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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Final Report

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Executive Summary

The Ministry of Education and the Council of Ontario Directors of Education (CODE) continue to be invested in furthering the research conducted in Rounds 1 (2011-12), 2 (2012-13), and 3 (2013-14) that documented changes in teaching practice and that strengthened student engagement, learning, and acquisition of 21st Century competencies. As such, part of the Technology and Learning Fund (2014-2015) agenda is to conduct the 21st *Century Innovation Research Initiative (Round 4),* in order to promote Ontario's renewed vision and core priorities for education.

Round 4 continues 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 the *Round 4 Innovation Research Initiative*, Curriculum Services Canada (CSC) worked with the innovation projects in documenting evidence of impact on teaching and learning within a common research framework. The research team continued to utilize case study methodology for the purpose of consistency in reporting data. Projects provided evidence on how technology impacted teachers, students, and systems. 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.

In this report, the qualitative and quantitative data provide insights that align with the purpose of the study. 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 by projects, 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. 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 by projects, 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 research team presents its analysis of the qualitative information reported by projects through the lens of impact on students, teachers, and systems. In analyzing the data submitted, the research team found that 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.

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.

In terms of student-to-teacher collaboration, a number of projects reported that students were taking more responsibility for supporting technology-rich class 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 were impacting the design and nature of their physical environment, and also were actively involved in supporting instruction and learning. It seems that increased collaboration among and between students and teachers opens the door to acquiring 21st Century competencies in that it provides the foundation for new pedagogical practices.

In this round, 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 Coordinators. 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. 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. Having technology readily and reliably available for use at any time of the day has increased teachers' willingness and confidence.

One of the biggest changes for teachers brought by 21st Century technology-enabled teaching and learning is shifting 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. Teachers also noted how they used cloud-based tools to learn with their students, giving discussion-based feedback on work in progress.

In several projects, individuals described how mobile devices have changed 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.

Data from the projects indicated that there is a new sense of the importance of technology as a tool for connections across the system. There appears to be an enhanced understanding that cohesive planning across schools and personnel is essential for scaling up and sustaining technology-enabled 21st Century teaching and learning. There is continued support for administrators and leaders as they recognize the advantages offered by the digital world. System priorities have shifted such that a wider group of stakeholders are involved in the conversation around technology use and decision making.

Many project leaders reported that their Round 4 innovation research was in alignment with system strategic plans and the belief that technology is an accelerator for learning. Overall, comments on system planning suggest that districts are in the process of incorporating technology integration as core to all of their initiatives. 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 with the intent to scale up and sustain technology-enabled teaching and learning.

It was noted that there is growing understanding that leadership is the key to scaling innovative practice. A shift in mindsets within schools is occurring because there is strong leadership and support. 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. 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.

In general, it is clear that there is solid recognition that system and school planning is fundamental to supporting students and teachers on their journey along the 21st Century educational pathway. Projects also 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.

The data reported by the projects in this *Innovation Research Initiative (Round 4)* 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.

Given the nature of global perspectives on changes to pedagogical practices driven by the technology-enabled environment, it seems clear that the Round 4 innovation research projects are 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.

Prologue

Moving to a More Specific Metaphor: From Topography to Particular Features that Highlight Sustainable Practice on the Learning Landscape

For the 21st *Century Innovation Research Initiative (Round 4),* the research team is shifting the metaphor from a broad vision of the changing educational landscape provided in Rounds 1, 2, and 3 to one where more specific landscape features are highlighted that can provide information to support and sustain teaching and learning across Ontario.

Much like current discussions related to the environmental impact of past practices on the features of the physical landscape, the 21st Century digital learning landscape calls educators to transform teaching and learning from a predominantly univocal conversation to one that is dynamic and connected on both a local and a global scale. Hence, new skills are called for to meet the needs of a changing world.

In Round 3, the research team noted project features that specified the acquisition of skills such as creativity, communication, and collaboration. The landscape for Round 4 incorporates such features that define and promote more precise pathways for 21st Century digital teaching and learning.

Like the projects described in this study, specific features of the learning landscape are varied according to each project focus. In Round 4, all 72 school boards, 4 school authorities, and 1 provincial school participated in the innovation research projects. As in each of the projects, the diverse topography calls for particular needs and actions (Dewey, 1938) in both geographic and digital terms. Local circumstances give rise to differing visions of innovative practices that when compiled, can help specify, scale, and sustain technology-enabled teaching and learning.

In this report, there are descriptions included that detail individual projects with information such as numbers of participants, including students, teachers, and staff, as well as the technology being used. We provide evidence-based information emerging from the projects that impacted teaching, learning, and system practices. We also report on conditions that point to a vision for education that is more globally connected and technologically engaged.

In Chapters 1 and 2, we describe the purpose and the background for the study and the study methodology. In subsequent chapters, we present our analysis of the information reported by projects through the lens of *impact on students, teachers,* and *systems*. In our epilogue, we highlight features that point to possible directions that lie ahead for continuing sector-wide progress in innovative practices.

From the information reported in the *Innovation Research Initiative (Round 4),* it is apparent that designing and focussing on more specific features on the 21st Century digital landscape is fueled and sustained by the commitment of educators and system personnel across Ontario.

Chapter 1

Describing Directions for Change on a Shifting Landscape: Background and Purpose for Round 4 Projects

The Ministry of Education and the Council of Ontario Directors of Education (CODE) continue to be invested in furthering the research conducted in Rounds 1 (2011-12), 2 (2012-13), and 3 (2013-14) that documented changes in teaching practice and that strengthened student engagement, learning, and acquisition of 21st Century competencies. As such, part of the Technology and Learning Fund (2014-2015) agenda is to conduct the 21st *Century Innovation Research Initiative (Round 4),* in order to promote Ontario's renewed vision and core priorities for education.

Purpose of the Study

Building upon foundations to date, the goals of the 21st *Century Innovation Research Initiative (Round 4)* focus on four key areas:

- to promote local innovation and leadership for 21st century (next generation) teaching and learning
- to support evidence-based and research-informed decision making that is focussed on the instructional core
- to situate Ontario's local innovation efforts within the wider context of current international research on the features of strong districts, whole systems reform that integrates effective technology-enabled pedagogy, and, emerging evidence on ' 21st Century effectiveness' in innovative learning environments
- to promote sector-wide engagement, foster common understanding, and support capacity building and knowledge mobilization in moving to scale-up pedagogy-driven technology-enabled practices for optimizing learning

Background: 21st Century Innovation Research Initiative (Round 4)

In January 2015, the Ministry of Education and CODE indicated their intention to work in partnership for a fourth consecutive year to support innovation research projects on effective practices for technology-

enabled teaching and learning across Ontario. Curriculum Services Canada (CSC) continued to work with the innovation projects in documenting evidence of impact on teaching and learning within a common research framework.

The Ministry and CODE continue to be committed to mobilizing the growing knowledge and effective practices that are evident across the province. Lessons learned from Round 3 (2013-2014) projects are consistent with both international trends in 21st Century next generation learning and with Ontario's education strategy (April, 2014). Local and provincial vision and the continuation of possibilities for whole system change create a powerful environment for ascertaining specific features that can further illuminate the learning landscape through the 21st *Century Innovation Research Initiative (Round 4).*

Important Features on the Technology-enabled Educational Landscape

As in the Rounds 1, 2, and 3 studies, the research team continues to consider a broad range of international literature pertaining to technology-enabled pedagogy. Such an expansive vision supports the overall goals of the Round 4 study, which is to ensure that graduates are prepared for a competitive, globally connected, and technologically engaged knowledge society and economy.

In 2010, the Organization for Economic Co-Operation and Development (OECD) published *Inspired by Technology, Driven by Pedagogy: A Systematic Approach to Technology-Based School Innovations* that pointed out the importance of placing pedagogy before technology when considering student engagement. In 2012, the OECD published *Connected Minds: Technology and Today's Learners* that focussed on how connectedness is shaping the economy and society. They note: "It is not about the technology [alone], but it is about connectedness! Devices and gadgets are less important than the ability to be connected" (p. 15). They write that: "Connectedness is the capacity to benefit from connectivity for personal, social, work or economic purposes" (p. 15).

McLoughlin & Lee (2010) write that there is: "a need to reconsider our notions of pedagogy [so that] educators and students move toward a social and participatory pedagogy rather than one based on the acquisition of pre-packaged facts" (p. 4).

Dede (2009) furthers this point noting that collaboration skills are important for cooperative interpersonal capabilities: "21st century workers increasingly accomplish tasks through mediated interactions with peers halfway across the world whom they may never meet face to face" (p. 2).

Fullan & Donnelly (2013) note that: “a lot more has to be done in fleshing out the nature of effective pedagogy in its own right, as well as how it relates to the use of technology to accelerate and deepen learning” (p. 11).

More recently, Fullan and Langworthy (2014) define the need for what they term ‘new pedagogies’ noting: “The ‘new pedagogies’ can be defined succinctly as “a new model of learning partnerships between and among students and teachers, aiming towards deep learning goals and enabled by pervasive digital access” (p. 2).

Given the nature of global perspectives on changes to pedagogical practices driven by the technology-enabled environment, it seems clear that the Round 4 innovation research projects are of central importance for continuing to develop clarity and compelling insights into a renewed vision for education that can continue to move teaching and learning forward in the 21st Century.

Impact on 21st Century Innovation Practices

As education has increasingly moved into a global sphere in the 21st Century, ways of enhancing connections between research, policy, and practice have become central for developing relevant skills in teaching and learning, and how to assess those skills.

By definition, to mobilize knowledge means to amass for action, based on a pre-determined theoretical grounding – the very opposite of a top-down model where new information is ‘delivered’ to school communities to be carried out without their input. The concept of knowledge mobilization in Dede’s (1999) terms means that the “islands of innovation” that local research initiatives represent can become a mainland of collective experience, thus greatly impacting the educational community on a wider scale in regard to utilizing 21st Century skills.

With regards to widespread implementation of innovative practices, Dede (1999) notes three important points that can enhance or impede knowledge mobilization: 1) Emerging information technologies enable a shift from the transfer and assimilation of information to the creation, sharing, and mastery of knowledge; 2) Dissemination efforts must include all the information necessary for successful implementation of an exemplary practice, imparting a set of related innovations that mutually reinforce overall systemic change; 3) A major challenge in generalizing and scaling up an educational innovation is helping practitioners “unlearn the beliefs, values, assumptions, and culture underlying their organization’s standard operating practices” (p. 2).

Fullan & Langworthy (2014) note: “Mobilizing whole systems toward new pedagogies is not a small undertaking. It requires nothing less than addressing the fundamental challenges and new potential of education systems in our age” (p. 75).

Underlying Features of 21st Century Learning

An underlying feature is one that is not noticeable on the surface of a landscape, yet its presence can obstruct growth and development, or conversely, may nurture sustained innovation. Much as roots are not visible but are an essential part of plants and trees, the theoretical underpinnings for 21st Century technology-enabled learning are an essential ingredient for the growth and development of teaching practices, learning skills, and system structures.

In a paper entitled *Shifting Minds 3.0: Redefining the Learning Landscape in Canada (2015)*, published by Canadians for 21st Century Learning and Innovation (C21Canada), the distinction between a traditional and a transformative vision of schooling is noted as: “The traditional view of educational practice is that teachers lead and students follow; curriculum and course outlines are prescribed; teachers develop lesson plans emphasizing direct instruction … and successful students replicate what they are taught” (p. 9). The transformative view is: “that learning is a social process, with teachers and students working together in partnership with each other and with experts beyond school, supported by digital technologies … the learning environment … is purposely designed for students to think, research, analyze, develop and improve their ideas, and demonstrate deep understanding through the work they produce” (p. 9).

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. As Fullan (2013) suggested and the C21Canada (2015) paper highlights, these skills are viewed as the underlying features of a successful transition to 21st Century technology-enabled skill development.

The notion that learning is a social process that builds on individuals’ prior knowledge has its roots in the work of constructivist theorists such as Dewey (1938), who noted that: “When education is based upon experience and educative experience is seen to be a social process … the teacher loses the position of external boss or dictator but takes on that of leader of group activities” (p. 59). Many other researchers

such as Vygotsky (1978), Bruner (1987, 1990) and more recently, Splitter (2009), and Shapiro (2011) have highlighted aspects of teaching and learning that are premised on teachers and students working together to bring their past experience and understanding to the task of creating new meaning. In a transformative or constructivist view, learning is best accomplished in socially interactive settings where dialogue forms the basis of new understanding and assessment for continued learning. Meaning is created in rich exchanges on topics explored and assessed by those present and with those available across the world through the use of technology.

Considering Reflective Practice

The concept of reflective practice has been accepted in educational circles for many years in terms of research, professional practices, and teaching. Schon (1983) described reflective practice as the capacity to reflect on action so as to engage in a process of continuous learning. He coined the phrase 'reflection-in-action' as a means of describing practitioners' way of being when coping with issues or situations in the moment, using their own prior experience, and 'reflection-on-action' following action taken, when a practitioner analyzes the consequences of his or her actions.

Recently, Rose (2013) has added to the concept of reflection positing the concept of 'reflection-then-action' as a means of taking time to slow down to think about next steps or actions. She notes that: "… reflection is not a unitary phenomenon but essentially a skill that each performs in his or her own way, in accordance with his or her particular situation, preferences, learning style, and capabilities. There is a willingness to accept such diverse phenomena as brainstorming sessions, online discussions and thinking on one's feet in the workplace as instances of reflection … [which results in the] diminishment of personal and social commitment to reflection as a form of thought that takes place within solitude and slowness" (p. 7). Rose quotes Prensky (2001) who observes: "One key area that appears to have been affected [by technology] is reflection … In our twitch-speed world, there is less time and opportunity for reflection … One of the most interesting challenges and opportunities in teaching Digital Natives is to figure out and invent ways to include reflection and critical thinking in the learning but still do it the Digital Native language" (p. 8).

Given the theoretical background to transformative or constructivist pedagogical practices noted earlier in this chapter, perhaps attending more specifically to reflection as a feature on the 21st Century technology-enabled landscape could, as Boud et al. (1985) note: "… [help] people recapture their experience, think about it, mull it over, and evaluate it. It is this working with [past] experience that is important in learning" (p. 19).

Chapter 2

Tools for Explaining Project Features: Methodology and Methods

In this 21st *Century Innovation Research Initiative (Round 4)*, the research team continues to utilize case study methodology for the purpose of consistency in reporting data. Projects provided evidence on how technology impacted teachers, students, and systems.

As noted in the Rounds 1, 2, and 3 research studies, case study research is well established in various disciplines such as law and medicine, as well as education (Sacks, 1990, 1995, 2010; Coles, 1993; Hartley, 2005; Yin, 2009; Flyvbjerg, 2011), as a means of gathering and explaining particularities about individual cases, and also about what may be common across cases. Case study research focusses on both the process of gathering data, and the final report (Stenhouse, 1984). Case study lends itself, to analyzing both quantitative and qualitative data received from each project. As Yin (2009) notes: "… the case studies' unique strength is its ability to deal with a variety of evidence – documents, artifacts, interviews and observations" (p. 11). Ultimately, the depth and breadth of data is dependent on information received from individual sites.

In this Round 4 report, the data provides qualitative insights that align with the study purposes as well as data that is quantitative in nature.

Data Collection Methods

To be congruent with the purposes of the study, data was collected within a common research structure, using a comprehensive self-reporting template. Also, CSC significantly expanded its research team to include field researchers who interacted with the project leaders throughout all phases of implementation. Each member of our field team was responsible for liaising directly with a number of innovation project leaders to support their progress. They used ongoing, focussed conversations, 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 initiative project leaders indicated that this interaction was a significant support in clarifying requirements for reporting on their initiatives.

Chapter 3

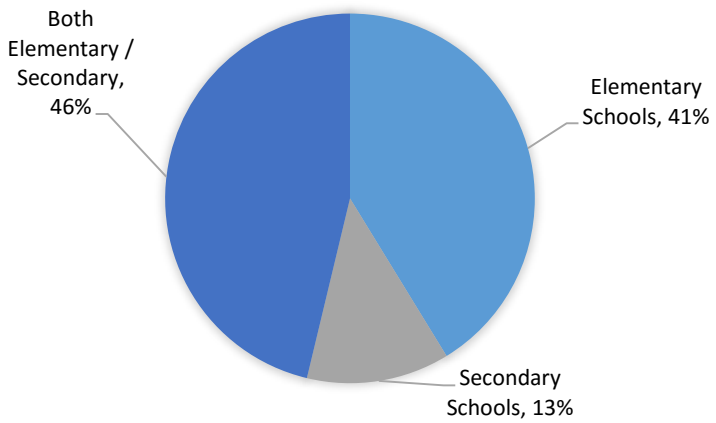
Describing Participants and their Project Designs

In June 2015, districts submitted final project reports using the reporting guidelines and template distributed by Curriculum Services Canada. From the information submitted, it is clear that there is intelligible and impressive disparity in the inspective focus and strategies utilized to chronicle research activities and to gather and analyze evidence of impact. The following charts and graphs provide an overview of selected contextual data submitted by the 68 English-language and 12 French-language projects.

1. Projects by School Organization

	English (68 projects)	French (12 projects)
Elementary Schools only:	26	7
Secondary Schools only:	10	0
Both Elementary and Secondary Schools:	32	5

Projects by School Organization (percentages across all English-language and French-language projects)



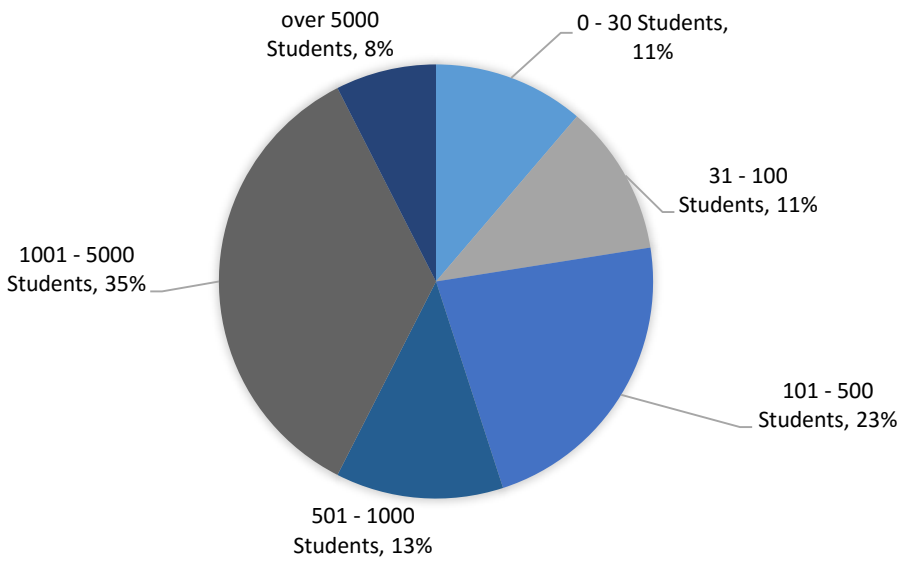
Of the eighty (80) English-language and French-language projects, fifty-six (56) projects are targeted at a specific range of grades or the specific content or skills taught at identified grade levels. Twenty-four (24) projects had a general system focus (JK-12) without restrictions to grades or divisions.

2. Projects by Level of Student Involvement

Based on the numbers reported by projects, over 170 000 students across the province were directly engaged in aspects of the *Round 4 Innovative Research Initiative*. The number of students in each project varied widely by the nature of the project activities and scope of the investigations, with 680 students per project being the median level of involvement. Fifteen (15) projects were specifically directed, in whole or in part, to supporting students with special needs or examining the requisite assistive technologies. There were eight (8) projects in total that reported there was no student involvement in their activities. These were projects that tended to extensively focus on teacher training, leadership development, or district processes/technologies.

	English (68 projects)	French (12 projects)
Projects with 0 – 30 students involved	5	4
Projects with 31 – 100 students involved	9	
Projects with 101 – 500 students involved	13	5
Projects with 501 – 1000 students involved	8	2
Projects with 1001 – 5000 students involved	27	1
Projects with over 5000 students involved	6	

Projects: Student Involvement (percentages across all English-language and French-language projects)



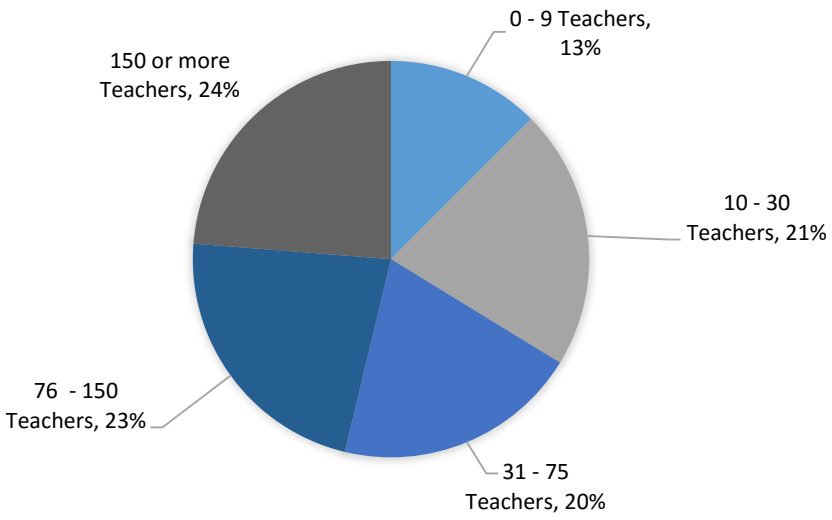
3. Projects by Level of Educator Involvement

All districts identified involvement by classroom teachers in their research. Based on the numbers reported by projects, 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. This is a significant increase in the level of teacher involvement from previous rounds of the initiative. This may be as a result of the broadening scope and nature of the research as districts build on learning from previous rounds.

Twenty-five (25) projects specifically identified in their reports that job actions by teachers in the spring of 2015 had a significant impact on their implementation activities, data collection, and scope of subsequent analysis and reporting of evidence of impact.

