Technology and Learning Fund

A Guide to Implementation 2017

CODE
Council of Ontario Directors of Education

Table of Contents

Introduction

Ontario's school districts, provincial schools, and school authorities are collaborating with the Ministry of Education and Council of Ontario Directors of Education (CODE) in 21C Innovation Research projects to transform learning and teaching practices for deeper learning and global competencies, enhanced by technology. This collaborative research has been underway since 2011. Since 2014, as part of advancing Ontario's renewed vision for education, *Achieving Excellence*, this collaborative work and study are now funded and integrated as part of the ministry's Technology and Learning Fund (TLF).

This guide was developed to assist districts, leaders, and teams with their understanding of the processes, considerations, and supports available for their TLF innovation research projects. The guide also includes the *Celebrating Ontario's Innovation Journey – An Iterative Rubric* which represents district work and experiences to-date in innovation scaling, informed by research and practitioner knowledge and expertise.

Technology and Learning Fund (TLF) Information

How do you prepare students to thrive in a rapidly changing, information and technology-intensive, globalized world?

Policymakers and educators around the world are grappling with this 21st century challenge, and Ontario is no different.

In an effort to bring innovation to learning, the government introduced the Technology and Learning Fund (TLF) in 2014 as a three-year, multi-faceted investment designed to support transformation in teaching and learning in Ontario.

The $150M Technology and Learning Fund is comprised of two interrelated allocations to district school boards, school authorities, and provincial schools:

1. **Funding Allocation for TLF Enhanced Supports**

   - Designated for the acquisition of relevant digital technology and learning tools such as tablets, laptops, cameras, software and 3D scanners and printers (up to 80% of allocation);

   - Designated for the provision of professional learning opportunities for educators and school and/or system leaders related to the development of new teaching and learning practices enhanced by technology (must be a minimum of 20% of the allocation).

   Note: Districts may decide to spend more than 20% on professional learning which would reduce the amount of funding for acquiring technology.

2. **Funding Allocation for Innovation Research**

   - Designated for school boards to develop and document their Innovation Research Projects towards systematizing and scaling-up new teaching and learning practices.

The TLF is intended to promote accelerated uptake of evidence-based, technology-enhanced, pedagogical practices focused on deeper learning and competencies, with particular reference to the draft global competencies under active consideration by the ministry: critical thinking and problem-solving; learning to learn/self-aware and self-directed learning; collaboration; communication; innovation, creativity and entrepreneurship; and global citizenship and sustainability. For more information on global competencies, see page 13.

TLF Focus Areas

District school boards use TLF funds to address at least one of four key areas of focus:

1. Create more educator-student learning partnerships through real-world, authentic learning tasks enabled by technology.

2. Provide more opportunities for student peer-to-peer learning enabled by technology.

3. Develop and provide professional learning about new assessment practices that reflect deep learning pedagogy aligned with *Growing Success*.

4. Provide opportunities to develop new learning partnerships among educators enabled by technology in addition to funding for face-to-face professional development.

Based on international research evidence, the areas of focus are intended to be broad and inclusive of a variety of practices that may look different from K-12, across subject disciplines and supported by diverse technologies. The focus areas enable active rather than passive learning through more time on deeper learning tasks and support transformations in teaching and learning practice required for students to develop the knowledge, skills, and characteristics that will lead them to become personally successful, economically productive and engaged citizens.

Processes, Timelines, and Research Design

Districts design innovation research projects to explore how changes in educator practice impact student achievement, well-being, equity and engagement. There are timelines, obligations and design choices to consider.

I. Timelines (approximate)

- September
  - Review district Action Plan

- October
  - Establish impact evidence process and tools
  - Gather baseline data
  - Sign district letter of agreement

- November
  - Register for a GoSecure account

- February
  - Attend Round Table Learning Event

- April
  - Gather data
  - Analyze impact evidence

- May
  - Complete Curriculum Services Canada Report

- June
  - Complete Ministry TLF Report and Action Plan

II. Innovation Research Projects Design

Where does one begin?

Student learning needs are at the heart of everything. Both the goals articulated in Ontario's *Renewed Vision for Achieving Excellence* and the theoretical underpinnings of the TLF's Innovation Research Projects speak to student learning needs, and focus on **deeper learning** and **global competencies**. These are the foundations of the TLF Areas of Focus.
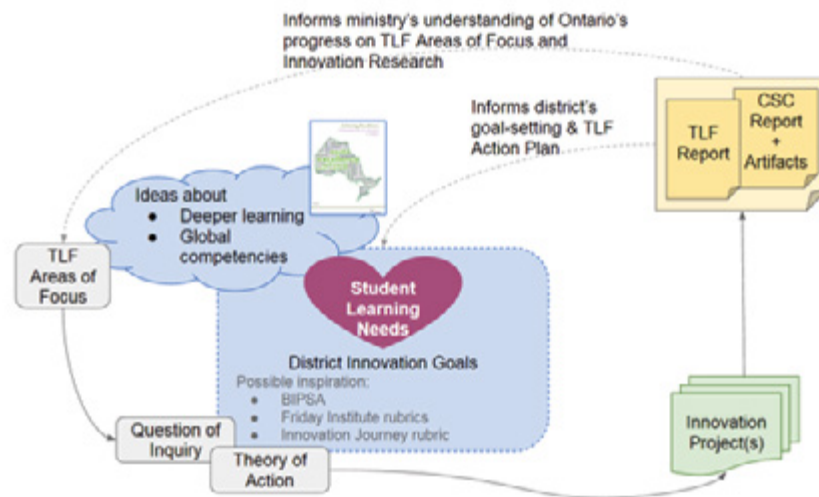
The Areas of Focus then spur a district's **question of inquiry** and subsequently, the **theory of action**. Ideally, these connect with the district's SILC (System Improvement Learning Cycle) and BIPSA (Board Improvement Plan for Student Achievement). They may draw inspiration from **Celebrating Ontario's Innovation Journey – An Iterative Rubric**, or perhaps the **Friday Institute – North Carolina – The Digital Learning Rubrics** shared with boards in 2016 addressing "Content & Instruction", "Professional Learning", and "Leadership". The district's theory of action and question of inquiry drive the district's innovation project(s).

