to comb through all the options without clear and effective policies for guidance.[5] However, procurement policies in edtech can come with unintended results: for example, if a policy creates an approved vendors list, it may run the risk of prioritizing incumbents over new companies that

[5] David Deschryver, "Helping Education Entrepreneurs and School Leaders Navigate the Procurement Maze," *American Enterprise Institute,* Sept 2020, https://www.aei.org/research-products/report/helping-education-entrepreneurs-and-school-leaders-navigate-the-procurement-maze/.

potentially offer more efficient or effective products.[6] This report presents such challenges and solutions based on an investigation of policies, outcomes, and best practices across Canada.

Section I introduces the concept of education technology procurement and unpacks some of the high-level differences between regions. It looks at the types of technology that schools and school districts purchase and who is involved in edtech procurement. It also discusses the difference between centralized, decentralized, and divisional purchasing, and summarizes the benefits and challenges associated with each of these. Finally, it provides a list of strategies that can help improve procurement outcomes in centralized, decentralized, and divisional systems.

DEFINING EDUCATIONAL TECHNOLOGY

Educational technology encompasses a broad range of solutions used to support schools. While a variety of definitions exist in the literature,[7] in this paper, edtech is broadly understood to be any technology that facilitates learning. This may include technology that facilitates productivity (e.g., collaboration or student management tools); specialized tools for supporting student learning in a particular curriculum area (e.g., a mathematics game or photo-editing tool); tools for improving accessibility of other systems for students with disabilities or neurodiverse students; or operational technologies (e.g., tools that enhance security and privacy or enable basic functions). Nevertheless, this report's primary focus is on practice rather than theory: the types of products that edtech procurement officers are responsible for, and how people in these roles in Canada evaluate, acquire, and monitor them. The information technology or educational technology specialist in a school or school district—often one and the same person in schools without the resources to support both—may have a definition of educational technology established more by convenience and necessity than clear boundaries. In this study, research participants were responsible for procuring, maintaining, and retiring a pragmatically broad set of technologies:

> "In a nutshell, if it's not an electric pencil sharpener and it's got a blinking light on it, it probably falls under my auspices. We supply computers; we build, design, deliver, and install the infrastructure the computers run on, including wireless, network, printing. It also includes telecommunication, PBXs, telephone sets, and training for those. Student records, information, safeguarding it, backup, security, availability. I manage all the licensing for all software across the division whether operational, administrative, or academic. And we are also the purveyor of education-specific resources.
>
> **— Director of Technology, School Board Level**

[6] Lauren Dachille, "Procurement Practices That Inhibit Innovation: A Case Study from the Edtech Startup Perspective," *American Enterprise Institute,* Jul 14 2020, https://policycommons.net/artifacts/1294836/procurement-practices-that-inhibit-innovation/1898034/.

[7] For example, the Association for Educational Communications & Technology (AECT) defines Educational Technology as, "the study and ethical application of theory, research, and best practices to advance knowledge as well as mediate and improve learning and performance through the strategic design, management and implementation of learning and instructional processes and resources." While broad, this definition emphasizes that edtech can *improve* learning outcomes and facilitate learning in new ways, such as distance education. AECT, "The Definition and Terminology Committee," n.d., https://aect.org/news_manager.php?page=17578, accessed Jul 11 2022.

> Obviously, if we're talking about the Chromebooks that are in kids' hands, that's edtech. What about a computer that a principal uses? We're getting further away. What about a computer that the school board-employed plumber uses to put the tickets in? Well, then we're really quite a ways away, but we're still in the same financial envelope that everything else comes out of. And do we include the firewalls and the network and the switches and the email servers, all of which people interact with, even students daily, even though they don't know it? And again, still, when talking about the big picture, the same financial envelope, buying a server or a set of switches for the network room, may diminish the amount of money available for Chromebooks for the student.
>
> **— Director of Technology, Provincial Government Level**

DEFINING PROCUREMENT

Procurement is the purchase of goods or services. Before educational technology can improve learning outcomes, support a school's digital infrastructure, or help a teacher manage student information, it must be procured by a school, district, or provincial or territorial government. In education, a procurement office could be responsible for everything from finding a construction contractor to purchasing computers for administrative staff, or evaluating and testing educational toys for a kindergarten classroom.[8]

In general, procurement begins with identifying a need, researching what the market can provide, selecting a solution, and making a purchase.[9] Procurement can take a highly structured, traditional form (and indeed, most procurement over a certain dollar value is mandated to do so—see **Appendix A**), or a form that is less traditional or structured. Traditional procurement includes competitive, solution-based requests for information (RFIs), requests for quotations (RFQs), and requests for proposals (RFPs), posted on a school or government website for proponent bids. Alternatively, procurement can involve a pilot or trial that occurs prior to a larger purchase, schools can engage in cooperative purchasing across jurisdictions to maximize value for money, or single teachers and schools can buy items under certain dollar values directly from a single vendor.

[8] The OECD defines government procurement as "goods and services bought by the government for consumption and investment but not for resale. Denis Audet, "Government Procurement: A Synthesis Report," OECD, 2002, https://www.oecd.org/gov/budgeting/43506020.pdf

[9] Tyler Farmer, Mairead Matthews, and Faun Rice, "Procurement Office or 'Living Lab?' Experimenting with Procurement and Partnerships for Smart Cities Technologies in Canada" (Ottawa, ON: Information and Communications Technology Council, February 2021), https://www.ictc-ctic.ca/wp-content/uploads/2021/03/ICTC_Report_SmartCities_ENG.pdf.

WHO IS INVOLVED IN EDTECH PROCUREMENT?

Depending on the school and board, any of the following roles may be involved in procuring educational technologies for the K-12 system. This study draws primarily from interviews and focus groups with people holding the following roles across Canada, along with a small number of benchmarking interviews with international equivalents. The descriptions in this section are primarily based on their responsibilities. See **Appendix C** for further information on research methods and tools.

The following list is not intended to be exhaustive, but rather to illustrate the wide variety of roles that may be held by procurement-related professionals. Similarly, the titles included here are illustrative, not prescriptive: job titles vary significantly by jurisdiction.

Directors of Technology are senior personnel who manage technology stacks for one or more school districts. Such personnel may be responsible for maintaining an inventory of technology resources, maintaining and updating devices and infrastructure, issuing tenders and negotiating direct purchasing, and managing ongoing purchasing agreements, licences, and warranties. In addition, this type of role may liaise between schools, IT professionals, procurement officers, and vendors in order to streamline procurement needs, identification, and technology implementation. This type of role may also involve supervising a technology helpdesk that provides IT support to education staff: furthermore, it may be split across more than one individual in districts with the resources to allow for specialization. In some jurisdictions, this role is also responsible for managing online learning systems and student records. ***Alternate Title Examples****: Technology Lead, Chief Information Officer, Chief Technology Officer, Senior Manager of Technology/ Stakeholders/Client Relations, Assistant Superintendent of Technology, Executive Officer of IT, Manager for Learning and Technology, Director of Learning Resources and Technology Services, Manager of Information and Educational Technologies.*

- In some jurisdictions, this type of role may exist both at the provincial/ territorial and the school board level, with distributed responsibilities. For example, one provincial interviewee managed online learning, student information, and provincial licensing from ongoing vendors, while school boards managed procurement for all other solutions as well as local technology inventories and updates. In other jurisdictions, this role may only exist at either the school board level or at the provincial/territorial level.

Procurement and Purchasing Professionals, including officers and managers, are likely to be responsible for general procurement beyond just educational technology, but they may also be specialized. Procurement professionals ensure that RFPs align with jurisdictional guidelines and work with IT and ET (educational technology) professionals to outline the scope of solutions requested. In centralized jurisdictions, such professionals may post RFPs on an aggregated website and manage vendor communication and evaluation.

Coordinators for specific district-wide services may get involved in certain types of edtech resource procurement, management, and distribution. For example, a library professional may coordinate library learning resources, including digital learning resources, across a district. A coordinator for accessibility and disability services may manage a repository of digital learning resources for students who need them, in concert with speech and language pathologists and other accessibility professionals working within schools. Such professionals may help with product identification and procurement, but also to implement or integrate solutions once procured, and help students and teachers gain access to new resources.

Educational Technology and Information Technology Specialists work under Director or Technology Lead roles, and more closely with teachers and principals. They may help procure technologies at a local level, meet with and vet vendors, examine technology learning outcomes and curriculum fit, run pilots, and maintain and troubleshoot the IT infrastructure and devices for a school division. Several interviewees said that school boards often had to choose between Educational Technology (ET) and Information Technology (IT) specialists when budgeting. IT was often prioritized because it "kept the lights on," but the person in this role might be expected to acquire ET expertise or fulfill ET duties as well.[10]

Advisory Committees and Boards take a variety of forms. For example, advisory committees for educational technology and curriculum may offer specialized knowledge on learning outcomes to directors of technology, coordinators, and procurement officers. Technology leads may also form interdisciplinary committees of teachers, IT professionals, and other professionals to help advise procurement and needs assessment decisions.

Principals, Superintendents, and Senior Administrators may collect and pass on requests for technology purchases from their teaching staff to regional directors, or may be responsible for direct purchasing, depending on the structure of procurement. Furthermore, Superintendents and Principals may help coordinate school IT teams, run local pilots, and gather evidence on whether procured solutions are improving learning outcomes.

Teachers encourage student learning in an environment supported by technologies, and thus identify gaps (e.g., broken or malfunctioning tools or infrastructure), apply procured technologies in their classrooms, and may have additional budget to make direct purchases of small solutions. Furthermore, teachers may provide feedback to procurement professionals and technology specialists regarding how well a solution has worked and what type of learning outcomes they witnessed in students. Teachers may help run pilot programs or act as the primary champions of a particular solution and then take on responsibility for training their colleagues on its use.

[10] For a Canadian discussion of the results of understaffing in remote and rural school divisions, consult Mike Nantais et al., *Digital Policy, Infrastructure, Procedures and Practices of Select Rural and Northern Manitoba School Divisions,* BU CARES Research Centre, 2021, https://www.bucares.ca/publications/digital-realities-rural-manitoba.

Provincial, Territorial, and Federal Governments set budgets (e.g., a provincial Ministry of Education), issue grants, lay out procurement frameworks and agreements, and establish the basic boundaries in which educators and edtech procurement operates. In regions with centralized purchasing systems, procurement takes place at the provincial or territorial level instead of at the school district or school level. In these regions, a shared services department located within the provincial or territorial government purchases edtech on behalf of school districts and schools.

Stakeholders Outside of Governments and The School System

Vendors develop and supply educational technologies. They may engage in marketing activities (e.g., calling directors of technology, IT/ET specialists, or teachers), piloting and evaluation activities, or formal procurement processes. In addition, some vendors may provide training for end users, long-term IT support, or other add-on services.

Not-for-Profits and Charities may create solutions for schools in under-resourced areas. For example, there are several charities across Canada dedicated to refurbishing recycled computers and gifting them to schools in need.

Third Party Researchers, Policymakers, and Advisors may work across civil society, vendors, and the public sector to provide evaluations of edtech solutions or convene multi-stakeholder events and conferences.

Parents and the Public directly and indirectly influence procurement. Both in education and in public sector procurement in general, officials are often concerned with public opinion: when dealing with new technologies, this can lead to risk aversion and more conservative decision-making.[11] Accordingly, parent groups and the public are indirectly involved in the types of solutions ultimately procured for schools. Parent committees or community advisory committees may also help raise money for specific programs, solutions, and services, thus directly involving themselves in procurement.

While all of these stakeholders (and more) are involved in educational technology procurement, their specific roles and responsibilities are mediated by policy, regulation, and practice in each jurisdiction across Canada. The next section outlines how authority and responsibility in edtech procurement is distributed in each of Canada's provinces and territories.

[11] Tyler Farmer, Mairead Matthews, and Faun Rice, "Procurement Office or 'Living Lab?' Experimenting with Procurement and Partnerships for Smart Cities Technologies in Canada" (Ottawa, ON: Information and Communications Technology Council, February 2021), https://www.ictc-ctic.ca/wp-content/uploads/2021/03/ICTC_Report_SmartCities_ENG.pdf." ; "Evolving Ed-Tech Procurement in School Districts," IDEO & Digital Promise, 2013, https://digitalpromise.org/reportsandresources/evolving-ed-tech-procurement-in-school-districts/.

CENTRALIZED, DECENTRALIZED, AND DIVISIONAL PROCUREMENT

Previous papers on education procurement, mostly focused on the United States, have accentuated the difference between centralized and decentralized decision-making and procurement.[12] In a centralized procurement system, purchases are made on behalf of end users (who are usually educators or students) by a centralized resource at the provincial or territorial level. Alternatively, in a divisional procurement system, edtech purchases are led by a centralized resource at the school or district level (such as a district superintendent or board-level procurement official). As such, in centralized and divisional procurement systems, the end user of the product or service is not the buyer. On the other end of the spectrum are decentralized, which put purchasing authority as close to the end user as possible. Procurement systems move along a spectrum of centralized to divisional to decentralized: in the most centralized systems, procurement is led by countries, provinces, or territories. In divisional systems, procurement is led by school districts or boards. Finally, in the decentralized systems, procurement is led by individual schools, principals, or even teachers.

Budgets for educational technology procurement can similarly be more or less centralized. While K-12 education funding is always centralized (typically determined by provincial or territorial governments), jurisdictions determine the portion of that spending that can be dedicated to technology in different ways. For example, schools or school districts may be given a set amount of funding per student to use as they wish, including for technology purchases. Alternatively, a provincial or territorial edtech budget may be determined separately by the Department or Ministry of Education and then managed by someone in a Director of Technology-type role for the entire region. Furthermore, budgets for educational technology may come out of a single envelope (e.g., the total budget for a Director of Technology-style role) or be a mix of spending from budgets for operations, capital expenditures, and curricular expenses.[13] When budgets are determined based on number of students in a school district, this often results in challenges for rural and remote divisions with a small number of students distributed across broad geographies, requiring more attention to infrastructure and accessibility than their funding envelope allows for. Interviewees in this type of district often worked in roles that combined responsibilities from IT, ET, and procurement.

[12] Tricia Maas, "A Blueprint for Effective and Adaptable School District Procurement," *CRPE Reinventing Public Education,* 2015, https://files.eric.ed.gov/fulltext/ED558568.pdf2015, https://files.eric.ed.gov/fulltext/ED558568.pdf, https://files.eric.ed.gov/fulltext/ED558568.pdf; *Mike Goldstein, "If Education procurement is Broken, is Teacher Choice the Answer?" American Enterprise Institute,* Feb 2020, https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Eric Kalenze, "What it Will Take to Improve Evidence-Informed Decision-Making in Schools," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Thomas Arnett, "Why Aren't Teachers Using the Resources Companies Sell to Their Districts," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x-91208https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Kalenze, Eric, "What it Will Take to Improve Evidence-Informed Decision-Making in Schools," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Arnett, Thomas, "Why Aren't Teachers Using the Resources Companies Sell to Their Districts," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x912082021, https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Eric Kalenze, "What it Will Take to Improve Evidence-Informed Decision-Making in Schools," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208; Arnett, Thomas, "Why Aren't Teachers Using the Resources Companies Sell to Their Districts," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208;

[13] "Evolving Ed-Tech Procurement in School Districts," *IDEO & Digital Promise,* 2013, IDEO-Digital-Promise-Report-Evolving-Ed-Tech-Procurement-in-School-Districts.pdf (digitalpromise.org)

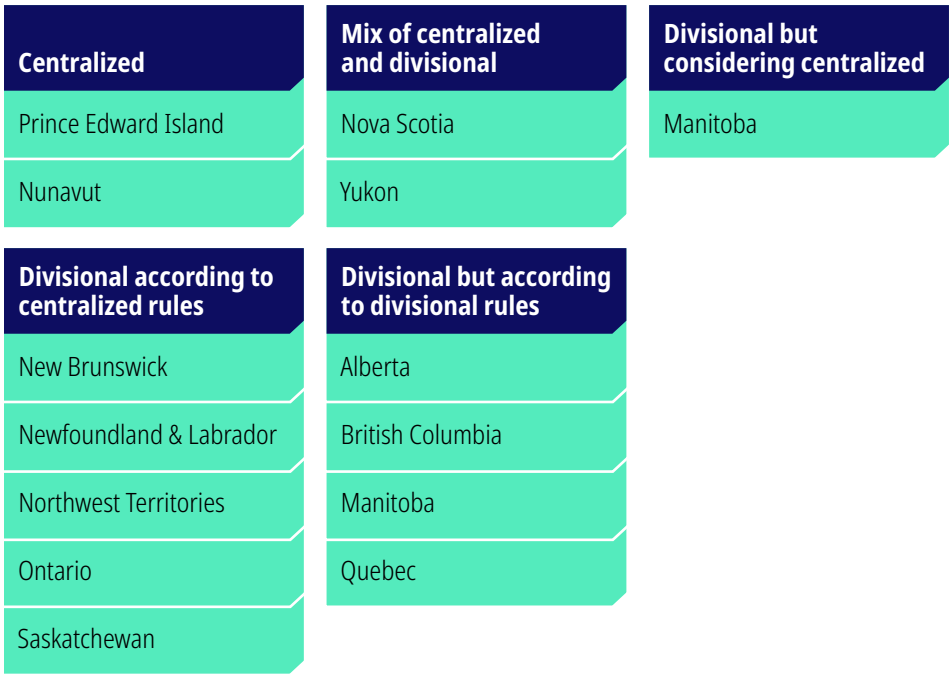

Figure 1. *The Canadian provinces and territories employ a range of centralized and decentralized edtech procurement systems.*

While there are some exceptions, in Canada, most educational technology procurement takes place through centralized or divisional procurement systems or a mix of both. In Prince Edward Island and Nunavut, edtech procurement is led by a centralized department at the provincial or territorial level. In Ontario, Quebec, British Columbia, Alberta, Manitoba, Saskatchewan, the Northwest Territories, New Brunswick, and Newfound and Labrador, edtech procurement is led by school boards and districts (though some projects may be centrally funded by the province). Nonetheless, in many of these regions, boards must follow provincially or territorially established procurement policies, such as purchasing thresholds for sole source, competitive, and public tenders. Notably, in the Yukon the provincial government oversees all schools through a centralized system, but in 2022, a First Nations school board was created in eight school areas to take on new responsibilities for curriculum, hiring, and allocating resources (i.e., purchasing).[14] In Nova Scotia, the provincial government leads many edtech initiatives, but districts can also engage in purchasing if they have additional budget. Finally, Manitoba is in the process of determining whether and how to move from a decentralized to a centralized system, and Manitoban interviewees were not yet sure what the new system will look like.