	English (68 projects)	French (12 projects)
Projects with 0 – 9 teachers involved.....	8	2
Projects with 10 - 30 teachers involved	13	4
Projects with 31 – 75 teachers involved.....	13	3
Projects with 76 – 150 teachers involved	17	1
Projects with 150 or more teachers involved	17	2

Projects: Teacher Involvement (percentages across all English-language and French-language projects)



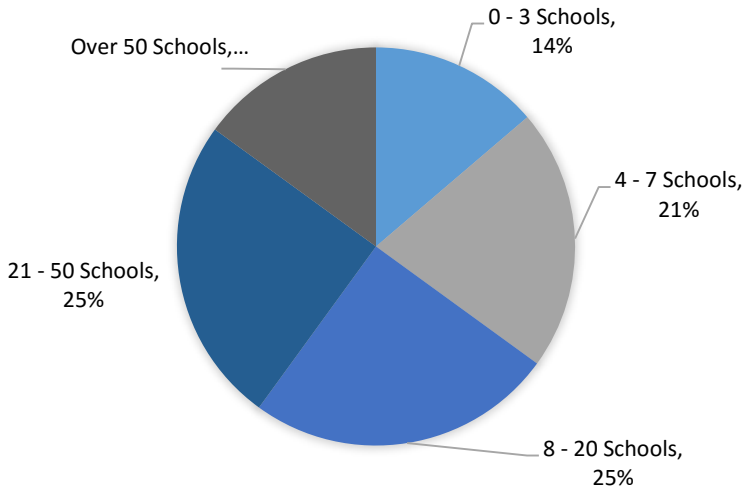
As well as classroom teachers, projects reported that in total 1790 school administrators (principals, vice-principals), 310 system administrators, and 870 support staff (e.g., information technology staff, program staff) had direct involvement in the project undertakings.

4. Projects by Level of School Involvement

All projects identified the number of schools involved or contributing to the initiative. Based on the numbers reported by projects, 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. Again, this is a significant increase in the level of involvement of schools from previous rounds of the initiative.

	English (68 projects)	French (12 projects)
Projects with 0 – 3 schools involved	11	
Projects with 4 - 7 schools involved	11	6
Projects with 8 – 20 schools involved	18	2
Projects with 21 – 50 schools involved	17	3
Projects with 51 or more schools involved	11	1

Projects: School Involvement (percentages across all English-language and French-language projects)

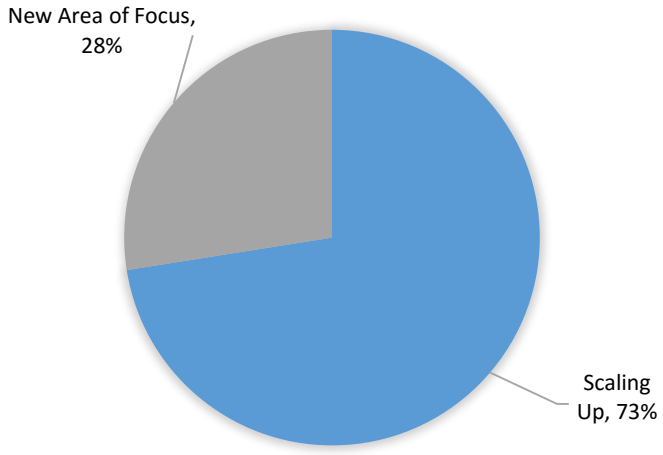


5. Building on the Learning from Rounds 1, 2, and 3

Projects were asked to identify if Round 4 scales up the reach or scope of research in previous rounds or was primarily a new area of investigation based on what was learned. The majority of projects indicated that their investigations were scaling up their learning from previous rounds.

	English (68 projects)	French (12 projects)
Scaling up the Reach or Scope.....	48	10
Investigates a New Area of Focus.....	20	2

Projects: Scaling Up or New Area of Focus (percentages across all English-language and French-language projects)

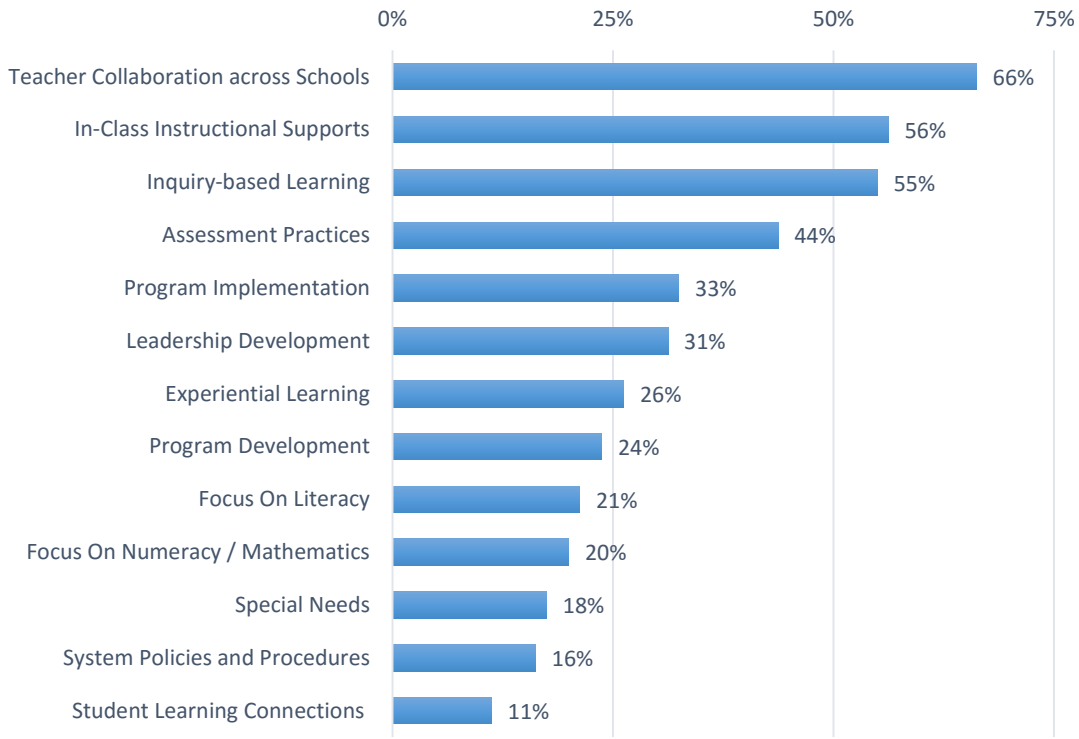


6. Project Elements

On the reporting template, project leaders were asked to identify the components of their initiative that were significant and planned elements of their innovation research. The template provided a list of elements of which the project leader could select all that apply. The reporting of identified elements is intended to highlight trends across projects' planned actions, and they are evident in the initiatives with widely varying degrees of emphasis and actions.

	English (68 projects)	French (12 projects)
Inquiry-based Learning	37	7
Experiential Learning	19	2
Focus On Numeracy / Mathematics	14	2
Focus On Literacy	12	5
Special Needs	12	2
Student Learning Connections (out of province or country)	8	1
Teacher Collaboration across Schools	47	6
In-Class Instructional Supports	39	6
Program Development	17	2
Program Implementation	24	2
Assessment Practices	29	6
System Policies and Procedures	11	2
Leadership Development	21	4

Percentage of Projects Selecting Identified Elements (combined English-language and French-language projects, with elements sorted by frequency)

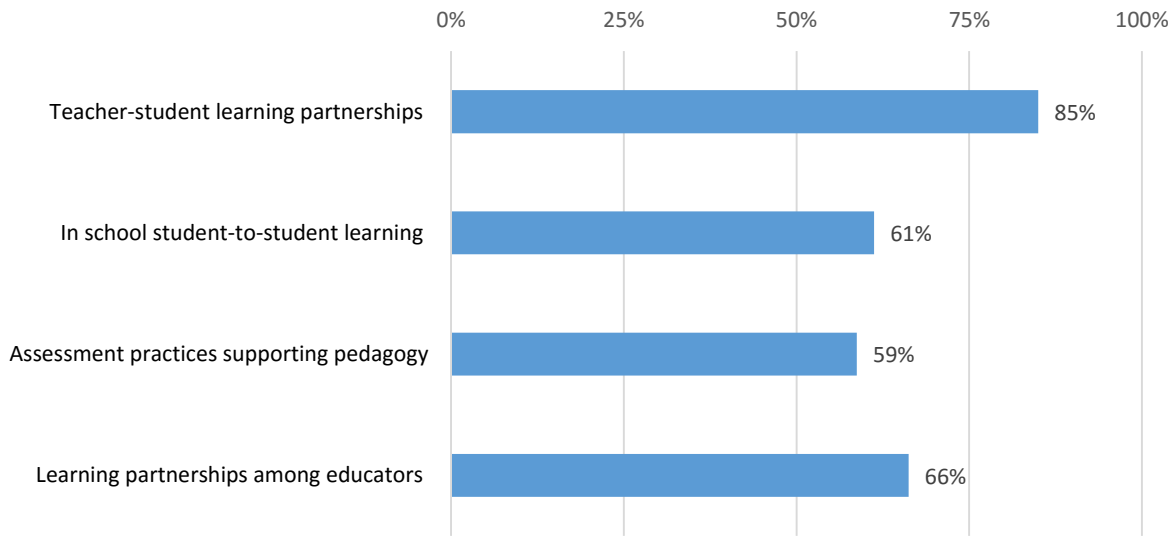


Project leaders were also asked to select one or more of the four (4) key areas of the *TLF 21st Century Innovation Research Initiative* that were directly aligned to their project activities. Seventy (70) of the 80 projects selected two or more of the key areas, with 20 projects selecting all four key areas.

The data below is based on project selection, and is evident in the reports with wide variation of emphasis.

	English (68 projects)	French (12 projects)
Key Areas of TLF 21st Century Innovation Research Initiative:		
Teacher-student learning partnerships enabled by technology	60	8
In school student-to-student learning enabled by technology	40	9
Assessment practices supporting deep learning pedagogy	38	9
Learning partnerships among educators enabled by technology	48	5

Percentage of Projects Selecting Each of the Key Areas of the *TLF 21st Century Innovation Research Initiative* (combined English-language and French-language projects)



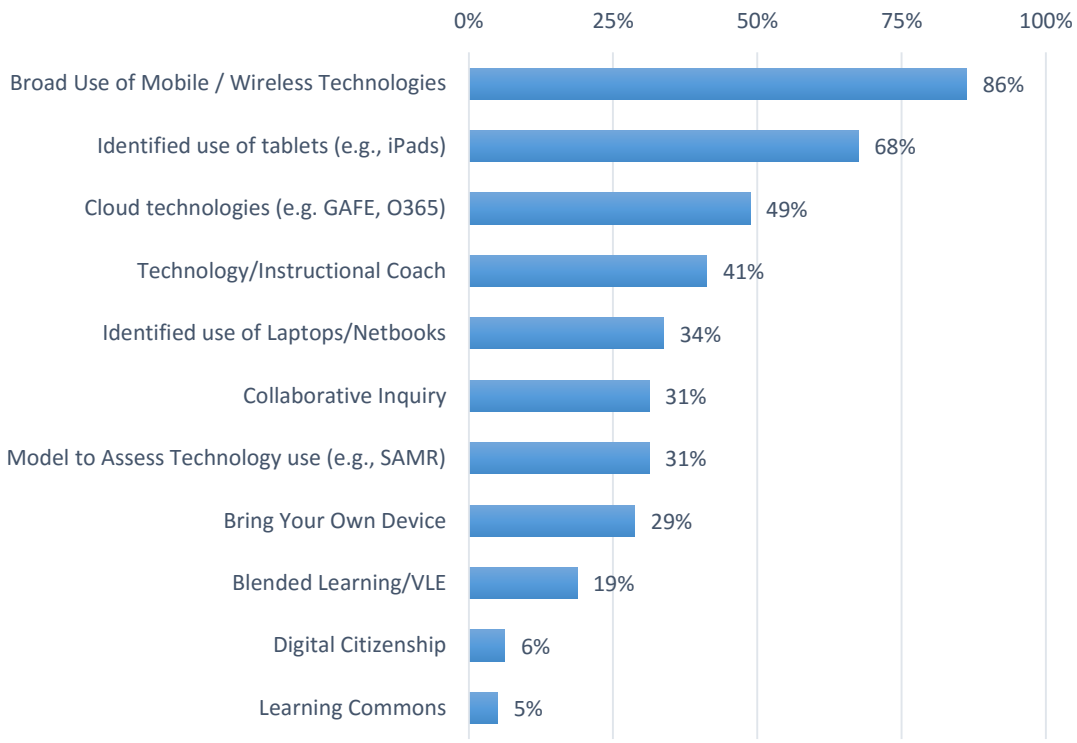
7. Additional Project Elements

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.

The list of themes shown below is not meant to be exhaustive and, the list intentionally excludes elements identified in the previous section. These themes have widely divergent scale and interpretation across projects. For some projects, it is a central focus. For others, it is a feature of implementation. These themes are intended to disclose patterns, but are not a reliable or practical means to designate or categorize the focus of individual projects.

	English (68 projects)	French (12 projects)
Collaborative Inquiry	25	
Blended Learning/VLE	15	
Digital Citizenship (ethical use of technology)	4	1
Learning Commons	4	
Use of Model to assess use of Technology (e.g., SAMR)	20	5
Technology/Instructional Coach (job-embedded support)	30	3
Broad Use of Mobile / Wireless Technologies	60	9
Identified use of tablets (e.g., iPads)	50	4
Identified use of Laptops/Netbooks (e.g. Chromebook)	25	2
Cloud technologies (e.g. GAFE, O365)	35	4
Bring Your Own Device	23	

Percentage of Projects for Identified Topics (combined English-language and French-language projects, with topics sorted by frequency)



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 appear to have broadened the nature and scope of their initiatives. During the first 3 rounds, the median level of student involvement ranged from 300 to 500 students per project, while in Round 4 the median level of student involvement increased to 680 students per project. Similar results were found in the level of teacher involvement. During the first 3 rounds, the median level of teacher involvement ranged from 24 to 30 teachers per project, while in Round 4 the median level of teacher involvement increased to 58 teachers per project. This suggests that 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.

Chapter 4

Highlighting Promising Pathways: Naming Features on the Learning Landscape

In this chapter, the research team presents information that incorporates the areas of investigation noted in Chapter 1 that form the focus and intent of this study. Building upon the three previous studies - Rounds 1 (2011-12), 2 (2012-13) and 3 (2013-14), this Round 4 study continues 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 context of international research; and to promote capacity building and knowledge mobilization to scale-up pedagogy-driven, technology-enabled practices for optimizing learning.

As Glesne (2011) describes: "Data analysis involves organizing what you have seen, heard, and read so that you can figure out what you have learned and make sense of what you have experienced" (p. 84). In analyzing the final data from this innovation research initiative, the research team found that systems as a whole reported strengthened efforts to enhance the use of collaborative processes in teaching and learning. As well, pedagogical practices and choices are increasingly determining the use of technologies that impact students, teachers, and systems.

As described in the Prologue, we use the metaphor of features on the digital learning landscape to delineate the data gathered in this study in order to name attributes that have emerged from the projects more specifically. Several recent international reports have also used metaphor as a way of situating their studies. For example, Fullan & Donnelly (2013) use the metaphor of the swamp as they suggest ideas for navigating new digital innovations in education, while Fullan and Langworthy (2014) use a geological metaphor describing a rich seam in their report on the attributes of deep learning. As Lawrence-Lightfoot (1997) notes: "Metaphors can serve as overarching themes and rich undercurrents that resound throughout the [research] … they act as symbols pointing to larger phenomena that emerge as significant [in the research]" (p. 55).

A Connecting Pathway: International Literature

The data reported by the projects in this *Innovation Research Initiative (Round 4)* 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 noted by these experts.

For example, in *A Rich Seam: How New Pedagogies Find Deep Learning* Fullan & Langworthy (2014) write that: 'new pedagogies' provide "a new model of learning partnerships between and among students and teachers, aiming towards deep learning goals and enabled by pervasive digital access" (p. 2).

In *The New Pedagogy: Students and Teachers as Learning Partners* (2013), Fullan writes that: "The basic notion is teachers and students as learning partners" (p. 24). He notes that while it is not entirely clear what the new pedagogy would look like, generally, the idea is that teachers become change agents and students become pro-active partners in learning. "Not only would this require radically new learning relationships between students and teachers, but also *among* them" (p. 25).

Claxton & Lucas (2013) in their report on redesigning schooling describe changes in countries such as England, Australia, Singapore and New Zealand that are applicable to Ontario's renewed vision. They note goals such as producing: "1) a confident person who is adaptable and resilient, knows himself, thinks independently and critically, and communicates effectively; 2) a self-directed learner who takes responsibility for his own learning, who questions, reflects and perseveres in the pursuit of learning; 3) an active contributor who is able to work effectively in teams, exercises initiative, takes calculated risks, is innovative and strives for excellence" (p. 7).

Similarly, reporting on data from a number of countries, Fullan & Langworthy (2014) describe: "the radical change in the relationships between all key players in learning: students, teachers, technologies, school cultures, curricula and assessments" (p. 1).

In the Round 3 (2013-14) final report, the research team described a shift among and between students, teachers, and systems towards a more collaborative, coordinated, and connected way of impacting 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.

In order to delineate the final data in this report, the research team uses three headings: 1) Impact on Students, 2) Impact on Instruction, and 3) Impact on Systems. It seems clear that provincially, 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.

1. Impact on Students

> *In the new pedagogies, the entire learning experience is deeply embedded in relationships …*
>
> *Fullan & Langworthy (2014)*

Collaboration

Overall, in this Round 4 study, it is noteworthy that 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. Communication is the important skill that forms the basis for collaboration, both of which are noted as essential for 21st Century technology-enabled learning (Fullan, 2013; Fullan & Scott, 2014). Communication among and between learners increases the potential for engagement in the learning process. Engagement furthers inquiry, which can open doors to new learning and insights. Information reported by projects indicates that this emerging pattern was evident.

Student-to-Student

> *Connecting learning to students' real lives and aspirations is often what makes the new pedagogies so engaging for students.*
>
> *Fullan & Langworthy (2014)*

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.

One teacher commented: “I noticed that students who were typically reluctant to share ideas were excited to contribute their responses, because everyone was contributing. This allowed all students to provide feedback to one another and it created less anxiety about being ‘wrong.’ Rather, students viewed any errors as a chance to help each other learn.”

Numerous projects noted that through the use of communication and collaboration applications such as Google Apps for Education (GAFE) and Office 365 (O365), opportunities were available for constructive feedback and peer-to-peer review. Technology was found to empower student voice in that it supported the sharing of experiences and positively impacted student engagement. One student commented: “I liked working with my group on [Google] Docs because everyone could edit and communicate.” A member of our field team interacting with several projects found that students reported it was easier to collaborate on a group assignment in a cloud environment over distance and time, and that they could all work together to edit and improve the final product; more time could be spent thinking about involving their peers in engaging discussions and analysis of different media sites.

Student-to-Teacher

> *In deep learning tasks, students also often partner with teachers in designing the structure or process of [learning] tasks…*
>
> *Fullan & Langworthy (2014)*

In terms of student-to-teacher collaboration, a number of projects reported that students were taking more responsibility for supporting technology-rich class 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 were impacting the design and nature of their physical environment, and also were actively involved in supporting instruction and learning.

A teacher commented: “My Grade 8 students are happy and engaged. They are excited to focus on student-driven research. As this type of learning is new, I have guided them and exposed them to lots of

documentaries and media, as well as lots of conversation about issues relevant to them and to our society. Students as well as several parents have commented on the higher engagement, as well as less stress and anxiety. My students … feel their work is interesting and meaningful; and they appreciate that each person can work at their own pace and level. They also really like to see me working alongside them – I am a colleague, and they get to see my creativity and collaboration skills in action."

Another teacher commented: "Student engagement in classes seems to be higher and I think students appreciate that teachers are trying to deliver information that is more relevant to what interests them now … Students will always need help to find relevant, accurate information but all students seem to find a voice through technology. The more a student can demonstrate their learning, the more it can direct teaching."

In several projects, communication and collaboration between students and teachers were reported as having improved through the use of cloud-based tools. Students were able to access resources on their own terms and were able to receive and use feedback from teachers more quickly, which resulted in improved understanding. A student commenting on using a multi-user collaboration tool, e.g., OneNote with the teacher said: "She [the teacher] was able to go into my binder and check my work without having to stop me from what I was doing … [she] was able to enter your work and give you feedback right there." Similarly, tablets and mobile devices were seen as a positive way to document learning through pictures and videos that could be shared in class and with parents through online communications.

Student Voice, Choice, and Leadership

> *The ultimate goal of new pedagogies is for students to become independent learners who are able to design and manage the learning process effectively for themselves.*
>
> *Fullan & Langworthy (2014)*

Ultimately, students are the beneficiaries of technology-enabled teaching and learning environments. The shifts to including students' voices in their own learning, and to providing them with choices in terms of tools and strategies supports them in becoming more autonomous, more resourceful, and more confident in a society that increasingly demands continuous learning. A project leader found that,

"students are beginning to take on a larger role in their learning. They must be responsible for their own learning and therefore must be given choices and freedom to explore during the learning cycle."

Across projects, a move appears to be well underway that positions students in central roles in supporting technology-enabled learning. For example, one project reported that: "[student] tech leaders are emerging – some students are finding increased opportunities to lead as a result of their interest in the use of the cloud-based and mobile computing options."

Technology-enabled learning appears to have increased student interest, confidence, and depth of inquiry in topics being explored. A teacher reflecting on students' participation reported: "Monthly rich-task projects allow students to apply their skills to authentic situations such as travel and online shopping. They track and report where and how they use their reading, writing, speaking, and listening skills, as well as showing off their cultural awareness, Internet safety, healthy relationship building, and financial literacy skills, all while celebrating their tech savvy."