At the end of the academic year, the innovation projects yield two reports: the **TLF report** and the **CSC report & artefacts**. The district's findings articulated in these reports could inform their **goal-setting** and **TLF Action Plan** for the next academic year. These reports also inform the ministry's understanding of Ontario's collective progress on the **TLF Areas of Focus** and **Innovation Research**.

Overview of District Steps for Innovation Research Projects:

- Identify student learning needs
- Consider Achieving Excellence, ideas about deeper learning and global competencies
- Consider the TLF Areas of Focus
- Review Celebrating Ontario's Innovation Journey - An Iterative Rubric (Appendix A)
- Develop a question of inquiry and theory of action aligned with district goals
- Design an innovation research project
- Gather and analyze pre-, formative and post data
- Submit two reports
- Revise and scale district practices based on what is being learned
- Refine the Action Plan

Design Considerations for Innovation Research Projects

The following are considerations and suggestions as districts plan, implement and measure their innovation project(s). It is important for districts to focus on how changes in educator practice impact learners.

1. **Review your district's Question of Inquiry. Does it:**

   - Begin with How or What?
   - Include an adult action/change in practice?
   - Include a student learning outcome that is measurable?

   Review your district's Theory of Action. Does it:

   - Identify actions to get to a desired state?
   - Include if/then statements that can be tested against impact evidence?
   - Allow for possible cycles of improvement?

2. **What kinds of practices promote deeper learning?**

- Real-world authentic learning opportunities (learning for transfer)
- Peer-to-peer (collaborative) learning
- Interplay of the cognitive, intrapersonal and interpersonal domains i.e. global competencies
- Self-directed learning
- Life-wide learning
- Experiential learning
- Interdisciplinary learning
- Service learning
- Global projects
- Field study
- Case-based; project-based; problem-based; inquiry-based learning
- Self/peer/instructor assessment to inform next steps aligned with Growing Success
- Professional learning partnerships

3. **How do we transform district culture to optimize conditions for teaching, learning and leading?**

- Capacity building
- Sharing leadership with everyone
- Leveraging expertise and leadership of all
- Enhancing growth mindset in the service of student achievement and well-being
- Recognizing and using promising evidence-based practices that foster effective leadership
- Shifting leadership practices and relationships that are reciprocal, agile and adaptive
- Creating a culture of collaborative professionalism and building professional capital
- Building renewed coherence in all work
- Leveraging digital tools to support collaborative professionalism and transparency

4. **What other participants/partners might be included?**

- Parents
- Community
- Employers
- Cross-panel partnerships (i.e., elementary and secondary)
- Post-secondary
- Experts
- Local/Global Partners
- University Researchers

5. **What are the potential impacts on educator practice?**

- Reported changes in instructional practice
    - Educator-student partnerships in learning
    - Authentic/Real-world learning tasks and opportunities
    - Peer-to-peer learning
    - Changes in assessment practices **aligned with** *Growing Success*
    - Educator shift to facilitator/activator
    - Educator use of digital technologies
- Educator-educator partnerships in learning, planning, and reflecting
- Participation in Professional Learning Networks
- Changes in beliefs, attitudes and mindsets
- Knowledge Mobilization
- Informal Leadership

6. **How will technology be leveraged to enable and enhance system, leader, educator, and student learning during the innovation research project(s)?**

- How will you monitor and measure?
- What will success look like?

III. Gathering and Analyzing Impact Evidence

How will you know that the innovation research project is positively impacting student achievement, engagement, equity, and well-being?

Districts develop processes for gathering and analyzing how changes in practice impact learners. This may include administering pre- and post assessments, conducting interviews, using rubrics, or developing indicators to determine the impact of innovation research project(s) on student achievement, engagement, equity and well-being. Districts use this information to refine and scale projects. Collecting and sharing of artefacts should follow district policy and guidelines for privacy.

What are some ways that Ontario school districts are gathering impact evidence?

- Pre and Post Surveys
- Rubrics
- Developing Indicators
- Testimonials/Interviews
- Pedagogical Documentation
- Observation Notes
- Learning Stories
- Artefacts/Student Work
- Moderated Marking
- Selecting Marker Students
- Focus Groups (involving a set of predefined questions)
- Student Thinking (Video, texts, etc.)
- Reflection Journals
- Analytics

Visit the 21st Century Teaching and Learning/Enseignement et apprentissage au 21^C Virtual Learning Environment to see a sample of tools districts have developed or are using to gather, monitor, and measure impact evidence.

What could be measured?

Changes in student achievement, engagement, equity and well-being might be measured.

Is there evidence of, for example:

- Improved learning skills and work habits?
- Achievement scores and course marks that have been gathered in ways that align with *Growing Success?*
- Increased credit accumulation?
- Greater depth of understanding (curriculum, goals, criteria)?
- Reduction of student isolation?
- Social emotional learning?
- Improved time on task and task completion?
- New student leadership capacities demonstrated?
- Improved resilience?
- Acquisition of important global competencies?
- Improved attendance?
- Differentiated/personalized learning?
- Student voice, choice and agency?
- Self-directed learning?
- Innovative spaces and opportunities, including formal and informal connections?
- Universal Design for Learning practices?

