

A Synopsis of the Final Research Report

Exploring Specific Features that Impact
Sustainable Practices on the 21st Century
Digital Learning Landscape

Local Innovation Research Projects in Ontario

Round 4

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The *21st Century Innovation Research Initiative (Round 4)*, continues to advance Ontario's renewed vision and core priorities for education to ensure that graduates are prepared for a competitive, globally connected, and technologically engaged knowledge society and economy.

Building on the previous rounds of this initiative, Round 4 innovation research was intended to promote and extend local innovation and leadership for 21st Century teaching and learning; to support evidence-based and research-informed decision making focussed on the instructional core; to situate Ontario's innovation efforts within the wider context of international research; and to promote capacity building and knowledge mobilization to scale up pedagogy-driven, technology-enabled practices for optimizing learning.

In Round 4, all 72 school boards, 4 school authorities, and 1 provincial school participated in the innovation research initiative. Data was collected using a comprehensive self-reporting template, and as well, the CSC research team interacted with the project leaders throughout all phases of implementation. They used ongoing, focused conversations and interactions through electronic communications, phone calls, and face-to-face site visits. The team offered further support as innovation research projects collected and analyzed data that identified evidence for sharing collectively and broadly. Innovation research project leaders indicated that this interaction was a significant support in clarifying requirements for reporting on their initiatives.

Projects provided evidence on how technology impacted teachers, students, and systems. They described the focus and implementation process used in their innovation research project and supplied evidence through examples and other documentation. This information offered valuable insights for others in integrating technology-enabled teaching and learning within their systems.

Qualitative and quantitative data provided insights that align with the purpose of the study. The quantitative data included numbers of students, educators, and schools involved in the Round 4 projects. Based on the numbers reported, over 170 000 students across the province were directly engaged in aspects of the Round 4 initiative. The number of students in each project varied widely by the scope and nature of the project activities, with 680 students per project being the median level of involvement. Based on the numbers reported, over 11 400 teachers across the province were directly engaged in aspects of the initiative with 58 teachers per project being the median level of involvement – a significant increase in the level of teacher involvement from previous rounds – may be as a result of the broadening scope and nature of the research as districts build on learning. As well as classroom teachers, projects reported that, in total, over 1790 administrators, 310 system administrators, and 870

support staff had direct involvement in the project undertakings. Based on the numbers reported, over 2100 schools across the province were directly engaged in aspects of the initiative, with 14 schools per project being the median level of involvement. The majority of projects indicated that their investigations were scaling up their learning from previous rounds.

Projects indicated that their planned actions included a number of elements such as inquiry-based learning, teacher collaboration, a focus on numeracy/mathematics, special needs, and assessment practices. In the innovation research, these elements were addressed with widely varying degrees of emphasis and actions. There were multiple themes within and across all projects. Projects had multiple aspects and differing combinations of activities related to the scope, use, training, and instructional focus of their technology-enabled project, e.g., blended learning, job-embedded support, use of mobile/wireless technologies, learning commons. These themes have widely divergent scale and interpretation across projects and only indicate patterns rather than specific focus for the innovation research.

In examining project data over the four rounds of the *21st Century Innovation Research Initiative*, there have been significant differences and changes in the nature and scope of the project initiatives. Projects are increasingly applying processes that scale their work across the system, and are placing greater emphasis on district-wide implementation strategies rather than on isolated, tactical investigations of specific devices, approaches, or applications.

From an analysis of the qualitative information provided by the projects, the results suggest there are deliberate and progressive actions being taken to further the impact that technology has in changing teaching practice, in strengthening student engagement, learning and achievement, and in scaling up and improving systems structures and policies to meet the increasing demands of living and learning in the 21st Century.

The data reported by the projects seems to indicate that across Ontario, progress in technology-enabled teaching and learning is consistent with the deliberate and steady move being experienced in a number of countries around the world, as documented by international researchers. There is strong evidence that increasingly, the relationships between and among students, teachers, and systems as a whole are continually moving to more collaborative, coordinated, and connected ways of impacting on teaching and learning. Systems as a whole reported strengthened efforts to enhance the use of collaborative processes in teaching and learning. In Round 4, a more focussed and deliberate move toward

collaboration among and between students and teachers was clearly evident, as was a broadened perspective on the use of technology by students, teachers, and systems.

The data reported is presented under the three headings: 1) Impact on Students, 2) Impact on Instruction, and 3) Impact on Systems.

Impact on Students

In reporting on their innovation research, projects identified key elements that are contributing to student engagement, learning, achievement, and acquisition of 21st Century competencies.

Consistently, the information highlighted *collaboration* (sometimes referred to as collaborative partnerships) in many forms as being instrumental in the process.

Many projects reported strengthened connections in student-to-student and student-to-teacher collaboration. More collaborative relationships between and among students and their teachers was evident as projects reported an increase in student voice and student leadership, and an increase in the scope of 21st Century technology-enabled learning.

