# A Synopsis of the Final Research Report

## Chronicling the Impact of the 21st Century Innovation Research Initiative on Students, Teachers, and System

## Local Innovation Research Projects in Ontario

## Round 6

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The *21st Century Innovation Research Initiative (Round 6)*, continues to advance Ontario's renewed vision and core priorities for education while chronicling the impact of technology and resulting changes in teaching and learning across the province. In Round 6, projects clearly reported a focus on supporting student success through increased emphasis on global competencies, enhanced pedagogical practices, and progressive scaling up and sustaining measures established by the system.

## Situating the Innovation Research

Building on the previous Rounds of this initiative, Round 6 innovation research is intended to promote and to extend local innovation and leadership for technology-enhanced teaching and learning; to support evidence-based and research-informed decision making, focused 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.

Through the *Innovation Research Projects (Round 6)*, the Ministry and CODE continued to support effective technology-enabled teaching and learning practices and system changes across Ontario. Curriculum Services Canada (CSC) continued its work with the innovation projects in documenting evidence of impact on students, teachers, and system, identified within a common research framework. In its work with the innovation research projects, CSC emphasized two areas for reporting data: how their work connected with the further development of global competencies in Ontario's students and how the system was addressing technology-enabled teaching and learning.

Projects reiterated the importance of a number of conditions being met so that technology-enhanced instruction and learning continue to support Ontario students during their education journey. These conditions include cultivating a collaborative learning culture among staff and a deepening of pedagogical understanding that reflects technology-enabled practices. It is also seen as important to build leadership capacity throughout the system at school and administrative levels; to apply sufficient resources, technology, and infrastructure; and to provide continuous opportunities for professional growth.

For the Round 6 study, Curriculum Services Canada organized the same field team members as for the previous Rounds to liaise with project leads and to offer support as they gathered and reported data. The field researchers interacted with project leads on a regular basis, and project leads followed up on the invitation to contact the research team as needed with questions or to dialogue about their project.

Field researchers visited project sites and were invited to attend district-organized events related to the project focus. Because dialogue and interaction was ongoing, collaborative relationships developed between individuals, strengthening the data gathering and reporting processes.

As the research team and project leads networked, they drew from classroom experiences, from whole district perspectives, from experts in the field, and from the cross-fertilization of ideas and perspectives gleaned from students, teachers, and administrators.

In Round 6, all 72 school boards, 4 school authorities, and a collective led by one of the provincial schools participated in the innovation research initiative. Data was collected within a common research structure, using comprehensive self-reporting templates constructed by the research team. Projects made consistently strong efforts to gather and submit relevant data that informed the research team's understanding of the project activities and the resulting educational impacts on students, teachers, and system, making clear connections either where the impact can now be evidenced or how it is anticipated in future. It is also evident that more districts are establishing system tools and processes that allow for reliable comparative analysis of change and growth over time. Protocols and procedures are being set to allow for more meaningful long-term measures of student learning and achievement, and as well, for policies and procedures.

At the outset of Round 6, districts submitted Project Profile data, using the reporting guidelines and template distributed by Curriculum Services Canada. This profile information described each project's participation data and identified the direction and areas of focus for their planned research. The field research team used this information in its ongoing conversations with the project leads. To further focus the projects in providing evidence, the research team prepared templates for the final report submission in June and for the artefact package that visually portrays the impact of the innovation research project through a myriad of examples and other documentation. In their accompanying artefact narrative, the projects present a context that gives meaning for the concrete examples and described the implementation process used in their innovation research project. As well, they included information about how the work connects to their continued efforts in technology-enabled teaching and learning. The projects submitted further evidence. This information which will be shared broadly offers valuable insights and promising practices for others in integrating technology-enabled teaching and learning.

## Reported Data

Qualitative and quantitative data provide insights that align with the purpose of the study. Overall, both the *quantity* and the *quality* of the submitted data presented through the final report and the artefact package provide significant insight into the impact that innovation research projects continue to have on technology-enabled teaching and learning in schools across Ontario. In their reporting, all projects demonstrate a stronger understanding of the needed evidence, either quantitative or qualitative, to show impact.

### *Quantitative Data*

Based on the numbers reported by projects, over 405 000 students across the province were reported to be directly engaged in aspects of the Round 6 innovative research initiative. In comparison, approximately 265 000 students were involved in Round 5. The substantial increase in the direct involvement of students may be an indication of a deliberate increased focus on developing global competencies.

While all districts reported students are involved in their investigation, the number of students in each project varies widely by the nature and scope of project activities with over 1330 students per project being the median level of involvement. In the previous Rounds, the median level of involvement increased steadily from 400 students in Round 1.