Considerations for Methods and/or Instruments

- Select/design instruments such as surveys, interviews or focus groups (involving a set of predefined questions), observation notes, reflection journals, student and educator work, etc.
- Will the instruments be used pre- and post or at multiple times over the course of the project, to measure change?
- Instrument administration – to whom, by whom?
- Who will analyze the information and where will the impact evidence be collected?
- How and with whom will the impact evidence be shared?

Consider multiple sources of evidence to create a robust picture of how changes in educator practice impact learners.

> *When thinking of impact evidence, refer to the Impact Evidence section of the Celebrating Ontario's Innovation Journey – An Iterative Rubric attached as Appendix A.*

IV. Reporting

Keeping your goals in mind and thinking of how you are documenting learning and gathering evidence at multiple stages of the project(s), will assist when it comes time to complete the Curriculum Services Canada and Ministry reports.

How can I find out what other districts are doing?

- Council of Ontario Directors of Education website includes Artefacts submitted with the year-end report

- 21C EduGAINS /ÉduSource website includes an overview of all Ontario 21C Innovation Research Projects

- 21st Century Teaching and Learning/Enseignement et apprentissage au 21e siecle Virtual Learning Environment (VLE) includes Roundtable breakout session and gallery walk submissions from various innovation research projects

Considerations for Deeper Learning

Deeper Learning and New Pedagogies

The Technology and Learning Fund is transforming education for deeper learning and global competencies. "Deeper learning" is defined as the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations i.e., transfer (National Research Council, 2012).

In its landmark report Education for Life and Work in the 21st Century, the U.S. National Research Council (2012) described "deeper learning" as an instructional approach important in preparing students with sophisticated cognitive, intrapersonal, and interpersonal skills. Modern digital tools and media now enable the use of deeper learning strategies in schools (Dede, 2014), including:

- Connected learning encourages students to confront challenges and pursue opportunities that exist outside of their classrooms and campuses (Ito et al, 2013);

- Case-based learning helps students master abstract principles and skills through the analysis of real-world situations;

- Interdisciplinary studies help students see how differing fields can complement each other, offering a richer perspective on the world than any single discipline can provide;

- Collaborative learning enables a team to combine its knowledge and skills in making sense of a complex phenomenon;

- Apprenticeships involve working with a mentor who has a specific real-world role and, over time, enables mastery of their knowledge and skills; and

- Learning for transfer emphasizes that the measure of mastery is application in life rather than simply in the classroom.

Fullan and Langworthy describe these practices as "new pedagogies" and remark that "the 'new pedagogies' are not just instructional strategies. They are powerful models of teaching and learning, enabled and accelerated by increasingly pervasive digital tools and resources...[The] access to digital tools and resources makes virtually all content knowledge available to everyone, at any time. This means... that educators no longer have to deliver broad swathes of content knowledge personally...Learning can become more focused on helping students *master the process of learning...*" (Fullan and Langworthy, 2014).

> *This is not to say that individual educators can't teach for deeper learning without technology… By analogy, imagine that you wish to visit a friend twenty miles away. You could walk, …but it would be much easier to use a bicycle, and it would far easier still to use a car. – Chris Dede, 2014*

In *The Role of Digital Technologies in Deeper Learning (2014)*, Dr. Chris Dede offers the following suggestions as priorities for developing deeper learning for all students:

- Stay focused on reducing achievement gaps by providing multiple methods of presenting information, expressing learning, and engaging students;

- Build professional capacity of educators to use digital tools effectively;

- Invest in research and development.

> *The most dangerous experiment we can perform is to keep our current systems of schooling in place. Over time, the disconnect between what our society needs and what industrial-age educational models can provide is widening – Chris Dede, 2014*

Dr. Dede has also contributed a 'think piece' for Ontario school and system leaders. In the report *Technologies that Aid Learning Partnerships on Real-World, Authentic Tasks* (2015), he profiles key international research findings that specifically address:

- creating more educator-student learning partnerships and real-world, authentic learning tasks enabled by technology; and

- providing more opportunities in school for peer-to-peer learning enabled by technology.

Review the 21st Century Teaching and Learning - What Research Tells Us for more information on New Pedagogies for Deeper Learning.

> *When thinking about planning innovation research projects that support deeper learning, refer to the Practices that Support TLF Areas of Focus section of the Celebrating Ontario's Innovation Journey – An Iterative Rubric (Appendix A).*

Global Competencies

What are global competencies? Why are they important?

Rooted in deeper learning pedagogy, global competencies are associated with growth in the cognitive, interpersonal and intrapersonal domains. Competencies are defined as knowledge, skills and attitudes. As jurisdictions around the world are grappling with the challenge of how to prepare students to thrive in the 21st century, teaching global competencies has become an important consideration.

The ministry's research has identified six draft global competencies to support all learners in a complex, rapidly-changing, technology-intensive globalized world. They are:

- Critical Thinking and Problem Solving

- Innovation, Creativity & Entrepreneurship

- Learning to Learn / Self-Aware and Self Directed Learning

- Collaboration

- Communication

- Global Citizenship and Sustainability

The research compiled in *21st Century Competencies: Foundation Document for Discussion, 2016*/*Competences Du 21 Siecle* shows that competencies are significant and have been shown to make a measurable contribution to educational attainment, relationships, employment, and health and well-being outcomes.