One project reported that from 2012 to 2015, teachers observed a significant increase in the number of students who are creating original digital content such as blogs, learning stories, profiles, and portfolios to demonstrate what they have learned. The number of students who have never created original content to demonstrate their learning fell from 74% in 2012 to 26% in 2015. Similar findings were reported in varying degrees across projects. A member of the field team noted: students are becoming increasingly attuned to the use of technology in their learning process to the point where students take for granted that technology is part of their classroom.

It seems that increased collaboration among and between students and teachers opens the door to acquiring 21st Century competencies in that it provides the foundation for pedagogical practices. *Collaboration* requires *communication* that relays information based on students' past experience and learning; *critical thinking* emerges as students engage in dialogue about problems and possible solutions together; *creativity* becomes part of the trial-and-error process of deciding on appropriate answers and directions; students' *character* continues to be molded as interactions with classmates, teachers, parents, and others help them form perspectives and attitudes. Ultimately, given the parameters of understanding that cognitive development is based in culture and social interaction (Vygotsky, 1978), the impact of collaboration for sustaining and scaling learning on the part of students and teachers cannot be underestimated.

Use of Technology

> *A fundamental premise of [the New Pedagogies Initiative] is that technology can play an indispensable deepening and accelerating role across all education processes.*
>
> *Fullan & Langworthy (2013)*

It seems clear that in terms of technology use in the Round 4 innovation research projects, there is a deepening understanding of the role that technology can play in learning environments. Across projects, the research team noted that there is an overall sense of increased confidence among students in incorporating the tools provided by technology into their learning. While as Prensky (2008) has noted, students have become adept at using technology in their social realm, applying it in their school lives requires them to connect technology to their pedagogical understanding in specific ways for specific outcomes.

A member of our field team describing interactions with projects noted: "In the past, typically student tasks were handed back in the form of a report or essay but now students are designing a website and they send the teacher a link to the website. Their website has all the different features and components that would have been present in the essay but they are communicating knowledge in an entirely different way using what makes sense to them." This individual also found that students clearly distinguished between previous courses where technology was not utilized regularly in the year prior, and their current access to tools. The students reported overwhelmingly that they preferred access to technology that enhanced their learning, improved their organizational skills and their ongoing interactions with the teacher and reflection on assessment. They routinely used home devices to access their work and their working partners through cloud-based tools.

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 editing their work.

A teacher found that "Using Google Apps, and specifically Google Classroom, is beneficial for students who may be absent from classes for any given reason. I had a student this year who went on a one-week family vacation. She was able to keep up all the assignments for our class through Google Classroom. I

was able to communicate with the student electronically and was able to provide immediate feedback. I also find the ability to edit student work on the computer helpful as students are then expected to address any corrections."

One student shared that, "My experience with reading and writing has never been positive. Spelling never came easy to me. When writing, I spent all my time trying to sound out words or guessing at letters instead of focussing on the important ideas. Technology has helped me in significant ways. Writing on my iPad has allowed me to focus on the big ideas swirling around in my brain. Before, I might have had a great idea to get started with, but slowly and slowly the idea would erode as my hand struggled to write the words. By the end of it, my finished product was nothing like the idea I had started out with."

There are a number of comments about positive changes 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. A student noted: "I started to hand my work in on time and I felt as if I was more productive." Another stated: "Now that I have the OneNote binder I'm more organized than before and I can catch up on missed work at home, which is very convenient."

Tools: Cloud Technology, Tablets and Mobile Devices

> *No technology has an impact on learning on its own; it all depends on how it is used.*
>
> *Luckin, Bligh, Manches, Ainsworth, Crook & Noss (2012)*

Technology appears to be being more fully embraced as part of regular instruction and used throughout the process of learning. Many comments from projects reported on the use of specific technology tools that enhanced learning. There is a sense across projects that students and teachers are more assured in their ability to use technology successfully as a regular part of learning and instruction.

In several projects, comments on the use of cloud technology provided examples that demonstrate this move. In terms of Google Docs, a project leader noted that: "Students were amazed that their work was always saved with each stroke of the key; there were no longer worries about 'lost' work, which reduced stress. … Students demonstrated the capacity for innovation and they approached new tasks with a positive attitude because they were able to use technology in their learning."

Cloud-based storage promoted student organization; it housed all of the apps that students required for their learning journey. Online bulletin boards such as Padlet were reported to be beneficial as they enabled students to pose open-ended questions and evoke multiple responses. Each student can view the responses of the other students and critically analyze and deconstruct the content, based on the success criteria developed together. Students could offer suggestions to the group and were able to develop a solid understanding of the topic.

A teacher noted: "They are effectively and efficiently using messaging within the document, Google hangouts, the research tool, revision history, sharing, and suggesting many more. …the best thing about all this is that it is so incredibly easy for students to use, relate to, and they are engaged! All in all, Google is extremely easy to use and allows for such rich differentiated learning!"

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.

Teachers and administrators noted that students 'look the same' when they all have the same tablet, which seems to help remove previously associated stigmas of difference. It was also reported that differentiated instruction was more easily accommodated with tablet use. A project leader felt that the students were naturally drawn to using mobile devices for learning. Another project found tablets to be impactful in that students were engaged in a range of metacognitive strategies where they had the opportunity to choose their own approach to assignments in terms of both applications and how they decided to research their content through search engines.

A teacher reported that: "iPads have brought a cultural shift in my classroom. Using iPads has provided hope and building a sense of 'I can.' Students shifted from a fixed mind-set to a growth mindset. The use of iPads in my classroom significantly increased student engagement."

Assistive Technology for Special Needs

> *In comparison to other interventions, assistive technology may have a significant effect in helping students with disabilities progress towards [their] goals … Assistive technology … can help the student learn how to complete the task and it can help to bypass an area of difficulty.*
>
> *Watson, Ito, Smith & Anderson (2010)*

Several projects reported that the use of mobile devices made learning more accessible and it has '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. A teacher reflected, "Now students are choosing new partners and are no longer overlooking the students with [special needs]."

Other projects echoed similar sentiments revealing that students with specific needs no longer seemed so different to classmates. For example, a teacher commented: "This student has a laptop for learning as prescribed by his IEP. He often resisted completing work in class because he felt centred out and wanted to blend in. Now he blends in and is feeling like a leader because he has lots of knowledge with technology!" Another commented: "When all students are working on different forms of technology, no one necessarily realizes that they may be working on a task that is different than his/her peers." From a student's perspective, a grade 6 student remarked: "Technology brings me up to the level of my friends in class. I'm not left out anymore."

Overall, it seems that the impact of assistive technology through devices such as tablets and netbooks is facilitating the acquisition of 21st Century learning skills for students with special needs. As is the case for all students, extending their capacity for learning is connected to a sense of wellbeing and confidence. Being able to work alongside classmates and share in class activities, using the same technological devices makes inclusion a reality in ways that were not available for students in the past.

2. Impact on Instruction

> *When teachers see that a new way of teaching or new tools spark engagement and learning, they naturally gravitate towards these new pedagogies.*
>
> *Fullan & Langworthy (2014)*

Collaboration

Overall, in Round 4 projects, there is a sense that teachers shifted from a tentative use of technology-enabled instruction to embracing technology as part of their pedagogical practice. A member of our field team describing this change noted that in this project's three previous rounds, the emphasis was on

how to increase the individual teacher's capacity and confidence in the use of digital technology for teaching and learning. In this round, however, the focus moved to building collaborative relationships among and between teachers so that there was an increase in fluency and confidence with technology-enabled instruction. Some collaboration was informal and school-based, while in other cases it was formalized. Other areas that influenced instructional practices in collaborative ways were teacher-student partnerships and job-embedded training and inquiry.

Teacher-Teacher

> *When teachers work together…they figure out collectively what works and what doesn't work, and they build a culture of learning…they build and share pedagogical capital…*
>
> *Cuban (2013)*

Comments from a number of projects offer insight into the power of teacher-teacher collaboration. In one case, teachers reported that having professional development in their schools provided them with an atmosphere where trusting relationships could be developed, resulting in more risk taking in a supportive environment across grades and across schools. Similarly, in another project at the secondary level, the collaboration between special education teachers and classroom teachers resulted in a new model of support based on co-teaching for a block of time each day. In some cases, teachers were using the strategies they were learning to transform their own instructional practice and to collaborate with peers.

In terms of engagement in 21st Century skill development, a board consultant related: "One of the things we noticed is that engagement has gone up during our [professional development] sessions … we found that having all the ideas [that emerged] in an online space resulted in the collaborative knowledge that was shared during the session … [meant that participants] could go back to it any time after the session."

Learning partnerships between teachers were noted as being brought to a whole new level through cloud technology because sharing across the school and the district could be accomplished with ease. One teacher reported: "My perspective on how to use technology effectively for learning and inquiry has completely shifted. I feel more connected to other educators and confident in finding resources to

support students navigating the Internet." Another said that: "This [professional development] has taught me so much and given me tools to make my teaching more engaging … I think it is sometimes easy to feel isolated being so spread out geographically throughout the board, but this [initiative] has been a good way to bring us closer."

Co-planning using technology was reported as supporting educators in considering bigger questions around assessment practices. Several projects shared that teachers co-created assessment materials through workshops, blogging, and tweets. It was noted that teachers were able to engage in these ways of working together more collaboratively because they had reliable access to technology in their classrooms and at home.

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 Coordinators. 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. This embedded learning proved extremely helpful in scaling up teachers' confidence in utilizing the new technologies. A member of our field team reported that the teachers and principals involved in a project indicated how crucial the technology coaches were to the success they were experiencing in integrating technology into their classroom practice.

Summing up the change toward more collaborative interaction with colleagues, one individual expressed the positive perspective that: "Networking with so many others who have a wide variety of skills and expertise to share and learn from [has enhanced] the bonding I had with my co-workers and how excited we are for the upcoming school year for all of our new initiatives."

Teacher-Student

> *Through partnering, teachers not only become learners themselves, but also begin to see learning through the eyes of their students.*
>
> *Fullan & Langworthy (2014)*

Perhaps one of the biggest changes for teachers brought by 21st Century technology-enabled teaching and learning is shifting their role from a traditional to a transformative stance; that is to be a facilitator and activator rather than remaining as the sole provider of student learning. It was reported by many projects that this move was made visible in the teacher-student partnerships. One teacher said: "The teacher-to-student relationship shifted. It became a true partnership because we were on the same level in our learning journey."

Some projects reported teachers' growing comfort level with student-led inquiry where teachers were co-creating success criteria with students for technology-enabled learning tasks. Another project that focussed on ways to redefine the student-teacher partnership reported that this move was accomplished by inviting students into designing learning tasks based on their personal interests, aptitudes, life experience, and community involvement. In one case, teachers and students co-created class learning experiences, thereby nurturing the students to become owners of their own learning. A teacher found that: "A result of my increased confidence in the inquiry-based approach is [that] it has allowed me to release control and allow my classroom practice to be student-led. This has consistently led to enhanced curriculum delivery and increased student engagement."

Commentary from a number of projects speaks to the changing nature of classroom environments as teachers include students as co-constructors in their planning, instruction, and assessment practices. 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. Students have more choice in selecting learning tasks and in collaborating with peers.

A member of our field team noted: Teachers are co-learners with students. The teacher told the students that "what we are doing is new and I'm learning with you and there's going to be times when we might need to lean on each other to figure different pieces out."

A teacher summed up her experience: "The use of technology in the classrooms has greatly impacted the teacher-student learning partnership in my classroom. Students having access to lessons and activities through methods other than teacher-directed instruction allows a greater number of students to feel successful as their learning and performance are in their control. They depend less on style of teaching, and programs can be adapted to meet the individual needs of each learner. As well, the student-teacher relationship has greatly improved in terms of communication … Through technology, I

can reach students quickly and effectively. … I think using technology creates an ongoing pathway of communication between teachers and students."

Use of Technology

> *…teachers need to develop and share ways of using technologies – either through informal collaboration or formal professional development.*
>
> *Luckin, Bligh, Manches, Ainsworth, Crook & Noss (2012)*

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. One teacher noted: "Through the knowledge and experience I have gained, I have felt more confident with using technology. Because of that added confidence, I have been more receptive to new ideas, views, and programs that can be used with students. My greatest change – my view of technology has changed. Rather than it being a piece of equipment to be used to type, Google search, etc., it is one method that students can engage in their learning with experiences that was never a possibility [before]."

Pedagogical Practices: Inquiry and Assessment

> *A fundamental premise…is that technology can play an indispensable deepening and accelerating role across all education processes…teachers use it as part of learning activity design, incorporating multiple digital resources and strategies…*
>
> *Fullan & Langworthy (2013)*

In a number of projects, a growing move toward inquiry-based learning was evident. A member of our field team described a different mindset among teachers in a project in that they were gravitating towards the use of technology and inquiry-based lessons and using iPads to document student learning. In similar fashion, a project leader reported that teachers were designing learning tasks that engaged students in deep thinking and inquiry using 21st Century competencies.

It was also reported that 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 them. In reflecting on this type of questioning, one teacher commented: "Am I giving my students 'Google-able' questions or am I making them think critically?" In a project, teachers told how they support student metacognition by making use of the "Explain Everything" app where teachers could see or hear students' understanding of their own learning.

Overall, projects indicated that 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.

In projects focussed on mathematics, it was noted that feedback to students was more immediate using apps such as *Educreations* and *Nearpod* to capture and document student thinking and provide immediate feedback to students. It also was noted that teachers are capturing student conversations and observations as a way to measure learning and plan next steps. For example, in Physical Education class, the teacher assessed student progress using videos to ensure that students' understanding of content was accurate and then collated the videos into a book to share with students. In music class, the teachers used Google to distribute a variety of digitalized music to individual students, then used technology to film student performance and give them feedback on their progress.

In still other projects, 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.

A teacher noted that using GAFE provided a rich, discussion-based environment where ongoing feedback becomes more of a dialogue than an end-point in the process. The end result of a unit or topic has become more about next steps for students in their learning process. One teacher noted: "Through the project, I got a quicker sense of student progress and students got faster feedback from me. This was particularly helpful for assignments involving the writing process."

Building Expertise Using Technology

> *The future is racing with technology…the complex and dynamic relationship between technology, pedagogy and change knowledge will need to be…nurtured if we are to get 'whole system reform.'*
>
> *Fullan & Donnelly (2013)*

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. A project leader reported that: "Teachers and Educational Assistants are now using [the cloud] to store and to share documents back and forth. They have mentioned to me trying at least one new thing on Google Apps."

In several projects, individuals described how mobile devices have changed their professional practice. 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. Teachers also noted how they used cloud-based tools to learn with their students, giving discussion-based feedback on work in progress. One teacher stated: "The integration of iPads into my foods classes was an exciting and rather challenging affair. The learning curve for both my students and I was challenging, but probably less so for my tech-savvy students. I feel like I am their coach; by filming groups of students prepping, cooking and cleaning, and then assessing the process, all of us can actually see how we did, and more importantly, how we can improve."

Overall, the 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.

3. Impact on Systems

> *The key to system-wide success is to situate the energy of educators and students as the central driving force.*
>
> *Fullan (2011)*

An important feature on the 21st Century digital learning landscape in the Round 4 projects is that systems are collectively less focussed on matters such as BYOD and learning commons as noted in the previous rounds of study. 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 with the intent to scale up and sustain technology-enabled teaching and learning.

Strengthened Connections

> *…in systems where we see effective implementation of new pedagogies, all conditions are realigned across the whole system to powerfully enable change.*
>
> *Fullan & Langworthy (2014)*

Many comments from projects indicate that there is a new sense of the importance of technology as a tool for connections across the system. There appears to be an enhanced understanding that cohesive planning across schools and personnel is essential for scaling up and sustaining technology-enabled 21st Century teaching and learning. For example, one project reported that their direction is now set through senior administration, which is leading to greater emphasis on technology use and includes senior leaders' engagement. There is increased alignment of staff such as coaches and special assignment teachers to support learning, and there is continued support for administrators and leaders as they recognize the advantages offered by the digital world.

In a project, the senior administration shared ongoing commitment to leverage technology to transform teaching and learning. Their vision is to provide 1:1 student access to mobile technology in order to

accelerate learning. Other projects described system leaders adjusting strategies and operational decisions to further support student success. System plans are incorporating the long-term development of technology-enabled teaching and learning.

A member of our field team noted that the technology-enabled learning culture is sufficiently established so that it supports the implementation of other policies. This individual highlighted the fact that system priorities have shifted such that a wider group of stakeholders are involved in the conversation around technology use and decision making. A project leader reported that the focus on technology-enabled teaching and learning continues to foster increased system engagement in re-imagining learning for students and in establishing optimal conditions for success.

Many project leaders reported that their Round 4 innovation research was in alignment with system strategic plans and the belief that technology is an accelerator for learning. In this regard, one individual noted: "Overall, the Board will be enhancing and deepening colleague-colleague, teacher-student and student-teacher collaboration using technology by providing all stakeholders with access to collaborative technological tools …"

In conversation with a project leader, a member of our field team learned that the district was making more informed and strategic decisions in its approach to the development and implementation of technology-enabled teaching and learning. An emerging sense of organizational confidence and self-awareness was felt to be evident.

Planning

> *One of the most important roles leaders can play in spreading the contagion of new pedagogies is to continuously develop, define and communicate the new vision.*
>
> *Fullan & Langworthy (2014)*

Overall, comments on system planning suggest that districts are in the process of incorporating technology integration as core to all of their initiatives. One project leader reported that their "technology learning plan" was developed to set the vision of where the system wanted to go and how to get there. Another described their current Board Improvement Plan (BIPSA) as reflecting technology integration for the school planning process as a whole.

A member of our field team found that goals to leverage technology as a means of connecting students and teachers were being developed in one district so they could link using their digital devices and post on school webpages. A project noted that revisions to their planning framework have been aligned more closely with the School Improvement Plan (SIPSA), again placing technology-enabled teaching and learning at the centre of planning.

In general, it is clear that there is solid recognition that system and school planning is fundamental to supporting students and teachers on their journey along the 21st Century educational pathway.

4. Moving Forward

> *As we continue to develop our understanding of technology's proof, potential and promise, we have an unprecedented opportunity to improve learning experiences in the classroom and beyond.*
>
> *Luckin, Bligh, Manches, Ainsworth, Crook & Noss (2012)*

Overall reporting indicated that positive changes are taking place as a result of the Round 4 innovation research. 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.

A challenge unique to Round 4 was the job action in the English-language public school boards, resulting in their inability to submit impact evidence related to their innovation research projects.

Positive Change

> *Whole system reform requires conditions that support educators in examining and reshaping the foundations on which their practice is built…*
>
> *Milton (2015)*

Reports from projects describe positive system changes. One project reported that it is evident there is widespread interest and positive impact on learning and teaching using technology. Another found that the project leads as well as teachers and students were all very positive about the impacts that new technologies were having on their work and learning environments. In one case, it was noted that pockets of excellence had become whole schools where innovation was occurring.

A shift to understanding that leadership was the key to scaling innovative practice rather than investment in new devices was noted by a project leader. A project leader noted that having a strong vision that is shared and communicated throughout the system is allowing for advancements in practice and in technology implementation. A shift in mindsets within schools is occurring because there is strong leadership and support.

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. Technology was described as being a tool to support sustained inquiry rather than an event in itself.

A project reported that teachers expressed positive opinions about significant improvements to the efficiency of school technology for student use. One comment the research team found powerful was that while concerns were evident about the changes brought by technology, these were expressed in the tone of a "critical friend" rather than voiced as resistance or impatience.

System Direction

> *To expand pedagogies to more sustainable, widespread practices that have measurable impact on learning, we must work together to further develop and refine insights about what new pedagogies are in practice and their implications for the roles of teachers, students, leaders and policy makers.*
>
> *Fullan & Langworthy (2014)*

Project reports indicate that systems are consciously making decisions about future directions for continuing the momentum established for technology-enabled teaching and learning. Several examples serve to highlight this positive process.

One project shared that their move forward was toward the development of deep learning tasks and strengthening learning partnerships through a job-embedded support model. Another reported that they were focussing on supporting teachers in integrating digital citizenship concepts into their instruction.

Several projects noted that the success of their Round 4 innovative research hinged on previous projects. They also 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. Districts are adopting strategies that indicate their increasing desire to embrace new teaching and learning practices. Districts 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.

Epilogue

Pointing the Way Forward for Sustainable Practice in a Rapidly Changing Environment

> *[Going forward our job is] to renew our goals for learning to include skills that prepare all learners to be life-long creative, connected and collaborative problem solvers and to be healthy, happy individuals who contribute to the common good in today's globally interdependent world.*
>
> *Fullan & Langworthy (2013)*

The research team returns to the metaphor of features on the learning landscape described in the Prologue to offer final remarks. Often, a first look at a landscape offers a panoramic view, one where the features that comprise the landscape are not clearly visible to onlookers. But, when the same environment is studied more closely across time, characteristics emerge that define the elements of the landscape with more precision. This pattern is present at the conclusion of the 21st *Century Innovation Research Initiative (Round 4)*, where an ever-deepening understanding of the pedagogical elements that comprise 21st Century technology-enabled teaching and learning are evident across Ontario.

Just as in the natural world where both large and small features are important for developing and sustaining growth, so too is the move forward on the technology-enabled learning landscape. In order to flourish, attention to features that contribute to the landscape can point the way forward for sustainable development. As knowledge about aspects that contribute to the longevity of sustainable practices increases, as has been the case in these Round 4 projects, it becomes possible to scale up growth through engaging others in learning more about features that ultimately can result in a renewed vision for the landscape as a whole.

Reflecting on the outcomes from Round 4 projects, one of the most important features is 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. As a result, another feature of note is the collaborative partnerships formed between and among teachers and students that are becoming more central to pedagogical practice.

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. In classrooms where collaboration is taking place, the necessary skills to support this type of engagement such as communication, critical thinking, and creativity are a visible part of teaching and learning.