All districts identified broad and extensive involvement by classroom teachers in their research. Based on the numbers reported by projects, over 25 000 teachers across the province are directly engaged in aspects of the initiative with 66 teachers per project being the median level of involvement. Round 6 data shows a substantial increase in the level of teacher involvement. In Round 5, approximately 15 000 teachers were involved and the median level of involvement was 60 teachers per project. The teacher involvement data highlights the broadening attention on instructional practices and the deliberate scaling up of technology-enabled teaching and learning.

As well as classroom teachers, projects reported that in total 2589 school administrators (principals, vice-principals), 300 system administrators, and 706 support staff (e.g., information technology staff, program staff) have direct involvement in the project undertakings. The substantial increase in the direct involvement of school leaders in Round 6 supports observations of the field team of the growing commitment to developing school-level leadership as a critical means of systematizing pedagogy-driven use of technology.

***Qualitative Data***

In preparing the comprehensive provincial report for Round 6, the research team analyzed the qualitative data under three areas of impact – students, teachers, and system.

In examining project data over the six 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. It is clear that provincially, systems are mobilizing knowledge gained over the past Rounds of study to increase capacity; to continue to scale up technology-enabled teaching and learning; and to put in place the conditions necessary for sustaining this approach.

In a foundation document for discussion entitled *Towards Defining 21st Century Competencies for Ontario* (Winter 2016 Edition), the authors note that: *"What's new in the 21st Century is the call for education systems to emphasize and develop these competencies in explicit and intentional ways through deliberate changes in curriculum design and pedagogical practice. The goal of these changes is to prepare students to solve messy, complex problems – including problems we don't yet know about – associated with living in a competitive, globally connected, and technologically intensive world"* (p. 3).

In the qualitative information provided by the projects, there are substantial indications that districts are taking deliberate and progressive actions to further the impact that technology has in changing teaching practice, in strengthening student engagement, learning, and achievement, and in scaling up and improving system' structures and policies to meet the increasing demands of living and learning in the 21st Century.

***Impact on Students***

In the reporting for this Round, it is evident that while there are a wide range of project initiatives, they all exhibit a common focus - the development of global competencies.

Learning how to work in collaboration with others, to become effective communicators, to use creativity and imagination, to think critically, and to understand the concept of citizenship and its responsibilities are essential competencies for preparing for life in today's global society. Aspects of character development

that highlight self-regulation, self-confidence, self-evaluation, and empathy are also a necessary part of lifestyle learning.

The data clearly points to a consistent focus on the process of learning enabled by technology. For example, a number of projects found that as opportunities for inquiry and problem solving increase, collaboration, communication, and feedback improve and overall interest and engagement is heightened as students work with individual interests, talents, and learning styles.

A significant emphasis on critical thinking and problem solving is evident throughout the projects. Projects reported that critical thinking is encouraged in a number of ways. For example, as students create their own questions and investigate areas of a larger topic of interest, they begin to think critically about how they would find information, whether their research makes sense within the larger schema, and the implications for their overall learning. Projects such as those that involve coding and robotics found that when students are provided with rich tasks and opportunities to learn from and use technology to express their learning in the classroom they are empowered to ask questions and seek answers.

A number of projects described collaboration as a significant aspect of students' learning. Students demonstrate collaboration, communication, and creativity as they share documents and work together to find ways to present their learning, using cloud-based productivity tools. It was also reported that students could work seamlessly at school and continue their work at home, using these tools. Projects reported that student collaboration with peers and teachers using shared documents results in increased critical thinking, effective communication, and digital citizenship.

There are indications that teachers understand the value in supporting student engagement and learning through the inclusion of student voice and choice, and the building of collaborative partnerships among students and others. Projects stated that collaboration has improved between students and that peer-to-peer partnerships are being cultivated as students learn from and support each other.

Many projects reported on global citizenship. Students are increasingly seeing themselves as global citizens with a responsibility to enact change in the world. Students are engaged in real-world problems and in collaboratively putting their solutions into possible actions from supporting community causes to exploring places beyond Ontario as they work on inquiry-based projects using technology. By being actively involved in a learning community, students can become fully participating global citizens, who are able to transfer their acquired competencies to life in an ever-widening digital world.

It was reported that students are developing the attributes associated with 'learning to learn' – meta-cognition, self-regulation, self-reflection, and self-advocacy as they become more independent and take more ownership for their learning. There is a growing shift for students toward the processes of learning and a new eagerness to be involved in learning using multiple technologies.