Technology-enhanced learning plays an important role in facilitating the acquisition of these competencies, as shown from districts' innovation projects. For example, a number of projects indicated that as part of technology-enhanced learning, students are increasing their understanding of the world and their role as **global citizens**. One educator noted that: "*Students are now realizing that the world outside the classroom is accessible and is part of their learning and seeing ways to explore and connect with others. They are becoming aware of sharing their own learning with parents, [other] students, and other people in education who are not a direct part of the classroom.*"

One of the most noticeable features of the previous round of innovation projects (Round 5) is that there is a positive acknowledgement by districts that the competencies needed to thrive in the 21st century are the same as noted in the international literature and are consistent with the draft competencies outlined above. For further reading on this, see: Positioning Global Competencies Within Technology-Enabled Instruction and Learning. A Brief on the Findings from the Local Innovation Research Projects Round 5 (Curriculum Services Canada).

Questions to consider:

How are your TLF innovation projects designed to facilitate the acquisition of global competencies? How are districts gathering impact evidence around global competencies?

Professional Learning Models

How can professional learning enhance educator practices and contribute to deeper learning perspectives for all students?

The funding allocation for TLF Enhanced Supports is designated for the provision of professional learning opportunities for educators and school and/or system leaders related to new pedagogical practices for deeper learning enhanced by technology (minimum of 20% of funding).

Schleicher (2016), notes that effective professional development is continuous. It includes training, practice and feedback, and provides adequate time and follow-up support. Successful programs involve educators and school and system leaders in learning activities that are similar to those they will use with their students and peers, and encourage the development of learning communities. A key strategy involves finding ways for educators to share their expertise and experience systematically. There is a growing interest in ways to build cumulative knowledge across the profession, for example by strengthening connections between research and practice, and encouraging schools and school systems to develop as learning organisation.

Schleicher describes how districts can develop new and meaningful learning partnerships among educators enabled by technology:

- Establish sustainable networks of learners at all levels that extend beyond professional learning sessions leveraged by technology to expand/deepen the learning.[1]

- Educators co-plan, co-learn (collaborative professionalism), driving their own learning about problems of practice and sharing findings to make learning visible and available to all.

- Develop and sustain models that are job-embedded, collaborative inquiry, coaching/mentoring, co-learning, transparent, and iterative.

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1 Schleicher, A (2016), Teaching Excellence through Professional Learning and Policy Reform: Lessons from Around the World, International Summit on the Teaching Profession, OECD Publishing, Paris. (http://dx.doi.org/10.1787/9789264252059-en)

Results from the *Mapping the Impact of the 21st Century Innovation Research Initiative on Students, Teachers, and Systems – Local Innovation Research Projects in Ontario Round 5* (2015-2016) indicate the following models of professional learning are yielding success in supporting educators and school and system leaders in the development of pedagogical practices that contribute to deeper learning for students while developing the required skills to thrive in tomorrow's workplace and promoting global competencies:

1. The use of in-class instructional supports, most often in the form of school-assigned or system-assigned technology coaches who are an 'at-the-elbow' professional resource for educators.

2. The promotion and expansion of intentional use of technologies that allow for educator collaboration across schools within and across systems.

3. The use of partnerships with colleagues in a co-learning perspective.

4. Educator-educator partnerships were increasing as a culture of risk taking and shared learning was developing. It was reported that there is greater frequency and comfort with co-teaching, co-planning, and participation in coaching opportunities in both elementary and secondary. Educators were more comfortable connecting with one another and learning together about changes in pedagogy and technology.

5. The use of differentiated approaches to professional learning including workshops, job-embedded learning, collaborative teams/networks/hubs (involved in co-planning/teaching/debriefing) and mentorship/coaching (mediated through face-to-face interactions, webinars, virtual learning environments, social media, online journaling and digital collaboration).

6. The use of co-planning, co-learning (collaborative professionalism) platforms where participants can drive their own learning about problems of practice and share what they've learned in order to make their learning visible to others and to inform their next steps.

Fullan & Quinn (2016) recognize the importance of whole systems being involved in professional learning. It is suggested that a sustained cycle of job embedded learning opportunities be created and designed for each role from the district to the classroom level. Moreover, schools and districts should emphasize the design of models of professional learning that take into account local context and that are inspired from the strengths and needs from the bottom up and the middle out.

Analysis of CSC Round 5 reports have shown that professional development by districts was reinforced by the use of technology. The use of technology is having effects outside the classroom and educators are more comfortable learning in a connected-collaborative environment. This shift marks a change in innovation and capacity building among educators as they seek out partnerships with other educators. It is clear that the notion of partnering has expanded and strengthened (60% of innovation projects involve educator collaboration across schools for professional learning).

When thinking about planning professional learning, refer to the Practices that Support TLF Areas of Focus section of the Celebrating Ontario's Innovation Journey – An Iterative Rubric (Appendix A).

Scaling and Systematizing

How do you ensure your TLF project is making an impact across your district?

When considering how to scale up innovation projects, Dr. Dede highlights the Five Dimensions of Scaling Up Innovation to consider – Depth, Sustainability, Spread, Shift and Evolution:

1. **Depth** involves the understanding of what makes an innovation model effective.

2. **Sustainability** means maintaining the innovation over time; understanding how to adapt to new circumstances.

3. **Spread** involves the extension of the innovation to large numbers, maintaining effectiveness while reducing resources and expertise.

4. **Shift** denotes transference in the ownership of the innovation; educators adopt it, and deepen it to meet their circumstances.

5. **Evolution** involves the influence of reshaping the innovation by its original developers.