While it is rare for edtech procurement activities to be assigned directly to schools, in most regions, schools are free to use locally raised funds to purchase edtech

[14] Anna Desmerais, "Yukon to set up First Nations school board after historic vote," *CBC News*, Jan 28, 2022: https://www.cbc.ca/news/canada/north/yukon-first-nations-school-board-referendum-1.6330577

on their own. That said, many of regions still require individual purchases to be approved at the board level, and some have enacted policies that prevent individual schools from using locally raised funds in this way without oversight or centralized IT approval. In other jurisdictions, schools have created business partnerships to receive funding or technology to trial in schools, the pros and cons of which are discussed below.

Allocating Budget for Edtech: Rarely Simple

In practice, edtech budgets are determined and allocated in a vast variety of ways across Canada. All of the following examples pertain to publicly funded schools.

Example 1: A school district mixing provincial and federal funding. One interviewee, a technology lead for a large but primarily rural school district, provided an example of how complex asset management, funding, and budgeting are in their school division. A sizable part of their budget (about half) comes from federal funding because they also provide contract services to some First Nations schools, while the rest comes from their province. Creating budget priorities is therefore a delicate balancing act between provincial and local needs. They keep a running record of all of the technology assets in their schools, identify critical gaps and areas for updates, prepare tenders, and publish them. Rather than leasing hardware, this division purchases devices outright, a common practice for rural and remote regions where shipping costs can be prohibitive and outweigh the benefits of more frequent upgrades.

Example 2: Provinces and territories working with the same edtech funding package for decades. In another jurisdiction a provincial interviewee commented that the amount of money set aside for technology spending had remained unchanged for years or decades in their regions, despite inflation and increased technology needs. Yet another said that they had been working on their department of education for many years to get a budget increase, and only succeeded during COVID. Edtech solution costs may vary extensively from year to year: for example, if the majority of student laptops in a region are procured in the same year, their warranties and efficacy could expire at the same time, resulting in high costs in some budget cycles and minimal costs in others. Too-restrictive budgets may end up incentivizing the wrong thing—in some cases, for example, a lease rather than an outright purchase is more affordable year over year, but costs more in the long run.[15] Furthermore, reliance on mechanisms like parent fundraising have been shown to perpetuate social inequities, with schools in lower-income neighbourhoods less likely to pursue fundraising for technology.[16]

[15] "Evolving Ed-Tech Procurement in School Districts," *IDEO & Digital Promise,* 2013, IDEO-Digital-Promise-Report-Evolving-Ed-Tech-Procurement-in-School-Districts.pdf (digitalpromise.org)
[16] "Connecting to success: Technology in Ontario schools," *People for Education,* 2019, https://peopleforeducation.ca/report/connecting-to-success-technology-in-ontario-schools

Example 3: The actor championing the initiative pays for it. In some jurisdictions, the budget that gets used for edtech procurement depends on whose initiative the project is:

> There are X amount of dollars pushed to the districts. The districts have the flexibility to say, 'This year, we're going to make a push toward more technology,' and allocate more resources in their budgeting accordingly for a year or two, or they may have three- or five-year plans. If we've brought in something new specifically from the province, then the province would supply the resources and hardware to go along with that. If a school initiative is just within the school, they use their own budget to move ahead in certain areas. It tends to be rather rigid when it gets to the provincial levels of how much we can do because the cost becomes very high.
>
> **— ET and Learning Specialist, Provincial Government Level**

Example 4: Teachers and schools accessing solutions at cost or for free from edtech companies. As discussed earlier, some edtech companies see classroom engagement as an investment worth preferential pricing. Furthermore, there are some not-for-profits and charities in the edtech space that offer solutions directly to classrooms, such as an organization that refurbishes and gifts old computers to schools in need, or an edtech company that gives their solution to an educator or classroom to get their foot in the door.

Centralized and divisional procurement are generally implemented as a standardization and cost-saving measure. Rather than hiring duplicate staff, or each school engaging in duplicate tenders, a centralized department can be established to respond to aggregate procurement needs. Centralized procurement may also make it easier for governments to keep track of ongoing tenders, help to ensure all tenders meet certain standards or criteria, and implement changes to procurement policy. In this study, several interviewees came from provinces that had recently considered further centralization of edtech procurement. Most notably, Manitoba and Newfoundland and Labrador have both considered implementing a shared services model at some point in the past few years. During the roundtable for this project, several participants felt shared services models were becoming more attractive to governments due to ongoing economic uncertainty and the lasting impacts of COVID-19.

Several interviewees, who were mostly administrators, felt it is more important for technology purchases to pass through a centrally located administrator than other school purchases. As one interviewee noted, "Having a dedicated person in charge of education technology purchasing helps to ensure that systems can be integrated, are appropriate for the sector, and are in compliance with data policies." Further, "If specialists [are only optional] and don't have time to look at a product, they might not be able to verify whether it works with the school or district's network or with legacy technologies." Another interviewee noted that "[boards] need to be careful when teachers propose buying tech because there's a [privacy and cybersecurity] risk." Notably, all of the procurement officials interviewed for this study involve an IT department or advisor in edtech purchases.

According to participants in this study, there are several ways to involve a centrally located administrator in technology procurement. One way is to include the administrator in the procurement process as an advisor, but not give them any market research responsibilities or decision-making authority. The other is having a centralized person or department look at new procurement requests from both an information technology and education perspective.

In the latter instance, this type of responsibility may be led by a Director of Technology, Technology Lead, CIO, or similar role for a province, territory, or district. This role can help regions manage cost savings and avoid overlap in their technology stacks. People in this role can safeguard interoperability and privacy, maintain an inventory of what has already been purchased, monitor usage and outcomes, and pursue mass purchasing when it will save costs. They can also weigh cost and benefits from direct purchases and SaaS or hardware leasing, monitor warranties and keep track of upcoming expenses, and stretch device life cycles as far as is sustainable.

Participants in this study also noted challenges with centralized procurement. Those who came from regions with centralized procurement cautioned that it can be complex and lengthy and may limit the ability of schools and boards to quickly respond to procurement needs. In some provinces and territories, the ministry of education shares its IT department with other ministries, meaning there is no dedicated IT department to procure for education. In these regions, procurement staff may lack a robust understanding of the education sector and its needs, or other ministries such as public security or healthcare may take precedence over education, delaying procurement timelines. As one technology lead and former educator explained, "It's hard for folks who aren't connected

to education in any way or who would rarely walk into a school to understand what the needs of the classroom are. I'm envious when I talk to my counterparts from other provinces that have a dedicated team for education procurement." Finally, one interviewee noted that while several large technology vendors provide discounts to K-12 schools, they often retract those discounts if another government entity leads the procurement process or tags on as a joint-purchaser.

Furthermore, for some regions and large school boards, mass purchasing can create high costs for software that not all students will use. For example, one large school board interviewed noted that they had a mandate to provide equitable access for their students, but they could not afford to pay for universal licences. Accordingly, this could mean "very complex negotiations with vendors about different kinds of access models where [the board] can monitor usage."

Usage-based Pricing

Two interviewees had worked with technology solution providers who operated either on a cost-recovery basis or with usage-based pricing. In one case, a SaaS company had offered their solution at cost in order to promote their product and teach kids professional skills that they might later use on the job. In another case, a company permitted usage-based pricing, where instead of charging a per-head licence fee, they examine usage statistics and charge according to the proportion of students who enrol. One procurement officer commented, "For me, usage-based pricing would be a real differentiator in a saturated market where there are so many [otherwise] comparable products."

Several private sector interviewees noted that in Canada, educators are not empowered enough by policy and practice to make procurement decisions, which can lead to decisions that are disconnected from end users (e.g., educators). Interviewees felt that it is often administrators, not educators, who make procurement decisions, which leads to decisions that are motivated not just by efficacy, but also by efficiency and cost. The table below provides a more extensive overview of the benefits and challenges associated with centralized, divisional, and decentralized procurement.

	Benefits	Challenges
Centralized Edtech Procurement	Enables consistent implementation of privacy policies, cyber security policies, and other policies related to tech. Allows for joint purchasing of high-tech resources and equipment, which tend to be more expensive that non-technology equipment and resources. Consolidates and broadens access to a broad array of technical skills that are required for technology procurement but can be difficult and expensive to source. Helps to ensure technology purchases can be integrated with legacy systems, meet specifications, and are in compliance with procurement policies.	Can lead to complex and lengthy procurement processes that limit the ability of schools and districts to respon to individual procurement needs in a timely manner. May involve procurement or IT departments with little to no understanding of education. Can reduce educator agency and lead to procurement decisions that are disconnected from educators and other end users. Can lead to the overemphasis of efficier and cost-related needs, and under-emphasis of efficacy and education-rela needs in procurement processes.
Divisional Edtech Procurement	Enables school districts to make independent procurement decisions based on local contexts and needs. Allows school districts to quickly respond to urgent needs like those resulting from COVID-19. Promotes technology purchases that meet curriculum and pedagogy needs and can be successfully integrated into classrooms. Enables consistent implementation of privacy policies, cyber security policies, and other policies related to tech. Allows for joint purchasing of high-tech resources and equipment, which tend to be more expensive that non-technology equipment and resources. Consolidates and broadens access to a broad array of technical skills that are required for technology procurement but can be difficult and expensive to source. Helps to ensure technology purchases can be integrated with legacy systems and meet technical specifications.	Can lead to complex and lengthy procurement processes that limit the ability of schools to respond to individu procurement needs in a timely manner. Can reduce educator agency and lead to procurement decisions that are disconnected from educators and other end users. Can lead to the overemphasis of efficier and cost-related needs, and under-emphasis of efficacy and education-rela needs in procurement processes.

Figure 2. *Benefits and challenges of centralized versus decentralized procurement.*

The Public Sector Perspective

In the interviews and roundtables held to inform this study, public sector perspectives on centralized and decentralized procurement were often informed by their positions within the school system.

Generally, **individuals at the school level** were in favour of decentralized procurement with less oversight or direction from boards or provincial or territorial governments. This perspective was mostly driven by a preference for the ability to make needs-based procurement decisions tailored to local contexts. During the public sector roundtable, one participant shared their perspective on locally driven purchasing:

> "Based on my experience in a few Manitoba schools, it is generally a strength when individual schools, principals, or teachers have a budget to make individual choices about technology that they require within their own school. The disadvantage is that it might not integrate well with the overall "divisional" plan, however, with planning and system checks, this can generally be overcome. [Divisions] can either ensure the technology will integrate well, determine what can be done if it doesn't, or evaluate whether [integrating well] matters at all.
>
> **— ET Specialist and Researcher, School Board Level and University**

Individuals situated at the board level were generally in favour of a hybrid model whereby schools and provincial and territorial governments could provide input and guidance on procurement decisions but authority ultimately remained with the board. This perspective was driven by a desire for standardized procurement processes but also for purposeful and well-planned technology infrastructure and the ability to mitigate privacy or cybersecurity risks. Still, several interviewees expressed a need for more active guidance and support from provincial governments on things like cybersecurity risk assessments or architectural models. Some were concerned that provincial governments too often "sit on the sidelines," leaving complex and burdensome policy decisions about IT architecture, privacy, or cybersecurity for school districts to address on their own. During the roundtable, one interviewee shared their perspective on divisional purchasing:

> "In British Columbia, each district can make their own choices, which allows for differentiation—Northern and isolated districts may need very different resources from Southern or more urban districts…Bulk purchasing can reduce prices, but the broadband connection in some communities prevents them from using all of the available tools or technology. In this case, divisional procurement is good because those communities can be very sensitive to their individual, local needs; however, they won't get that discounted, bulk-purchase price.
>
> **— Former Educator and Provincial Government Administrator**

Individuals situated at the provincial or territorial level had a less homogenous perspective. For some, divisional procurement was more favourable as it offloaded procurement-related responsibilities from the provincial or territorial government. For others, it was more favourable to centralize procurement so as to streamline procurement processes, bulk-purchase, and hopefully, cut costs.

Finally, in terms of private sector interviewees, this study mostly engaged larger edtech businesses that operate on a national or international level. In general, these interviewees favoured centralized procurement and felt that not having standardized curricula or procurement policies at the provincial and territorial level, let alone at the national level, is a weakness (but it is worth noting that smaller businesses that only operate on a local level might have a different opinion). With the exception of one interviewee, decentralized procurement **was seen to complicate the sales process** by "creating unnecessary hurdles" and making it difficult for sales teams to figure out to whom they should present products. Further, complicated sales processes led some participants to only sell to larger Canadian districts, which they deemed were worth the time and resource investment. Others stopped selling to Canadian districts entirely, focusing instead on schools in the United States:

> "Disparities in how complex the sales process is effects whether a company chooses to sell to different districts. It's worth it to go through a complicated process in a big city like Toronto but might not be worth it in a smaller or more remote community... It is worth it if you're looking at it from the perspective of social good, but not in terms of potential income. Similar challenges exist when choosing between a smaller school board in Canada, versus one in California.
>
> **— Educational Technology Vendor**

Alternatively, one private sector participant, who was previously an educator, favoured decentralized procurement:

> "I think from an administrator or manager's point of view, having all procurement take place at the board level is the most ideal. But from a teacher's perspective, it's important for them to feel like they make the decisions that go on in their classroom and that they select the software that's most effective for their students. Administrators need to scale solutions, create cost efficiencies, synchronize systems, and in doing so, push technology on to teachers. The challenge with that is the centralized approach has historically seen a low adoption rate. That's how the first edtech sales went—for us, we've moved from a top-down to bottom-up approach.
>
> **— Educational Technology Vendor**

IMPROVING PROCUREMENT OUTCOMES IN CENTRALIZED, DECENTRALIZED, AND DIVISIONAL SYSTEMS

Certain regions are better suited to centralized or decentralized procurement based on their population size and density, the internal diversity of their schools and districts, their economic climate, and the potential for economies of scale. Nonetheless, both centralized and decentralized procurement have benefits and drawbacks, meaning there is always room for innovative strategies that improve procurement outcomes. This section of the report discusses some of the strategies surfaced by interviewees and roundtable participants during this study. First, strategies to improve outcomes in decentralized and divisional systems are discussed, followed by those that improve outcomes in centralized systems.

Strategies for Decentralized and Divisional Systems

Opt-in Group Purchasing Organizations

Many interviewees provided examples of joint purchasing in their region, either in the form of **a group purchasing** organization or the ability to **purchase collaboratively** with other districts or government organizations. Several provinces have established arms-length organizations to actively seek out group purchasing or shared contract opportunities.[17] Some are revenue generating and operate on a fee-for-service model while others are publicly funded. The driving force behind them is economic—that group purchasing can streamline procurement and create greater economies of scale. Their primary goal is to save the province or territory time and money, but they can also provide equitable access to technology across a province or territory.