In regard to change in systems, a feature of note is that there is less focus on matters such as BYOD and learning commons. 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 with the intent to scale up and sustain technology-enabled teaching and learning.

Even though there remain challenges for systems, a noticeable feature 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.

Ontario educators are attentive to and hence are more fully engaged in the transformation of specific features of teaching and learning that can ensure students are prepared for life in a locally and globally connected technology-enabled society. It seems that the pronouncement that Fullan noted in his book *Stratosphere* (2012) is well underway: "[that] Pedagogy is becoming sharper and more penetrating; technology is becoming mightier and easier to use and integrate … [as is] … the growing clarity and power of design and change knowledge that will be essential for achieving reform on a large scale – whole system reform" (p. 54).

To conclude, the specific features on the technology-enabled 21st Century learning landscape indicate that just as in natural settings where particular features are always evolving and changing, so too is the direction for education in Ontario. As Fullan & Langworthy (2014) write: "We are at the early stages of a learning revolution that will define in specific terms the citizen of the future as a knowing, doing person who can function productively in a complex world" (p. 76).

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Appendix

Project Report Summaries

Algonquin and Lakeshore Catholic District School Board

Project Title	**K-3 iPad Project**
Description	Our K-3 iPad project is a next step in a well-developed and planned out Technology Embedded Learning Plan. It is also a natural extension of last year's CODE project. We purchased 5 iPads per K-3 classroom and delivered professional learning connected to our broader system numeracy strategy. Teachers, ECE's and students engaged in deep inquiry work around pedagogical documentation and assessment opportunities in Math.
Context	*Number of students*: 3500 *Number of teachers*: 186 *Number of schools*: 35 *Grades/Program*: K-3 teachers, ECE's and students
Impact on Students	The use of Adobe Voice in our classrooms is an excellent example of student voice and its impact on learning. The videos demonstrate how students are learning to share their work with others. The outcome and impact on learning has been tremendous in so many different areas. At the same time we know that we are really only scratching the surface and could be considered to be at a beginning phase in our exploration of technology and its many educational uses.
Impact on Instruction	The greatest impact has been in the area of risk taking. Teachers, especially those who work with grade partners are learning so much from each other. At the same time that we have been working on this project we also began to roll our Office 365 to all of our staff. Many teachers indicate that OneNote has been a great tool to assist with recording and sharing student progress especially between FDK teams. Many teachers report that iPad technology and OneNote have changed their assessment practices greatly. They indicate that assessment is becoming more about next steps for students rather than an evaluation of the end result.
Impact on System	Our Technology Embedded Learning Plan was developed to set the vision of where as a system we wanted to go and how we wanted to get there. The combination of a well-developed plan and resources to support has allowed us to achieve success in a strategic initiative that reads. "We will continue to focus on developing 21st Century Learning Environments that align technology investments with educational priorities and build confidence in IT infrastructure and support."

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Algoma District School Board

Project Title	Educational Technology Leads
Description	Our Educational Technology Lead action plan focuses on system-level professional learning opportunities as well as opportunities for collaboration, co-learning and job-embedded learning with colleagues at the school by assisting teachers with the integration of technology into teaching and learning. In time, this will lead to the deep learning task development and assessment practices enabled by technology. Our multi-year plan fosters teacher-to-teacher, teacher-to-student and student-to-student learning partnerships and real-world, authentic learning tasks enabled by technology supporting the development of 21st century skills, such as collaboration, creativity and critical thinking. Our investigation of the Educational Technology Lead role is to determine if there is increased teacher confidence, more integration of technologies into teaching and learning, and higher student engagement in real-world, authentic learning tasks.
Context	*Number of students*: 1200 *Number of teachers*: 350 (300 teachers and 50 Technology Leads) *Number of schools*: 36 Elementary Schools & 10 Secondary Schools *Grades/Program*: K-12, Educational Technology Leads (one teacher from every school)
Impact on Students	Many students have been introduced to a variety of new applications and learning tasks enabled by technology to support their learning. The introduction of the ADSB Standards for Digital Learning K-12 is supporting teachers by providing a guide to help integrate technology and digital learning into The Ontario Curriculum, into teaching practice, and into students' repertoire of skills to support and enhance continuous learning. As noted in the data, a majority of the focus was on technology operations and concepts and communication & collaboration. These results are indicative of the focus on the implementation of Office 365 in the first year of this initiative. In many cases, the Educational Technology Leads encouraged a student-to-student and student-to-teacher learning partnership at their schools. The term "technology ambassador" was adopted to describe this partnership where students are taking a lead role to support technology enabled learning. These student "technology ambassadors" offer support for other students and teachers in their schools fostering learning partnerships.
Impact on Instruction	The data indicates there has been a positive impact on teacher practice. In this first year of the initiative we were building capacity with the Educational Technology Lead teachers to improve efficacy with technology and learning opportunities enabled by technology. The Educational Technology Leads were developing teacher-to-teacher learning partnerships with colleagues at their schools. They were provided time to work with teachers at their school in job-embedded opportunities to support teachers and students with authentic

	learning opportunities enabled by technology. The initial survey results indicated that the job-embedded sessions significantly promoted the development of teacher-to-teacher learning partnerships, enabled by technology. The comments by the Educational Technology Leads show that the teacher-to-teacher learning partnerships are improving and resulting in a culture of risk taking and sharing. These student-to-teacher and teacher-to-teacher learning partnerships will be even more important to foster as the classroom environment changes with the introduction of more mobile technology and students bringing their own devices to support learning.
Impact on System	The Educational Technology Lead initiative is contributing to our system scaling and sustaining of pedagogically-driven, technology-enabled practices by building capacity at each site by having one key individual at each school. The vision of the Algoma District School Board is to engage learners in innovative experiences that maximize achievement, build confidence and develop responsible citizens while utilizing technology in purposeful, responsible and innovative ways to support their learning. The Educational Technology Leads are an instrumental team member in the development of the school's professional learning by ensuring that technology is effectively utilized as a learning and teaching tool, supporting the use of technology integration into the curriculum, and providing training and one-to-one support to colleagues through job-embedded professional learning opportunities. Educational Technology Leads play an important role in building capacity at the school and assisting teachers with integrating technology into their deep learning tasks and assessment practices to increase student engagement and to accelerate learning. The Educational Technology Lead role aligns with our Board's strategic goals and is aligned and integrated with other innovative work being conducted with the eLearning and Instructional Lead professional learning communities. The Educational Technology Lead role and technology-enabled learning and teaching is embedded in our Board Improvement Plan for Student Achievement and our Educational Technology Plan.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Avon Maitland District School Board

Project Title	**Next Generation Learning: 1:1 Device Initiative**
Description	The project seeks to have enhanced, ubiquitous technology in the hands of Intermediate students and staff across the District to support implementation of our District Strategic Plan and to transform teaching and learning environments. The NGL initiative was launched for Intermediate students to begin building a mobile environment that supports the development of our Student Outcomes of creativity, communication, critical thinking, collaboration and problem solving and to support the creation of positive and inclusive learning environments. Students became engaged in the content in powerful ways. Teachers began changing their practices to accommodate the changes in students. Everyone discovered new ways to express themselves through digital means. Initial evaluations documented student improvements in their attitudes towards school and in their evaluations of themselves as learners. The initiative now included teachers and students from across the entire Board. Our infrastructure was also put in place in the same short time span. Five years became 15 months.
Context	*Number of students*: 2200 *Number of teachers*: 138 *Number of schools*: 22 *Grades/Program*: Grades 7-9
Impact on Students	Students are aware of and embrace the changes in the learning process and note that these processes have become more collaborative and creative. Reactions to these changes are mostly framed in a positive way with students citing increased access to information and better communication with and feedback from teachers as important benefits. Students recognize that iPads do not need to be used to the exclusion of all other modes of learning. They believe that there sometimes should be a choice in terms of using or not using the iPad in order to best support their learning on particular tasks or subjects. Although work is completed differently in many classrooms, this shift has not led students to feel there is more work, just different work. Students acknowledge that the mechanism for producing and submitting work has shifted. Yet, they describe this shift very positively, citing that it is easier for them to stay on track, to submit work when they are absent and to access resources they need for their assignments. Based on data from multiple sources, it is clear that students do require further support and skill development in order to effectively and efficiently adjust to this additional mode of learning.
Impact on Instruction	According to educators, the iPad has allowed learning to become more accessible and productive. The iPads have been described as “levelling the playing field” because all of the learners have them and task differentiation has become more of a classroom norm. Educators also recognize that more

	professional learning is necessary to fully realize the gains of these devices in the classroom. Equity, access, productivity are all significant and important gains. Another gain described by educators was the increased student-teacher communication. Administrators and teachers are already finding it to be a useful tool for enhancing learning.
Impact on System	As the initiative and the impact research moves forward, AMDSB can continue to monitor the implementation using the SAMR model (Puentedura, 2010). In future phases of the impact research, AMDSB may look to use this model in conjunction with other frameworks already being used to understand teaching and learning (e.g. Bloom's). The integration of these theories aligned with research from the field and contextual examples from within AMDSB will provide a robust understanding of these competencies in the classroom. In conclusion, the iPads have been very well received by the AMDSB community and are being woven into teachers' and students' teaching and learning practices. A highlight of the project at this early stage is the way that the iPads have promoted equity and inclusion, in terms of both exceptionality status and socio-economic status. Positive impacts have also been seen in all student outcome areas, particularly in communication, collaboration, and creativity. The iPads were given at a developmentally opportune time, and indications suggest that the iPads will be very beneficial for students in both their current and future learning environments.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Bluewater District School Board

Project Title	**Scaling Up the Potential of Technology Through Strong Pedagogy**
Description	Our project has had three areas of focus: We are introducing *Open Access* to the Bluewater network allowing non-board owned devices to utilize the network for purposes of learning. The project must bandwidth for the operation of essential systems, monitor the use of bandwidth in the school to ensure access for purposes which support our educational goals, and ensure security of board data and essential operating systems. We have supported inquiries around the effective use of technology for students who require technology to learn We have supported the utilization of the newly introduced Microsoft Office 365 virtual collaboration space.
Context	*Number of students*: 850 *Number of teachers*: 35 *Number of schools*: 9 *Grades/Program*: K-12
Impact on Students	*For students who require technology to learn* Students increased capacity and understanding of the appropriate technology and software to use to support their learning (e.g., voice-to-text / text-to-voice software, word prediction software, calculators, storing and retrieving completed work, alternative forms of demonstrating learning using a variety of media, research skills). Increased efficacy with regard to learning and proficiency – students see themselves as competent and capable learners who are able to reflect and articulate on successes and next steps and problem solve around their particular learning needs. Increases in achievement evident. As one teacher reported: "Marks went up from levels 1 and 2 on the diagnostic assessment to levels 3 and 4 on literacy assignments for all students." *Student collaboration* Increased effective use of peer editing to upgrade work. Increased output for reluctant writers. *Assessment for, as and of learning:* Students able to demonstrate higher levels of proficiency during observations than through traditional product based tasks. Students using technology to capture their own learning and the learning of peers. Authentic demonstrations of learning.
Impact on Instruction	Increased use of technology to capture student learning. Moving away from product-based assessment to capturing demonstrations of learning from

	conversations and observations – teachers engaging in moderation of student work captured through documentation – use of technology to engage the class in collaboration. Teachers more aware of and better able to support the use of technology for students who require it to learn (e.g., ensuring students have access to the appropriate technology required for the task, ability to support a variety of software and hardware applications). Greater awareness and use of technologies and tools which support learning (e.g., OneNote, virtual manipulatives, online media resources, online research). Increased demand and interest in using technology as a learning tool in the classroom. Role of the teacher changing more to that of a facilitator of learning rather than the holder of knowledge – more of an inquiry based approach to learning.
Impact on System	Supports the broadening of assessment of student work and opportunities for precision and differentiation (e.g., pedagogical documentation). Supports achievement of students with learning disabilities; in particular, intermediate students writing the OSSLT. Supports the efforts to increase student engagement by giving students greater voice and agency in the design and demonstration of learning. Allows for more effective and efficient use of the available resources (open access).

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Brant Haldimand Norfolk Catholic District School Board

Project Title	**The Transforming Learning Project**
Description	The project builds upon the work of previous projects funded by CODE and aligns with the District's long-term work in improving the learning opportunities we provide. The overarching goal that the current project is helping staff shift from a focus on the teaching to a focus on the learning. Each principal selected a lead teacher to represent their school using the criteria of expertise with instructional pedagogy and leadership. The 29 lead teachers participated in 3 full-day workshops together to help develop the specific project goals, the success criteria, and the professional learning required to enable the achievement of the goals. The target group for the current work was our grade 4 to 8 teachers. Despite the tight timelines and competing activities across the district, 98 of the 108 grade 4 to 8 teachers received a full day of professional learning. The morning half of the professional learning activity saw them collaborating to explore innovative, technology-enabled teaching and learning practices to impact student learning and the acquisition of 21st Century competencies. The afternoon session saw staff collaborating on the student devices in the District's online Office 365 space to familiarize themselves with the tools and processes, to record their learning, and to share ideas for reimagined learning opportunities enabled by the technology. Staff also learned how to integrate the new laptops into the existing classroom technology. Guided by feedback from our schools, 2 additional sessions were offered and 44 additional staff were able to access the professional development. Once the pedagogical transformation and purposeful use of technology to facilitate it had been established, student devices were distributed to schools. The device selected for student use is a low-cost Windows-based device that has been designed to work with the Office 365 environment and other resources available via the Internet. The decision to use carts that held a small number of devices was intentional to maximize the likelihood that the vision established with the lead teachers (groups of students collaborating around a few devices to support their inquiry rather than students working in isolation in a 1 to 1 model) would be realized. The number of devices distributed to each school was based on population at a ratio of 12:1, adjusted to ensure no school received less than 2 carts (14 laptops).
Context	*Number of students*: 5500 *Number of teachers*: 221 *Number of schools*: 29 *Grades/Program*: Grades 4-8
Impact on Students	At this time we only have data from a limited number of sources - feedback gathered through professional learning session exit slips, artefacts posted by participating teachers, and observations and conversations during classroom learning visits.

	General Highlights: Observed students working in small groups using the technology to facilitate their inquiry rather than in 1 to 1 situations (1 student 1 device). The conversations led to more questions, to further inquiry, and then to greater understanding. Observed or have evidence of students collaborating to research a variety of topics, create newspapers, create pictographs on ecosystems and water systems, and research, write scripts, and then create movies to present their learning The work created had fewer errors in conventions, included graphical elements to help convey ideas, and the technology enabled students to work on it at different times, using different devices, and from different locations. Students reported excitement at the newer ways they could access learning and represent their learning. They also reported that they liked how the technology removed the barriers they had experienced previously (e.g. moving files from school to home).

Impact on Instruction	• Observed that students tend to take over the role of driving the use of the technology while staff facilitate the learning (this was one of our key staff development objectives, to take the responsibility of knowing how to use technology out of the teacher's hands)
	• Observed student-teacher collaboration:
	  ○ Students sharing work via their OneDrive or in a class OneNote in Office 365 and teachers giving feedback both during and after the task
	  ○ Teachers providing access to additional learning resources via D2L and class OneNote resources
	  ○ Teachers enabling the students to drive the learning
	  ○ Students choosing topics and tools to further their learning
	  ○ Students using online tools to collaborate with peers
	  ○ Students taking responsibility for their learning by choosing topics, dividing tasks, and coordinating resources

Impact on System	This initiative supports the shift in focus that we believe will support closing the gap and improving learning outcomes for all. The goal in our system is on changing the focus from the teaching to the learning. The professional development that took place this spring helps to move us further toward our goal. Not only are staff improving the learning opportunities they provide using the new approaches developed, but they are using some of those same strategies to transform how they access their own learning and collaborate with peers. In short, much of what we have done through this project is to try and change how we leverage the power of technology to improve how we work and learn at the BHNCDSB. The good news is that we are beginning to see evidence of change from our classrooms right up to senior administration.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Bruce-Grey Catholic District School Board

Project Title	**Using Technology to Deepen Learning and Transfer 21st Century Skills to Other Areas of Learning**
Description	We are learning and teaching using the 21st Century fluencies and technology in innovative ways to prepare students for the dynamic and ever changing world they live in. Our BGCDSB research initiative centers on using cloud-based learning platforms to optimize collaboration and critical thinking where students will be equipped through new and innovative applications of technology.
Context	*Number of students*: 460 *Number of teachers*: 22 *Number of schools*: 11 *Grades/Program*: K-8, FSL 10-11
Impact on Students	Teachers co-created class projects with students, which enables the students to become owners of their learning. Through the increased use of technology for inquiry, research, design, and communication the use of technology positively impacts student assessment practices and achievement. When teachers are more confident to effectively use technology in their classroom, students are provided choice and the tools they require that suit meet their individual learner needs. If needed, teachers are given opportunities to visit other schools and classrooms to see how to integrate technology into the curriculum.
Impact on Instruction	This project allowed for a positive impact and change on teacher practice. Our teachers self-identified as being learners. Through collaboration with students to create their own projects, teachers were comfortable allowing students to lead the learning through 21st Century competencies. In this initiative there have been knowledge based community hubs are using already formed professional learning communities, and we used those communities for sharing. Sharing has expanded beyond the communities, where teachers are going back to their schools and building capacity with other staff members and classes. Classroom environment has changed – more than configuration, more natural to see groups, partners, sharing, seeing students using multiple technologies (Chromebooks and iPads together).
Impact on System	This initiative contributes to our system scaling and sustainment of pedagogically driven, technology-enabled practices by aligning with our Board Improvement Plan for Student Achievement. These alignments include: • Action plans for development of the IPP and how it will unfold: all students in the board will be using e-portfolio as a place to collect their student work- the “All About Me” portfolio K-6 and “Career Cruising” in 7-12. • Access to the system wide MOOC (Massive Online Open Course) for Religion

	and Family Life curriculum supplementation. • Explicit connections between learning goals, success criteria, and timely-qualitative feedback, emphasis on learning processes. • K-12 student voice as considered and collected through conversations, observations, and products, we see student engagement (start with curriculum goals, identifying learning goals through co-creating success criteria and then …). • Alignment of board improvement plan and this project, through the use of 21st Century tools (e.g., Chromebooks, iPads, etc.) for equitable access. • We use already existing structures, such as CIL-M (Collaborative Inquiry in Learning Mathematics), K-Hubs (Kindergarten Groups), French networks, instructional Coaches, Resource Teachers, Consultants, Religion PLC's (professional learning communities), etc., to build capacity around cloud-based sharing tools that align with our Board Improvement Plan for staff leadership development and professional learning.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Catholic District School Board of Eastern Ontario

Project Title	**Technology Integrated Learning**
Description	Grade 4 5 (Core and Immersion) Science Teachers took part in a professional learning day titled "Using Technology for Science." This session showcased how technology can be used in the classroom to promote inquiry, in addition to many of the available technology tools and resources available for Science teachers. A total of 31 teachers participated in this professional learning day. Teachers who attended the session received technology (Surface 3 and a wireless projector) to leverage in their classroom. Most of our day was focused around building capacity in the following areas: • Blended Learning Model: One of our goals was to deepen each teacher's understanding of the Blended Learning model and how it can support flexible pacing, differentiated instruction, and anywhere, anytime, anyplace learning. • Safe and Secure Online Learning Environment: Providing teachers and students with a safe and secure virtual learning environment is a continued priority for the Board. Teachers were introduced to "BrightSpace" as an online learning environment. Building capacity and awareness around the effective use of the available pedagogical tools in "BrightSpace" has allowed teachers to move toward a 21st Century teaching and learning model that aligns with MFIPPA. • Getting Started with Office 365: Office 365 opens the door to new learning opportunities and teaching strategies that fundamentally change the way we educate. During our Professional Learning day, teachers were introduced and had the opportunity to learn simple entry point strategies to try with their students moving forward. We have created a VLE in BrightSpace for the Grade 4/5 Science and Technology Group to share best practices, engage in meaningful discussions around ICT integration and access professional Development that aligns with our TLF Innovation Research Theory of Action.
Context	*Number of students*: 0 *Number of teachers*: 31 *Number of schools*: 18 *Grades/Program*: Grade 4/5 Science and Technology Teachers
Impact on Students	• The Blended Learning model and the use of Office 365 and BrightSpace has increased student engagement and their ability to be creative and innovative, to critically think, to communicate and to collaborate. • Enriched lessons: Educators have used Office 365 and the Ministry provided content from eLearning Ontario to create new learning opportunities that were previously inconceivable for our students. • The use of Office 365 and BrightSpace has allowed our learners to showcase their

	learning in many ways using a variety of online platforms and tools • CDSBEO Office 365's home in the cloud has allowed our students to learn anywhere. Files and programs are accessible anywhere, on any computer or any device. Students can easily access their assignments from home using the same tools.
Impact on Instruction	The effective use of technology has required a shift in pedagogical approaches. The Blended and Flipped classroom models have allowed teachers to explore and implement deeper and more meaningful integration of computers technology in their classroom This year, we built capacity and awareness around the use of "BrightSpace" allowing our teachers to move toward a 21st Century teaching and learning model that aligns perfectly with MFIPPA. Through the combination of Office365 and BrightSpace, we have leveraged our board assessment and evaluation process. The tools have allowed for a mark book that meets our Board and Ministry policy of evaluating most consistent and recent student work. The Turnitin feature provided our students with an easy way to ensure that they are properly citing their sources and that their work is original. Educators have the ability to assess, report on and improve student performance with built-in analytics tools that use data to help educators make more proactive decisions. Teachers are more focused on student voice because of their ability to capture student thinking which is helping them learn more about each individual student using programs such as Microsoft OneNote.
Impact on System	Our actions system-wide will be guided by "Lean Six Sigma" & Prosci's ADKAR: Define: Build awareness of the desired transformation Measure: Create desire to transform among those affected Analyze: Train knowledge for the transformation Improve: Ensure ability and conditions exist to change Control: Reinforcement of the change Building awareness and capacity around "BrightSpace" and Office 365 at the Administration and School Improvement levels have been another focus for our Board this year. The use of a virtual learning environment is transforming the manner and approach on how we deliver professional development. "PD in 20" is a new way for teachers to engage in building capacity around the integration of computer technology in the classroom. The e-learning contact hosts an online webinar once per month focused around a specific tool or strategy that relates to blended learning, Office 365 and "BrightSpace". Yammer groups in Office 365 are being used to create collaborative learning communities where administrators and teachers can continue the learning journey after on site professional development. Curriculum consultants are using "BrightSpace" to host online professional development and resources related to their field of expertise. These online resources allow for easy sharing of resources and a professional development system-wide in a cost-effective manner.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil des écoles catholiques du Centre-Est