The following may be useful to support District School Boards in identifying actions for scaling up innovative practices:

- **The 5 Dimensions of Scaling Up Innovation: Depth, Spread, Sustainability, Shift and Evolution** – Dr. Chris Dede, the Timothy E. Wirth Professor in Learning Technologies at Harvard's Graduate School of Education, describes the opportunities and challenges of scaling innovation models. [Video 8:59]

- **The 5 Dimensions of Scaling Up Innovation: Depth, Spread, Sustainability, Shift and Evolution** – This graphic offers an at-a-glance look at the five dimensions of scaling innovation models. [Graphic]

- **Director's Highlights** – Scaling Transformative Practices video is where Directors of education share insights about successful practices that have been implemented system-wide. System leaders share how and why their innovation projects are transforming learning environments for both students and educators, and reflect on changes in professional learning models and the impact of a growth mindset for all learners. [Video 4:38] The viewer's guide to the Director's Highlights video is a useful resource to support districts as they use the video for their own professional learning. [Viewer's guide]

- **What Research Tells Us** – This document highlights emerging themes and priorities from international and local innovation research that may be helpful in your strategic decision-making. [Document]

While analyzing Round 5 reports it is evident that all districts are "spreading" what they have learned from their innovation research projects by scaling (increasing the number) and systematizing (embedding it across their system).

Strategies for Scaling might include:

- establishing professional learning communities
- providing learning for educators
- building relationships and capacity for supporting unlearning
- using virtual cloud-based technologies to connect learners
- using student experts for peer-to-peer learning
- inviting community members to share their expertise with schools
- embedding projects in school improvement plans

Strategies for Systematizing might include:

- developing multi-year strategies
- aligning projects with other school/board funding/ministry/programs/initiatives
- involving leaders from across teams/departments
- providing learning for all educators
- multi-grade/interdisciplinary strategies
- involving educators from across teams/departments

When thinking about scaling up your project think about how you will measure the impact you are having. Refer to the Scaling section of the Celebrating Ontario's Innovation Journey – An Iterative Rubric *attached as Appendix A.*

Digital Citizenship

What is Digital Citizenship? Why is it Important?

The digital domain is changing how students interact with and respond to the world. Technological innovations offer new opportunities for learning in and out of school, as well as the ability to connect and learn from communities around the world. Technology, including social media, is a way of life for young people that we can no longer ignore if schools are to remain relevant to our students.

The innovations that make it easier to connect people, information and digital resources from across the globe also call for new knowledge, skills and social behaviours that ensure these powerful tools are used in responsible and ethical ways.

Evidence from the Technology Learning Fund shows that district school boards are developing local responsible use policies, codes of conduct, and/or BYOD guidelines to promote respectful and responsible use of technology and develop innovative, safe, inclusive and accepting learning environments.

District school boards are considering the following when developing local policies and guidelines:

- *What* do the terms digital technology, digital literacy, and digital citizenship mean to the schools' communities?

- *How* will a digital citizenship policy prepare students for further education, the world of work, and everyday life?

- *What* are the envisioned benefits to school communities of having a digital citizenship policy in place?

- *To whom* does the policy apply? (e.g., students, educators, parents, volunteers, administration, supervisors, staff, trustees, and school visitors)

- *Who* should be involved in the development of this policy? (e.g., educators, parents, students, IT staff, administration, trustees).

Digital Citizenship Resources

OSAPAC/CCPALO – Ontario Software Acquisition Program Advisory Committee and the ministry, together with educators and school leaders across the province, co-created a Digital Citizenship Resource. This identifies categories and attributes of a digital citizen with K-12 learning materials and classroom connections. The School Leader Learning Series part 1 addresses Digital Citizenship including "Big Ideas, Key Questions, Need to Know and Going Deeper" sections.

EduGAINS 21st Century Learning site highlights Digital Citizenship with examples of classroom connections and professional learning approaches. Explore the resources under the site sections:

- Innovation in Action Videos

- Research – Readings

- Making Connections

- Document de fondements

- Resources et references

- Citoynnete numerique

The ministry introduced a virtual learning space for communication, collaboration, curation, and creation. Digital Citizenship programs shared by Ontario districts are highlighted along with provincially developed resources. This 21st Century Teaching and Learning environment is accessible via your eCommunity account. Contact your district's Technology Enabled Learning and Teaching (TELT) Contact/PREAV for further support or email chris.pagliari@teltgafe.com.

Refer to the Digital Citizenship section of the Celebrating Ontario's Innovative Journey – An Iterative Rubric attached as Appendix A.

TLF Considerations: Student Voice, Authentic Tasks, Equity of Access, Well-Being,

The TLF aims to promote student engagement and success in Ontario's schools by listening to and learning from students; by providing relevant and authentic tasks; and by ensuring equity of access to technology-enhanced learning opportunities so that all students can optimize their potential. The following provides brief information about these areas and resources you can use.

Student Voice

In these videos, students share their thoughts on what it means to be authentically engaged in learning.

- Student Voice: Highlights (2014) [Video 2:51]
- Student Voice: Building Communities of Empowered learners. Waterloo Region DSB (2016) [Video 6:50]

In this video, system leaders share how and why student engagement and achievement are improving, while students reflect on how their learning environment is changing to meet their needs. Transforming and Learning Highlights (2015) [Video 9:11]

This video shows how students can extend their learning within the school and then apply what they have learned to solve real world problems. Student Voice and Choice [Video 6:24]

This video provides a glimpse into a grade 5 classroom in the Upper Grand District School Board in Guelph, Ontario. It shows peer-to-peer learning enabled by technology and illustrates the importance of developing collaborative skills such as giving feedback and valuing others' perspectives. Peer to Peer Learning.