According to interviewees in this study, group purchasing organizations are beneficial in some cases but not in others. For instance, group purchasing organizations can help school districts get better prices from vendors (particularly software vendors),[18] but this tends to occur more often for smaller districts than large ones. Larger districts with a high number of schools and students may already get the lowest possible prices from vendors, so organizations that charge fees for their services may actually increase purchasing costs. Districts may also be unable to group purchase due to their local contexts or needs. A common example is that many districts do not have a strong enough broadband connection to adopt all the tools offered by group purchasing organizations. Small and large districts also have very different technology needs, making joint purchasing more useful for products used by a wide variety of districts. Specifically, interviewees felt group purchasing could be useful for internet services, hardware devices like laptops or computers, library resources like EBSCO, and software licences like Microsoft 365. **Because many factors can prevent districts from taking part in group purchasing, public sector interviewees felt they should be, by default, opt-in.**

[17] Manitoba established the Manitoba Education Research and Learning Information Networks. Ontario established the Education Computing Network of Ontario and Ontario Education Collaborative Marketplace. British Columbia established the Focused Education Resources Society. Alberta established the Alberta Educational Purchasing Group.

[18] John Bailey et al., "Smart Series Guide to EdTech Procurement," *Digital Learning Now,* 2015 https://digitallearningnow.com/site/uploads/2014/01/Procurement-Guide-FINAL.pdf

Collaborative Purchasing Strategies

Collaborative purchasing enables multiple districts to engage in a procurement process without the involvement of a group purchasing organization. In this study, many interviewees provided examples of collaborative edtech purchasing, some more formally established than others. Some interviewees worked in regions where collaborative purchasing is common and even encouraged by formal policies. For example, in Newfoundland and Labrador, public bodies are required to submit an annual procurement plan to the Public Procurement Agency so they can identify opportunities for consolidated purchasing.[19] Others participate in regular meetings with IT departments, chief information officers, and school boards to discuss upcoming procurement opportunities and determine where collaborative purchasing might be beneficial. Still others felt their districts were only "in the infancy of that sort of collaboration." Importantly, not all regions have a clear or efficient mechanism to determine when collaborative purchasing would be useful.

Interviewees had several interesting ideas for how collaborative edtech procurement could be improved or made clearer. Procurement officials from Ontario and British Columbia were unsure whether they could collaborate with organizations that are not schoolboards or are from other provinces. Meanwhile, officials from Atlantic Canada very clearly understood these rules, and even maintained open lines of communication with other types of public organizations and schoolboards in other provinces. Indeed, one interviewee noted that they keep in touch with procurement officials from other Atlantic provinces "almost on a weekly basis." Cross-border collaboration is clarified by the Atlantic Procurement Agreement[20] and the recently published Guide to Selling to Governments in Atlantic Canada.[21] In 2015, through the Canadian Collaborative Procurement Initiative, the federal government extended the use of its procurement instruments (such as standing offers) to the provincial and territorial governments, including schools.[22] Interestingly, no interviewees in this study referenced this initiative while discussing collaborative purchasing opportunities in Canada.

Procurement officials from Ontario and British Columbia saw a unique opportunity for large districts from multiple provinces to collaborate. Interviewees explained that because of their unique technology needs, it is often not useful for large districts to collaborate with small districts in their own province. Large districts need products that can handle a very large number of

[19] Government of Newfoundland and Labrador, "Newfoundland Labrador Public Procurement Policy," March 8, 2022, https://www.gov.nl.ca/ppa/files/Public-Procurement-Policy_.pdf

[20] Governments of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island, *The Atlantic Procurement Agreement: A Memorandum of Agreement on the Reduction of Interprovincial Trade Barriers Relating to Public Procurement,* (January 18, 2020), https://procurement.novascotia.ca/media/53153/atlantic%20procurement%20agreement.pdf

[21] Council of Atlantic Premiers, *A Guide to Selling to Governments in Atlantic Canada,* Oct 2020, https://cap-cpma.ca/wp-content/uploads/2020/10/CAPFinalEnglishGuideWEB.pdf

[22] "Canadian Collaborative Procurement Initiative," November 2021, *Government of Canada,* https://buyandsell.gc.ca/policy-and-guidelines/supply-manual/section/9/70

users, have excellent user verification logic and back-end infrastructure, can track usage by individual user and school, and have robust warranty, training, and IT support packages. Unfortunately, Canada's largest districts are spread across multiple provinces, while some provinces have just one.[23] Interviewees felt Canada would benefit from clearer guidelines and more routine communications with procurement officials in other provinces:

> I think there's greater opportunity to collaborate between districts. We have a purchasing consortium in our province and it's okay, but I think it would be better or more useful if there was some kind of mechanism that we could use to say, 'Hey, Montreal, Vancouver, Edmonton, what are you doing? How are you handling this problem?' We're large and we need products that scale, so it's not always that useful for us to be able to partner with a smaller board on an RFP because we don't need the same products as them. We have very different needs. It would be great to have a national vehicle to connect us with other school boards.
>
> **— Edtech Procurement Professional, School Board Level**

Several interviewees brought up their technology stack or technology environment in the context of collaborative purchasing. Procurement and IT teams are sometimes limited by their technology environment as to what they can buy, whether it be iOS, Google, SAS, or IBM, and this can also impact what districts they work with. One interviewee noted that, "when it comes to education technology, we work with [school district A] the most because we're a Google environment and so are they; [school district B] is iOS, so we don't liaise with them as much." Adopting the same product or working with the same vendor may also encourage two districts to work together. For instance, the same interviewee kept in touch with a nearby district more often after they both adopted PowerSchool, a student information system.

Capacity Building at the Board or School Level

Several interviewees provided examples of capacity building programs that improve the quality of edtech purchases or standardize purchasing across schools. One interviewee discussed a training program that their board runs for principals, who often come from education backgrounds, and may have little to no experience assessing the long-term value of tech purchases:

> One of the things we did was try to create a framework for assessing return on investment. We want [principals] to look at an iPad or a student-based device and ask themselves, 'How many student interactions will this device

[23] Ontario, for instance has three school boards with over 100,000 students (namely, the Toronto District School Board, Peel District School Board, and the York Region District School Board), while Alberta has just one (the Calgary Board of Education). Meanwhile, British Columbia has two large districts, Surrey and Vancouver, which have approximately 60,000 and 89,000 students respectively.

> have over its lifetime?' A Chrome Book will probably get used 1000 times before it's no longer useful, and it costs $300, so that's what, 30 cents per interaction? Compare that with a white board that costs $3,000 and is only used by a teacher every so often. Principals generally don't get trained to do this—and some have never thought about or considered these kinds of things before.
>
> **— Edtech Procurement Professional, School Board Level**

In addition to assessing return on investment, the board trains principals on how to design a technology plan and how to articulate what success will look like after the purchase:

> We teach them how to say, 'I'm looking to accomplish these things; these are the types of solutions I'm going to look at; and these are the outcomes that will help me determine whether I've been successful.' The other thing they need to know is how much they'll spend [on that technology] each year.
>
> **— Edtech Procurement Professional, School Board Level**

Standardization Tools

Two interviewees discussed the need for more robust training to standardize the use of privacy impact assessments and cyber risk assessments. According to one interviewee, in British Columbia, every edtech resource is supposed to go through a privacy impact assessment, but there has been no centralized training to standardize this process. As a result, some districts have hired "expensive lawyers" to conduct their assessments while others have allocated the task to teachers with no formal training. Another interviewee recounted a similar experience in another province:

> We ask for a cyber risk assessment for anything new that comes in. We get vendors to rate whether their products are low, medium, or high risk, and the cyber risk team also does an assessment. [The problem is] neither the vendors nor the cyber risk team make the final decision. That decision lies with the requester, who will sometimes go forward with integrating a high-risk system. We need a framework to deal with these issues.
>
> **— Edtech Procurement Professional, School Board Level**

One way to ensure these kinds of assessments are applied in a more standardized way is an approved vendor list. Districts can publish a list of products or vendors that have already been vetted for privacy and cyber security risks and make that list available to individual schools. School purchases may be limited to products and vendors included in the approved vendors list, or the list may simply be a recommendation. However, approved vendor lists also disadvantage new market entrants, which may include small, startup, and local companies.

Privacy in Edtech Procurement

Privacy assessments and processes are essential to safeguard student data. They are also complex and specialized, requiring knowledge that not all educators or procurement specialists have. In some cases, an IT specialist or Technology Lead/Director will conduct privacy impact assessments for their jurisdictions. Interviewees in these roles expressed that they had the technical expertise to conduct privacy assessments and were happy to take on the role "because the review of privacy extends far beyond what is immediately visible or comprehensible to educators." However, they rarely had the time to do all the requirements well when vetting multiple solutions, and some voiced frustration with the expansion of bureaucracy and compliance requirements:

> "Six years ago a PIA [privacy impact assessment] was maybe 10 pages long, produced in house, not very detailed. Now I have several on my desk that are 100 pages long. We contract external contractors to do them, they cost $30,000-50,000 each, and they take months to do. It's hugely expensive and slows things down.
>
> **— Director of Technology, Provincial Government Level**

Similar to other areas of procurement and edtech evaluation and implementation, understaffing complicates privacy assessments:

> "[In rural divisions] it's all going to get dumped on one person. In larger divisions, we see more of a team of people. In smaller divisions, we've talked to people that procured, troubleshooted, did the infrastructure, the privacy—they used to have all those positions and then, as funding got cut, they rolled it all into a single position so that they could still afford technology.
>
> **— ET Specialist and Researcher, School Board and University**

Some study participants attempted to mitigate the burden of running lengthy privacy assessments by building all of the compliance requirements into an RFP process, "so the lawyers on the side of the companies who are bidding on the contract can understand what our expectations are right off the bat, instead of us trying to negotiate with them post-bid and having them say, 'Well you never asked for that.'" Other study participants skirted privacy assessments by ensuring that all software operated in a user environment that did not reveal individual student identities.

Finally, one interviewee expressed excitement about building privacy and cybersecurity awareness into the curriculum and teaching K-12 students to "bake privacy into systems design" through experiential learning. While not directly related to procurement, they looked forward to a future where K-12 students were actively co-managing their own security and privacy with educators as a part of their learning process.

Strategies for Divisional and Centralized Systems

Collaboration

> The piece that's the most important for me is collaboration. Procurement has to be done through collaboration. There can't be one person deciding what the next great math resource will be. All of the relevant stakeholders need to be at the table because even if it looks like a great resource at face value, it may not be great when it's rolled out… There has to be an academic, a businessperson, and IT services person involved to make sure you get a wrap-around, 360-degree perspective of the resource and how effective it is… It might be great academically but full of cyber risk. It could look great from a tech perspective and look like it's a lot of fun but not provide academic value.
>
> **— Centrally Assigned Principal, School District Level**

Collaboration was by far the most common strategy for improving outcomes in centralized systems. Procurement officials from divisional and centralized systems felt it was important to collaborate both **with end users** and **with individuals or departments from multidisciplinary backgrounds.** Collaborating with end users means having formal mechanisms in place for teachers, principals, and students to submit procurement requests, provide input on RFP parameters, and give feedback on past purchases. It also means earmarking funds for end users to be seconded from local schools to centralized departments and be included on procurement committees. Meanwhile, including multidisciplinary perspectives means establishing a role or department that is responsible for assessing edtech purchases from each of the following perspectives: pedagogy, curriculum, accessibility, cyber security, privacy, interoperability, relevance for Indigenous students, digital equity, and diversity and inclusion. More details about how to include end users and multidisciplinary perspectives in the procurement process are provided in **Section II** of this study under the following subsections: Launching a Procurement Process, Assessment and Decision-Making, and Implementation and Process Management.

SECTION II

NAVIGATING THE PROCUREMENT PROCESS

The world of educational technology solutions is rapidly changing, and it can be challenging for procurement officers, IT and ET professionals to keep track of everything that teachers, vendors, and parents suggest is helpful. Accordingly, while the traditional procurement process begins with need identification, procurement in educational technology can have a wide variety of impetuses other than a systematic investigation of needs. And finally, schools and technology specialists may balance numerous priorities in the procurement process by looking for energy efficiency, local businesses, or solutions with evidence for improving educational outcomes. Competing priorities and asks from a wide variety of stakeholders can place significant pressure on understaffed schools, boards, and governments. Indeed, a report from Johns Hopkins University assessing the state of educational technology procurement in the U.S. identified the following key areas of the procurement trajectory for improvement, each of which resonate with the findings discussed in this paper's focus on the Canadian system.

I. Funding allotment slim district technology budgets have led to high pressure on vendors to market their products and left schools with little time and energy to explore purchases beyond the essential

II. Needs assessments often run informally by one technology professional rather than systematically by many stakeholders

III. Edtech product discovery a significant challenge for districts and providers, where schools do not have staff or time to thoroughly examine available products

IV. Edtech product evaluation no accessible sources of rigorous evidence for majority of edtech products, leaving districts to rely on informal recommendations, pilots, or trials, which are not always conducted systematically

V. Edtech acquisition length of RFP process frustrating for some stakeholders[24]

The Hopkins team proposed the following solutions to these challenges: namely, offering schools better guidelines for conducting systematic needs assessments, creating a national website to evaluate evidence for edtech efficacy (which now does exist), and expediting purchasing processes.

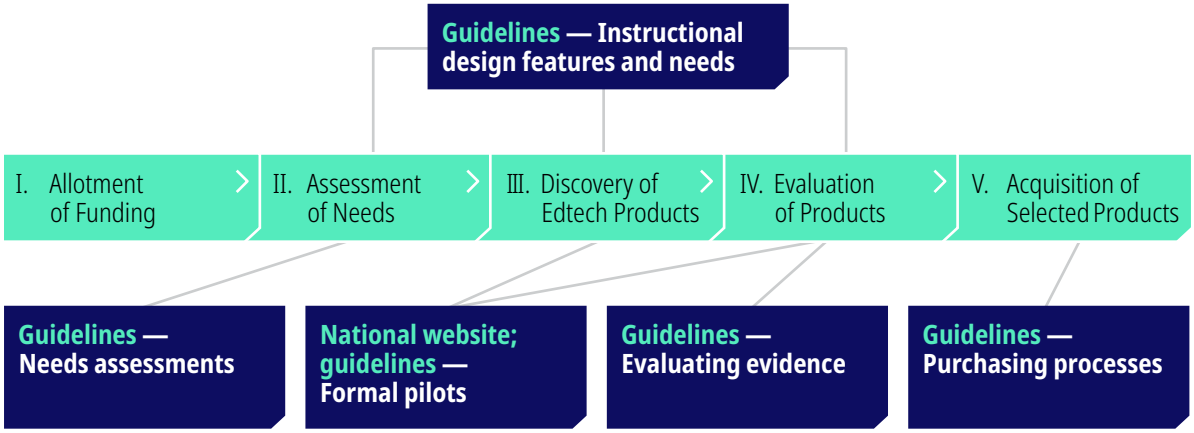

Figure 3: *Edtech procurement Operational Framework with recommended changes, reproduced with permission from Jennifer Morrison, Steven Ross, Roisin Corcoran, and A.J. Reid, "Fostering Market Efficiency in K-12 Ed-Tech Procurement," Centre for Research and Reform in Education (CRRE) at Johns Hopkins University, September 22, 2014, https://digitalpromise.org/wp-content/uploads/2016/02/DP_ImprovingEdTechPurchasing_FullReport.pdf., p. 59.*

While not formally part of the procurement process, **implementation, process management, and post-procurement evaluation** were also highlighted as key challenges by interviewees in this study. Following successful procurement, a technology must also be implemented; for example, once an IT solution is vetted and procured, someone must train teachers on how to use it, and this may or may not be the responsibility of the same person in a school, board, or government who identified and procured the solutions in the first place. Part of what this report offers is a look at the pragmatic approaches that people responsible for educational technology take to making the best choices possible for technology in their classrooms across Canada.

[24] Jennifer Morrison, Steven Ross, Roisin Corcoran, and A.J. Reid, "Fostering Market Efficiency in K-12 Ed-Tech Procurement," *Centre for Research and Reform in Education (CRRE) at Johns Hopkins University,* September 22, 2014, https://digitalpromise.org/wp-content/uploads/2016/02/DP_ImprovingEdTechPurchasing_FullReport.pdf.

Accordingly, Section I of this paper laid the groundwork for understanding edtech procurement in Canada with an overview of:

- The basics of edtech and procurement
- The stakeholders involved in edtech procurement
- Centralized, decentralized, and divisional procurement differences across Canada and outcomes for budgeting and planning

Section II will cover needs assessment through market awareness, acquisition, implementation, and evaluation.

STAYING ON TOP OF THE MARKET

Much of product discovery happens before or outside of a procurement process. For example, while a competitive RFP process may introduce a district to new vendors and solutions, that RFP may be inspired by a solution that an educator saw at a conference or through independent research from a procurement officer. Vendors in the private sector may similarly conduct cold calls to market their products to procurement officers, schools, districts, and provinces and territories, not always knowing which stakeholder is ultimately responsible for decision-making. From a public sector perspective, however, product discovery may occur in an ad-hoc manner, without readily available information on product outcomes and quality.[25]

Through discussions with the public and private sector, ICTC aimed to better understand the relationships between the edtech sector and the broader education system. This involved exploring issues like whether education stakeholders believed they had a good understanding of the offerings are available or whether there had been positive or negative experiences in past interactions with vendors. In some cases, public-private connections are developed through teachers exploring edtech options, or there may be pre-existing relationships with vendors based on previous purchases or interactions. An education expert from the Atlantic region highlighted the fact that they were speaking to larger vendors for edtech solutions on a quarterly basis. Provincially, there may also be existing relationships with local vendors, particularly in cases where there are directives to support local businesses providing similar competitive options.