Project Title	**The development of critical thinking and IT competences through a network of expert teachers (i.e., Student Exit Profile Leads) and virtual and tactile learning environments**
Description	Having targeted a series of training [*sessions*] and an enhanced accompaniment model (based, in part, on the learning that happened during Phase 3 of the project on research and innovation in the 21st century), CECCE is developing, concretising, and refining an innovative, fluid process that will build teacher capacity, system-wide, and promote instructional practices for in-depth learning and the integration of technology, in order to expand and amplify student learning. CECCE has focussed on the development of the technical competences and skills of its teachers, directing its Student Exit Profile Leads to virtual spaces for dialogue, lateral collaboration, and training. CECCE has focussed on sharing in a Google+ virtual community; learning through integrated training in Google Classroom; (group) support on an as-needed basis in Google Hangout; weekly (individual) support through a "help-profile" Gmail account; and the creation of a resource in the form of a "Student Exit Profile" website. Although we have begun an analysis of the development of critical thinking and IT competences in students in the preschool, intermediate, and junior divisions, the data are based on a preliminary look at learning in students in Grades 4 to 6. The research questions that the data analysis will address are as follows: • In a context of system-wide professional development for the Student Exit Profile Leads, what are the most useful—and most widely used—virtual environments for information, training, and sharing? • In tandem with the work of the Student Exit Profile Lead teachers, the IT-applications staff, and the school principals, how can Malcolm Gladwell's *Tipping Point* theory be used to change the culture in our schools, "transform the learning experience", and achieve in-depth learning? • Grades 4 to 6: Together with pedagogy centred on critical thinking, how can access to technology expedite and improve the development of IT competences in our students?
Context	*Number of students*: *Number of teachers*: 51 *Number of schools*: 51 *Grades/Program*:
Impact on Students	Although we will continue to measure the impact of the training on the development of student IT competences in 2015-2016, we already have some preliminary data on students in Grades 4 to 6. Grades 4 to 6: Together with pedagogy centred on critical thinking, how can access to technology expedite and improve the development of IT competences in our students? We noted improvements in: • The students' engagement in their learning; • The students' ability to use technology at school effectively and autonomously for learning

	purposes, with a minimum of supervision; • Student collaboration to identify the information they needed in order to solve a problem; • Student research, i.e., the extent to which students would re-launch a search using keywords when they were not satisfied with the results that they had obtained previously.
Impact on Instruction	In 2014-2015: • CECCE worked closely with the schools' Student Exit Profile Leads, by means of a series of training [*sessions*] and an enhanced accompaniment model. When asked whether this process had had a positive impact on their practice, 83.3% of teachers (for whom this question was relevant) responded that it had had a "major" positive impact; • CECCE designated 53 of its Leads as TC2 Coaches; these individuals will act as critical thinking coaches in their schools; • CECCE worked on its definition of "transforming the learning experience"; • CECCE worked to develop a tool to help schools measure their progress on "transforming the learning experience"; • CECCE planned the development of new measures, looking for systemic indicators of critical and creative thinking, IT competences, and student engagement. Surveys were administrated to school principals and Student Exit Profile Leads to identify their greatest moments of success in 2014-2015. These included: • An atmosphere of trust and openness and a growth mindset; • Technological integration; • Critical thinking and questioning; • Collaboration; • Engagement; • Professional learning communities (PLCs); and • Training and coaching.
Impact on System	In tandem with the work of the Student Exit Profile Lead teachers, the IT-applications staff, and the school principals, how can Malcolm Gladwell's *Tipping Point* theory be used to change the culture in our schools, "transform the learning experience" and achieve in-depth learning? (2014-2015) In September 2014, each of the Student Exit Profile Leads worked with his or her school principal on three criteria for working on the school culture, implementing the new student exit profile, and transforming the student learning experience. The Student Exit Profile Leads were required to work in partnership with three different personality types at their school (what Gladwell refers to as Salesmen, Connectors, and Mavens) and to find ways to communicate the key messages in a way that would be meaningful to school staff (buy-in), taking into account their particular context.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire de district catholique Centre-Sud

Project Title	**Techno-pedagogy and Inquiry-based Learning in Centre-Sud**
Description	This year, in the process of validating the impact that the addition of various digital tools has had on learning (e.g., portable computers, ChromeBook, Nexus tablets, tactile screens), we experienced collaborative learning situations involving multidisciplinary teams. The aim was to develop knowledge of inquiry-based learning and document the progress of students who were successful in following the steps of the inquiry-based learning process and developing a 21st century skill or skills. This project involved the junior division teams and some of the intermediate division teams. The Board team consisted of a group of professionals from various departments: Techno-pedagogy, the virtual learning environment (VLE) support administrator, the school technician, the school principal, key staff in the junior and intermediate divisions, the TacTIC Team, and the coordinator for the technicians. The project was carried out over the year in six-week cycles consisting of 10 steps. During the year, students and teaching staff used their personal account and the Google tools to document examples of learning. • Teaching staff used the technology integration matrix to place activities in context and then attempt to place them in the matrix, using a variety of digital tools; • Inquiry-based learning situations integrating high-performance strategies for differentiated learning were used; • Teaching staff provided descriptive feedback based on the learning outcome and the assessment criteria. They used digital tools to provide this feedback; • A model digital classroom was created. The physical environment of the classroom was modified to engage the students and encourage participatory pedagogy. **<u>Other notes:</u>** • The Board team with the school team: co-planning based on the teacher's current planning; • The use of platforms suggested by the Board, Google, and VLE as spaces for collaboration. (In the past, we would start with pre-prepared training modules. We would then ask participants to identify ways in which these modules could be used, how these modules could work with what the teachers were already doing or how they could be modified. When we start where they are, their engagement is more palpable and we feel as though we are addressing a real need.)

Context	*Number of students:* 300 *Number of teachers*: 24 *Number of schools:* 8 *Grades/Program:* students in the junior division; intermediate division Social Studies courses
Impact on Students	With everything that relates to inquiry, online research, and the stages of the inquiry process, the students saw a distinct improvement in their skills. For many, it was the first time that they had been explicitly taught how to do a search on a question for which they couldn't do a Google search. No notable difference, pre- and post-project, where the students' results were concerned. Observation: the students already had very good technical skills; they didn't need the technical component as much as the teachers did. Extensive work on giving the students a voice: enabling them to choose the research question; guiding them in group exploration; giving them the time they need for communication/collaboration; and equipping them to use online platforms that are user-friendly and easy to access at school and at home. The students were more engaged with their learning thanks to the work they accomplished in the Cloud (GAFE [*Google Apps for Education*]). When they received feedback, it enabled them to make adjustments more quickly and to go farther with their learning. The students used Google and VLE platforms for their homework and for communicating. We noticed that shy students were better able to express themselves with the Cloud tools; they were active in their learning and even had opportunities to have contact with community partners.
Impact on Instruction	In terms of teaching practices, we saw an impact on: • The pedagogical strategies used: teachers were less inclined to pick a research topic for their students. Students were more involved, choosing topics that reflected their ideas, questions, tastes, and interests; • The number of opportunities for sharing between students and between students and the teacher; • Active listening in the classroom. Teachers really cut down on the time they spent teaching the steps in a lesson, with more time devoted to student co-learning. Students build understanding based on the responses of their peers. • There was a pronounced decrease in disruptive behaviour in the classroom; the students were very engaged when they had opportunities to work with the technological tools and in the Cloud; • It is very clear that the virtual learning environment (VLE) mobilized the knowledge and understanding of both students and teachers. The students accessed documents using any web-based tool. Several instances of collaboration were noted. • There was a change in the collaborative planning approach in the schools that

	received support. Following the coaching sessions, they were all able to contribute to planning equitably, which made planning more meaningful. This resulted in stakeholders feeling that they had added value. They expressed a sense of engagement with the digital age. As a result, we noted a certain degree of accountability ("each of us has a role to play"), validation of the acquisition of skills by each person, and an atmosphere of trust.
Impact on System	In terms of the impact on system-wide activities, we noted that: • The Board looks at technology from a system-wide perspective. Our service plan for the various departments (Pedagogy, Special Ed, IT) contains several joint actions; • Videos documenting what we observed and what we learned are informing the Board's actions; • An increasing number of school plans include technology for learning; this is especially true of schools receiving intensive support from the Board; • When combining techno-pedagogy and inquiry-based learning, we need to teach students differently, involving them in lesson planning and in their own learning; • Interest is growing. Even though, this year, we focused on Social Studies [*in the junior and intermediate divisions*], engagement is increasing among staff in other departments and grades; • Some teachers are using Google for feedback between students and some principals are using it with their teaching staff. Increasingly, department heads are using the Cloud for planning, surveys, and file-sharing. Our work methods are really changing. There is a lot of collaboration; • Interest is growing in the community, with workshops for parents to alleviate their anxiety over the use of technology by primary, junior, and intermediate division students. Parents are receiving tools to increase their understanding and enable them to ask questions; • Modelling for teachers; creating an atmosphere of trust between the teacher and the student and between students; • Close co-operation between the pedagogical department and the IT department.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil des écoles publiques de l'Est de l'Ontario

Project Title	**In-depth Learning in Today's Schools (known as "Intellectual Engagement in the 21st century" during the first 3 phases)**
Description	The goal of CEPEO's project on intellectual engagement in the 21st century (now known as In-depth Learning in Today's Schools) was to promote key pedagogical practices, using technology, in order to develop students' intellectual engagement, skills, and habits. Teachers were coached on acquiring new competences, so that they could develop new pedagogical practices and incorporate IT and develop their leadership skills so that they could regulate their own pedagogical interventions (assess themselves and improve their pedagogical scenarios in all subjects). School principals were coached on the development of monitoring tools. Following the intellectual engagement project for CEPEO students, our team looked at next steps, i.e., introducing engaging, system-wide pedagogical approaches. To achieve this, we: • Developed an inventory of technological tools already in use in our Board's schools; • Developed an inventory of engaging pedagogical practices that made use of technology, in order to develop 21st century competences. The goal of the project was to reduce the gaps in the pedagogical approaches being used and in the technology available to 21st century learners.
Context	*Number of students:* 500 *Number of teachers*: 76 *Number of schools:* 6 *Grades/Program:* Grades 7-10
Impact on Students	The results indicate that the initiative had an impact on the students' intellectual engagement, self-determined motivation, and perception of usefulness of the French course in students who lacked motivation at the beginning of the school year. In addition, the results suggest that the use of technology in the French course had an impact on the following three competences and habits: initiative-taking, autonomy, and collaboration. "We saw a significant improvement in three competences and habits, i.e., initiative-taking, autonomy, and collaboration in students who had not been using technology when the data were first keyed in, but who were using it during the school term following this initial time period."
Impact on Instruction	The results indicate that there was an improvement in the pedagogical practices teachers used to engage their students between Time 1 and Time 2. For practices that foster competence and autonomy, the difference was significant. The analyses suggest that the most significant changes in the teachers related to: 1)

	presentation of the competences and habits to the students (co-construction of criteria for assessing these competences and habits with the students); 2) encouragement to interact with the content and ask questions; 3) introduction of assessment for learning; 4) contextualization of the development of these competences and habits; 5) the introduction of a variety of technological tools into the lessons, to support the development of the students' competences; and 6) the use of technological resources to make a connection with students outside of classroom time.
Impact on System	Activities during the project that helped to give pedagogical practices an enduring quality included: • Coaching from the principal to develop monitoring grids, to foster the development of leadership and to ensure that engaging pedagogical practices are introduced into the Board's schools; • Sharing the knowledge and lessons learned during the project through presentations to various groups, including the meeting of K-12 principals, during which the principals from participating schools shared their experiences. • Integration of the lessons learned into the schools' improvement plans and into the 2015-2016 Action Plan. The report on technology in CEPEO and the creation of an acceptable threshold, developed in Spring 2015, will make it possible to distribute the tools equitably, based on the needs of the schools during 2015-2016.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire catholique Providence

Project Title	**The Impact of the Use of Technology on the Transformation of Pedagogical Practices and Learning Environments**
Description	We moved into the digital age in Phase 3 of the project by introducing a suite of Cloud applications across the Board. In Phase 4, we wanted to maintain momentum in the field, with the specific goal of increasing the use of technology in pedagogical practices and student learning. This initiative is part of our Board's mobilization of technology and our objectives for fostering student learning and 21st century skills and habits. Our integration of programming tools and concepts is based on Ruben Puentedura's SAMR (Substitution Augmentation Modification Redefinition) model; it is being used to support adaptation of our pedagogy during the various parts of this initiative. Support for staff consists of training sessions, integration models, and continuums of expectations for learning that have been designed for the harmonization of pedagogy and technology. Together with the school principal, the secondary school techno-pedagogy coach works in a focused, ongoing fashion with the teachers selected for the project. The full-day Kindergarten and physical education teachers are equipped with tablets and begin transforming their pedagogical practice. Following planning, training, discussions, and modelling, they are able to plan lessons that use the tablets effectively in a variety of different contexts for collaboration, communication, differentiation, and assessment. The transformation consists primarily of developing competences and adapting pedagogy. This will enable students to develop new knowledge and 21st century competences (The Six C's) and engage them more fully in in-depth, lifelong learning.
Context	*Number of students:* *Number of teachers*: 155 *Number of schools: 30* *Grades/Program:* Grades K - 12
Impact on Students	Right now, the data for our students are largely qualitative. They are in the form of teacher feedback, student traces, etc. In 2014-2015, we focused primarily on transforming pedagogical practices in order to enter the digital age with our teachers. However, we were able to collect some traces from the physical education teachers, documenting the use of technology for learning in pairs. Through reflective sharing and plenary discussions during subsequent training sessions, the teachers shared their amazement at the students' engagement in this process. Collaborative work seemed completely natural to them; after a brief explanation of an activity, they got right down to work. The teachers shared how the students were able to find "problems" and solve them, either working on their own or in pairs. This was also evident in their observations on skills and habits. They appreciated having an opportunity to implement an approach like this.

Impact on Instruction	The secondary school coach was able to work with several teachers. The analysis of their journals was very revealing; it described the teachers "awakening" to the possibilities that technology offers. With the help of the coach, the teachers were able to explore the tools available in the Cloud, figure out how to use them *appropriately,* and incorporate them into their planning. In some cases, the coach first modeled teaching in the new format and then they discussed their observations, improvements, adaptations, and so forth. The coach developed a monitoring tool that allowed for, and encouraged, the participation of the teacher being coached. One challenge for the teachers that came with the changes in their practices is assessment; assessment is not always easy, especially when technology is being integrated. Taking photos and videos of the students in action was a success, particularly when they could do it as a team for the students. They enjoyed sharing the task, where observations were concerned, because they could share the traces they had saved, talk about them, do a quick review with some students, follow up with parents with evidence of the students' learning, and so forth. The model included with this report is the sample that the teacher consultant used during the training.
Impact on System	In addition to the journals, we can also see all of the preparation, research, planning, communication, and organization that the techno-pedagogy coach has to do for working on an ongoing basis with the teachers being coached. At the request of the head of techno-pedagogy, the coach kept track of his time. This proved to be VERY important because it revealed: • The technical problems that had to be addressed before the teachers could move forward (these mirrored the fears that the teachers documented in their journals); • The AMOUNT of time and the INTERVENTIONS required to introduce the tools needed to carry out the activities; • The STAKEHOLDERS, often from different sectors, who had to be called in before we could move forward with the initiative; • The range of tools that the teachers were interested in and that the students would obviously be using. The data in the journals and in the coach's log were extremely useful.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire catholique de district des Grandes Rivières

Project Title	Transforming our Pedagogy through the Use of Technology
Description	In 2014-2015, CSCDGR led three projects as part of its research initiative entitled *Initiative de recherche sur l'Innovation au 21e siècle, 2014-2015 (Phase 4).* These projects focused on 1) oral communication in early childhood; 2) a collaborative inquiry on ALF (*Actualisation linguistique en français-Communication orale*) and oral communication and 3) documenting our pedagogy. ***Oral Communication in Early Childhood***. We pursued our research in 2014-2015, creating a hub of two schools in the Board's southern area and a hub of three schools in the Board's central area. The goal of this project is to improve oral communication in preschool and primary division students. The project is based on Carmel Crévola's research and writing on improving oral communication in schoolchildren. One of the foundational principles of the project is that oral communication must be taught explicitly in order for receptive language and expressive language to develop. Ms. Crévola states that teachers must give more thought to what they say to their students (i.e., their pedagogical language) because they often speak at a level that children are unable to comprehend. We used technology to support the oral communication project on many levels. Digital tablets became a feedback tool for teachers (reflective sharing practice), a tool for documenting traces, a tool for assessment for teachers, and a tool for creativity for students (e.g., Chatterkid). Interactive whiteboards proved very useful for projecting stimuli: photographs, videos, and sounds. ***Collaborative inquiry on ALF***: This inquiry was based on the principle that if language is taught, every day, using strategies and activities for building vocabulary, the language competences of students will improve. Throughout the year, teachers and educators used different applications on the iPad to create learning activities to build vocabulary. The students used an application to record their voices and create a video from a photograph. The software program Excel was used to create documents making it easier to see students' entry and exit profiles. The data were presented in circle graphs, making it easier to see where students had made progress and where they had experienced challenges. When a child asked a question or when a problem arose during a game, the pedagogical team stepped in to find an answer or a solution by asking the children questions. This encouraged them to think, explore, observe, and ask questions—it encouraged them to learn. The team documented the entire process of inquiry. With the students, the team did a brief search on the Internet and posted the findings on the interactive whiteboard. In this way, the children also looked for answers to their questions. The pedagogical team showed the students the film clips they were making on a regular basis. The children liked seeing themselves in the clips. They saw the entire process that they had used to arrive at the end result. Documentation is useful for showing parents their children's progress. A virtual wall

	was shared with parents where they could see their child in action. This made it possible to share what was happening in the classroom and to inform parents about their child's learning. The documentation gave the children an opportunity to review what they had learned and to keep going.
Context	*Number of students: 918* *Number of teachers: 45* *Number of schools: 22* *Grades/Program:* Preschool and primary divisions, Grades 4 to 8
Impact on Students	*1 – Survey providing feedback on improvements in oral communication with the use of technology* The survey results indicate that most of the respondents were almost entirely in agreement that technology influenced their students' oral communication. There was the audio dimension (e.g., stories, songs, videos, instructions for games), which works on receptive language. There was the visual dimension (images, videos, students working), which sparks students' interest and curiosity and stokes their desire to communicate. The survey respondents reported that technology stimulates interaction between students (expressive language) in the form of spontaneous conversations and exchanges. According to the survey, winning practices that use technology include: student self-regulation (descriptive feedback using an iPad); keeping students interested in their learning (applications); and getting students involved in their learning process (Attachment 8). *2 – Survey providing feedback on the oral communication hubs* According to the survey, all of the teachers felt that this approach had had an impact on their teaching practices for oral communication. They reported that explicit instruction in oral expression provided a framework that created opportunities for getting their students to talk. What is more, this process is readily transferable to other subjects and situations. In fact, some teachers now use it all day long. The teachers also agreed that this approach had a visible impact on their students' oral communication. They talked more and took more risks in expressing themselves; they were more comfortable sharing their ideas and more confident expressing themselves orally. All of the respondents noted that the students had made progress. One teacher noted that the students in her group could now form complete sentences from interesting ideas.
Impact on Instruction	The techno survey revealed that three practices changed with the integration of technology: use of the interactive whiteboard, integration of iPads into the learning centres, and use of Google Drive. The teachers were making increasing use of the interactive whiteboard to create educational games and motivate their students. Similarly, they were integrating iPads into their learning centres to spark the students' interest in new applications. The teachers were using Google Drive for sharing and for communicating with

	participants in the oral communication project. Almost all of the respondents said that technology had helped them to observe their students and collect and analyze traces of oral communication. Most reported that technology, such as the iPad, made it possible to go back and look at the context in which the students were learning—something that is not always possible with direct observation and note-taking. In response to questions about their strengths, respondents reported that they were more resourceful, adapted more quickly to new things, and felt more comfortable integrating new technologies. They wanted to integrate these practices into their teaching. Their most frequently expressed wish was for training on using technology more effectively. Their second most frequently expressed wish was for opportunities to practice their newfound knowledge. They really appreciated the support they received, especially with the video clips. They reported that the videos enabled them to evaluate themselves and to modify their teaching and learning practices.
Impact on System	In our Board, we are seeing a complete transformation in our teachers in terms of their pedagogical culture and practices. The types of coaching that we have provided (PLC, video clips, etc.) and, especially, the reflective sharing that has resulted have transformed their teaching practices. Technology was an asset in this process; it provided the tools they needed to facilitate, expand, and enrich their reflective thought processes and analyses. Coaching enabled those involved to make significant personal and professional progress. This new culture of collaboration can now be shared more widely in our schools and in our Board. Based on our teachers' comments, it is possible to say that integrating technology into our oral communication activities has had a positive impact on learning. The new approaches that use technology really got the students engaged in learning activities. We therefore feel that the use of technology made it possible to optimise the learning and teaching strategies in the oral communication approach. One of the Board's schools got parents involved in the oral communication project, which gave them a more active role in their child's acquisition of language skills. The results of this initiative show that partnerships between the school and the home can be beneficial for students and that maintaining and expanding the oral communication/parent partnership in years to come would be a good idea. The Board is looking at how to use technology to further develop this partnership. A website such as padlet.com would make it possible to create a virtual wall documenting learning in the classroom that could then be shared with parents. At home, students could share what they are experiencing and learning at school. Parents would be more fully informed about what is happening in their child's class and have a better grasp of the objectives for learning.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire catholique Franco-Nord