Real-world, authentic learning tasks

Dr. Chris Dede from Harvard University has written 'think pieces' for Ontario school and system leaders. In his first report, Technologies that Aid Learning Partnerships and Real-World, Authentic Tasks, he profiles key international research findings that specifically address:

- Creating more educator-student learning partnerships and real-world, authentic learning tasks enabled by technology; and

- Providing more opportunities in school for peer-to-peer learning enabled by technology

Technologies that Aid Learning Partnerships on Real-World, Authentic Tasks (2015)

- English
- French

The video provides a glimpse into a grade 7 mathematics class in the Ottawa-Carleton District School Board where students are working on an authentic, rich task. Real World Math Connections [Video 5:02].

This video shows how new learning partnerships between educators and students, within and beyond the classroom walls, are being developed through real-world, authentic tasks. Mystery Skype [Video 2:56].

Other Ministry of Education resources:

- Speak Up – A Toolkit for Student Voice
- Capacity Building Series – Student Voice Transforming Relationships

Equity of Access

It is important to note that equity of access to technology does not imply that there must be a 1:1 policy in place. In fact, reflections from the Innovation Research have indicated that having students share technology devices has resulted in increased skills in communication and collaboration. Further, equity of access to devices should be linked to deeper learning opportunities in order to support optimal learning potential for students.

As well, all students require the ability to access the curriculum, and to demonstrate their learning in order to meet their educational potential. Assistive technology (e.g. software, mobile devices, accessible versions of textbooks and media) are critical in providing voice, as well as equitable access for students with special education needs. For more information about assistive technology tools, please see:

- At the Sagonaska Demonstration School, students focus on reading and writing development, using assistive technology to support learning and developing personalized learning strategies. Sagonaska Demonstration School [Video 5:25]
- Research Monograph #50: Assistive Technology Tools
- Learning For All (2013)

When considering equity of access think about:

1. Connectivity (equitable and consistent access to the Internet)

2. Ubiquity (access to technology when needed)

3. Interconnectivity (access to collaboration tools)

4. Equity (access to technology for all students)

5. Universal design and differentiated instruction (personalized learning, including student voice and choice)

Approaching Innovation Projects with an Inclusive Perspective

All educators should be aware of various dimensions of diversity, for example, citizenship status, disability, gender, race, religion, socioeconomic status, sexual orientation, etc., and how they can impact a student's experience in the school system. Indeed, in a "truly equitable system, factors such as race, gender and socioeconomic status do not prevent students from achieving ambitious outcomes" (Equity and Inclusive Education in Ontario Schools, 2014).

The TLF represents a powerful opportunity to advance greater equity and inclusion for all students. Consider how technology-enhanced learning might promote equity for, or inclusion of, student groups who typically face barriers that prevent them from fully participating in class or school activities (e.g. students with special needs, FNMI students) or are underrepresented in the larger student population (e.g. girls in STEM).

In designing and thinking about reporting on your innovation projects, consider:

- How will your innovation projects mitigate barriers (e.g. stigma; barriers to learning / engagement) for students with disabilities/special needs?

- How will you address barriers that prevent some students from fully participating in class or school activities through your innovation projects?

- How will you address barriers to fostering parents' engagement in their children's learning at home and at school through your innovation projects?

- How will you leverage your innovation projects to foster a learning environment that gives students a sense of safety and belonging so that they are empowered to take risks, explore new ideas, and take responsibility for their learning?

Approaching Innovation Projects with a Well-Being Perspective

Well-being is a positive sense of self, spirit and belonging that we feel when our cognitive, emotional, social and physical needs are being met. It is supported through equity and respect for our diverse identities and strengths. Well-being in early years and school settings is about helping children and students become resilient, so that they can make positive and healthy choices to support learning and achievement both now and in the future. Ontario's Well-Being Strategy for Education Discussion Document (2016)

In designing and thinking about reporting on your innovation projects, consider:

- How will your innovation projects promote a positive sense of self, spirit and belonging to meet the cognitive, social and physical needs of learners?

- How will your innovation projects develop student identities, strengths and resiliency?

- How will your innovation projects build student capacity to make positive, healthy choices?

When thinking about Student Voice, Authentic Tasks, Well-Being, Equity and Access, refer to Celebrating Ontario's Innovation Journey – An Iterative Rubric (Appendix A).

Technology Use and Purchases

How do you decide what technology your district will purchase?

Learning outcomes and your district school board vision of new teaching and learning practices enhanced by technology should be the main considerations when deciding on technology purchases.

Work by Dr. Ruben Puentedura (2013) and Dr. Chris Dede (2014), emphasize the need to consider the outcome of the learning when making decisions about technology use (and purchase). The following chart provides a look at target outcomes for students and the types of technology tools that can support the achievement of the learning goals.

Sample Target Outcomes for Students	Types of Digital Tools and Resources
Communication, collaboration, digital citizenship	Social and Collaboration Tools – Support knowledge building (e.g., blogs, online discussion forums, file sharing)
Inquiry-based learning, responsibility, decision making	Hybrid and Mobile Technologies – Broaden access to education beyond the school walls/ school day (e.g., tablets, laptops, Cloud technology, BYOD)
Metacognition, problem-solving and reasoning, analysis	Visualization Tools – Support mastery of abstract concept (e.g., graphing tools, 3D printers, interactive maps)
Perseverance, self-efficacy, problem solving, creativity and innovation, critical thinking	Immersive Media and Simulations – Situate learning in real-world and augmented realities (e.g. adaptive software, interactive content, virtual learning environments, interactive games)

Results from the innovation research projects show that districts are keeping their learning goals in mind and coordinating across their system when making decisions about technology purchases.