[25] Julia Kaufman and Rebecca Kockler, "Lessons from Louisiana's Efforts to Create a New Marketplace for High-Quality K–12 Curricula and Professional Development," American Enterprise Institute, June 2020: 20210, https://www.aei.org/research-products/report/lessons-from-louisianas-efforts-to-create-a-new-marketplace-for-high-quality-k-12-curricula-and-professional-development/.

Some public and private sector interviewees felt "cold call" awareness and relationship-building falls short of their needs. Public sector-vendor relationships have many positives. They can result in innovative proposals like the usage-based pricing discussed earlier in this paper. When procurement departments are well-resourced, public sector-vendor relationships can be a symbiotic way to stay on top of new trends and maintain open lines of communication. Nevertheless, both public and private sector participants in this study voiced frustration with this method of product discovery. For example, vendors may have incentives to make sales and may be inclined to exaggerate or "over-sell" the functionality and benefits of edtech solutions. In situations where a school, district, or province has insufficient availability of dedicated staff to investigate tech solutions, cold calls can be a burden on procurement officials, who have limited time and resources. Similarly, they can result in a heavier burden for individual teachers and other staff who must sort through and understand offerings made through unsolicited cold calls and outreach.

Study participants voiced several examples of relationship-building opportunities that better serve everyone involved. These relationships between educators and the edtech community can be strengthened through joint training or professional development programs. The Apple Distinguished Educators (ADE)[26] program and professional development resources[27] were identified by an educator interviewee from a rural community as an example of an industry-led professional development group that is helpful for connecting with like-minded individuals who wish to share experiences and innovations in education technology. The ADE program is used to recognize educators who are using Apple products or services to transform teaching and learning. This includes a network of nearly 3,000 educators in 43 countries, who create digital content (such as eBooks), share inspiration for projects or lessons, and connect for curated chats as part of a larger network of advisors and advocates.[28] Other large vendors such as Microsoft[29] and Google[30] also have connections to teachers who champion or demonstrate products in school districts. While it was noted by one industry interviewee that some educators do not look favourably on their colleagues who participate in programs led by large technology corporations (which may offer perks or benefits to these individuals), but from an industry perspective, it was simply described as the way things work and, ultimately, a way to help students by getting the best tools and training into the hands of teachers.

[26] "Apple Distinguished Educators," Apple, accessed June 2022, https://www.apple.com/ca/education/k12/apple-distinguished-educator/
[27] "Apple announces new coaching program and features for educators", Apple, March 2022, https://www.apple.com/newsroom/2022/03/apple-announces-new-coaching-program-for-educators/.
[28] "Apple Distinguished Educators," Apple, accessed July 2022, https://www.apple.com/ca/education/k12/apple-distinguished-educator/.
[29] "Microsoft Educator Program," Microsoft, accessed June 2022, https://docs.microsoft.com/en-us/learn/educator-center/programs/microsoft-educator/.
[30] "Discover programs for educator professional development and student engagement," Google for Education, accessed June 2022, https://edu.google.com/intl/ALL_ca/for-educators/certification-programs/professional-expertise/.

Educational technology events are another way to build connections between industry and the public sector. Roundtable discussions with public sector stakeholders found that edtech events, whether conferences or conventions, are a way to efficiently see a variety of different offerings. However, there have been fewer opportunities for educators to attend such events due to disruptions caused by the COVID-19 pandemic. Furthermore, an edtech researcher from an American not-for-profit noted that there may be inherent limitations in edtech conferences, as they can be heavily skewed toward technology researchers or industry product developers, while few educators attend (which may reflect uneven availability of professional development opportunities and resources for educators). This lack of representation can make it difficult to build connections and understand customer needs.

Several interviewees and roundtable participants suggested holding Canada-wide edtech conferences where procurement teams and vendors from different regions could collaborate. One participant stressed the importance of inviting IT and procurement staff to such conferences, in addition to board executives or department leads:

> There are national conferences that our CIOs or CTOs might go to, but that kind of staff changes a lot, particularly when you compare the lifespan of a CIO or CEO with the lifespan of an IT or procurement staff member who does the day-to-day work. It would be really useful for us to have a chance to ask each other questions and get feedback.
>
> **— Senior Manager of IT, District Level**

"Sandboxes" are low-pressure environments for practical product discovery. One way of encouraging development in education technology is to provide "sandboxes" or real-world environments to test, troubleshoot constraints, and support continuous innovation.[31] It is believed that this limited and controlled implementation (to "play within the sandbox") is critical for providing additional evidence to decision-makers regarding efficacy, cost-effectiveness, and implementation. Theoretically, the use of sandboxes can result in more rapid scaling up of interventions by testing and trialling different tech products, pedagogical approaches, policies, or funding to better understand what combination of factors proves to be effective.[32] These can also be used in post-secondary settings to allow staff and students to access novel technologies that are not formally supported yet.[33] One example of these digital sandboxes is the Digital Promise Content and Data Exchange (previously known as DOCENT) which allows educators and students in select schools to discover, try, and evaluate education

[31] "Our Strategy, Part 2: Deep dive into our approach, focus countries, and theory of change," Edtech Hub, Feb 2022, https://edtechhub.org/2022/02/28/our-strategy-part-2-deep-dive-into-our-approach-focus-countries-and-theory-of-change/.
[32] Ibid.
[33] "Technology Sandbox," Drexel University Information Technology, accessed June 2022, Technology Sandbox | Information Technology | Drexel University.

technology products free of charge in a "digital sandbox" before deciding whether to adopt the products on a larger scale. This platform uses a single login, making it easier for educators to assign modules and view usage and assessment data from multiple programs without requiring students to remember multiple logins.[34]

In other instances, schools have used the term sandboxes to refer to communal places to share and store multimedia content. The Arkansas Digital Sandbox provides a live streaming channel for all schools in the state and has allowed education content to be shared since 2012.[35]

Finally, several interviewees noted the importance of the private sector in overcoming budget constraints, particularly during the current economic climate. Private sector partners can provide schools with grant funding, devices like laptops or tablets, and assistance developing and delivering curricula, such as cybersecurity or software development modules. Notably, some districts were more advanced in their ability to secure partnerships with the private sector, partially due to in-house staff who had the knowledge and experience to make these partnerships happen, and partially due to their proximity to large urban centres and, in turn, large technology companies. Going forward, it will be important for districts who have not previously engaged in such partnerships to consider how they might do so and how it might benefit their schools.

International Innovations in Edtech Procurement

U.S.: Teacher Wallets

The United States has tried various initiatives to improve edtech procurement and successfully integrate new technologies into the classroom, one example being a "teacher wallet." Teacher wallets provide funds directly to teachers with the goal of making teachers "fiscal decision-makers." The funds can be used to purchase innovative but inexpensive apps and tools and enable individual teachers to address local needs quickly and outside of bureaucratic procurement processes.[36] A notable example of a teacher wallet project is a partnership that started in 2013 between the Bill and Melinda Gates Foundation, DonorsChoose, and Digital Promise. They provided $6,000 to more than 300 kindergarten to Grade 8 teachers for digital courseware purchases.[37] The project sought to increase teacher agency and better understand teacher demand for digital courseware or other software tools.[38] A review of the program concluded that "there is a unique role for teacher-

[34] Digital Promise, *Digital Promise 2013 Annual Report,* 2013, http://digitalpromise.org/wp-content/uploads/2016/03/2013_AnnualReport2.pdf.
[35] "Welcome to the Arkansas Digital Sandbox," Government of Arkansas, accessed June 2022, https://adesandbox.arkansas.gov/site/sandbox-login#:~:text=The%20Arkansas%20Digital%20Sandbox%20has,every%20school%20in%20the%20state.
[36] Office of Educational Technology, "Ed Tech Developer's Guide," *US Department of Education,* April 2015, https://tech.ed.gov/files/2015/04/Developer-Toolkit.pdf;
[37] Roland Stephen, "Teacher Demand for Digital Courseware: A Report on the Teacher Wallets Program (Executive Summary)," *SRI International,* Oct 2014, https://www.sri.com/publication/education-learning-pubs/digital-learning-pubs/teacher-demand-for-digital-courseware-a-report-on-the-teacher-wallets-program-executive-summary/.
[38] "All Day, The Gates Foundation is Giving Teachers a Back-to-School Boost!," Donors Choose, Aug 2018, https://www.donorschoose.org/blog/gates-foundation-2018-back-to-school-boost/.

purchased courseware," including meeting the specialized needs of students, supplementing district-provided curriculum, and enabling teachers to experiment in ways that entire districts may not be able to.[39] Notably, teacher wallets can be further supplemented by grants or other types of direct financial assistance.[40]

Teacher wallets generally appeal to edtech reformers who want to further empower educators by giving them greater freedom to make technology purchases.[41] One interviewee, an edtech professional from Quebec, agreed with this sentiment—they had previously taught in the United States and had enjoyed the freedom and independence provided by teacher-allocated funds. That said, most interviewees in this study felt that the risks associated with teacher wallets outweigh the benefits. Teacher-allocated technology funds were not common among interviewees in this study and were often not allowed. Still, many interviewees admitted that board procurement policies are not always followed to a tee, and that in practice, many educators do procure low-cost apps or tools for use in their classroom without board approval. As one interviewee noted, schools and boards need to be careful when allowing individual teachers to make technology purchases because it can incur risks on multiple fronts, including privacy, cybersecurity, and even functionality. One board got around this challenge by maintaining a list of pre-approved purchases that teachers could use individual funds to buy. Other studies have noted that teacher-allocated funds are often too small to incite real technology change and are more likely to go to non-technology purchases like classroom supplies.[42]

U.K.: Building an Edtech Strategy

The U.K. provides another comparison point for edtech procurement. The U.K. is a leading jurisdiction in this space as it "is home to more than 1,200 edtech companies, and it is estimated that educators spend £900 million ($1.4 billion CDN) on digital tools annually."[43] This has accelerated with the rise of remote learning and digital transition during the COVID-19 pandemic and has resulted in the U.K. "attracting investments worth more than US$1 billion since 2014—more than the next three countries combined [in Europe]—and dominating the European edtech market."[44]

However, prior research in the U.K. has noted that significant spending on ICT equipment and services in the previous decade did not result in radical improvements to learning experiences or attainment; notably no technology had

[39] Julie Remold et al., "Executive Summary Teacher Demand for Digital Courseware A Report on the Teacher Wallets Program," SRI Education, Oct 2014, https://www.sri.com/wp-content/uploads/2021/12/sri-teacher-wallets-final-report-executive-summary_0.pdf.
[40] "EdTech Grants For Your Classroom, School or District You Need to Apply For" SAM Labs, March 2022, https://samlabs.com/us/edtech-grants-classroom-school-district-apply/; Madda, Mary Jo., "Where to Find Money for Your School's Edtech Purchases," EdSurge, Nov 2016, https://www.edsurge.com/news/2016-11-21-where-to-find-money-for-your-school-s-edtech-purchases
[41] Goldstein, Mike, "If Education Procurement is Broken, is Teacher Choice the Answer?" *American Enterprise Institute,* Feb 2020, ED606311.pdf
[42] Ibid.
[43] Jonathan Perry "Beyond the gadgets: Why EdTech procurement needs revisiting as we return to face-to-face learning," FE News, May 2021,
Beyond the gadgets: Why EdTech procurement needs revisiting as we return to face-to-face learning – FE News
[44] Genna Ash-Brown, "UK edtech market expected to reach £3.4bn this year," Education Technology, Sept 2021, https://edtechnology.co.uk/business/uk-edtech-market-expected-reach-3-4bn-this-year/.

an impact on learning on its own but was dependent on how it was used.[45] Like many other education systems, there is often a "top-down" approach to purchasing and implementing new technology projects but with limited sharing of successes and practices between schools; in other words, some well-informed individual schools or innovative teachers show innovative practices as "islands of excellence," however, this does not spread throughout the system.[46]

One challenge is data privacy protection. The following has been noted:

> There is no coherent framework for edtech procurement. The role of DPOs [data protection officers within the U.K. and EU contexts], edtech freelance consultants and procurers, and school leaders [in the U.S.] is to support decisions about the choice of edtech products to buy into and use. DPOs in the U.K. seek to establish whether edtech vendors adhere to data privacy conditions set forth by the General Data Protection Regulation (ICO, 2021). In the U.S., in the example of the interviewed school district (Cambridge, MA) a special consortium is set up (SPDC, 2018) to vet edtech products by using specially developed data privacy contractual agreements (obliging vendors to adhere to the Family Educational Rights Protection Act [U.S. Department of Education, 2011]). While this sounds like a straightforward task, DPOs and school leaders say it is not.[47]

In practice, there is a "growing movement away from running large, formal procurement based on a long list of functional requirements toward a more 'solutions-for-the-future' approach where groups of schools work with technology partners… to build out specifications based on key stakeholders' user experience, for staff, children, parents, and senior leadership teams."[48]

At a national level, the U.K. government has launched an overarching Edtech Strategy to identify barriers to the effective use of technology in education. One component of this is for the Department for Education to work with program partners to select a national network of Demonstrator Schools and Colleges. These Demonstrators will receive between £75,000 and £150,000 in grant funding.[49] By providing demonstrations of successful implementation of education technologies and encouraging peer-to-peer teacher learning, it is hoped that this will help educators and administrators better understand the offerings that are available, find evidence for student impact to improve their ability to choose new technologies to adopt.[50]

[45] Rosemary Luckin et al., "Decoding Learning: The Proof, Promise and Potential of Digital Education," Nesta, 2012, https://media.nesta.org.uk/documents/decoding_learning_report.pdf.
[46] Oliver Quilan, "How do schools buy digital technology?" Nesta, Nov 2015, https://www.nesta.org.uk/blog/how-do-schools-buy-digital-technology/.
[47] Velislava Hillman "Edtech procurement matters: It needs a coherent solution, clear governance and market standards," London School of Economics, April 2022, https://www.lse.ac.uk/social-policy/Assets/Documents/PDF/working-paper-series/02-22-Hillman.pdf.
[48] Simon Fry, "Hello, good buy!" Education Technology, Feb 2021, https://edtechnology.co.uk/features/edtech-procurement-hello-good-buy/
[49] Genna Ash-Brown, " The Edtech Demonstrator Programme: a new dawn for the sector," Education Technology, March 2020, https://edtechnology.co.uk/teaching-and-learning/the-edtech-demonstrator-programme-a-new-dawn-for-the-sector/.
[50] Ibid

A 2019 U.K. edtech roundtable also highlighted several emerging trends:

> Schools may not know where they should go for advice and support. While some are happy to interact directly with companies, others prefer to seek impartial guidance. The number of trade shows and specialist publications for schools has declined significantly.

> The absence of a centralized or regional procurement system for English schools has caused the market to become fragmented between 20,000 individual institutions. This makes it harder for assistive technology companies to promote their products and services to potential buyers, which in turn drives up the costs for schools.

> Schools can be 'hard to reach' as they have limited time and resources. They also have to plan their actions months in advance and cannot easily purchase equipment as and when the need arises.[51]

This matches many of the Canadian challenges in procurement and technology adoption. As ICTC heard in discussions, there have been fewer opportunities to get exposure to different products and services in tradeshows and finding the right solutions can be difficult. Also, regional procurement systems can make it challenging for industry to tailor their offerings and proposals for different parts of Canada. In response to these issues, the Department of Education has undertaken several new initiatives, such as:

- Creating frameworks and deals with suppliers to help bring prices down
- Developing a product catalogue
- Working with the British Education Suppliers Association (BESA) to offer a technology lending library
- Organizing regional events to improve access to assistive technology products, services and expertise around the UK[52]

In the U.K. there have been initiatives to improve the acquisition and adoption of new technologies in education settings through demonstrator projects. This is part of the national strategy of establishing demonstrator projects to showcase the use of technology in classrooms and developing networks of expertise and information sharing from educators. The role of educators in sharing best practices and opportunities for edtech innovations is a crucial component of this strategy.

[51] Clive Gilbert, "Outcomes: UK EdTech at home and abroad", All Party Parliamentary Group for Assistive Technology.
[52] Clive Gilbert, "Outcomes: UK EdTech at home and abroad," *All Party Parliamentary Group for Assistive Technology,* Feb 2020, https://www.policyconnect.org.uk/research/outcomes-briefing-uk-edtech-home-and-abroad.