Project Title	**Bringing our Classrooms into the 21st Century**
Description	This year, we began implementing our plan to enter the 21st century. This plan was developed during the 2013-2014 school year as a means of transforming the system so that it could better meet the needs of 21st century learners. The plan includes the transformation of learning in our schools through the implementation of a new pedagogical and technological vision for our Board for the 21st century. It also includes professional development for the student success support team so that it can more fully support the pedagogical and technological transformation happening in our schools. It also includes a transformation of the role of the IT team to recognize the ongoing work that it must do to support technological transformation in the classroom and across the system. It includes the role and responsibilities of senior officials and school principals in providing leadership essential to a successful transformation of the system. During our research initiative on innovation in the 21st century, we focused on the implementation of our new pedagogical vision for 21st century learning in five pilot schools, i.e., two urban schools and three small remote schools. Over 50 members of the teaching staff took part. We also provided the Board's student success support team with professional development so that we could more fully support our schools in this pedagogical and technological transformation. One of our objectives was to gradually implement the development of partnerships for learning, making more room for the voices of our students, the development of lifelong learning skills, and the development of student leadership. Another objective was greater awareness, and fuller implementation, of differentiated pedagogy, reflecting our students' needs, strengths, and interests. There was also a focus on in-depth learning in the classroom, fostering greater student engagement in the construction of knowledge and the development of competences essential to the 21st century: creativity, critical thinking, collaboration, communication, character education, and citizenship. Yet another objective consisted of integrating digital technology to support and foster 21st century learning. Each of our classrooms has a SMART board (interactive whiteboard). In the five pilot schools, we provided a set of six iPad tablets for K-3 classes, a set of 10 iPad tablets for 4-6 classes, and an individual tablet for each student in 7-8 classes.
Context	*Number of students*: 660 *Number of teachers*: 50 *Number of schools*: 5 *Grades/Program*: K-8
Impact on Students	We analyzed the data that we had collected through our observations, our assessments of student work, comments made by teaching staff during year-end interviews, two surveys, and the teachers' self-evaluation matrix. This analysis resulted in the following observations about the impact of the pedagogical and technological

	transformation on student learning. *Learning Partnerships* We noted that the teaching staff in the five pilot schools began implementing learning partnerships with their students. Generally speaking, the teachers gave the students more say in the management of learning and the choices that resulted from this learning. Increasingly, teachers are allowing their students to choose their learning tools, subjects to explore, learning processes, and forms of expression. The students appear to be taking greater responsibility for their learning. Interestingly, some teachers reported that their students were more open to taking risks with their learning. Generally speaking, their students were more autonomous. Some teachers offered their students greater latitude in determining how they would demonstrate achievement of the learning objectives and progress on the targeted competences. Generally speaking, we noted that the teaching staff were more strongly encouraging peer collaboration. The students were helping each other more and offering each other more feedback. We often saw students helping each other to use applications, search for information, and document their learning (audio and video documentation, presentations, virtual creations). We often saw students with special needs shine, as they helped their peers with technology; this had a major impact on their self-esteem. In some classrooms, for team projects, the students organized themselves and divvied up tasks and responsibilities without help from the teacher. We also saw more collaboration between classes in different grades in the same school. In some cases, junior and intermediate division students were sent to preschool and primary division classrooms to help the students—and in some cases to help the teacher—with the use of technology for learning. In many cases, the students explored the technological tools and then explained to the teacher how to use them for the pedagogical task at hand. In many cases, the development of learning partnerships took the form of a greater degree of student responsibility for learning, greater collaboration between learners, and a stronger student voice. *Student Engagement* Implementing new pedagogical practices and integrating technology had a marked impact on student engagement and motivation. The development of learning partnerships appears to have had an impact on student engagement; students now have a voice and can participate in the decisions that are required throughout their learning. In-depth learning often has an impact on student engagement; it fosters student curiosity. In addition, students are more motivated and engaged because the learning is more authentic and relevant to their reality, especially when it relates to their future. The ability to present their work and productions to their peers was also a motivating factor for them. Generally speaking, implementation of the new pedagogical vision appears to have had a positive effect on student behavior. Because there is more collaboration, discussion, and mutual support during learning situations, there are fewer challenges in terms of student behavior and discipline. In many cases, we saw an increase in self-esteem. However, we should point out that students having difficulty concentrating

	and paying attention appeared to require extra support to stay on task. We noted that, in some cases, the use of technology had a greater impact on boys. They often prefer to read and write using technological tools. One teacher reported that, in her class, boys with behavioral problems agreed to do tasks with technology that they had previously refused to do without technology. Implementation of the Board's new pedagogical vision, supported by the integration of digital technologies, has had an impact on student engagement and motivation. This appears to increase the amount of time that students invest in tasks and, as a result, the quality of their work. We should point out, however, that problems accessing the wireless network and limited access to websites resulted in frustration that had a negative impact on student engagement. Some students also reported their frustration in using the technology when they had technical challenges. *Student Achievement* With the implementation of the new pedagogical vision, supported by digital technology, our students seem to be handing in work that is of better quality. In our opinion, the increase in student engagement and motivation, in itself, has contributed to an improvement in student achievement. Based on our observations and analyses of student work, there were marked improvements in reading, writing, and mathematical problem-solving. This improvement in student achievement was made possible with the implementation of the new pedagogical vision, in particular, targeted pedagogical strategies supported by technology. This technology enables the students to: • Go back over their work and learn from their errors; • Use a word prediction app to improve their writing tasks; • Access digital books (such as *Bidules,* a software application for the creation of interactive computer music and multimedia*,* or *Lire-tôt*), which are of particular interest to boys; • Get more practice in preparation for oral presentations, especially for students for whom this is a challenge; • Engage in peer reading activities, using documents that are colourful and richly illustrated; • Re-work their oral presentations and the work they submit to demonstrate that they have reached the learning objectives; • Create more traces of their work; • Share exemplars, where samples of work are projected on the interactive whiteboard; and • Monitor their progress thanks to virtually instantaneous feedback from their peers and teacher. The teacher who is responsible for assessing student work confirmed that, in the three

	small rural schools, implementing the new pedagogical practices for 21st century learners and integrating digital technology helped to improve student achievement in communication, mathematics, reading, writing, and the development of work skills and habits, particularly where autonomy, collaboration and self-regulation were concerned.* We would also like to point out that learning supported by the use of technology appears to have a major impact on achievement in male students. Several teachers reported that their male students wanted to push ahead, get more information, and work harder on assigned tasks. Generally speaking, technology contributed to improved achievement in students with special needs. The stigma attached to using a digital device as a support was eliminated by the fact that all of the other students were using the same technologies. It goes with saying that when a student is able to use assistive technology more fully, he or she experiences more success in reading, writing, organization, and oral communication. With the use of technology, these students have successful experiences that they would not otherwise have.
Impact on Instruction	Based on our analysis of the data that we collected through our observations, our assessments of student work, comments made by teaching staff during year-end interviews, two surveys, and the teachers' self-evaluation matrix, we were able to make the following observations about the impact of the pedagogical and technological transformation on instruction. In our opinion, implementation of the Board's new pedagogical vision, supported by the integration of digital technology, resulted in major changes in the practices of the teachers involved. 89% reported that with the changes this year to bring the Board's classrooms into the 21st century, they changed their pedagogical approach. We saw changes linked to the development of learning partnerships in the classroom and, by extension, throughout the school. We were able to examine implementation of the practices associated with in-depth learning, which includes the development of competences essential to the 21st century. We also observed that teaching staff were making a genuine effort to integrate digital technologies for learning. We also saw staff make efforts to transform their students' learning environment. *In-depth Learning* With the implementation of the Board's new pedagogical vision for the 21st century, the overwhelming majority of teachers have made changes in the classroom. Based on our observations, we are seeing a gradual transformation of pedagogical practices toward more in-depth learning. This change is fully underway, but will probably take a number of years, even for engaged teachers. As the year progressed, we noted that several teachers were making more use of questioning to foster knowledge construction in their students. We also noted that tasks were far more authentic. A few teachers also attempted to use access to technology as a way of encouraging innovative approaches. The integration of technology also resulted in changes in pedagogical practices in the classroom. Several teachers used apps designed specifically for demonstration to help their students explain their learning process or their thought processes when problem-

	solving. Technology also made it possible to conduct larger-scale projects, still within a reasonable amount of time. *Development of Competences for the 21st Century* We were able to identify several activities and tasks performed in classrooms in the five schools that contributed to the development of these competences in our students. With the help of technology, these tasks and activities helped students make progress, particularly on the following competences: communication, collaboration, creativity, critical thinking, and work skills and habits required for character education. *The Learning Environment* We saw an increasing number of students being active and moving around the classroom. There was much more interaction between students, which meant that the classrooms were a bit noisier and seemed more chaotic. Rather than chaos, however, this was indicative of the energy the students were putting into sharing and collaborating. Increasingly, classrooms are organized to serve multiple functions, enabling students to work at their desks, on the floor, in the hall, and sometimes, outside the school building. The desks are positioned and used in a variety of ways, depending on the pedagogical goal. Increasingly, teachers are asking for multi-purpose tables instead of desks. *Integration of Technologies* Teachers are integrating digital technology for learning to varying degrees. Some are using technology constantly as a tool for learning. Some are using it occasionally to enrich a lesson or to have students perform a technology-enriched task. We noted that the complexity of the tasks performed with technology increased with the students' age and the teacher's comfort level with technology. According to our analyses, technology was used in all school subjects, with more pronounced use in literacy and numeracy. We can say that our teachers made effective use of technology this year to foster student achievement in reading, oral communication, and mathematical reasoning. In classrooms that had one tablet per students, the teacher used technology to create a schedule and digital communication tool that the students and their parents could access. This tool allowed for instant sharing of student work, timetables, important messages, and relevant news. To make the most of classroom time, the flipped classroom strategy was also used. Some teachers tried to create learning centres that used technology for enriched learning; however, this is not a common practice and will require a special focus in terms of professional development going forward. Using technology for learning appears to have facilitated certain forms of differentiated instruction. However, we will need to provide more professional development to assist teachers in recognizing opportunities for differentiation based on student profiles. This year, our evaluation of our efforts to bring our classrooms into the 21st century consisted of the administration of the self-evaluation matrix for teachers on two occasions: first, in September, to provide baseline data and second, in June, for end-of-

	year data. This matrix consists of 21 statements about our new vision. For each of these statements, the teacher had to indicate whether he or she was in the mode of discovery, exploration, appropriation or mastery. Comparing the data for September and June yielded some interesting discoveries. For each of the statements, a large percentage of teachers at all five schools reported that they had progressed to the next level or, in some cases, by several levels. This could be an indication that the teaching staff are increasingly appropriating the Board's new pedagogical and technological vision. Our teachers are increasingly comfortable with the concept of learning partnerships, with the implementation of strategies for in-depth learning, and with the integration of digital technologies for learning.
Impact on System	The focus of our efforts to bring our classrooms into the 21st century is pedagogy. We are focusing on transforming our pedagogical practices in the classroom. We will ensure that these practices endure by insisting that the transformation happens system-wide. We are also insisting that teaching staff always start from a pedagogical intention and that technology only be used to enrich and foster in-depth learning. This initiative has enabled us to develop a clear, specific vision of what transformation for the 21st century—pedagogy-centred transformation—means for our Board. This vision is shared by, and accessible for, all of the Board staff. By rallying all of our staff around this vision, we can provide transformational leadership that will result in a complete modernization of our schools and in success for all of our students. This initiative has also enabled us to develop an implementation plan that is guiding the operationalization of this vision for 21st century learning across the Board. This plan includes a comprehensive, well-defined program for professional development and ongoing support for our teachers. This will ensure that practices that integrate pedagogy and technology are of lasting value in the classroom. Clearly, developing a team of teacher consultants that have appropriated this new pedagogical vision for the 21st century will also ensure that the transformation of our pedagogical practices endures. This implementation plan deals with a vast number of elements that are essential to the success and permanent impact of our transformation for the 21st century.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire catholique du Nouvel-Ontario

Project Title	School-Family Communication and Collaboration in the Digital Age
Description	In the context of technology-based teaching and learning in the 21st century, ongoing collaboration and effective communication by means of teacher-student partnerships and student-student partnerships for learning foster student success. *Conseil scolaire catholique du Nouvel-Ontario* chose Microsoft Office 365 and its suite of Cloud applications to promote and facilitate collaboration between students, and between students and their teachers.
Context	*Number of students*: 192 *Number of teachers*: 9 *Number of schools*: 5 *Grades/Program*:
Impact on Students	The competences at the centre of the innovation research project are communication and collaboration. Using the suite of apps in Microsoft Office 365, the students developed competence in communication through opportunities to communicate with their teacher and peers on their tasks and to receive feedback from them. They were then able to use this feedback to improve their performance, directly in connection with assessment for learning. In addition, the students developed competence in collaboration by working together on tasks in the classroom and elsewhere. Microsoft Office 365 is in the Cloud; as a result, the students are not restricted to school time for working on their assignments, which they can do anywhere, at any time. Through the Excel survey, they gained essential knowledge in terms of peer feedback and evaluation. They learned how to offer constructive feedback based on specific criteria, enabling their peers to improve and vice versa. They learned how to use feedback from their teacher and/or the other students to make progress in their own learning and achievement.
Impact on Instruction	Use of Microsoft Office 365 resulted in visible changes in teaching and learning practices and implementation of the curriculum. By encouraging the use of these tools to communicate with [*other*] students and offer descriptive feedback, the students had access to written communication at all times and were able to use it to improve their learning. Instead of receiving verbal feedback (which they often forgot and did not use to progress toward their summative assessment), the students could refer to this feedback constantly and work on aspects required to stay on the path to success. As a result, this practice had an impact on evaluation practices both *for* learning and *as* learning. Following the integration of this technology, there was also a change in the physical and social learning environment. The configuration of the classrooms changed, with groupings of desks that enabled the teacher to move easily from group to group, asking questions and providing support. The students were constantly interacting in the classroom, outside the school, and outside of regular classroom time. The impact of the learning partnerships and related teaching and learning strategies such as communication and collaboration between the teacher and the students and

	between students was positive for both the teacher and the students. We noticed that prior to introducing Microsoft Office 365, teacher-student and student-student communication and collaboration only happened in the classroom and during school hours. With this initiative, teachers and students were not limited to the four walls of the classroom or to the school bell for communicating and collaborating on school work. Teachers changed their practices, providing ongoing descriptive feedback to students and constant support outside of classroom time.
Impact on System	This initiative helped to increase system activities, enabling the Board to continue offering a variety of training sessions, modelling in the classroom, and differentiated support to teachers during the school year. It was also possible to continue with the training on innovation research projects from previous years. The teaching staff involved in Phase 1 of the blended learning project for Grades 7 and 8 called *CODE 1 – Apprentissage hybride en 7e et 8e* were introduced to new mediatized resources and emerging technology tools (e.g., Microsoft Office 365, the Virtual Learning Environment, the iPad, etc.). This enabled them to further enrich the blended learning experiences of their students and to continue networking and sharing best practices. This year, newly hired teachers and teachers returning from leave had an opportunity to participate in a repeat of the training offered last year on the implementation of a data collection, management, and analysis tool making it possible to more effectively monitor the progress of all students, following the principles for assessment found in the policy document entitled *Growing Success* (the project called *CODE 3 – Le Calepin du Coffre du CSCNO*). These last two initiatives ensure that research projects from previous years continue to be relevant for our Board. Having said this, the Board's pedagogical team was able to offer differentiated professional development and to continue to build the ability of teachers to implement pedagogical practices that are based on technology and that focus on the development of their students' 21st century competences and to transform their teaching practices and optimize their students' learning. More directly in connection with Phase 4 of the research on innovation in the 21st century (School-Family Communication and Collaboration in the Digital Age), individualized training and coaching were offered particularly to teachers and principals testing the new CSCNO parent/student portal that was developed by an in-house design and programming team (see 1st Theory of Action). In the spring, training sessions on Microsoft Office 365 (see 2nd Theory of Action) were offered to members of the Board's pedagogical team and to specific teachers and student for the first phase of system-wide deployment of Microsoft Office 365. The pedagogical goal for use of the suite in the classroom was to foster communication and collaboration and to promote the development of digital-age language skills in students. The first theory of action developed as part of Phase 4 comes out of the observations, practices, and suggestions of teaching staff who integrated use of the Calepin du Coffre (Phase 3 project) into their practices for teaching, assessment, and sharing feedback with students. Several teachers asked for a reliable, user-friendly, secure tool for closer, ad hoc communication on student progress with parents identified in the Calepin. The second theory of action developed as part of Phase 4 draws its inspiration from the first research project on blended learning in the classroom and further

	development of the students' 21st century competences, particularly, face-to-face and remote communication, collaboration, and creativity. This initiative greatly helped to expedite the process of developing a vision for learning in the digital age and the process for revising/developing administrative policies and directives for responsible use of the Internet, the technological tools available to staff and students (e.g., tablets), the Board's website, the schools' websites, the parent/student portal, and Microsoft Office 365. The official launch of the new vision for learning in the digital age at CSCNO and a system-wide presentation of these administrative directives (new and revised) is scheduled for our professional learning days and training sessions in 2015-2016.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire de district catholique des Aurores boréales

Project Title	**From the invisible to the visible**
Description	Our research initiative originates in one of the Board's objectives for improving reading. In the preschool division, we focus on vocabulary development. Through collaborative inquiry and with the goal of tracking student progress more effectively, teachers in the preschool division use an iPad to explore various types of electronic pedagogical documentation. Electronic portfolio software (ePortfolio) is used to document traces of learning and to organize and communicate the progress of each student. Using Class Dojo, the staff monitor the students' use of functional vocabulary and provide them with feedback that is positive, visual, and virtually instantaneous.
Context	*Number of students*: *Number of teachers*: 9 *Number of schools*: 7 *Grades/Program*: Preschool division
Impact on Students	The teachers noted on numerous occasions that technology had a positive impact on the students' motivation to learn. Technology enabled the students to start taking small steps toward critical thinking, providing them with opportunities to correct themselves after seeing themselves on video. The students enjoyed: • Being able to record themselves in order to create learning centres in which their voices became a key component of a game; • Seeing themselves on video in order to start recognizing their strengths and to foster dialogue between the teacher and the student; • The simple act of being filmed.
Impact on Instruction	With the use of technology, teachers are using a wider variety of traces of learning; they are also increasing the frequency with which they use more technology-based traces of learning. In addition, with an opportunity to see their students in action over and over again on video, the teachers can adjust their teaching strategies to meet the students' needs more effectively. They used video to record the conference with the students that was used for a diagnostic assessment and also for a summative assessment. Video enabled the teachers to review each conference several times, analyzing the students' progress more fully and planning future learning situations more effectively. One unexpected bonus was the possibility of seeing the development of the students' social skills on video.
Impact on System	To support our staff, online and in-person coaching sessions were offered on a regular basis. During the inquiry, the teaching staff met twice for co-planning, reviewing progress, and identifying next steps. There were also work sessions for each teacher with the coach to discuss student progress and offer more individual support. At the end of the project, there was a one-day in-person meeting to review the results of the inquiry, the lessons learned, the wins, and the challenges. This work session was

	an opportunity for the group to perform an analysis so that they could continue teaching the vocabulary and document the students' learning and improve their strategies for teaching French in a minority French-language setting. According to the teachers' feedback, technology is enabling them to analyze student progress more effectively because they are able to play the recordings of a student in an oral communication situation or a conference over and over again. Because this project was such a success, it has been integrated into the Board's improvement plan. In the context of a collaborative inquiry on vocabulary for students in K to Grade 2, this project will help us to achieve the following objective for literacy: by June 2016, 56% of elementary school students will be reading at Level GB+ and 60% of students will be reading at DRA Level 4. These percentages represent a 10% increase. We will continue to build the capacity of the system in two ways: by working with our coaches, face-to-face, during our regular education service meetings and by working with them remotely, on an as-needed basis.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire de district catholique de l'Est ontarien

Project Title	**Components of the Integration of Learning Environments in the Digital Age: School and Classroom Projects**

Description	This grant is being used to implement CSDCEO's digital identity and citizenship plan. Several projects are integrated into this plan in which teachers, students, parents, principals, and teacher consultants evolve in their professional learning cycle.
	
	Participants implement their project by answering one of the following six research questions.
	
	1. If teachers appropriate the foundations and tools to enable students to develop a process of inquiry and critical thinking in the digital age and if they participate in the development of strategies to assess them, they will have the tools they need for integrating it in the classroom.
	
	2. If the school adopts the digital portfolio, collecting triangulated evidence of learning, student achievement and intellectual engagement will increase.
	
	3. Does the implementation of a 1:1 model support the development of 21st century competences?
	
	4. In the context of a 1:1 initiative, what is the impact of a Cloud platform (Google Apps), a location that supports the development of 21st century competences, and a centre for success on student engagement and learning in a digital age school?
	
	5. Where classroom management is concerned, what are the similarities and differences between digital classrooms and conventional classrooms?
	
	6. How do we move from simply using technological tools and strategies to actually integrating them in a way that supports the development of 21st century competences?
	