In *Alive in the Swamp (2013)*, Fullan and Donnelly have developed an index that can be used to determine the power of an innovation. With respect to the use of technology, Fullan and Donnelly indicate that the following should be considered when determining whether or not technology is being used to its full potential in transforming teaching and learning:

1. Quality of user experience/model design – digital tools are participatory, engaging, co- creative, and collaborative

2. Ease of adaptation – students' ability to access the platform or content wherever and whenever they want

3. Comprehensiveness and integration – every learner has equitable access and the technology use is embedded in the school day

Here are a number of questions to think about before purchasing technology:

1. How does this technology support the student learning goals and deeper learning pedagogy?

2. Does this technology have dependencies that are not in place? (e.g., If I am buying an interactive whiteboard, do I have a data projector, computer, power etc.?)

3. Is this technology similar to what is already in place so that others can help me? (e.g., purchasing a technology foreign to the school may mean there is no in-house support)

4. Is this technology compatible with systems that I access? (e.g., are tablets/ laptops compatible with your DSB student management system?)

5. Does my IT organization support this technology? How will this technology fit with our current technology resources?

6. What is the longevity/adaptability of the tool for long-term use?

7. What is the cost-efficiency? Can we partner with a co-terminus board to negotiate a better price?

8. Is the technology investment sustainable and what is the refresh plan at the end of the initiative lifecycle?

9. What level of technical support is required to support the implementation?

10. What level of learning is required at all levels of the organization to fully realize the potential and what funding is available to support this learning?

11. What is the impact on the current network resources (WiFi, LAN/WAN & Internet)?

12. Does the technology provide a complete ecosystem (apps, charging carts, protective cases, central management tools, data storage, printing, maintainability, vendor support)?

13. Is the Infrastructure in place able to sustain the initiative? Is the wireless, WAN and Internet bandwidth adequate?

14. How are technology purchases aligned with and reflective of the district's System Improvement Learning Cycle (SILC), the strategic plan and the goals as outlined in the BIPSA?

What structures and systems are in place to gather and assess impact evidence on the effectiveness of the technology that is purchased and how is it being used to inform future actions?

Resources

What is available to support educators, school and system leaders on their journey to transform education?

1. **CODE** – Council of Ontario Directors of Education site has Technology and Learning Fund pages with supports that address:

    a. Overview that shares a welcome and introduction to the TLF;

    b. Technology Enabled Learning section that includes newsletters, think pieces from Dr. Dede – our critical friend, and the 21st Century discussion document for Global Competencies;

    c. Ontario's Learning journey with all research reports since 2010;

    d. Online reporting responsibilities and supports;

    e. District artefacts that represent various district learnings.

2. **EduGAINS** – 21st Century Learning Unit maintains a website for educators, school and system leads, and professional learning facilitators. Resources and supports on EduGAINS include:

    a. Information about 21st Century Learning;

    b. Technology and Learning Fund section that highlights the goals, district innovation videos and stories;

    c. Research that addresses Ontario and International findings as well as further readings for technology-enhanced learning and teaching;

    d. Making Connections resource documents that guide our understanding of 21st Century learning;

3. **21st Century Teaching and Learning/Enseignement et apprentissage au 21ᵉ siecle** - The Ministry introduced a virtual learning space for communication, collaboration, curation, and creation. Within this environment, one can see content to support TLF goals, news items, and participate in asynchronous discussions and/or the facilitated virtual sessions. This 21st Century Teaching and Learning environment is accessible via your eCommunity account. Contact your district's Technology Enabled Learning and Teaching (TELT) Contact/PREAV for further support or email chris.pagliari@teltgafe.com.

4. **#InnovatiON21c/InnovatiON21s** is another medium that may provide resources and supports.

Refer the Celebrating Ontario's Innovative Journey – An Iterative Rubric *attached as Appendix A to determine your learning needs.*

Appendix A: Celebrating Ontario's Innovation Journey – An Iterative Rubric (draft)

Ontario's school districts* are collaborating with the Ministry of Education and Council of Ontario Directors of Education (CODE) in 21C Innovation Research projects to transform learning and teaching practices for deeper learning and global competencies, enhanced by technology. This multi-year, collaborative research investigation has been underway since 2011. School districts share their projects and learnings with the Ministry, CODE and each other in various ways, including creating artefacts, participating in annual 21C Round Table events and virtual and voluntary professional learning sessions, contributing to video clips and providing impact evidence through online reporting tools, check-ins and comprehensive research reports to the external research team, Curriculum Services Canada (CSC).

From this extensive work and learning journey over many years the ministry have begun to identify district practices that advance the goals and areas of focus of the TLF and that might indicate whether local practices are at a 'beginning,' 'mid-' or 'well on the way' stage of scaling innovation for deeper learning and global competencies. This trajectory of observable practices from the evidence to-date is outlined in the draft rubric descriptors which follow. The draft rubric represents our collective work and experiences to-date in innovation scaling in Ontario, informed by a blend of leading research and practitioner knowledge and expertise. We anticipate that the rubric will evolve as new learnings and practices emerge, as we learn our way forward together. We share this rubric as a celebration of the remarkable work taking place across the province and as a tool to help districts consider what their next steps in their journey of innovation scaling might be.

We invite and welcome your input in helping to strengthen the rubric for its intended purpose as a resource for school districts in planning forward.

INQUIRY	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
Inquiry Question	Focus is on technology to support student learning.	Focus is on changing teacher practice to enhance student learning.	Focus is on deeper learning practices to impact student learning.
Theory of Action	Focus is on technology to engage learning.	Focus is on change in teacher practice to impact student learning.	Focus is on deeper learning to impact student growth and inform next steps.