Australia: The Digital Education Revolution Program

Australia has seen success in their multi-year Digital Education Revolution (DER) program. This was launched in 2008 to prepare all Australian students for an increasingly digitized world. Notably, this was a substantial national program with $2.4 billion AUD ($2.17 billion Canadian) funding over seven years.[53] This was a multi-dimensional program that involved investment in infrastructure as well as devices and allowed flexibility at the implementation level for territories and schools to purchase a mix of devices (whether netbooks, laptops, tablets, or desktops).[54] Ultimately, the DER program provided over 290,000 devices for student use across 2,701 schools.[55] IBM was also involved, supporting professional development activities and assisting 15,000 educators integrate technology into instruction plans.[56] This tech initiative also underwent an independent review for impact, and it was found to be a major success in enhancing educational outcomes, accelerated a digital transformation in schools, provided robust infrastructure and uptake of technology, and profoundly impacted low socioeconomic status schools.[57]

LAUNCHING A PROCUREMENT PROCESS

Deciding Which Process to Follow

One of the many decisions a procurement officer must makes when launching a procurement process is what type of process to follow. While the exact terminology may vary, procurement officers generally have three types of procurement processes to choose from: a direct purchase, invited competitive process, or open competitive process. A **direct purchase** or sole source purchase is when a procurement official directly purchases a product or service from a single vendor without engaging in an invited or open competitive process. An **invited competitive process** or limited call for bids is when a select number of vendors are invited to bid on a procurement opportunity. Finally, an **open competitive process** or public tender is when a procurement opportunity is made public for any vendor to bid on—for example, by being posted on a publicly available website. The table below provides a summary of the advantages and challenges associated with each type of procurement.

[53] Johannes Conrads et al., *Digital Education Policies in Europe and Beyond: Key Design Principles for More Effective Policies,* Publications Office of the European Union, (Luxembourg, 2017) https://publications.jrc.ec.europa.eu/repository/handle/JRC109311.
[54] Ibid.
[55] "Australia Experiences a Digital Revolution," Intel, 2010, https://www.intel.com/content/dam/www/public/us/en/documents/case-studies/Ed-Transformation-CS-Australia-HiRes.pdf.
[56] Ibid.
[57] "Digital Education Revolution Program Review," *Australian Government Department of Education, Skills, and Employment,* June 2013, https://www.dese.gov.au/australian-curriculum/resources/digital-education-revolution-program-review

Type of Prodcurement Process	Advantages	Challenges
Direct Purchase	Quick and efficient for both parties.	Non-competitive, which could obscure transparency and limit competition. May preclude other vendors from suggesting alternative products or services.
Invited Competitive Process	More competitive and transparent than a direct purchase—predefined evaluation criteria and specifications are used when proponent selection cannot be made solely on price.	Less competitive and transparent than an open competitive process—may preclude some vendors from participating. May preclude some vendors from suggesting alternative products or services. Involves rigid rules and, according to some, is a process that can be slow and inefficient.
Open Competitive Process	Most competitive and transparent process—predefined evaluation criteria and specifications are used when proponent selection cannot be made solely on price.	Involves rigid rules and, according to some, is a process that can be slow and inefficient

A procurement officer might choose a direct purchase for its efficiency or a competitive process for its ability to foster competition, however, their choice may also be constrained by the financial thresholds stipulated by local rules or legislation. Most of the provinces and territories have rules that dictate different types of procurement processes, as do several regional and international trade agreements. The Government of Newfoundland and Labrador, for example, requires school boards to conduct an open competitive process when purchasing goods with an estimated value of $26,400 or more and services and public works with an estimated value of $105,700 or more.[58] Meanwhile, the Government of Ontario requires an open competitive process for procurement opportunities valued at $100,000 or more.

In terms of trade agreements, financial thresholds are included in the Agreement on Internal Trade,[59] Atlantic Procurement Agreement,[60] New West Partnership Agreement,[61] Canada-European Union Comprehensive Economic and Trade

[58] Government of Newfoundland and Labrador, "Newfoundland and Labrador Regulation 13/18: Public Procurement Regulations under the Public Procurement Act," (Iqaluit, NU, 2021), https://assembly.nl.ca/Legislation/sr/Regulations/rc180013.htm.
[59] "Agreement on Internal Trade: Consolidated Version," Internal Trade Secretariat, (Winnipeg, MB, 2015), https://www.cfta-alec.ca/wp-content/uploads/2017/06/Consolidated-with-14th-Protocol-final-draft.pdf
[60] Governments of New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island, *The Atlantic Procurement Agreement: A Memorandum of Agreement on the Reduction of Interprovincial Trade Barriers Relating to Public Procurement,* (January 18, 2020), https://procurement.novascotia.ca/media/53153/atlantic%20procurement%20agreement.pdf
[61] Governments of British Columbia, Alberta, Saskatchewan and Manitoba," The NWPTA - The Agreement," New West Partnership, Jul 1, 2015, whttp://www.newwestpartnershiptrade.ca/the_agreement.asp

Agreement,[62] and others. While trade agreements can sometimes lead to more consistent rules by harmonizing financial thresholds across the provinces and territories, they tend to only apply to very high-value procurement opportunities, limiting their relevance for many edtech procurement opportunities. The Agreement on Internal Trade, for example, only applies to the procurement of goods and services worth more than $100,000.

Determining the Scope of Work

In addition to determining which process to follow, procurement officials must work with other departments to clearly define the "scope of work" that will guide the purchasing team. The scope of work is the part of a request for proposals (RFP), request for information (RFI), or request for quotation (RFQ) document that describes the product or service being procured. For instance, it can specify the mandatory functional and technical requirements, the procurement timeline, and the number of units being procured. A clearly defined scope of work is one way to ensure a procurement process goes well: after all, it is what communicates to procurement officials and vendors what the end users' needs are.

Several interviewees provided examples of procurement processes that were not successful due to a poorly defined scope of work. One interviewee felt it can be challenging for educators and procurement officials to scope out their needs due to the fast pace of technology change. This sometimes leads to RFPs that are "overdeveloped" with "ridiculous requirements," and in turn, products with "way too many complicated features." Another interviewee brought up instances where their department procured products that were disappointing or did not have the features they wanted: "What went wrong?" they asked. "That comes down to the scope and specifications: were they specific enough? Were they clear?" A third interviewee felt that "generally, when a tender doesn't go well, it's because the tender is based on inaccurate or outdated school needs, [the buyers] haven't been clear about what they're looking for or haven't asked enough questions." In addition, procurement teams may face challenges if:

- They use an RFP when an RFI is more appropriate (One edtech vendor noted that RFIs could be used more often and more strategically in Canada to help districts learn about new edtech solutions and give vendors an opportunity to provide information about their products and services to districts. However, procurement teams would likely require additional resources in order to engage in RFIs more often.)
- They fail to obtain stakeholder alignment
- Their scope of work is missing requirements or includes unnecessary or unreasonable requirements

[62] "About CETA," Government of Canada, Nov 2021: https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/ceta-aecg/about_ceta-propos_aecg.aspx?lang=eng

- They fail to dictate their desired pricing structure
- They do not establish measurable metrics to assess vendor solutions and pricing[63]

Challenge-Based Procurement

While RFPs, FRQs, and RFIs have traditionally relied on a very specific and detailed scope of work, some procurement teams have started to take a more flexible approach: instead of describing the desired solution in extreme detail, they provide vendors with an explanation of the **problem** or **challenge** they are trying to solve and leave the vendors to identify a possible solution. This approach to procurement is generally referred to as problem-based procurement, challenge-based procurement, or outcome-based procurement. It can provide districts with solutions that solve problems or improve processes in ways they might not have been considered before.[64] Also, because a school district does not need to know what solution they want before issuing an RFP, RFQ, or RFI, it reduces the amount of research procurement teams need to do before launching a procurement process.[65] Finally, challenge-based procurement can help districts adopt a "tool-for-task" approach whereby technology solutions are procured to support specific tasks, needs, or curriculum areas (as opposed to one tool being adopted to support all areas of learning). In the quote below, one interviewee discusses their experience conducting a challenge-based procurement:

> "We normally put out an RFP with very detailed specs, but we just recently changed our approach and put out an RFP that described a few different learning scenarios [instead]—a STEM scenario, a general learning scenario, and a library scenario. The scenarios provided context about the types of situations we wanted to [be able to] support and the needs we had. Vendors would apply and explain why their solution would work in that scenario. Previously, we'd put out a call for devices with very specific specs, and the vendor would need to tell us how their product meets them.
>
> **— Edtech Procurement Professional, School Board Level**

For vendors, challenge-based procurement can be favourable because it presents their solutions from being screened out of the procurement process by an overly detailed or limiting scope of work. That said, there are some drawbacks to challenge-based procurement: it can be more difficult for vendors to quickly identify what procurement opportunities are relevant to them, and it can be more difficult for schools to evaluate bids consistently.[66] Overall, very few interviewees had tried or been involved in a challenge-based procurement process, suggesting it is not a common approach for Canadian schools.

[63] Mary Pratt, "How to write an RFP and statement of work for an IT services contract," *TechTarget.com,* March 24, 2020:, https://www.techtarget.com/searchcio/tip/How-to-write-an-RFP-and-statement-of-work-for-an-IT-services-contract
[64] Lauren Dachille, "Procurement Practices That Inhibit Innovation: A Case Study from the EdTech Startup Perspective," *American Enterprise Institute,* July 2020, https://www.aei.org/wp-content/uploads/2020/07/Procurement-Practices-That-Inhibit-Innovation-1.pdf, p.
[65] Farmer, Tyler, Mairead Matthews and Faun Rice, "Procurement Office or 'Living Lab?' Experimenting with procurement and partnerships for smart cities technology in Canada," ICTC, Feb 2021: https://www.digitalthinktankictc.com/ictc-admin/resources/admin/ict-creportsmartcitieseng-1.pdf Tyler Farmer, Mairead Matthews, and Faun Rice, "Procurement Office or 'Living Lab?' Experimenting with Procurement and Partnerships for Smart Cities Technologies in Canada" (Ottawa, ON: Information and Communications Technology Council, February 2021), https://www.ictc-ctic.ca/wp-content/uploads/2021/03/ICTC_Report_SmartCities_ENG.pdf
[66] Ibid.

ASSESSMENT AND DECISION-MAKING

With so many variables to account for in edtech purchases, assessment and decision-making can be extremely difficult. There are many examples of edtech purchases that have not gone well, leading to tech that becomes dated too quickly, is difficult for IT teams to integrate and manage, or receives poor uptake by educators and students. In this study, interviewees highlighted many strategies for effective assessment and decision-making, but five stood out as best practices:

1. Reviewing existing research on edtech solutions' learning outcomes and priorities like accessibility
2. Making decisions collaboratively with other departments and end users
3. Using proof-of-concepts or walk-throughs to ensure a product is suitable and compatible with existing IT systems
4. Using pilots or trials to gauge interest among end users and obtain feedback
5. Treating assessment as a constant, iterative process

Reviewing Existing Research on Edtech Solutions' Learning Outcomes

In a rare Canadian study on edtech procurement, 10 senior professionals in Ontario school districts were interviewed to see if edtech procurement followed evidence-based decision-making practices. The study found that:

> "Senior leaders are making acquisitions that are not aligned with current scholarship, that districts struggle to use data-driven decision-making to support the governance of educational technology spending, and that districts do not have effective assessment measures in place to determine the efficacy of a purchased technology.[67]

The authors note that this is not solely a problem of the education officials: empirical evidence on edtech learning outcomes for individual solutions can be few and far between and often lacks rigour and generalizability.[68] The choices being made by senior officials responsible for edtech acquisition were more likely to be influenced by cost; compatibility and interoperability; features such as durability and accessibility; organizational vision; and pedagogical philosophies and norms.[69] However, the authors identified a key opportunity to log data on procurement and implementation, and use it for improved evidence-based decision-making in future.

[67] Jason Riberio, "Educational Technology Decision-Making: Technology Acquisition for 746,000 Ontario Students," *Canadian Journal of Educational Administration and Policy* 176, pp:1-30, 2016.
[68] Ibid.
[69] Ibid.

Similarly, American research has found that despite policy-driven measures such as the Every Student Succeeds Act (ESSA), which attempts to enforce research requirements in order for schools to access funding for new solutions,[70] few educators have heard of the resources available to them to evaluate new solutions (such as What Works Clearinghouse, Evidence for ESSA, and Regional Educational Laboratories).[71] These resources are essential steps toward making learning outcome research more accessible; nevertheless even they have some challenges that are hard for schools to navigate. One interviewee commented, for example, that What Works Clearinghouse was slow to update its database of edtech studies and did not always do enough to evaluate the quality of the evidence it hosts. Furthermore, an international interviewee had seen edtech companies commission studies that would never be published because they hadn't found significant evidence of improved learning outcomes, and then proceed to continue research until they had a study with significant results.

In the interviews conducted in this study, few individuals responsible for procurement discussed accessing evidence on learning outcomes. In part, this was seen as a skill gap: it is not easy for school administrators to build the expertise to evaluate the rigour of a study commissioned by an edtech company:

> "I would love for districts to push harder on [issues of] evidence and the quality of the evidence. But that isn't something your superintendent is usually able to do. They aren't digging in beyond the sales pitch. They don't have a sense of rigorous methods.
>
> **— International interviewee with expertise in evaluating edtech**

Even though few interviewees had the resources and time to access learning outcomes research, many did convene interdisciplinary committees where another stakeholder such as an educational technology specialist or curriculum specialist would be primarily responsible for evaluating a technology solution's potential impact on learning. Limitations such as time and capacity often prevent procurement teams from following up to examine and publish the outcomes of their procured tools (and indeed, it would be difficult to disaggregate tool utility from implementation issues, for example). However, as will be shown throughout this section, a bank of research, formal and informal, the utility and success of edtech tools in pilot programs and full adoption would begin to fill what is currently a significant gap in Canadian educational technology assessment.

[70] David Deschryver, "Helping Education Entrepreneurs and School Leaders Navigate the Procurement Maze," *American Enterprise Institute,* Sept 2020, https://www.aei.org/research-products/report/helping-education-entrepreneurs-and-school-leaders-navigate-the-procurement-maze/.

[71] Eric Kalenze, "What it Will Take to Improve Evidence-Informed Decision-Making in Schools," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?

Consulting Existing Accessibility Standards and Research

Increasingly, those responsible for edtech procurement are expected to be proactively assessing technology solutions' accessibility features rather than waiting for students to identify gaps and challenges.[72] Furthermore, while it can be hard to find rigorous literature on learning outcomes (see above), there is a strong and growing literature on accessibility standards for educational technology solutions. For example, one paper recommends enshrining Web Content Accessibility Guidelines (WCAG) in procurement, which would mandate elements like adjustable text size, audio and text descriptions of videos and images, and other essential features.[73]

Across the board, procurement officials recognized the importance of consulting resources on accessibility during assessment—so much so that they deferred entirely to a specialized accessibility department or consultant. Accessibility committees, counsellors, or consultants might include clinicians, speech therapists, and psychologists who are able to review and assess new solutions for accessibility compliance as a part of their duties. In a similar manner, well-resourced school boards may have access to advisory committees on inclusive resources. Furthermore, some jurisdictions mandate unique accessibility features: for example, the Territory of Nunavut ensures that student learning systems can use the territory's official languages, including Inuit languages' syllabic characters that require the installation of different fonts.

Collaborative Decision-Making

Interviewees felt it is important to assess edtech solutions and make procurement decisions in collaboration with end users and other departments. Individuals with different academic and professional backgrounds—whether education, IT, accessibility, or something else—see different requirements as important and add different perspectives to procurement teams. In this study, individuals with technology backgrounds tended to focus more on requirements related to tech, such as product design, integration with legacy IT systems, privacy, and security. Past studies also identify interoperability as important for IT teams, particularly when purchasing tools that share data with other devices or software.[74] Specifically, new edtech purchases need to sync with a district's broader ecosystem of apps and devices, and for any data collection to adhere to standards.[75]

Interviewees with education backgrounds focused more on requirements related to curriculum, pedagogy, and a product's functional use in the classroom. Many edtech vendors are headquartered in the United States and obtained their first

[72] "Accessibility of Education Technology: Guiding principles for procurement," *Desire to Learn, 2018: https://www.d2l.com/wp-content/uploads/2018/11/D2L-Accessibility-Guiding-Principles.pdf*
[73] Ibid.
[74] Nicole Krueger, "The five pillars of edtech procurement: As educators rethink how they make technology decisions, these are the critical factors to consider," 2020, *Empowered Learner,* https://cdn.iste.org/www-root/PDF/EL%20January%202020-weboptimized.pdf
[75] Ibid.

customers there, meaning it is not uncommon for edtech solutions to be tailored to U.S. curricula. As one interviewee noted, "one of the things [Canadian procurement teams] struggle with when it comes to U.S. vendors is that they and another school district might say it meets their curriculum needs, but they'll be referring to a U.S. aligned curriculum, which might teach European history in Grade 10, as opposed to say Grade 11 or 12." As a result, curricula-related aspects of edtech solutions need to be looked at in considerable detail and at times, translated from a U.S. context to an Ontario, New Brunswick, or British Columbia one.