	7. Pedagogical services works collaboratively with principals to ensure that teachers who want to participate in these initiatives either have a system-wide project that supports them or a school project or classroom project to create:
	
	• System-wide
	  ○ Google 101, 201, 301
	  ○ Enhancing or transforming one's pedagogy
	  ○ iCN
	  ○ 1:1 at the Kindergarten level for language learning
	  ○ Google for families
	• Class – 1:1 model
	• School – 1:1 model

Context	*Number of students*: 1400 *Number of teachers*: 1000 *Number of schools*: 33 *Grades/Program*: K – 12
Impact on Students	In connection with the measures employed in Phase 3 of the Canadian Education Association's project, *What did you do in school today?,* and based on our data collection and analysis, teachers and students reported an increase in their engagement with their learning task and classroom or course. Students also reported that they learned a lot about the collaborative tools, software, and Cloud platforms. See the evidence from the 1:1 model project. To ensure sound management of the framework for the 1:1 model and other strategies to integrate technology, teachers are integrating competences that support the development of a digital identity. Students navigate the Internet safely by making decisions based on critical thinking that also integrates a process of inquiry and moral discernment. See evidence from the classroom iCN project. Some students will also have the opportunity to participate in sessions of the Google Family project, in which they work with their parents to develop their competences. See evidence from the Google Family project.
Impact on Instruction	It goes without saying that student learning requires instruction and opportunities provided by teachers in the classroom. The evidence in the "Impact on Students" section directly above is also relevant to this section. More specifically, it is in connection with the technology integration matrix, which suggests various points of entry (Phase 3), that our system-wide initiative [*word missing, possibly "for"?*] enhancing or transforming pedagogy gives several teachers an opportunity to collaborate with principals, teacher consultants, teachers and students with the goal of improving their practice and learning and improving student learning. [*sic*] Teachers report a sense of increased efficacy with respect to their integration of technology, 21st century competences, and teaching. Their students also report having more opportunities to: • Collaborate with their peers • Hold classroom discussions • Choose their tools or strategies • Know the criteria for assessment • Receive feedback See evidence from the project on enhancing or transforming pedagogy.

Impact on System	Exceptionally, this year, our projects enabled us to work with all of our teachers on an approach that targets the foundational knowledge of all CSDCEO educators so that they recognize the potential of their collaborative platform. Participants reported that they felt more comfortable using the technological tools associated with their Google account. See one of the presentations for the Google 101, 201, 301 project. We also decided to increase parental involvement in our educational and technological transformation so that parents could support their children's process and strategies. The feedback has been incredibly positive from the principals taking part in this initiative, and from parents, participating teachers, co-leaders, and students. See the deliverables for the Google Family project. The two system-wide groups: enhancing or transforming one's pedagogy with the SAMR model (Phase 3) to improve one's practice. The professional learning cycle (Phase 3) for these teachers consists of coaching in the classroom (Phase 3). Teachers develop pedagogical leadership by opening their classroom up to others. See the deliverables for the project on enhancing or transforming pedagogy.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire public du Grand Nord de l'Ontario

Project Title	**The Impact of Techno-pedagogical Coaching on Teaching and Student Learning in the 21st Century**
Description	Our project advocates coaching for Grade 7 and Grade 8 teachers as they integrate technology into their pedagogy. Teachers are given the tools they need to make their teaching more participatory and differentiated, through the process of inquiry. Students are able to further develop their 21st century competences. All of our Grade 7 and Grade 8 students will have access to a technological tool (either a laptop or Chromebook). All Grade 7 and Grade 8 teachers will receive coaching from the Board's literacy and numeracy coaches and the Board's teacher consultants. This project will build the capacity of the Board's pedagogical team. TacTIC teacher consultants will support the Board's pedagogical team and teachers.
Context	*Number of students*: 271 *Number of teachers*:22 *Number of schools*: 6 *Grades/Program:*
Impact on Students	Based on the surveys and the observations of the teachers and coaching team: • Students are demonstrating increased motivation and enthusiasm towards their learning • Students are communicating and collaborating with each other more, both inside and outside of classroom hours, using the tools that have been made available to them (e.g., Google Drive, Classroom, etc.) • Students are analyzing and evaluating information from increasingly diverse sources, usually with the suggested tool • Students have a greater variety of tools available to them and find themselves in an open environment in which they can use the tool of their choice to demonstrate their learning (e.g., choosing whether to use the GeoGebra application or paper and pencil to draw rotations for their Mathematics course).
Impact on Instruction	Based on the surveys and the observations of the coaching team, the teachers: • Have transformed their pedagogical practices and innovated in their teaching practices, using different tools and approaches • Have become more confident in their use of technological tools in the classroom as a result of the coaching • Are more likely to integrate technological tools into their pedagogy as a result of the coaching • Have begun to develop assessments that enable students to use technology to demonstrate what they have learned

Impact on System	This initiative supports the Board's vision, which is to build teacher capacity and confidence with respect to the integration of technological tools into pedagogy. Teachers will be coached throughout the shift towards a pedagogy that is increasingly participative and differentiated. This initiative is part of a system-wide best practice, i.e., coaching in literacy and numeracy. Coaches who are already in place will integrate technology even more during the coaching process and will be in a position to lead the change towards 21st century learning. Collaboration between members of the Board's pedagogical and technical team and members of the province's TacTIC team is the key to the success of this initiative.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire public du Nord-Est de l'Ontario

Project Title	**Technology in Support of Learning**
Description	The purpose of our project is to combine the preferred approach to documentation with technology in order to document learning by collecting digital evidence. This will make it possible to create student learning portfolios and track their success.
Context	*Number of students*: *Number of teachers*: 17 JK and SK and 4 Grade 7 *Number of schools*: 7 elementary and 2 intermediate *Grades/Program*:
Impact on Students	As recommended in the preferred approach to documentation and assessment for learning, students play an important role in their own learning. Each time a student chooses an item to keep in his or her learning portfolio, he or she must justify this choice. This results in discussions between the student and the teacher or ECE or another student. The student must act as a collaborator in the narrative of his or her own story as a learner; it is important to have discussions about his or her learning.
Impact on Instruction	With the advent of the new Full-Day Kindergarten program, our teaching practices were bound to change. The new program is based on the pedagogical documentation approach and so it was natural to continue in this direction. What we have added is the technology to collect, sort, analyze, and store evidence of learning.
Impact on System	As mentioned at the outset, we decided to combine pedagogical documentation with our 21st century learning project. This has enabled us to avoid duplication and to have a more focused, system-wide approach. We started with JK, SK, and Grade 7 initially in order to lay the foundation for a project that will grow to include other grades in the future.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Conseil scolaire Viamonde

Project Title	**The Active Use of Technology in Elementary and Secondary School Classrooms**
Description	The purpose of this project is to increase teachers' and students' use of technology in the classroom. This helps pre-school and secondary school students to develop their portfolios, their ability to co-operate in the classroom learning community, and to be more motivated about and engaged in their learning, particularly boys. Note that students develop 21st century competences such as autonomy, co-operation, motivation, and engagement. This enables pre-school teachers to collect authentic, up-to-date data on their students' oral communication competences and to develop new teaching practices and strategies based on their students' needs and interests. This means using technology to conduct searches, having the students film each other, and viewing videos in relation to the things that the students are researching.
Context	*Number of students*: 57 pre-school students, 216 secondary school students *Number of teachers: 21* *Number of schools:* 7 *Grades/Program*: Pre-school, Intermediate/Secondary School
Impact on Students	*(Pre-School)* 21st century competences: Co-operation between students and communication of what has been learned Improvements in teacher assessment practices: more assessment for learning, particularly descriptive feedback, and also more self-assessment. Given the more frequent feedback, students have an increased understanding of the expectations and of what the teacher is communicating. They adjust their behaviours accordingly. The students assess themselves after they listen to or watch their own statements; they correct themselves and improve. The students work with the teacher to comment on items in the portfolio and describe what they have learned. *(Secondary)* Competences in learning and innovation 1. We note a significant impact on student learning with the use of technology. Technology has enabled students to create and discover new concepts that relate to their own understanding of what they learn. Students have more time to learn more about the subjects that they are passionate about: criteria for 21st century competences (creativity and learning). 2. Tools that measure the impact of the partnership on student learning show

	an increased rate of file-sharing and more time spent on preparing projects and presentations. With the use of tablets and electronic portfolio software, students can take evidence of their learning and share it with their peers or teacher for positive descriptive feedback. Criteria for 21st century competences (communication and co-operation). 3. The teacher, the technological tool transformed his or her learning into a discussion in the classroom with the students.[sic] Through various problem-solving scenarios, the teacher leads the students to engage in reasoning activities, using assumptions. Criteria for 21st century competences. (critical thinking and problem-solving). *Relationship and professional competences* 1. An impact on student behaviour and well-being dominated in the data collected from the student survey. In some schools, teachers have changed their teaching practices since the introduction of technology, while at the same time adopting a student-centred pedagogy. Teaching of theoretical material is divided into brief video clips, which students watch at their own pace. They have access to assessment tools as they progress and learn. Thus, students develop autonomy and a sense of initiative. Criteria for 21st century competences (initiative and autonomy). 2. The relationship that teachers develop with their students has a significant impact on the latter's academic and professional progress because, as we know, it is the human factor that makes the difference in education. Students are at the centre of their learning, working with their peers, and developing social and intercultural skills. Criteria for 21st century competences. 3. The change made to the learning environment with the use of technology has resulted in the emergence of co-operative practices and the sharing of professional experiences. Teamwork and co-operation prepare students for the future. Within a team, some students will lead the debates, some will take notes, and others will present. These are our leaders (leadership and responsibility). Criteria for 21st century competences.
Impact on Instruction	*(Pre-school)* Improvement in teachers' assessment practices. Teachers film, record or photograph students and work with them, in the moment. (descriptive feedback and assessment for learning) Students are motivated to record themselves (and to watch themselves) to demonstrate what they have learned; this provides a greater volume of data on each student. Watching themselves, students learn to assess themselves. They work with the teacher based on the feedback and discuss the validity of the evidence of their learning and what they want to add to their portfolios. Evidence of learning is kept in a portfolio, which is accessible at all times. The children develop the ability to talk about what they have learned and to describe their progress in their own words.

	(Secondary) Thanks to technology and to a reorganization of the learning environment (for example, tablets): 1. Teachers forgo direct instruction and use individual instruction (or instruction in small groups). After a diagnostic assessment, they identify students who did not understand the concepts and provide more in-depth instruction. 2. The change to the structure of the classroom enables teachers to offer online instruction (to students who are watching video clips), in-person instruction (differentiation), and instruction at collaborative activity stations (for students who are still working and discovering new concepts). 3. Teachers [engaging in] diagnostic assessment can easily perform differentiation (individual teaching or teaching in small groups) because they are able to focus on coaching students in the application of concepts.
Impact on System	Our experience is based on a small scale project with a number of participating schools. It enabled us to see what could work in the context of the current system. This contributed to the development of our vision of the exit profile for Viamonde students in terms of 21st century competences and digital citizenship. Our experiences, our wins, and the challenges we encountered were the starting point for the discussions of the Board techno-pedagogical committee. This committee will identify actions for articulating our vision for the digital age within our school board. For example, during one Board-level ICT fair, we shared these experiences with teachers who were there to receive training. They became models and resource people within their school and within the Board. Another example is our model for coaching teachers within the Board; this model has been modified so that it always includes a digital age component. This enables us to continuously develop our teachers' pedagogical practices for teaching 21st century competences.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

District School Board of Niagara – Project 1

Project Title	Earn a Device
Description	Teachers from all grade levels and schools were invited to participate in the Earn-A-Device program. Participants were selected based on school and/or area initiatives. Criteria for selection was developed by the area superintendents and aimed at the "novice" level technology user.
Context	*Number of students*: 3750 *Number of teachers*: 150 *Number of schools*: 105 *Grades/Program*: Grades K to 12
Impact on Students	Increasing the comfort level of teachers to use technology in the classroom directly relates to student engagement, achievement, 21st Century Competencies, and learning partnerships as technology implementation provides an increase of relevant learning strategies for our students. Students can produce learning examples in a variety of formats and when done in a digital nature, teachers can also provide more rich, personal assessments and evaluations on a more regular basis.
Impact on Instruction	Teachers learned to work more efficiently with regards to collaboration between themselves and students and between students and other students in the class and how they were assessing and evaluating student products during the creation process and after completion. By providing ongoing feedback, student production increased in quality and complexity. Teachers also became more comfortable in sharing their strategies and ideas during the EAD sessions, creating complex assignments with differentiated learning outcomes and strategies for all.
Impact on System	The EAD project has changed how technology for teachers is being handled in the DSBN. Rather than giving out laptops, iPads, or Chromebooks for teachers, they are earning their devices by learning how to use them in the classroom with their students. Training and support is a large, up front need [of teachers] for support by the IT4 Learning Technology Training Team in the DSBN, but the creation of a collaborative environment for sharing resources and pedagogy regarding the implementation of technology in the classroom will offset the continued need for support. EAD participants will become technology integration leaders in their school as they become more comfortable with the tools that they have been provided. They know where to access more centrally shared strategies and supports because of the courses that they have completed.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

District School Board of Niagara – Project 2

Project Title	Connect
Description	CONNECT 2015 offered professional learning opportunities for all types of educators and education leaders, including teachers of every discipline, tech coordinators, administrators, superintendents, teacher educators and media specialists. Attendees received: • Access to more than 180 sessions and learning opportunities. • Entry to an interactive exhibit hall featuring more than 100 companies. • Two thought-provoking keynotes. • Opportunities to connect and network with more than 1500 fellow educators and education leaders.
Context	*Number of students*: 150 *Number of teachers*: 110 *Number of schools*: 105 *Grades/Program*: Grades 6-10
Impact on Students	• Students were given the opportunity to create an augmented reality and digital media project. • Students had the opportunity to attend information sessions. • Students were able to connect technology with the curriculum. • Increased collaboration with the Microsoft O365.
Impact on Instruction	Educators had the opportunity to attend a wide array of educational sessions and hands-on learning environments, to build their content knowledge while learning new strategies, and to gain exposure to the most timely and relevant topics and trends in educational technology. They are provided with tangible resources and hands-on teaching strategies that can be implemented right away. This rich learning experience also equipped them with valuable knowledge they can share with their colleagues as technology ambassadors. By passing on the information and resources they gather, they become leaders in the development of digital age learners.
Impact on System	• This is part of our board strategic and improvement plan. It forms the basis of the school ITS operational plan for hardware purchases, software purchases and professional development. • This conference connects all stakeholders to improve student achievement. It allows teachers, principals and superintendents (and their professional associations) to identify and share effective and innovative teaching practices that include the use of technology.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

District School Board of Niagara

Project Title	**DreamBox**
Description	The project is designed to meet the individual mathematics needs of students in our system through a computer based program called DreamBox. DreamBox is an adaptive mathematics computer program which responds to the individual needs of each student as they work through the activities and lessons in the program. DreamBox adapts to the developmental needs of each student, and while it generally aligns with our curriculum, it is more focused on aligning with the current needs of each student. The technology provides students with contexts and links to models which enables students to make sense of the mathematics they are learning. The program gathers and reports student performance in relation to curriculum expectations, which provides teachers another assessment tool to track student achievement. This data allows the teacher to further identify the strengths and needs of their students, both through in-class instruction and through this computer program.
Context	*Number of students*: 18 960 *Number of teachers*: 672 *Number of schools*: 85 *Grades/Program*: Grades K to 6
Impact on Students	Students have gained confidence and perseverance in their abilities to solve problems, as they now have more strategies which allow them to be more flexible when solving problems (increased flexibility is increasing confidence). Students also use more models to think through problems which they don't know how to solve when they first get to the problem (the models are encouraging them to persevere). Both of these benefits have also created a richer dialogue in classrooms where students are better able to represent their flexible thinking and share during problem solving tasks and classroom discussions. In all classrooms where DreamBox has been used significantly, DreamBox has added knowledge of strategies and models to students, regardless of the experiences in regular classroom instruction.
Impact on Instruction	Teachers have gained confidence and perseverance in their abilities to teach mathematics. They now have more strategies which encourage them to be more flexible when teaching students through problem solving (increased flexibility in understanding of developmental landscapes of learning concepts is increasing teacher confidence). They also use more models to represent student thinking or think through problems themselves, which they may not know how to solve when they first get to the problem (the models are influencing them to persevere). Both of these benefits have also created a richer dialogue in classrooms where teachers have an increased mathematics for teaching knowledge (which allows them to better identify the strengths and next steps a student needs at a given time, and ask questions and/or make visible the

	thinking that students are struggling with). Teachers have also improved their understanding of the great gains that can be made for struggling students when they use assessment from classroom instruction, and the data from DreamBox to provide additional support in areas needed. This improved teacher understanding has also resulted in an increase in teacher efficacy in providing more appropriate support for students who face challenges in mathematics. These gains were all extremely more evident in classrooms where the instruction aligned with the research-based approaches that are suggested in the curriculum, and supported by resources we have been working with over the last many years. In classrooms where this teaching is not frequently implemented, DreamBox has added knowledge of strategies and models to students and as a result, to teachers who may have been previously unaware of the variety of strategies and models that can be used to more flexibly solve various problems and to give contexts and models to operations and problems.
Impact on System	System scaling is significantly impacted by many aspects. We have focused this year on the following actions: deepening our understanding and awareness of the curriculum, deepening our mathematics for teaching knowledge, and deepening our awareness and use of research-based resources. DreamBox has supported the individual needs of our students, while at the same time, supported our educators in relation to these goals. System scaling of this initiative will also require more focused efforts across the system. Administrators play a key role in the focus and usage of the program in their schools. Where administrators have made this a priority, student achievement has increased (as evidenced by increased time on the program and increased gains across the curriculum as measured by the program). We have a significant number of students who demonstrate that mathematics is challenging for them. Alongside all of the effective strategies that we will continue to implement within the classroom setting, and in sessions with LRTs, DreamBox provides a supplemental support for students who are struggling in mathematics. Increasing our focus on this group of students in relation to DreamBox is a further need within our system. As well, DreamBox provides additional practice and support for all students and can provide a challenge for students who are doing well with regular classroom instruction, to persevere and problem solve their way through new learning opportunities (sometimes before are presented through regular classroom instruction).

NOTE: Information in the summary is taken directly from the data contained in the final project report.

District School Board Ontario North East

Project Title	**Making Student Thinking Visible Through iPads**
Description	Both the math, and literacy goal, in our board improvement plan focus on students' ability to make their thinking visible. Our team wondered if the iPad could serve as a catalyst for changing pedagogy to make more space for student critical thinking in the classroom. If we used the SAMR model to guide our integration of the iPads, would our tasks change enough so students' thinking would be more visible? We decided to pilot 3 classrooms in a 1-to-1 iPad project. We decided to target grade 7 and 8 classrooms. Our three classroom teachers had a range of ability with technology. This range of teacher familiarity and comfort with technology would also give us a sense of how our range of teaching staff might respond to such a program. We brought the team together, and reviewed the deliverables for the initiative, and introduced SAMR, the Technology Integration Matrix [TIM], and the ISTE standards. At our next meeting, we brainstormed a list of applications that we could use that were aligned with the work of the BIPSA, and SIPSA. We brought in an Apple Distinguished Educator to facilitate some capacity building. This proved to be an important catalyst as this training showed what was possible, and gave the teachers some concrete ideas of how to use the iPad in literacy and in numeracy. From this point on, we brought the entire team together twice a week to monitor progress and determine next steps. Every other meeting we met via video-conferencing and the alternating meetings were face to face. As we were co-planning, we found our ideas were richer, and the resulting tasks were much better at showcasing student thinking. We also found that we had quite a few technological challenges that we had to overcome. In particular, we had issues with our bandwidth, WiFi density, Airplay, and our internet filtering rules. Working closely with teachers, helped IT to better understand the problem by realizing how the policy they had implemented actually hampered how the technology was used. Because we had co-developed the theory of action, we had an excellent plan in place for gather pre and post data on the students. We had a pre and post assessment task for literacy and numeracy. We also had a series of pre and post interview questions for students and teachers. Unfortunately, the work-to-rule campaign hindered our ability to complete all these assessments.
Context	*Number of students*: 68 *Number of teachers*: 3 *Number of schools*: 3 *Grades/Program*: Grade 7 and 8 Literacy and Numeracy
Impact on Students	Early data has shown an improvement in the area of literacy, as measured by a pre and post literacy assessment. The labour situation prevented us from being able to administer and collect our post math assessment. Student voice videos,

	and teacher observations, reveal a significant increase in student engagement, which results in more assignments being completed by students, and no student opting to not complete an assignment. Given these results, we firmly believe that a 1-to-1 iPad program has the ability to be a catalyst to improve student achievement and to be a catalyst for teachers to make significant pedagogical shifts.
Impact on Instruction	Our teachers really focused on shifting their pedagogical practices to try and get at student metacognition. For example, they made extensive use of the "Explain Everything" app. They pull a completed assignment, via a picture, document, or video, into "Explain Everything" and they would justify where, in the work, they felt they met the success criteria, and would summarize be stating how well they think the achieved the learning goal. The teachers found this type of task pivotal in actually see/hearing each student's understanding of their own learning. Teachers could then quickly give precise feedback. Our pilot projects made some small steps on metacognition, but it needs to be developed further. Our pilot teachers clearly experienced a shift in beliefs where they no longer felt they need to provide all the content knowledge, but rather facilitate the acquisition of content knowledge through carefully constructed tasks.
Impact on System	The success of this project has allowed the system to make the decision to invest in establishing a 1-to-1 iPad program board wide. For the 2015-16 school year, all students in grades 7 through 10 will receive an iPad to be used for learning. All teachers will be supported by an iCoach to ensure the iPad is integrated in a meaningful way which is aligned with making student thinking visible. The focus will be on student inquiry, and facilitating that inquiry with an iPad. The iCoaches will support teachers in using those applications to facilitate rich tasks, and student inquiry. We have a plan for supporting three types of teachers: • Those that need the "Foundational iPad 101" training. • Those that need to develop integrating the technology with effective pedagogy. • Those that are innovators. (Teachers will be used to support the other groups, but will also be connected to one another to push each other's thinking.) We will work with principals so they understand the "why?" behind this tool, and have a clear picture of what effective practice looks like. For this, we will use the Technology Integration Matrix and SAMR. To ensure alignment, we have taken steps to revise our strategic plan, BIPSA, and SIPSA to show the connections between those three documents and effective technology integration & innovation. As a result of this project, we have also made major investments in upgrading our WiFi density, and bandwidth in schools. IT has also changed several policies that will make it easier for staff and students to use the technology.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Dufferin-Peel Catholic District School Board