TLF Areas of Focus for Deeper Learning and Global Competencies			
Practices that support areas of focus	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
1.Create real-world authentic learning opportunities enabled and enhanced by technology.	Exploring inquiry-based approaches for learning.	Creating opportunities for inquiry that extend learning beyond the classroom (connecting to peers, another class, community experts).	Deepening inquiry-based approaches to determine real-world challenges/problems for construction of new knowledge, action, and reflection.
2. Deepen teacher-student and peer-to-peer learning partnerships enabled and enhanced by technology.	Exploring methods of educator-student and peer-to-peer collaboration.	Creating opportunities for educator-student and peer-to-peer collaboration through the use of pedagogical models (e.g. project-based learning; self-directed learning etc.).	Seeking student voice to enable co-learning between educator-student and student-student and local/global community-student.

Practices that support areas of focus	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
3. Enrich learning through research-based effective pedagogical models. (Inquiry-based models such as: project-based learning, problem-based learning, challenge-based learning, self-directed inquiry, knowledge building, collaborative inquiry, design thinking, integrative thinking etc.)	Exploring pedagogical models to enrich learning.	Choosing pedagogical models that create opportunities for deeper learning. Educator drives the inquiry learning process.	Innovating the inquiry learning process within pedagogical models by shifting ownership of the learning process to students. Students drive their learning process.
4. Transform assessment practices to reflect deep learning pedagogy enabled and enhanced by technology.	Exploring ways to leverage technology to assess learning, guided by *Growing Success*.	Focusing on assessment 'for' and 'as' learning, leveraging technology.	Deepening technology use for formative assessment: pedagogical documentation, transparency of self- and peer assessment, connecting with authentic audiences, electronic portfolios, timely, descriptive feedback from a variety of sources local and global.

Practices that support areas of focus	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
5. Develop effective professional learning models. (job-embedded, collaborative inquiry, coaching/mentoring, co-learning, transparency, iterative) to enhance learning partnerships and networks among educators enabled and enhanced by technology	Using technology to inform professional development topics (e.g., survey to select focus, sharing resources). Focus of professional learning is on leveraging technology to enhance student learning and is primarily event based.	Creating professional learning models that build partnerships at all levels for co-learning supported by technology. Shifting professional learning to focus on changing pedagogy (using frameworks such as: SAMR, TPACK, TIM, competencies).	Establishing sustainable networks of learners at all levels that extend beyond professional learning sessions leveraged by technology to expand/deepen the learning. Educators co-plan and co-learn in the spirit of collaborative professionalism, to drive their learning about problems of practice and sharing findings to make learning visible.

Scaling	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
Scaling Process	Exploring which practices/innovation to scale.	Focusing on a deep practice/innovation and aligning with other strategic plans (SILC, BIPSA, SIPSA, Multi-year plan).	Knowledge of what to focus on (depth) what to implement and support (sustain, spread and shift) and determining what and how to measure impact on student growth and achievement.

Leadership			
Becoming "formative organisations" with strong learning leadership. Learning environments and systems do not just change by themselves but need strong design with vision and strategies. To be firmly focused on learning such leadership needs to be constantly informed by self-review and evidence on learning achieved. (Schooling Redesigned, OECD, 2015)			
Leadership	**Beginning Journey** (Exploring – Emerging – using – beginning)	**Mid-Journey** (Adopting – choosing – focusing on – creating opportunities)	**Well Underway** (Transforming – evolving – refinement – deepening)
Leadership	Exploring ways to identify and engage technology leaders at different levels (educator leaders, coaches, school and system leaders). Professional development experiences are predetermined at higher levels based on board perceptions of professional learning needs. Explores social media as a means of professional learning, begins to experiment with using social media to capture professional learning.	Beginning to create a shared vision of global competencies by creating conditions that model them and using a lens of global competencies to inform decision making (budget priorities, organizational/operational structures, professional learning goals). Creating, developing and supporting co-learning networks at different levels (within schools, between schools, outside of district) involving different levels of leadership through use of technology and social media.	Modeling a collaborative and iterative learning stance (Leadership for learning, collaborative professionalism) and using global competencies to inform and frame decision making processes. Focusing on ways to sustain, review, build capacity and reflect on strategies to support global competencies as part of a multi-year process.

Impact Evidence	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
Impact Evidence	Gathering and sharing evidence – not yet analyzing or interpreting data in order to inform decisions.	Creating processes for gathering, sharing, and analyzing evidence for impact on student learning (considering impact of educator practice, learning environments and leadership learning), learning from other districts.	Refinement of processes for gathering, sharing, and analyzing impact evidence that informs decision making for student success and focused on student need. For example: establishing a baseline, pre- and post- assessments, triangulation, marker students or classes, control groups, CBAM (Concerns-based Adoption Model), case studies, partnering with researchers, working with district research departments, developing success criteria, actively soliciting feedback from students/teachers/ parents, testimonials, etc.

Digital Citizenship	Beginning Journey (Exploring – Emerging – using – beginning)	Mid-Journey (Adopting – choosing – focusing on – creating opportunities)	Well Underway (Transforming – evolving – refinement – deepening)
Digital Citizenship	Reviewing and updating existing policies and procedures (e.g., acceptable use guidelines, BYOD policies) or developing new policies for mobile learning realities in schools and classrooms.	Strategies for teaching and modeling respectful and responsible communication and digital citizenship at the school or classroom level, including face-to-face, blended and virtual learning contexts.	System strategies for teaching and modeling digital citizenship and integrating the tenets of digital citizenship into the learning models.