Educators may also approach edtech procurement from a holistic, social perspective. For instance, in summarizing their approach to edtech procurement, one interviewee listed a series of hard-hitting questions about values, equity, and accessibility:

> "Does [this product] align with our strategic goals, values, and mission as a school board? Is it anti-oppressive? Anti-racist? Does it promote equity? Is it culturally responsive? Is it reflective of the students in our school system? Does it offer multiple access points for students? Are there options for students with special education needs? Does it cater to a variety of learning styles? Is it accessible—and I don't just mean in terms of accessibility needs, but is it intuitive? ...Is there ease of use?
>
> **— School Principal**

Finally, individuals with procurement backgrounds tend to focus more on issues such as pricing structure, warranties, and repairs, and whether the requirements align with procurement rules. The table below provides a summary of the different requirements surfaced by interviewees.

Type of Interviewee	Considerations brough up in interviews
Technology background	The number of users a product needs to support simultaneously.
	Whether the product requires user verification and the ability to set up individual user accounts.
	Whether the board or school needs to be able to access the product and push changes from a back-end portal.
	What privacy, security, or accessibility laws the product must adhere to.
	Who has ownership over data and intellectual property (IP) generated by the product's development or use.
	Whether the product needs the capability to track usage and report usage over time.
	Whether the product includes training or tech support.
	Which legacy IT systems the product needs to integrate with.

Education background	What types of curricula the product can support and whether the product includes locally relevant curricula. Whether the product is representative of diverse groups. Whether the product can be integrated into a classroom in more than one way, such as to facilitate both independent and group work. How much training or professional development the product requires. Whether the product actually solves a challenge faced by educators or students in the classroom.
Procurement background	Whether the requirements are specific and clear enough and can be measured using comparable criteria. Whether the requirements follow best practices and are in compliance with procurement rules. Whether the requirements are fair, transparent, and defensible and do not provide an advantage to one vendor over another. What the pricing structure is for the product or service and how to compare different vendor's pricing structures. What warranties or repair services are included in the purchase.

Sustainable Procurement

While some districts had standard policies or clauses related to sustainability and environmental impact, there was a dearth of policies and clauses specifically related to ICT sustainability. Sustainable ICT procurement and lifecycle management are two areas that districts will need to improve upon in the future in order to limit the environmental impact of their technology stack.

Most purchasing teams engage end users and multidisciplinary staff in one way or another, but how they do so differs substantially.

Among districts interviewed for this study, the most basic approach to user engagement was establishing a Google Form, Microsoft Teams channel, or other online tool that end users could use to suggest technology purchases. End user requests are reviewed by a single decision-maker or committee and, if approved, passed on to the procurement or IT team for further consideration. Two of the districts that use this approach have a multidisciplinary team review edtech requests and include representation from curriculum, IT, finance, and procurement. One district had only recently adopted this approach. Prior to its adoption, "it was tough for teachers to get innovative and effective [technology] into the classroom, even if [the technology] was something rudimentary that other districts already had."

Districts with a more developed approach to user engagement included end users in the development of RFPs and other procurement documents, and on purchasing committees. An example of this is temporarily releasing teachers and principals from in-school duties to engage with boards on procurement activities. For larger districts, it is not uncommon for boards to have a centrally assigned teacher, principal, or librarian that works with their corporate team full-time and can inform procurement activities as needed. Similarly, one of the districts involved in this study regularly convenes advisory committees to facilitate input from various community groups, including parents, accessibility advocates, BIPOC (Black, Indigenous, and people of color) families, and individuals who identify as 2SLGBTQIA+.

Overall, interviewees felt that user engagement can take time and cost money but invaluably improves procurement outcomes. Existing publications caution that "districts that don't involve teachers in technology purchases at all often struggle with low adoption rates because the software doesn't meet classroom needs."[76] Further, not engaging teachers during the procurement process can lead to low buy-in later on. In this study, interviewees noted that user engagement drives maximum return on investment for technology purchases and helps procurement teams properly identify and meet school needs. They felt that educators and administrators need to collaborate more, but that because time and space is so limited in education, collaboration does not always take place. At the very least, interviewees felt it is important for teachers, principals, and other end users to be able to suggest technology purchases to their school or board on an ongoing basis. This way, administrators can use the suggestions to identify trending or overlapping needs—such as 10 teachers in the math department wanting a specific software product—and use their budgets more strategically.

Proofs of Concept and Walk-Throughs

Several interviewees felt it is important to conduct a hands-on discovery process when purchasing a new software or device. This could mean conducting a proof of concept or "walk-through" with the vendor's sales or product engineering team or conducting a self-led discovery process using a loaned licence or device. Whether part of a formal RFP process or an informal way to learn about new vendors, discovery processes can help ensure a solution is intuitive and easy to use, has all of the expected functionalities, and is interoperable with existing tools or network infrastructure. They can also be a way to test claims by vendors about what a product can do. As one interviewee noted, "Sometimes, when the rubber hits the road, the story changes, and what the vendor puts on paper is different to what they can showcase."

[76] Nicole Krueger, "The five pillars of edtech procurement: As educators rethink how they make technology decisions, these are the critical factors to consider," 2020, *Empowered Learner,* https://cdn.iste.org/www-root/PDF/EL%20January%202020-weboptimized.pdf

Pilots and Trials

Pilots or trials can enable a district to **de-risk** and **evaluate** solutions, while training professionals to use them and observing student adoption. Districts can collect quantitative and qualitative feedback on a tool's usefulness from teachers and students and assess whether it is, in the end, valuable for wider distribution. Pilots and trials can also present opportunities for new and small companies to demonstrate their effectiveness. Furthermore, in an ideal situation, a pilot serves as professional development for a vendor as well as an evaluation opportunity for a school board: a vendor can retrieve information on user experience and learn about implementation challenges that allow them to improve their product in future.[77] Pilots are not only an opportunity to trial a solution, they are also an opportunity for an educational jurisdiction to work with key staff within in a company and learn whether an account manager and implementation support team will be a good fit.[78] Additionally, proponents of edtech pilots and trials believe they would:

- Create opportunities for more fulsome and proactive evaluation of edtech products, rather than subjecting educators and procurement professionals to unsolicited sales calls[79]
- Be conducted with a comprehensive inventory of existing solutions in hand to evaluate overlaps, gaps, and incompatibilities[80]
- Improve opportunities for local and early-stage companies through a de-risking process that does not exclude startups or companies without pre-existing contracts[81]
- Result in a solution that end users can easily implement (in short, something that will be used)[82]

Pilots are often run informally and without systematic, pre-determined standards of evaluation. If boards ran pilots with a rigorous design and published their findings, they could contribute to the growing literature on educational technologies.[83] This type of work might be an opportunity for collaboration

[77] John Bailey et al., "Smart Series Guide to EdTech Procurement," *Digital Learning Now,* 2015 https://digitallearningnow.com/site/uploads/2014/01/Procurement-Guide-FINAL.pdf, p. 14.
[78] John Bailey et al., "Smart Series Guide to EdTech Procurement," *Digital Learning Now,* 2015 https://digitallearningnow.com/site/uploads/2014/01/Procurement-Guide-FINAL.pdf, p. 15.
[79] Lauren Dachille, "Procurement Practices That Inhibit Innovation: A Case Study from the EdTech Startup Perspective," *American Enterprise Institute,* July 2020, https://www.aei.org/wp-content/uploads/2020/07/Procurement-Practices-That-Inhibit-Innovation-1.pdf, p. 2.
[80] John Bailey et al., "Smart Series Guide to EdTech Procurement," *Digital Learning Now,* 2015 https://digitallearningnow.com/site/uploads/2014/01/Procurement-Guide-FINAL.pdf
[81] Tyler Farmer, Tyler, Mairead Matthews, and Faun Rice, "Procurement Office or 'Living Lab?' Experimenting with Procurement and Partnerships for Smart Cities Technologies in Canada" (Ottawa, ON: Information and Communications Technology Council, February 2021), https://www.ictc-ctic.ca/wp-content/uploads/2021/03/ICTC_Report_SmartCities_ENG.pdf. ; Lauren Dachille, "Procurement Practices That Inhibit Innovation: A Case Study from the EdTech Startup Perspective," *American Enterprise Institute,* July 2020, https://www.aei.org/wp-content/uploads/2020/07/Procurement-Practices-That-Inhibit-Innovation-1.pdf, p. 3.
[82] "Edtech Procurement and Adoption," *Digital Promise,* https://challengemap.digitalpromise.org/technology-network-infrastructure/edtech-procurement-adoption/, accessed May 27 2022.
[83] Jennifer Morrison, Steven Ross, Roisin Corcoran, and A.J. Reid, "Fostering Market Efficiency in K-12 Ed-Tech Procurement," *Centre for Research and Reform in Education (CRRE) at Johns Hopkins University,* September 22, 2014, https://digitalpromise.org/wp-content/uploads/2016/02/DP_ImprovingEdTechPurchasing_FullReport.pdf https://digitalpromise.org/wp-content/uploads/2016/02/DP_ImprovingEdTechPurchasing_FullReport.pdf.

between vendors, the public sector, and civil society, as it is in vendors' interests to gather evidence that their solution improves student outcomes. (an impartial study may be best run by a third party).

Pilots and trials do not themselves solve the problem of sourcing in the first place: a procurement officer or educational technology specialist may still be inundated with sales calls from vendors requesting pilot programs, with little time and few resources to differentiate between solutions. However, several organizations such as Digital Promise offer toolkits for educators and procurement officers to use in order to articulate a need or challenge,[84] discover and select products using clear evaluation criteria,[85] and then plan, implement, and collect and analyze data on the pilot's success.[86] Other resources, such as Johns Hopkins University's "Evidence for ESSA" site, not only list existing research on edtech resources but also evaluate the quality of each study that has been conducted on an edtech solution, grading evidence on how rigorously the pilot research was conducted.[87]

Proactively integrating evaluation into a pilot program, by consulting existing resources and setting up clear internal standards for what a successful pilot looks like, is key to running an effective internal evaluation. Successful pilot programs will result in technologies that teachers, students, and other staff are willing and able to use. The principles of successful pilots discussed here were reinforced by a study that asked how K-12 schools in the U.S. were implementing pilots, including what information was collected, and how pilot evidence was evaluated in making a procurement decision. The authors found that to improve pilot-to-procurement efficacy, districts running them should:

- Engage in transparent communication with all parties
- Include formal and informal processes and mechanisms for collecting teacher and student feedback, and pass this on anonymized to help companies improve their products
- Run a pilot for long enough to make an evaluation substantive
- Shape clear post-pilot expectations for all stakeholders
- Refine the pilot process itself by taking note of what worked, or didn't work well
- Provide adequate IT support, technological infrastructure, professional development for teachers, etc.[88]

[84] "Identify Need," *Digital Promise,* accessed May 27, 2022, https://edtech.digitalpromise.org/identify-need/
[85] "Discover & Select," *Digital Promise,* accessed May 27, 2022, https://edtech.digitalpromise.org/discover-and-select/,
[86] "EdTech Pilot Framework," *Digital Promise,* accessed May 27, 2022, https://edtech.digitalpromise.org/,
[87] "Evidence for ESSA," n.d., accessed May 27, 2022, https://www.evidenceforessa.org/.
[88] Valerie Adams-Bass, Drew Atchison, and Liza Moore, *Pilot-to-Purchase, Piloting Ed-Tech Products in k-12 Public Schools,* 2015, https://doi.org/10.13140/RG.2.1.1625.4324.

Interestingly, the study authors also found demographic variation among students who evaluated the effectiveness of pilot programs. In the study's six districts, racialized students were more "excited about using educational technology." The authors hypothesize that this may have to do with negative perceptions of traditional education for racialized students.[89] While this is an area that could use investigation in a Canadian context, it emphasizes that a pilot program is best evaluated with careful attention to a region's context, student histories, and learning types. Evidence for success in one jurisdiction may not always translate to another.

Many interviewees working in educational technology procurement regularly ran pilots or trials. Although, what constitutes a formal "pilot" can be ambiguous. When asked about pilots and trials, interviewees described the following evaluation activities (not all of these are formal pilots or trials, but all are fact-finding or evaluations that may or may not occur alongside a formal tender process):

- A vendor-initiated pilot or trial (e.g., a vendor provides free hardware or software for many schools and gathers feedback)
- A more extensive trial with teachers and/or students, evaluated with user adoption rates, frequency of use, quality of content, teacher feedback
- A systematic trial that puts effort into sampling representative schools in a region and collecting feedback from as many stakeholders as possible

While all interviewees put effort into obtaining sound feedback, no one interviewed reported running a pilot that measured a technology solution's impact on measurable learning outcomes. This type of study can be difficult for a school system to implement and may best be done with a research partner. Nevertheless, interviewees reported trials or pilots being a simple way to ensure that teachers liked a solution, that it would work with their infrastructure, and that vendors were responsive.

[89] Valerie Adams-Bass, Drew Atchison, and Liza Moore, *Pilot-to-Purchase, Piloting Ed-Tech Products in k-12 Public Schools,* 2015, https://doi.org/10.13140/RG.2.1.1625.4324..

Constantly Iterating

Finally, innovative schools and districts understand that edtech procurement is a constant, iterative process. They try out new products at a small scale or for short periods of time; regularly reassess old technology purchases; and rely on usage statistics and other indicators to make informed decisions. One interviewee, a librarian and edtech specialist, commented that their approach to technology purchases is similar to how they develop a library collection: that is, adding new resources if something is missing, obtaining more copies of items that see high use, and dropping items people do not use. Another interviewee said that assessment needs to be an ongoing process because tech can stop being responsive to a school's needs very quickly. Several districts reported only licensing new software for up to a year or reviewing all tech purchases on an annual basis.

In terms of indicators, interviewees in this study relied on the following when deciding whether to renew or expand an edtech purchase:

- Usage statistics, such as the number of teachers using a product, the number of hours of student engagement, or how long it takes for usage to fade
- User feedback provided in feedback channels or internal forums
- Qualitative insights on the roadblocks that people face while using a technology
- Expert feedback from privacy or accessibility specialists

IMPLEMENTATION AND PROCESS MANAGEMENT

Integrating technology into the classroom happens after the procurement process is complete, but procurement decisions can significantly impact how successfully edtech is implemented and adopted. For example, parameters in an RFP can shape how a product is developed and customized, with consequences for how user friendly it is for teachers. Furthermore, procurement can include stipulations that vendors train a certain number of users or provide ongoing support to teachers and classrooms. One interviewee noted that "generally, when a tender doesn't go well, it's because the tender wasn't based on accurate or current school needs." They compared finding the right vendor to interviewing new candidates for a job.

Many existing studies on educational technology procurement have identified integration and implementation as a key challenge: for example, one U.S. paper found that, on average, 67% of edtech software licences in K-12 education are

not used.[90] Teachers, procurement officers, and administrators may be "awash" with new edtech and not have the time or energy to implement technologies in the classroom once procured.[91] This problem can be exacerbated by the absence of adequate processes to alert teachers to procured new resources and a plan for professional development and training on these tools.[92] In one U.S. study, researchers interviewed public school teachers to understand what would and would not lead them to adopt new instructional tools and practices. They found that teachers are more interested in adoption when a solution solves a clear problem in their classroom, makes teaching more enjoyable, and does not require an extensive change to the teaching methods they have developed overtime. Measures such as mandates and product promotion were not seen as effective incentives to promote long-term adoption and integration.[93] Furthermore, school and school district culture can influence teachers' enthusiasm about implementation: if teachers feel that too many "top-down" solutions have been tried without success, educators can experience fatigue around new programs.[94]

In short, much of the literature on this topic notes that teachers are most likely to implement something that is genuinely and obviously helpful to them.[95]
In this study, a former educational technology specialist recounted a story about a solution that was in place for years but only became useful when its adoption became necessary:

> "We've had Microsoft 365 for three or four years in most divisions, but most teachers had never used Teams or didn't know what it was. But when they went to remote learning [during school closures in the COVID-19 pandemic], it was like 'now you're using this platform,' and most people didn't know how to use it. It was basically a division scramble to get information out to teachers.
>
> **— ET Specialist and Researcher, School Board and University**

In part, teachers not noticing the value of a tool is influenced by procurement. When a single teacher in a procurement region requests a solution, procurement officers may need to purchase it for the entire region's use. However, access to (and time for) evidence-based decision-making is a second challenge to adoption and implementation. If teachers had time to investigate the evidence on which tools produced the best instructional outcomes (and which procurement professionals

[90] Nicole Krueger, "The five pillars of edtech procurement," *ISTE,* December 25, 2019, https://www.iste.org/explore/empowered-learner/five-pillars-edtech-procurement.
[91] Frederick M. Hess (Ed.), "Rethinking K-12 Education Procurement," *American Enterprise Institute,* 2021, https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf
[92] Thomas Arnett, Why Aren't Teachers Using the Resources Companies Sell to Their Districts? *American Enterprise Institute,* 2019, https://www.aei.org/research-products/report/why-arent-teachers-using-the-resources-companies-sell-to-their-districts/
[93] Ibid.
[94] "Evolving Ed-Tech Procurement in School Districts," IDEO & Digital Promise, 2013, https://digitalpromise.org/reportsandresources/evolving-ed-tech-procurement-in-school-districts/.
[95] E.g., Ibid; Mike Goldstein,"If Education Procurement is Broken, is Teacher Choice the Answer?" *American Enterprise Institute,* Feb 2020, ED606311.pdf

made those purchases), it is possible that more tools would be adopted.[96] Some note that educational research is siloed from instructors, and that better adoption would be facilitated if teachers were more aware of edtech evaluation resources (e.g., What Works Clearinghouse, Evidence for ESSA) and were part of evaluation conversations leading to procurement.[97] As discussed earlier in this paper, teacher involvement in procurement may also help ameliorate challenges with classroom implementation.