In terms of student-to-student collaboration, many projects reported shifts toward: focussing student learning on strategies such as peer-to-peer learning partnerships, driven by inquiry into topics under study; having students take a lead role in supporting technology-enabled learning; and encouraging student conversations as a way to further greater understanding. In general, projects reported increasing efforts and opportunities to have students work together, e.g., explaining the use of different apps to one another; explaining their thinking to peers and their teacher; offering meaningful feedback on projects; finding answers among themselves and then sharing them with classmates and teachers.

Across projects, a move appears to be well underway that positions students in central roles in supporting technology-enabled learning. Students are taking more responsibility for supporting technology-rich learning environments, e.g., by demonstrating how to use specific digital tools for completing learning tasks. In some cases, projects reported that learning tasks were being co-developed by students and teachers, which resulted in the inclusion of student voice and choices in how the learners decided to engage in their own learning. Students are impacting the design and nature of their physical environment, and also were actively involved in supporting instruction and learning. There is a steady move to including students' voices in their own learning and to providing them with choices in

terms of tools and strategies that support them in acquiring the essential competencies for living in a society that increasingly demands continuous learning.

The *use of technology* as a tool for learning was a further major contributor reported by the projects. With the use of communication and collaboration applications such as Google Apps for Education (GAPE) and Office 365 (O365), opportunities were available for constructive feedback and peer-to-peer review. Many projects also commented positively on the use of tablets and mobile devices. Students reported that they are beginning to see themselves differently as learners: more autonomous, more resourceful, and more confident as they regularly use the mobile devices to support their learning. Positive changes were seen in a variety of students who ran the gamut from being unmotivated to class leaders who took new responsibility for their own learning and for helping others.

Projects identified an overall sense of increased confidence among students in incorporating the tools provided by technology into their learning. Students reported excitement at newer ways they could access information and represent their learning. They found that barriers they had previously experienced such as moving files from school to home, working with peers on a task, and having access to information provided by the teacher, were removed through the use of technology. Technology use accommodated real time collaboration and teamwork, and students were able to work simultaneously on planning, developing, and finalizing their work.

Several projects reported that the use of mobile devices made learning more accessible and ‘leveled the playing field’ for students with special needs with regard to accessing information and increasing skill development. Teachers and administrators noted the positive impact of tablet use with regard to equity and inclusion.

Technology was found to empower student voice in that it supported the sharing of experiences and positively impacted student engagement. Technology-enabled learning appears to have increased student interest, confidence, and sense of wellbeing, and has extended their capacity for deeper learning.

Impact on Instruction

In the *Innovation Research Initiative (Round 4)*, an ever-deepening understanding of the pedagogical elements that comprise 21st Century technology-enabled teaching and learning are evident across Ontario. *Collaboration* (sometimes referred to as collaborative partnerships) is seen as being instrumental in transforming pedagogical practices. Collaborative partnerships formed between and

among teachers and students are becoming more central to pedagogical practice. Learning partnerships between teachers were noted as being brought to a whole new level through cloud technology as they engaged in co-planning, sharing strategies, and collaborating in areas such as assessment practices.

In Round 4, there was a focus on building collaborative relationships among and between teachers to increase their fluency in and confidence with technology-enabled instruction. Some collaboration was informal and school-based, while in other cases, it was formalized. In many projects, identified educators were assigned responsibility for supporting technology-enabled instruction and learning. This role had various designations such as IT Champion, iCoach, eTech Coach, and Learning Technologies Coordinator. The common ground they shared was reported to be collaborating with teachers to enhance instructional practices and bring appropriate technical knowledge for building capacity for 21st Century technology-enabled teaching and learning. Their support was central in building teacher confidence, e.g., they introduced teachers to appropriate software and challenged them to go the next step in technology-enabled instruction.

Throughout the project reports, teachers were described as being more motivated to *use technology* and to explore various ways of incorporating technology into their pedagogical practices. Having technology readily and reliably available for use at any time of the day has increased teachers' willingness and confidence.

In several projects, individuals described how mobile devices are changing their professional practice. Teachers are in the process of building their technological expertise, becoming more open to using a variety of mobile devices and cloud-based tools for their planning and instruction. Teachers in a number of projects reported the positive advantages of technology for organizational management, professional development, assessment, and responding to the needs of individual students.

One of the biggest changes for teachers brought by 21st Century technology-enabled teaching and learning is altering their role from a traditional to a transformative stance; that is to be a facilitator and activator rather than remaining the sole provider of student learning. In a number of projects, a growing move toward inquiry-based learning was evident. Teachers remarked that they were more open to inquiry-based strategies in the classroom largely because of the availability of mobile devices, which they felt provided equitable access to information for students. The tools provided by an array of technologies and media are supporting increased student engagement, creativity, and responsibility for their learning as part of the inquiry process and for demonstrating their understanding of curriculum content.