In terms of overall adoption of global competencies, projects reported that students are challenged; more actively involved in assessing their own academic progress; more engaged and resilient when completing activities; and are more independent thinkers. Students' attitude towards learning is more positive as they take more risks and are more persistent in taking control of their own learning.

***Impact on Teachers***

Projects reported on the changing role of teachers in technology-enabled classrooms and how it is impacting the way they consider student learning and their own thinking about planning, curriculum, instruction, and assessment. Teachers described how they intend to maintain and expand pedagogical shifts, including: leveraging digital learning; building in more student choice and voice in learning; connecting learning tasks to the real world; and integrating new partnerships. Learning partnerships are forming between classrooms, between schools, and globally as digital learning is being leveraged. Overall, it seems clear that teachers participating in these projects are embracing changes to their role and seeing students in a new light - one that empowers students to be progressively seen as partners in the learning process.

Teachers are taking more responsibility for their own professional growth. Projects shared that teachers are co-planning and co-learning in the spirit of collaborative professionalism. Some projects are focused on developing and supporting co-learning networks at different levels such as within schools, between schools, and outside the district. It was reported that teachers feel time to collaborate with peers is an enabler for integrating competencies into their instructional practice. As a result, there is strong evidence that there is an increase in teacher confidence with the design of cross-curricular, open-ended inquiries. Other projects reported teachers delving deeper into technology use in order to provide students with richer, more meaningful, and more purposeful learning tasks. As a result, students are given more tools and opportunities to create, design, and problem solve as part of their learning.

Technology is facilitating assessment practices, especially *assessment as* and *assessment for* learning. A clear trend emerged showing that the use of technology opens up the concept of what counts as evidence of learning. Projects reported that technology allows for the deepening of assessment practices, and

highlight feedback during the learning as a way of thinking about assessment as part of the learning process. It was reported that the way teachers provide feedback is changing and this is having a direct and timely impact on their teaching practices and the students' learning experiences.

***Impact on System***

Projects reported that there is a growing understanding that leadership is the key to scaling innovative practice. As evidenced in the previous Rounds, districts are taking a more strategic and comprehensive approach that focuses on partnerships, coordinating school and system planning, ubiquitous access to technology, and job-embedded training and support.

System planning suggests that districts are incorporating technology integration as core to all of their initiatives. System priorities have shifted such that a wider group of stakeholders are involved in the conversation around technology use and decision making.

A shift in mindsets within schools is occurring because there is strong leadership and support for administrators and leaders as they recognize the advantages offered by the digital world. Teacher leadership is also highlighted as an important aspect of building capacity in school systems. Teachers who were engaged in previous rounds of study are described as showing great leadership with their peers and in their schools, sharing their passion for digital learning with others.

There was evidence that building capacity and a culture of growth within districts is continuing to expand. School-based professional learning networks are supported by social media so that teachers have access to supportive professional learning colleagues across the system. Professional connections are made through provincial educational networks which support teacher learning beyond a school district.

Opportunities to further develop collaborative cultures at all levels is highlighted through participation in cross-board and jurisdictional events, symposia, and shared learning experiences. System learning is indicated through increasing coordination and collaboration among teachers, schools, and administrators as well as interactions with members of multiple stakeholder groups.

Overall, projects indicate a positive sense that building a technology-enabled learning environment and culture takes time and must reflect the evolutions in pedagogy and in the ever-widening digital world. Districts recognize that progressively students, teachers, and the system are both more capable and better equipped working within the digital milieu to take technology-enabled teaching and learning to the next level.

## In Summary

It is clear that there is continuous progress as students, teachers, and system refine and add to their knowledge about technology-enabled teaching and learning. Our patterns of evidence following six Rounds of research imply that innovation in pedagogical practice is now more readily accepted as commonplace by students and is broadly and increasingly embraced by teachers. Impact evidence suggests that technology-embedded learning at all levels within the system is becoming integral to district plans for scaling up and sustaining growth.

Teachers are increasingly comfortable and skilled with embedding technology in teaching and learning and, in employing a range of digital collaborative tools and strategies to positively impact their interactions with students and colleagues. Students report an increased interest in classroom learning experiences as they exploit technology to reach goals and gain meaningful feedback and guidance from teachers.

Pedagogy is driving the appropriate and planned use of technology in classrooms, as global competencies move to the foreground in learning and teaching. Students, teachers, and system are now using the language of global competencies as reported in the international literature in their dialogue, in their daily learning, and in future planning.

Going forward, aligning system-wide assessment practices with the goals of technology-enabled teaching and learning and the development of global competencies highlighted as central for current pedagogical practice seems to be an important matter to delineate and address.