Professional Development and Technology Integration Specialists

Professional development is a core feature of effective edtech implementation. In one American survey, 31% of teachers noted that they weren't using certain technologies in their classrooms due to a lack of training.[98] Teacher professional development (PD) is crucial to support strong return on investment from procured solutions. However, PD needs to be implemented intentionally and sustainable. For example, one U.S. study saw poor uptake of solutions even with PD attached. It recommended job-embedded support on an ongoing basis because initial professional development did not result in teachers being able to trial and troubleshoot in real scenarios. Teachers must have technology specialists or colleagues to assist them while integrating the technology into their classroom rather than relying on single early training.[99] This sentiment was echoed by interviewees in this study who had been teachers (or involved closely with teachers at some point in their careers). Some teachers experienced participated in a workshop for a new technology solution and then lacked ongoing support and had to learn about the tool after work hours.

> "Training has to be continuous and ongoing. It doesn't work when you just attend even a one-day session. That's not enough because teachers will go back to their schools and test out the technology solution's features, and if it doesn't work the way it's supposed to, they'll probably opt not to waste their class time figuring it out. And so, the solution will die until the next PD day, which is months away. You need in-house expertise constantly training on these things, and you need administration pushing it, always talking about it, and offering more training. Teachers really have enough on their plates.
>
> **— ET Specialist and Researcher, School Board and University**

Ongoing, continuous training is particularly important for constantly evolving solutions: as teachers deal with updates and new software, they may require regular support. Professional development training on edtech solutions is related

[96] Eric Kalenze, "What it Will Take to Improve Evidence-Informed Decision-Making in Schools," 2021, *American Enterprise Institute,* https://www.aei.org/wp-content/uploads/2021/02/BK-Rethinking-K12-Education-Procurement_online.pdf?x91208
[97] Ibid.
[98] Nicole Krueger, "The five pillars of edtech procurement," *ISTE,* December 25, 2019, https://www.iste.org/explore/empowered-learner/five-pillars-edtech-procurement.
[99] Thomas Arnett, "Why Aren't Teachers Using the Resources Companies Sell to Their Districts?" *American Enterprise Institute,* 2019, https://www.aei.org/research-products/report/why-arent-teachers-using-the-resources-companies-sell-to-their-districts/

to procurement in many jurisdictions in Canada. For example, in one instance an educational technology specialist was frustrated by a "top-down" technology implementation where no money had been set aside to procure additional professional development support from the vendor:

> "The government gave this specific envelope of money, which was to be used to ensure that every classroom had [a particular technology] in it. What ends up happening is that for people like me, technology consultants, that becomes 100% of your job because you're the one who's working with [the company that provides the technology], then training people on how to use their [technology].
>
> **— ET Lead, Provincial Government Level**

Technology integration specialists, or edtech specialists, may or may not exist in school districts, depending on local budgets and priorities. For districts that have them, their role is to "work with school-based staff and regional staff to help people understand how to integrate technology into their classrooms." For many interviewees in rural and remote regions of Canada, people in this type of role were lacking: for example, one interviewee in the Territories noted that their division for teacher development had 20 vacancies due to a lack of housing. However, all divisions had innovative ways of improving professional development, adoption, and implementation. Suggestions and solutions included:

- Making purchases with an implementation plan in mind that matches the lifetime of the hardware or licence being acquired
- Flying in a trainer from an edtech company to train specific teachers, designated as "champions" for the solution in their schools, who will then train their colleagues
- Articulating school needs very clearly during procurement, minimizing barriers to adoption early in the process (e.g., ensuring that solutions are user friendly, work well with other technologies in a school)
- Take teacher feedback to vendors to ensure that successive generations of an edtech product better meet classroom needs
- Supporting existing networks of teachers, formal and informal, who engage in edtech research, collaborate, and share knowledge and outcomes
- Seeking out new opportunities, such as edtech conferences and alternate scheduling, to carve out more time for teachers to research, trial, and implement edtech

Soliciting and Acting on Teacher Feedback Following Adoption

Earlier sections have shown that it can be helpful for procurement decision-makers to acquire teacher feedback on a solution for several reasons:

- To improve future procurements
- To learn how teachers are using a product (as intended, in novel ways, not at all)
- To build a body of evidence on what will and won't be successfully adopted by schools
- To identify needs such as additional professional development and build them into budgets

While few interviewees had formal mechanisms for receiving teacher feedback, many procurement decision-makers felt overwhelmed by the informal teacher feedback they received. For example, they found that teachers often made requests or comments that contradicted their colleagues or realities of budgeting, security, and privacy, etc. "Like anything else, we hear complaints more quickly than we hear positives," one procurement officer explained.

One interviewee had a standing policy of surveying or interviewing teachers after a product was implemented, then combining this information with adoption figures such as usage data and user logins. Another interviewee in a different school board and province worked with their data management team to establish measurement criteria about a project's success and how student and teacher feedback could be incorporated. While this required time and capacity that might not be available to all school boards, the utility of having a formal system rather than needing to rely on individual impressions was clear. Several other interviewees voiced a desire to institute something similar:

> "There are two pieces to that: one is creating an expectation, and the second is following through to see what the usage or buy-in is and how that compares to the expectation. If you don't have an expectation, there's no way to know if your usage is good, right? In my experience, we fall short on setting that expectation and then following through to see it was met.
>
> **— Director of Technology, Provincial Government Level**

> I want to switch to a website where people can leave a feedback form. Teachers can reach out right now, but it's just via email. We look after 800 teachers, and it can be very challenging—everybody has different opinions, and annual subscriptions cost hundreds of thousands of dollars sometimes.
>
> **— Director of Technology, Territorial Government Level**

In sum, instituting formal feedback processes might allow procurement officers to quantify feedback and requests, and assess them more easily. Importantly, having this type of data may also help edtech specialists and procurement officers create the evidence they need to acquire more sustainable funding and staffing from provincial and territorial governments.

THE IMPACT OF COVID-19

The rapid spread of the COVID-19 pandemic in 2020 led to a massive disruption of the education system at all levels. The closure of in-person schooling and widespread adoption of online and distance learning represented unprecedented change.[100] Schools and educators quickly navigated these challenges, which included a quick transition to mass online learning (entailing the adoption of new technologies and pedagogy and ensuring adequate access to devices and broadband internet).

An associated positive development was that the immediate needs of schools resulted in increased funding and accelerated measures to acquire and adopt necessary edtech products and services. However, this also resulted in increased strain on procurement staff and systems. Edtech experts and procurement staff had to adjust to rapidly changing parameters and varied needs. In some cases, education systems had to quickly transition hundreds of schools from in-person learning to online systems. As one interviewee noted, this forced some schools to start procuring for two parallel education systems: one that supported students learning online and another that supported those attending class in-person. While most classrooms were closed for parts of the 2020/2021 school year, some remained open to accommodate students with special learning needs who could not be properly supported at home.

[100] Maryna Ivus, Trevor Quan, and Nathan Snider, "Uncharted Waters: A World-Class Canadian E-Learning Paradigm" (Ottawa: Information and Communications Technology Council, October 2021), https://www.digitalthinktankictc.com/reports/uncharted-waters.

This led to changing roles and duties as the pandemic fundamentally altered aspects of the education system. As Canadian interviewees noted, this led to significant new learnings: "We had no past history or past experience to rely on because nothing like this had ever happened, and every school district in the world faced the same challenge." The ongoing COVID-19 pandemic has led to rapid changes throughout the system, especially for foundational IT needs. Indeed, this has led to an increased focus on remote learning, internet infrastructure, student information systems, and even "Bring Your Own Device" (BYOD) policies.

As a result of this disruption, some interviewees stated that there has been more openness to running pilots or allowing vendors to conduct proof-of-concept demonstrations to show their capabilities.

Interviewees were grateful that emergency funding was available to help provide additional resources to navigate these challenges, but in some cases, there were concerns about the implementation; it can be more difficult to recover promised funds and demonstrate the need to have expenses approved rather than be provided additional funding upfront. In other cases, provincial subsidy programs were crucial to help purchase new equipment, personal computing devices for students, and to expand internet offerings for underserved populations, but this was accompanied by worries that it will be a challenge to address ongoing costs (such as training or maintenance) to support these projects in the future.

Implementation of new technologies today can look much different than it did two years ago. One example mentioned is that software training for educators is now done virtually, both synchronously and asynchronously. Fully online training started due to the pandemic and haven't gone back to face-to-face lessons, although this may be changing. With the widespread acceptance of remote learning, there have also been new opportunities created. For example, some school systems are partnering with local colleges to establish virtual labs and online cybersecurity coursework.

These changes to the education system have led to increased focus on issues of cybersecurity, student data privacy risks, and high-speed networks for online and hybrid learning. This in turn has been incorporated into procurement considerations.

The COVID-19 pandemic led to admirable efforts by educators to quickly adapt to public health measures. In addition to the pivot to online learning, interviewees described stories of teachers who created paper packages of assignments to deliver to student homes where there was insufficient access. However, despite these individual efforts the disruption from the pandemic was uneven across the population. At a systemic level, interviewees noted that this transition was sometimes easier at large school divisions that had more resources or dedicated staff to help manage this transition process compared to smaller districts. Furthermore, some school districts were nimbler than others. As one education consultant in this study noted, they made it work with or without technology to ensure that no one fell through the cracks, but this often came down to the efforts of individual teachers, schools, and districts. Furthermore, uneven availability of equipment, internet, or even dedicated space in homes for students to learn can result in challenging learning environments.

CONTINUED IMPACTS

For all the short-term disruption caused by the forced shift to online learning, schools reopened, and learning returned to traditional structures for many students. Interviewees noted that things have mostly returned to normal, but there is still support for online learning, which remains more robust than before the pandemic.

Beyond the public health risks of future waves or possible temporary school closures, another pressing issue could be COVID-19 burnout. Research from the Canadian Teacher's Federation indicated that "97% of participants stated they experienced increased physical, mental, and emotional workload, and job demands during the 2020-2021 school year,"[101] driven by increased workload, uncertainty, and inadequate support. Interestingly, a study of Canadian school teachers and staff found that even after the initial COVID-19 disruption, anxiety and psychological distress remained elevated compared to pre-pandemic levels.[102]

These sentiments were echoed by an interviewee in this study. They believed that in their networks, many of the more innovative and tech-forward teachers have been simply exhausted from the COVID-19 pandemic. After enduring a long period of "survival mode," there is a loss of enthusiasm to try new efforts or projects. This is marked by a sense of weariness and hesitation to take on additional work from new tech initiatives, pilot projects, or potential partnerships with edtech companies. This may be reflected in the reduced interest in educator professional development discussion groups.

[101] "'But at What Cost?' Mental Health Report," Canadian Teacher Foundation, accessed June 2022: https://vox.ctf-fce.ca/mental-health-research-report/

[102] Sarah M Hutchison et al., "School staff and teachers during the second year of COVID-19: Higher anxiety symptoms, higher psychological distress, and poorer mental health compared to the general population," *Journal of affective disorders reports* 8 (2022): 100335. doi:10.1016/j.jadr.2022.100335.; "2021-22 Annual Ontario School Survey: A perfect storm of stress," People for Education, 2022, https://peopleforeducation.ca/report/2022-annual-report-on-schools-a-perfect-storm-of-stress/.

SECTION III

STRATEGIES FOR IMPROVING CANADIAN EDTECH POLICY

As part of this study, ICTC held two policy roundtables—one with public sector procurement officials and one with the private sector. During the roundtables, the participants conducted a SWOT (strengths, weaknesses, opportunities, and threats) analysis of education technology procurement across Canada. The table below summarizes the strengths, weaknesses, opportunities, and threats associated with Canadian edtech procurement according to public and private sector stakeholders.

Overall, it is clear the stakeholders involved in edtech procurement are both experts in their field and can identify areas for improvement. Together, the SWOT analysis and the stakeholder insights point to important strategies for improving edtech procurement in districts across Canada.

	Public Sector	Private Sector
Strengths	**Highly specialized professionals lead edtech procurement across Canada** Individuals involved in edtech procurement are highly specialized and have a wealth of knowledge about technology and procurement processes. Many districts have additional experts on topics like curriculum, accessibility, privacy, and security.	**Edtech is a catalyst for innovation in education** Edtech companies push educators to innovate in positive ways and find new ways to do things.

Divisional purchasing allows for localization

Large portions of Canada's education sector purchase edtech at the district level. Divisional purchasing has many benefits, such as purchasing teams being able to tailor purchases to local contexts and needs, and being able to respond quickly to emergencies like the COVID-19 pandemic, and more seamless professional development planning.

Canada has a strong edtech industry and strong academic researchers in the edtech space

Canada has advanced and engaging digital learning platforms and content. The products that come out of Canada are strong and Canada is respected in the global edtech marketplace.

Canada's post-secondary institutions and academic researchers do a really good job of researching the use of technology in education, such as the use of technology resources for literacy training. There is a wealth of strong researchers for Canada's education and edtech sector to rely on for efficacy studies.

Canada is very diverse and offers a great environment to pilot new edtech products and services.

Weaknesses

Public Sector

The public sector has limited resources, which can result in slow procurement processes

Tech is continuously evolving and there is not enough professional development time for schools, educators, and procurement officials to keep abreast of the latest trends.

Many procurement and IT teams are overwhelmed by purchase requests from teachers, causing burnout and delays. Edtech purchases involve significant workload for procurement and IT teams, including privacy impact assessments, integration, and maintenance (NV, NS).

In regions with centralized procurement, schools and districts face significant delays.

There is sometimes not enough resources devoted to obtaining user feedback or including educators and other stakeholders in procurement processes.

Private Sector

The public procurement process can be complex and cumbersome

It can be difficult for edtech companies to find schools or districts to work with to build a list of prior customers.

The sales process is complicated and burdensome, leading some companies to not sell in Canada or to smaller districts.

Edtech companies are unclear on who they should talk to in education about their products and services.

Many jurisdictions are hesitant to experiment with new products or solutions.

Public officials tend to be comfortable with the partnerships they already have and are not open to securing new partnerships

It can be difficult to balance the need for local purchasing with the need to reduce risks

It can be difficult for districts to strike a productive balance between enabling educators to inform and even lead edtech purchasing, and mitigating the risk of privacy breachers, cybersecurity incidents, or tech purchases that do not integrate with existing systems.

Many rural and remote districts are limited by insufficient broadband access

Regions with slow or insufficient broadband access are severely limited in terms of what edtech they can adopt, and often spend a large portion of their tech budgets on connectivity.

There is a lack of alignment between the different levels of government and different stakeholders

Stakeholder priorities in education are not aligned: students, teachers, districts, and governments want different things.

There is not enough educator involvement in edtech procurement decisions.

There is no clear strategy for curriculum or edtech at the national level, leading to a patchwork of strategies and solutions, and duplicate processes for companies, such as curriculum vetting.

Opportunities

Public Sector

There is an opportunity for centralization to assist with budget shortages

Some provinces are considering further centralizing their procurement, which could be a way to deal with ongoing budget cuts at the district level (although districts may see reduced funding to offset this).

There is an opportunity to use the pandemic as a catalyst

The pandemic brought more attention to challenges related to education technology, such as the need for reliable internet access, and there is an opportunity to generate more traction in this space.

The pandemic has made educators and students more familiar with edtech. There is an opportunity to support them in thinking of new ways to utilize digital tools.

Private Sector

There is an opportunity for Canada to lead internationally on privacy and diverse efficacy studies

Canada can lead in data privacy by developing uniform privacy legislation or a national portfolio of privacy-conscious edtech companies.

Canada, with its diverse population, can lead in conducting diverse efficacy studies.

There is an opportunity to try new and innovative approaches to procurement

Some of Canada's larger cities have innovative districts that are open to piloting new tech or trialling new tech in a sandbox environment (an isolated testing environment). There is an opportunity to expand this approach to other, more diverse districts.