As part of the changing nature of learning environments, teachers are including students as co-constructors in their planning, instruction, and assessment practices. With the growing move toward inquiry-based learning, teachers are designing learning tasks that engage students in deep thinking and inquiry involving 21st Century competencies. Teachers are using thought-provoking questions, statements, and questioning techniques to stimulate students' critical and creative thought processes, and in making material personally relevant to students.

Technology plays an important role both as a motivator and facilitator in the teaching and learning process. Students are challenged to explain their thinking and relay it to teachers using online journals and discussion posts. Students are encouraged to be creative in demonstrating their learning, which deepens their higher thinking skills as they pursue their inquiries. Teachers also noted how they used cloud-based tools to learn with their students, giving discussion-based feedback on work in progress.

Technology is facilitating assessment practices; especially *assessment as* and *assessment for* learning. Student questions, inquiries, and demonstrations of their learning are captured through technology and provide a reference for teachers when planning instruction and in addressing learner needs. Technology also is a useful tool for teachers to give immediate and specific feedback to move the learning forward.

Impact on instruction in Round 4 projects suggests that teachers are welcoming the increased collaboration with colleagues and students that is afforded by technology. They are also using technology to adjust their practice toward deep learning pedagogies (Fullan & Langworthy, 2013, 2014) that focus on metacognitive skills essential for journeying along the 21st Century educational pathway.

Impact on Systems

Projects acknowledged that their experiences in the previous rounds of the innovation research built their capacity to move forward in scaling up and sustaining their efforts for 21st Century teaching and learning. Systems are taking a more strategic and comprehensive approach that focusses on partnerships, coordinating school and system planning, ubiquitous access to technology, and job-embedded training and support.

Round 4 innovation research was in alignment with system strategic plans and the belief that technology is an accelerator for learning. Systems are adopting strategies that indicate their increasing desire to embrace new teaching and learning practices. They understand that the way forward for learners to

succeed in the globally connected world rests upon their acquisition of skills necessary to participate and contribute to society in meaningful ways.

System planning suggests that districts are in the process of incorporating technology integration as core to all of their initiatives. There is a new sense of the importance of technology as a tool for connections across the system. System priorities have shifted such that a wider group of stakeholders are involved in the conversation around technology use and decision making.

It was noted that there is growing understanding that leadership is the key to scaling innovative practice. There appears to be an enhanced understanding that cohesive planning across schools and personnel in the district is essential for scaling up and sustaining technology-enabled 21st Century teaching and learning. A shift in mindsets within schools is occurring because there is strong leadership and support. There is continued support for administrators and leaders as they recognize the advantages offered by the digital world. It was further noted having a strong vision that is shared and communicated throughout the system is allowing for advancements in practices and in technology implementation.

There remain system challenges such as the reliability of the infrastructure, however educators are more tolerant and accepting because of a broader appreciation of the educational benefits in using technology.

Perhaps most importantly, a move toward building a culture of inquiry – a digital age culture of learning to enable people to think differently – was reported.

Systems are consciously making decisions about future directions for continuing the momentum established for technology-enabled teaching and learning.

In Conclusion

The theoretical underpinnings for 21st Century technology-enabled learning, as documented by international researchers are an essential ingredient for the growth and further development of teaching practices, learning skills, and system structures. Skills such as learning how to work in collaboration with others, becoming effective communicators, using creativity and imagination, thinking critically, understanding the notion of citizenship and its responsibilities, and attending in a deep way to character development such that self-regulation, self-confidence, honesty, and empathy become part of lifestyle. Ontario educators are attentive to and hence are more fully engaged in the transformation of these specific aspects of teaching and learning so that students are prepared for life in a locally and globally connected technology-enabled society. Systems have moved forward in embracing 21st Century

learning, and are increasingly adopting the strategies necessary for transforming teaching and learning in a technology-dependent world.

In Round 4, a more focussed and deliberate move toward collaboration among and between students and teachers was clearly evident, as was a broadened perspective on the use of technology by students, teachers, and systems. One of the most important features was the noticeable movement on the part of teachers away from the tentative use of technology-enabled teaching and learning to a more open and confident appreciation of the changes that technology can bring to their work with students. There is a move away from a traditional view of teaching based in a one-way transaction from teacher to student, to a more transformational one where acquiring the skills necessary for deep learning are central to the educational experience. A feature of this change is a move to inquiry-based learning using various forms of technology, where students are given more freedom to explore topics in collaboration with others, and to provide evidence of their learning.

Even though there remain challenges for systems, a noticeable feature of the Round 4 innovation research projects was that there is a positive tone of understanding that building a technology-enabled environment takes time and is exemplified by ongoing change in educational environments.

Overall, from the data provided, it is clear that the *21st Century Innovation Research (Round 4)* projects were of central importance for continuing to develop clarity and compelling insights into a renewed vision for education in Ontario that can continue to move teaching and learning forward in the 21st Century.