There is an opportunity to partner with the private sector to overcome budget constraints

The public sector has limited resources to teach tech skills while private sector companies face difficulty sourcing labour. There is an opportunity for educators to partner with the private sector to design curriculum and teach students technology skills while meeting labour demand.

The public sector spends considerable resources navigating the edtech market and lacks a centralized venue to learn about new tools. There is an opportunity for the public and private sector to partner together on an annual edtech conference to reduce workload.

	Public Sector	Private Sector
Threats	**Public funding is limited and constantly under threat** Budgets are always tight and there is a constant threat of consolidation, reduced salaries, and "cuts" through attrition. Many procurement budgets do not account for inflation. Many edtech vendors are from the United States, and the exchange rate leads to high prices for Canadian schools. Northern and remote districts face additional costs, such as shipping and travel, higher internet costs, and surcharges from by vendors for doing business in remote areas. These districts are also more likely to receive amage. **Supply Chain Issues** The COVID-19 pandemic and other geopolitical events have disrupted global supply chains and, in edtech, have led to significant backlogs and delayed shipments.	**Public funding is limited and can be unpredictable** Public funding for edtech is unpredictable and complex and often relies on multiple funding sources being pieced together. Solutions that are not core to math or science, such as those focused on diversity, rely on separate, grant-based funding pools. **Threats to Canada's Private Sector Edtech Industry** Economic uncertainty is making it harder for edtech companies to secure funding. Canadian edtech companies are competing with well-funded, hyper-growth companies from the United States and India that have large talent and marketing budgets and look for Canadian startups to buy out. It is difficult for edtech companies to compete with not-for-profits and charities that provide content for free, either with funding from government or industry, as open source, or supported by ads.

Privacy and Security

Some parents are highly concerned about their child's data being shared with edtech companies. Yet, it is very difficult for children to partake in school activities these days without sharing some data. For parents to be trusting, districts need to be vigilant in doing privacy impact assessments and other paperwork that can be difficult and expensive.

Cyber risk insurance providers require stringent privacy and security policies, such as multi-factor authentication, limiting what software schools can offer.

Tech companies can too easily fail to empower teachers or cause digital fatigue.

POLICY ROADMAP

One of the core weaknesses and threats and the centre of nearly all discussions on edtech procurement is budget and resourcing. Education budgets are subject to numerous forces, including provincial priorities and decisions around how centralized edtech spending should be. Accordingly, many of the opportunities and strategies outlined by study participants are ways to make processes more affordable and efficient, while many of the threats and weaknesses centre on financial insecurity and instability. Many study contributors advocated for larger budgets for edtech procurement—or, at a minimum, inflation-adjusted budgets that take into account new equipment needs for COVID-19 and remote education and provide support for new processes and services like privacy impact assessments. In addition, funding for specialized staff (both ET and IT workers, accessibility and inclusion consultants, privacy specialists) and professional development time would improve outcomes in the edtech procurement space. This is particularly true for rural and remote regions. Many regions with small student bodies struggled to find adequate funding for infrastructure and support. Beyond more funding for edtech procurement and personnel, the following measures may help those involved in K-12 edtech procurement to improve processes, save money, and develop new systems.

1. Where possible, strike a balance between centralized, decentralized, and divisional procurement

Stakeholders of all kinds could see various benefits in centralized, decentralized, and divisional procurement. Centralized procurement can save costs through mass purchasing, and allows for a more efficient assessment of interoperability, privacy, accessibility, and other important standards: for example, it would not be efficient to have every school or school board run their own procurement and privacy

assessment for the same technology solution. Similarly, it is helpful to have a central inventory of existing technologies to review for budgeting (e.g., monitoring warranty expiration dates) and compatibility.

However, centralized procurement does not always adequately consider the needs of the end user, educator, and student, and may not be cost-effective when purchasing a solution for a whole region if it is requested by a small group of people. Involving end users at all stages of procurement, incorporating their ongoing feedback, and negotiating usage-based or other fee schedules with vendors can help with these challenges.

All told, there are certain measures that are most easily centralized, and others that are more easily kept divisional or decentralized. All regions can work toward the best possible balance of these models. Other ideas include:

a. Standardize and fund end user involvement in procurement (e.g., give educators time and money to participate in procurement, paying money to pull teachers from class when needed)

b. Create resources for underfunded districts who are not able to access expertise in privacy or accessibility (e.g., in a decentralized or divisional system, offer a centralized role that can offer this expertise as a part of their duties)

c. Share information on innovative purchasing agreements like usage-based fees, including information about which vendors offer usage-based pricing, across and between jurisdictions

d. Bring together people with multiple backgrounds onto a purchasing committee or procurement team to ensure the product is assessed from a curriculum, pedagogical, technical, business, privacy, security, and procurement perspective

e. Allow different levels of procurement decision-makers to trial innovative approaches to procurement (e.g., challenge-based procurement, pilots and trials, proof of concept and walk-throughs) and share their findings with peers in their jurisdiction

2. Enable more collaboration between procurement stakeholders from different regions—for instance, enable more collaborative purchasing by districts from different provinces or territories but with similar contexts and procurement needs

Across the board, stakeholders did not have very many opportunities to meet, share best practices, and discover or vet solutions. Some edtech conferences exist in Canada but are designed for particular stakeholder groups (e.g., academic conferences rather than civil society), be virtual conferences, or have high access fees.[103] An accessible conference that attracts people who work in various roles would solve a number of the problems articulated in this paper. For example, school districts voiced interest in collaborating with others across the country to purchase or trial solutions but did not know how to initiate this kind of partnership. While some interviewees found cold calls useful, some vendors and procurement officers were frustrated by them—vendors because they were not sure who was ultimately responsible for decision-making, and procurement professionals because sales calls required a lot of their time and were difficult to sift through. A Canada-wide conference would bring exposure to edtech companies and allow districts to meet. If it included educators, procurement professionals, and ET and IT specialists and researchers, it would also allow for multidisciplinary collaboration in purchasing and planning new projects.

Furthermore, an in-person, interdisciplinary conference would:

a. Allow educators and procurement officials to access and review current knowledge on edtech solutions and impacts on learning

b. Allow for improved communication of the outcomes of pilots and trials. When evaluated properly, pilot and trial findings could be presented to peers, and centralized in a repository much like the existing U.S. models of What Works Clearinghouse or Evidence for ESSA. Given the upfront time needed to host and contextualize pilot findings (e.g., comment upon evidentiary rigour) an academic or civil society partner would be helpful in this area

c. Create opportunities for school districts to involve research partners (e.g., a graduate student in education or psychology) in pilots and trials, thus improving study design

[103] A predatory open access publisher does not engage in peer review and typically has a low impact factor but charges high fees for authors to enrol in conferences and/or publish their papers. The World Academy of Science, Engineering and Technology is the organization offering an edtech conference in Canada in August 2022 (ICETIS 2022: 16. International Conference on Educational Technology and Information Systems) and has been identified by several reviewers as a predatory publisher (see for example, Daniel Oberhause, "Hundreds of Researchers from Harvard, Yale and Stanford were Published in Fake Academic Journals," *Vice.com,* Aug 14, 2018, https://www.vice.com/en/article/3ky45y/hundreds-of-researchers-from-harvard-yale-and-stanford-were-published-in-fake-academic-journals)

d. Allow procurement officers to share reflections on novel approaches to procurement (like challenge-based procurement) and gather recommendations from peers across Canada

e. Allow vendors, educators, and procurement decision-makers to discover each other's work without resorting to cold calls

Several interviewees voiced the importance of the private sector in overcoming budget constraints, particularly during the current economic climate, which is defined by high inflation and the risk of a near-term recession. Private sector partners can provide schools with grant funding, devices like laptops or tablets, and assistance developing and delivering curricula, such as cybersecurity or software development modules. Some districts were more advanced in their ability to secure partnerships with the private sector, partially due to in-house staff who had the knowledge and experience to make these partnerships happen, and partially due to their proximity to large urban centres and in turn, large technology companies. Going forward, it will be important for districts that have not previously engaged in such partnerships to consider how they might do so and how it might benefit their schools.

3. Give people working in procurement more time to standardize and systematize their processes, creating improved cost savings and educational outcomes in the long run

Many people working in education feel like they are playing catch up with the newest technologies, technologies that are expiring or dying in their schools, and privacy and accessibility standards they need to comply with, among other challenges. Procurement officers and other public sector stakeholders need more time and staffing to create systems that will help them in the long run. This could include funding and support for:

a. Instituting formal teacher feedback programs and standardized or automatic usage data, allowing procurement officers to assess the success of a product's implementation more effectively and objectively

b. Creating a standardized process for teacher requests, allowing them to create a more objective needs assessment prior to launching a procurement process

c. Allowing procurement professionals or technology leads to build inventories of their existing solutions, monitor warranties and opportunities for cost saving

d. Allowing procurement professionals to build measures related to privacy, accessibility, etc. into RFPs pre-emptively

e. Allowing procurement stakeholders to spend time accessing research on the learning outcomes of edtech solutions

f. Building in time for teacher professional development, from vendors or IT specialists, and ensuring that it is ongoing, would help with process management, and that technologies are being used. Without time spent on implementation and usage, procurement has not lived up to its primary purpose

Among the participants who gave their time to this study, many had experienced staff reductions and/or stagnant funding in an era of inflation and e-learning. While all of the ways forward posited in this section may help edtech stakeholders improve outcomes in their schools, only so much can be done without additional funding and staff to support technology procurement and integration across jurisdictions in Canada.

APPENDIX A: SUMMARY OF TRADE AGREEMENTS

Most, but not all provinces and territories, have established regional procurement policies, which govern procurement by organizations in the public and MASH (municipal governments, publicly funded academic institutions, school boards, and health and social services) sectors. In addition to these regional policies, public- and MASH-sector organizations are bound by internal and international trade agreements, some of which include:

- The Canadian Free Trade Agreement (internal)
- The New West Partnership Trade Agreement (internal)
- The Ontario-Quebec Trade and Cooperation Agreement (internal)
- The Atlantic Trade and Procurement Partnership Memorandum of Understanding (internal)
- The Comprehensive Economic and Trade Agreement (international)

These agreements require MASH-sector organizations to follow specific rules when using public money to make high-value purchases. For example, the Canadian Free Trade Agreement requires school boards to follow specific rules when purchasing goods or services (other than construction) valued at $100,000 or greater, and when procuring construction services valued at $250,000 or greater.[104] Meanwhile, the Comprehensive Economic and Trade Agreement only applies to goods and services purchases valued at $651,000 or greater, and construction services valued at $9,100,000 or greater.[105] Because the value of edtech purchases is often far below the stipulated thresholds, trade agreements are not often triggered by edtech purchases. Nonetheless, they may apply in the case of very large purchases. Some examples of rules that are included in trade agreements and apply to edtech procurement are:

- **Non-discrimination:** many trade agreements prohibit provinces, territories, and school districts from differentiating between suppliers or goods or services on the basis of geographic location. In other words, it is prohibited to preference one supplier over another

[104] "Canadian Free Trade Agreement: Consolidated version," 2017, *Canadian Free Trade Agreement,* https://www.cfta-alec.ca/wp-content/uploads/2017/06/CFTA-Consolidated-Text-Final-Print-Text-English.pdf
[105] "Government Procurement," January 2022, *Government of Canada,* https://www.international.gc.ca/trade-agreements-accords-commerciaux/topics-domaines/gp-mp/index.aspx?lang=eng

based on geographic location alone. Non-discrimination clauses can sometimes be broken if it can be demonstrated that breaking such a clause achieves a legitimate objective, such as public security and safety, environmental protection, consumer protection, or affirmative action programs for disadvantaged groups. Under exceptional circumstances, provinces and territories may also implement a regional economic development clause that preferences local suppliers so long as they announce it prior to the call for tender and minimize the discriminatory effects of the clause

- **Transparency:** many trade agreements require provinces, territories, and school districts to make their procurement policies, procedures, and guidelines readily accessible. Similarly, many require these entities to post-procurement opportunities and notices on a website that is free to access or, at the very least, low cost, publicly available, and easy to use

- **Fair and competitive process:** most trade agreements require a fair and competitive process for purchases with a value that is greater than the stipulated financial thresholds. (Usually, a fair and competitive process means issuing an RFI, RFQ, RFP, or call for tenders)

- **Buying groups:** usually, trade agreements must be followed by buying groups, even if the buying group includes some organizations that are not part of the public or MASH sectors

Many trade agreements (and regional procurement policies) include exceptional cases where the trade agreement's provisions will not apply, even when the financial thresholds are met. Some examples of exceptions that are included in trade agreements and apply to edtech purchases are:

- To ensure interoperability and compatibility with existing products (notably, this exception was raised several times by interviewees)

- To recognize exclusive rights, such as exclusive licences, copyright, and patent rights, or to maintain specialized products that must be maintained by the manufacturer or its representative (this exception was also raised several times by interviewees and is perhaps the most pertinent for edtech purchases, which are often software licences and are therefore governed by copyrights)

- Where the good or service can only be supplied by a particular supplier and no alternative or substitute exists (again, this exception was raised several times by interviewees when referencing very specialized education software or hardware)

- In the case of an unforeseen situation of urgency, and the goods or services cannot be obtained in time using a competitive process (a good example of this was when the COVID-19 pandemic required schools to move online in a matter of weeks)

- When procuring a prototype or co-developing a good or service with a vendor for the purpose of research, experiment, or study, or original development (this would be case if a province, territory, or district chose to work with a vendor to develop a pilot tool or service)

- When the purchase is funded primarily by donations that are subject to conditions that are inconsistent with the trade agreement (such as if a school conducts its own fundraising or receives a donation)

- When there is a need for government confidentiality or security and an open tender would compromise this need

- When the purchase is funded in whole or in part by an international cooperation organization, such as the Organization for Economic Cooperation and Development or the United Nations Educational, Scientific, and Cultural Organization

- When compliance with the trade agreement interferes with a province, territory, or school district's ability to maintain security or order or protect human life

- When the province, territory, or school district tries to issue an open call for tenders, RFI, RFP, or RFP but only receives one or no bids

When trade agreements do not apply (for instance, due to an exception or because the purchase value does not meet the stipulated threshold), provinces, territories, and school districts are generally required to follow the procurement rules set out in their regional legislation, regulations, or policy directives. The list below identifies whether school districts are required to follow provincial or territorial level procurement policies, and if so, what the thresholds in that region are.

APPENDIX B: RESEARCH METHODOLOGY AND STUDY LIMITATIONS

The research methodology used in the development of this report consisted of a combination of primary and secondary research.

SECONDARY RESEARCH

The secondary research for this study focused on an analysis of existing literature for Canadian and international settings. A robust literature review was leveraged to highlight or clarify key themes, trends, and emerging issues.

PRIMARY RESEARCH

Key Informant Interviews

Primary research for this study consisted of a series of 20 key informant interviews (KIIs) and were held with a variety of subject matter experts from across Canada. KIIs played an important role in gathering insights on trends, specifically as they related to general perceptions, personal experiences, and first-hand accounts related to challenges and new opportunities.

This research included interviewees from every province and territory in Canada as well as several international education technology experts. It encompassed school districts of different sizes and socioeconomic status to ensure a range of perspectives.

Public Sector and Private Sector Roundtables

These interviewees were supplemented by two roundtables held in the Spring of 2022. These events were held separately to provide discussion spaces for public sector stakeholders as well as private sector stakeholders. The public sector roundtable included educators and administrators from across Canada. Ten participants discussed the process of finding the right vendors and products, differences across the provinces and territories and between districts, key challenges, and opportunities for improvement.

The private sector roundtable also had seven participants from across the country to discuss the process of getting technology into Canadian schools, differences across the provinces and territories, and opportunities for improvement. Participants represented a diverse range of companies and roles (ranging from business development to senior executives).

These roundtables provided a space for group discussions and included a collaborative SWOT (strengths, weaknesses, opportunities, threats) exercise to identify specific issues in the Canadian edtech procurement ecosystem. This SWOT exercise culminated in several recommendations to improve edtech procurement as described earlier in this report.

STUDY LIMITATIONS

While ICTC attempted to ensure that the research process for this study was as exhaustive as possible, there are inherent limitations to sample size and the qualitative nature of the interviews. It can also be difficult to define education technology and to cross compare policies or terms across jurisdictions (provincially or for other countries).

ICTC conducted 20 KIIs, which is a modest sample pool of interviewees. This means that these responses must be regarded as insights and cannot necessarily be taken as objective "trends" that represent the Canadian experience.

Efforts were taken to ensure that the language used is in accordance with the UN Convention on the "Rights of Persons with Disabilities," however, it is recognized that language and terminology used may become out-of-date. ICTC aimed to use the most respectful words possible when writing these reports (while acknowledging that the most appropriate terminology may change over time) and has conducted this research with the intent to respect the dignity and inherent rights of all individuals.