Project Title	**Supporting 21st Century Innovation in Learning through Mobile Electronic Devices**
Description	To support 21st century innovation in learning, the board is focusing on the integration of personal electronic devices (PEDs) project that explores the implementation of the board's PEDs policy, procedures, and the student agreement that is signed by parents/guardians and students regarding the board's expectations of students when using PEDs at school. The purpose of our PEDs pilots is to develop an understanding of the "real world" implementation realities associated with the launch of student access to the board wireless (WiFi) network via their own personal electronic devices (PEDs) at a sample of schools. Secondly, the project intends to explore/develop a range of preliminary pedagogical supports and ideas for participating teachers to help them integrate student PEDs into the classroom. In phase one of the PEDs inquiry, each of the board's seven families of schools had one school participating. Each participating school was determined through selection criteria The PEDs phase two schools were selected by pairing each of the phase one participating schools with its corresponding elementary or secondary school.
Context	*Number of students*: 1500+ *Number of teachers*: 160+ *Number of schools*: 30 *Grades/Program*: K-12
Impact on Students	Baseline data have been collected to assess student perceptions regarding the anticipated use and impact of mobile electronic devices. For example: • The majority of students surveyed (86%) are likely to bring in their own personal electronic device (PED) to school when board enabled WiFi is made available. • Nearly three-quarters of student respondents (72%) think that having an electronic device in class will make them more interested in learning. • Most student respondents (80%) feel that technology is important in helping them learn at school. Educators compared tend to underestimate the number of students that will have access to PEDs in class, while overestimate the students' social apprehensions regarding PED usage to school. Educators are also more concerned about security than students. Educators estimated that about 75% of students would have access to a PED that they could bring to class, compared to 86% of students. Nearly half of Educators (43%) are worried about students feeling that they will be judged because of the PED they have or don't have, while just 14% of

	students indicated that they are worried about being judged. Educators (62%) are worried about the security of PEDs at school, while just 39% of students are worried about losing their PED at school.
Impact on Instruction	Baseline data have been collected to assess educator perceptions regarding the anticipated use and impact of mobile electronic devices. The benefits of the mobile devices were predominantly focused around mobility, with respondents citing greater flexibility/freedom (43.3%) and the ability to access technology without leaving the classroom (38.3%) as clear advantages. Similarly, from the perspective of supporting diverse learners, ten percent of respondents felt that this flexibility of location was a key benefit to some learners. Interestingly, over 15% of respondents reported that mobile devices permitted additional and/or longer access to computers over and above lab/library computer availability, while nearly as many felt that immediate access to a camera and microphone on some devices was definitely an asset to students. Finally, educators were asked to indicate whether the mobility provided by mobile devices was worth the logistics and challenges experienced. The greatest proportion of respondents indicated that yes, the mobility was worth the efforts needed to manage mobile devices, and cited a number of reasons: mobile devices provided additional access to technology beyond the lab/library computers (8.3%); mobile devices permitted better differentiating of the learning activities (8.3%); mobile devices were more flexible and/or versatile (6.7%); mobile devices permitted students seamless access technology in their classroom (6.7%); and mobile devices were more responsive to various learning styles (3.3%).
Impact on System	A variety of system-level impacts have grown out of this project so far. Learnings to date have indicated a need to address a variety of structures and procedures such as: • Refinement of existing personal electronic devices (PEDs) policy. • The development of local school technology plans to ensure digital learning experiences for all students, regardless of whether or not they have their own device to use at school. • The technology infrastructure in schools. • The development of sample lessons and other resources with multiple entry points for educators to use in the integration of technology in the classroom/school. • The development of Dufferin-Peel's own Catholic digital citizenship resources that reflect the board's unique culture and faith tradition. • Parent/guardian and student access to board wireless agreement.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Durham Catholic District School Board

Project Title	**The Power of One: OneNote, One Portal and One Creed**
Description	The purpose of our innovation research project, entitled The Power of One was threefold: 1. Investigate the benefits of Microsoft's OneNote Class Notebook Creator 2. Pilot blended learning module that explores the Catholic Graduate expectations in the context of 21st Century Learning Competencies (Footprints). 3. Create a virtual portal through which students and teachers can access resources with a single sign in. The innovation project builds on our experiences from previous innovation projects in that we are continuing to investigate both cloud-computing and the blended learning model.
Context	*Number of students*: 175 *Number of teachers*: 9 *Number of schools*: 7 *Grades/Program*: Grade 10 English, grade 10 History and grade 11 & 12 religion, as well as teachers and students in grade 7 and 8
Impact on Students	Our survey revealed that there was an impact on student engagement. For example, before the project began less than 50% said they enjoyed school. At the conclusion of the project the number had risen to over 50%. Students said, "It (use of technology) made my learning a lot more fun", and "I felt more connected to the learning." Regarding the learning partnership between teacher and student, almost 75% of students were communicating electronically with their teacher via their O365 board email accounts. One said, "I can just email my teacher if I'm having trouble and the response is faster than waiting a whole day just to ask her questions." With respect of the ability to share the OneNote binder with their teacher, students said, "She was able to go into my binder and check my work without having to stop me from what I was doing", and "The teacher was able to enter your work and give you feedback right there." Students believed they were more organized and efficient. One noted, "I started to hand work in on time and I felt as if I was more productive", and other stated, "Now that I have the OneNote binder I'm more organized than before and I can catch up on missed work at home which is very convenient." Students were not happy at the prospect of losing access to the computers and OneNote: "I might be more unorganized and all over the place", and "I might get behind in class."
Impact on Instruction	Our project impacted teacher practice in a variety of ways. One teacher said her classroom is now "95% paperless". She also noted that there are "no longer any classroom management issues". Students stated, "I now go right to work when I

	get into the classroom", and "Before this semester started I would rarely ask for notes I had missed. Now, the first thing I do, after I miss a class, is to check my online binder for the notes from the previous day." Another said, "I don't lose things anymore." Regarding teacher-to-teacher learning partnerships, a project SharePoint Site was created within Office 365. Teachers visited the site to share resources and offer technical support to their peers.
Impact on System	Our project contributed to system scaling by serving as a pilot for the system-wide launch of Office 365. Office 365 is now being used as a tool to moderate school improvement plans via a SharePoint site. Many departments within our board are now using the various tools for collaboration and content creation. Without our CODE project, this would not be the case. Our Project has also led to conclusions about how we will conduct future professional development. 38 teachers were released for two half-day sessions for training on models of technological integration and a variety of applications that could be used in class. 63% of teachers did not respond to a follow up survey. For those that did respond, 64% state they have yet to implement any aspects of the training. Based on this, our future professional development will focus less on large group training and more on school-based release time to plan and implement technology driven pedagogy. Accountability will be ensured through monitoring visits.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Durham District School Board

Project Title	**Technology Integration & Teacher and Student Collaboration in Grades 5, 8 and 9 Mathematics Classrooms**
Description	The purpose of this project was to align our current multi-year embedded instructional technology plan with our desire to gain a better measure of student engagement and achievement in mathematics classrooms. We likewise wished to build on our past years' 21st Century Learning project work in order to further the momentum we'd acquired with past training. This year's focus was geared specifically to teachers in grades 5, 8 and 9 and with respect to the subject of mathematics instruction and student learning. Our project involved the following: • Face-to-face training (full day training focused on integration of technology into mathematics instruction and to promote student learning) • Development of a web-based teacher instructional resource • Opportunities for collaborative lesson-planning (co-plan) both in a face-to-face and an online method of sharing lesson ideas between teachers • Provision of device bundles to each grade 5 & 8 classroom (6 devices per grade 5 classroom and 10 devices for each grade 8 classroom)
Context	*Number of students*: 9475 *Number of teachers*: 379 *Number of schools*: 130 *Grades/Program*: Grades 5, 8, and 9 mathematics teachers
Impact on Students	Data collection and project participation by teachers was halted in the DDSB in the spring of the 2014-2015 school year due to labour action on the part of both secondary and elementary teachers. This negatively impacted our ability to train teachers and for them to participate in project surveys and reviews. From the anecdotal data that was collected early on in the project, teachers reported improved student understanding and improved engagement.
Impact on Instruction	Teacher access of the 21st Century Math portal space was monitored in the first month of its use and showed significant increases weekly of individual teachers viewing resources. Likewise the grades 5 and 8 blog sites demonstrated a great deal of use with 100's of submissions prior to the work action. Early stage training surveys provided us with data suggesting that teachers ranked themselves 3.7 out of a possible 5 where 1 was weak and 5 was confident in terms of technology integration and use. It would have been our intention for further survey this population of teachers throughout the spring to gauge what we believe was an increase in their confidence and use of technologies in the classrooms. Teachers who participated in the training listed a variety of new strategies and activities that they were integrating into their classroom use of technology. Teachers also reported successfully using D2L and Gizmos activities

	for mathematics instruction and developing inquiry activities with a variety of applications. Key to our training this year was the fact that it was led by math specialists both at the K-6 and 7-12 level. These training initiatives were supported by Programs Technology Facilitators, however the "face" of the training was very much one of experienced classroom teachers in the area of mathematics. Our teachers reported feeling successfully supported, but most importantly, reported that the mathematics focus (unlike a technology focus), was directly related to their school's improvement planning process.
Impact on System	Our district has built a transparent and step-by-step instructional plan for the implementation of training and provision of devices in the coming years. We have successfully scaled our cloud services product to all students and staff and will be applying its use to the areas of mathematics in the coming years. We have built a scaled PD model for technology integration which has allowed teachers to approach their training at a level that is appropriate to their needs. Teachers considering themselves new to technology integration take workshops at a "101" level after school earning credits towards receiving their own laptop for instructional purposes as well as accessories such as speakers, locks and laptop bag. Our technology leaders in each school (called Educational Technology Leaders – ETLs), attend a Sept. symposium which provides them with the needed knowledge to train and lead their own teachers in each year's technology focus (this year's CODE focus was grade 5, 8 and 9 math). This conference gathers more than 200 teachers from across the district and is teacher driven and supported by central staff. This scaffolded approach allows our teachers in the classroom to present directly to their colleagues. Parallel to these training activities, our "math focus group" also received face-to-face training in embedded technology initiatives and is asked to return to their schools to train like-grade and divisional colleagues. Grades 5 and 8 teachers were also provided opportunities to plan lessons together at training events in the spring. Our current Board Improvement Plan also reflects the current technology integration plan and directs schools to consider how technology integration will appear in their school planning process.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Grand Erie District School Board

Project Title	**Effective Demonstration Classrooms & BYOD**
Description	The focus of the Grand Erie 21st Century Innovation Research Initiative is on Demonstration Classrooms as a form of teacher professional development to support change in teacher practice. Specifically, our Demonstration Classroom Pilots highlight the use of personal devices in the classroom to support student learning. We have chosen the above focus for our Innovation Research Initiative because our findings from Round 3 indicated that teachers needed to see what learning with technology looks like in 21st century classrooms. This led us to consider researching how to establish effective Demonstration Classrooms to support change in teacher practice that ultimately leads to deeper student learning.
Context	*Number of students*: 870 *Number of teachers*: 14 *Number of schools*: 13 *Grades/Program*: A representative sample of elementary and secondary teachers and their students from across Grand Erie
Impact on Students	The Demonstration Classroom pilot resulted in promising outcomes for students that require further study to understand fully. Our main research activity, the Student Work Study Teachers working alongside students in order to understand their learning, was cancelled due to ETFO job action. We are left with some promising findings but none that illuminate the impact on student learning. Secondary students were comfortable having teachers observe them and were amenable to having observing teachers in their classroom up to 4 times a semester. Key to their comfort is being briefed by their teacher in advance so that they know what to expect, and understanding that the teachers are there to learn and not to assess the students. Observations support what we have found in previous years: that students are interested in supporting teachers with the use of educational technology. We are encouraged by the implications for teacher-student partnerships and also with our decision to move forward with activities to grow and support them. Observing teachers reported that their students "loved" the new applications they introduced. The teachers reported a high degree of engagement, even to the extent of students not wanting to stop the activity. From the Ed Tech team notes, we recognize problems with WiFi that we still need to overcome. This causes some frustration among students. The main issue to overcome, however, is inconsistent teacher attitudes toward smart phones. Secondary students use mainly smart phones as their mobile device and want to use them in class. Throughout the board, many teachers do not allow them in the classroom. With BYOD, the board is promoting the use of personal devices as learning tools and Ed Tech is actively supporting teachers to leverage students' technology for learning. Students expressed frustration over the lack of a consistent messaging on smart phones in class.

Impact on Instruction	This professional development model was developed in direct response to our findings from last year's evaluation of the Ed Tech Initiative. Teachers asked for professional development that was peer-led, classroom-based, focused, and relevant. Feedback to the secondary PD was overwhelmingly positive. Teachers left the PD session feeling like they learned new things they could implement that would improve their practice. Teacher buy-in and approval for the professional development model is a promising success. We learned that 6 out of 7 teachers had implemented in their classrooms what they learned in the demo. The seventh teacher stated that s/he hadn't had time yet but did intend to at some point. We are encouraged by the high degree of uptake of learned material. Teachers experienced very positive feedback from their students regarding the new technology and most shared what they learned with their colleagues in their home schools. Some teachers asked for how-to guides, resources, content, and instructions to support their use of the application and student devices going forward. It appears that they feel there is a gap in support to the extent that if they had the resources to refer to, they would be "good to go" and could also more effectively share what they learned with their colleagues.
Impact on System	This pilot provided the information and results we needed in order to take the model system-wide. It is a decentralized model which means that the look and feel will vary across the board due to diverse locations, student/teacher culture, and priorities. Key to the success of the model are: • Time. Building time in the PD day for teachers to discuss curriculum and deep learning pedagogy related to the strategic use of the technology is key to making the learning for teachers valued for its impact on the effectiveness of their practice. Building time in the PD day for teachers to collaborate with colleagues strengthens professional relationships and makes the learning more relevant. Finally, building time in the day for teachers to learn the technology, practice, and set it up for their class enables the successful implementation in their own classroom. • Keeping it simple. Teachers readily implemented an easy and effective application that they saw demonstrated. The results were very positive. Students reacted favourably and encouraged their teachers to do more. We know from the educational research literature that experiencing successes in the classroom is an effective influence on teacher risk-taking in changing their practice. Key to the success of the Demonstration Classroom model is introducing simple tools that are effective, easy to set up and deploy.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Greater Essex County District School Board

Project Title	**System-Wide Implementation of Technology-Enabled Pedagogy to Support Higher Order Thinking and 21st Century Competencies**
Description	We believe that the investment in the formal and informal leaders in our system provides the necessary foundation for innovation to thrive and the conditions in which pedagogical change can occur and be effectively supported. The work we are asking our teachers to do is difficult and different. We needed to focus on how to make this work sustainable, impactful and possible. *Digital Learning Team* We have pockets of excellence, where teachers are at the cutting edge of technology integration and changing the shape of learning. We were confirming time and again that our work to provide a foundation of support to formal and informal leaders, and creating the conditions and culture for innovation to happen, was the key to spread and sustainability. The aim of this project was to spend a half day providing professional learning for every teacher in our system from Kindergarten to Grade 12, focused on the digital learning tools available through our board (specifically Office365), the application of the SAMR framework and how it influences changes in the tasks were are asking students to do, as well as a focus on where the "6 C's" (Fullan, 2012) are evident in the classroom. *University of Windsor Collaborative Inquiry Partnership* We continued to work with the University of Windsor to fund innovative collaborative inquiry projects in our board. This year there were four projects, in addition to the ten board/University funded research projects. For this project, teams are released for a "launch" day, where they are supported in organizing their topic, creating inquiry questions and theories of action, and starting to plan for their inquiry, including how they will gather data. This project has become one of the places where we are able to support true teacher innovation. *21c Project* Part of our innovation and research work in the previous years of funding was exploring Fullan notion of the 6 C's. We set up a few classes where teachers explored the idea that the 6 C's emerge from student inquiry and from taking an interest in society and social justice issues. Ten teachers were given the provocation to allow their students one hour per week "to improve something in the world". This work was impacted by the provincial work action and will be resumed in the 2015-2016 year. *Student Leadership Project* We continued to work with the same structure as previous years in our student leadership project. We worked this year with a further nine schools in this project. Other areas of focus included: • 21c Project • Administrator Support • System-Wide Math PD • DreamBox

	• Special Education Support • Microsoft Academy • Microsoft Summit These areas are reported in the artefacts.
Context	*Number of students*: 35,600 *Number of teachers*: 2,322 *Number of schools*: 78 *Grades/Program*: K-12
Impact on Students	The impact of this work on student achievement can only be determined to a point, in part due to the limitations placed upon us by the political situation. *Digital Learning Team* Every student in the system has engaged in ½ day of learning about digital citizenship and responsibility. Our school climate data shows that there has been no growth in electronic means of bullying (although it still exists) and that the vast majority of our students attend school in a safe environment and are aware of how to deal effectively with the challenges of the digital world. Anecdotally we have heard from schools that instances of problems stemming from these types of issues are down, but we have yet to verify through our incident reports. *University of Windsor Collaborative Inquiry Partnership* The research conducted in this partnership pointed to a few key areas of student learning that were impacted: "Flipped Classroom" - Students in a flipped classroom in secondary science demonstrated increased understanding of course content. "6 C's Inquiry" – Students involved in self-directed inquiry addressing issues of social interest saw increases in their frequency and depth at which the 6 C's were evident in their work. Microsoft Academy –Students in this program were observed to be engaged in learning and developing confidence and the ability to reflect upon new learning and feedback.
Impact on Instruction	*Digital Learning Team* From a pedagogical perspective, we know that every teacher in the system has had learning based on using digital work tools, both as a professional and to support teaching and learning, and have been involved in conversations about the SAMR framework and a reflection on the impact of technology on task. There have been significant changes in practice in a significant number of classrooms. Because we are not able to run a second round of the Apple testing tool, it is not clear the extent to which this is, but it will emerge. Our second system review of technology in the classroom will also provide measures for this, and we will continue to find ways, post EQAO and work action, to tie pedagogical changes into increases in student

	achievement as a result of this work. *University of Windsor Collaborative Partnership* "Flipped Classroom". Teachers took on the role of creating technology-based instructional supports, and subsequently exploring a wide range of classroom teaching strategies with the "extra" time they generated. Collaborative learning in the teacher partnerships was evident, between and across schools, and the relationship between teacher and student saw positive changes. "6 C's". These educators were driven to put the students in the lead of their own learning, pursuing not only topics of interests but topics that were based on social interests and were actionable. *Student Leadership Project* This project clearly shows a changing role and attitude of the teacher in the class away from a teacher-focused learning experience and towards a collaborative one where every learner has a voice, both in the learning content and in the tools they use to present said learning.
Impact on System	Our work has essentially been a cycle of innovation with the ultimate goal that ownership for the work lies at the school level. By enabling innovation, taking the lessons learned to inform system change, and then supporting schools and teachers to explore the potential of these changes, we are engaging in a system inquiry cycle where the ownership is in the hands of those doing the work. The innovations we spread are those that teachers, students, and administrators are experience success with, rather than a top-down implementation of ideas and models. This, coupled with the fact that we have a clear and explicit approach to building the capacity of our formal and informal leaders to "do" this work, is a clear illustration of a responsive school system tailoring learning experiences to the needs and successes of the schools. The fact that the leadership of this work, and the setting of future direction, is now at the senior administration table, and is part of conversations around BIPSA, Strategic Plans, and all areas of system learning and change, shows that we have built the importance of this work into our system improvement plans.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Halton Catholic District School Board

Project Title	**Professional Learning in the 21st Century: Sharing Responsibility Throughout the System**
Description	This year's project was an expansion and refinement of last year's focus on our need to expand and systematize 21st Century teaching and learning in our board. Our data to date indicated that the professional learning model - teacher-lead collaborative inquiry supported by research and professional learning provided by the board team - was successful in producing lasting changes in teacher practice and in student learning, and helped us to identify three key areas of continued investigation and support: • Building capacity through sharing the learning in the project schools • Building the capacities of leaders through system-wide sharing • Building system capacity by connecting other 21st c projects in the board to the CODE projects We made five particular changes based on data from last year and our understanding of Chris Dede's five sources of leverage: • Including principals more explicitly in inquiry groups and in large group sessions • Expanding the number of teams • Changing the composition to include a combination of self-identified applicants and invited teams • Using last year's team leads as mentors to the new teams • Including an IT contact for technology purchases and distribution as well as acting as a resource in the large group sessions We supported 18 inquiry projects this year: • 5 self-identified • 10 were identified by us based on our data about student:tablet ratios • 3 were self-identified from last year but had substantial changes to their team's makeup (including the departure of the team lead Each project was asked to provide evidence of best practices of students' learning and demonstrating the board's 21st century outcomes. Teams developed an inquiry question, theory of action, and implementation plan for professional learning and for collecting evidence. Teams then met according to their implementation plans. Next, the focus was on identifying and collecting quality evidence, refining their learning plans, and reviewing the requirements for budgeting and reporting. The final meeting was an opportunity to analyse and present results/artefacts, invite friends, and allow for sharing within the district facilitated by our communications department Each team produced a final report. This information is part of the data analyzed and submitted for this report. It will also be used within the board to build capacity and share the learning.

Context	*Number of students*: 1525 *Number of teachers*: 61 *Number of schools*: 18 *Grades/Program*: K-12
Impact on Students	While our project focused on educator learning, evidence of student learning has been reported from the project teams through open-ended items on the survey as well as through their individual project reports. In general, survey respondents noted an increase in student confidence in their use of technology and in engagement in activities. In some cases, survey respondents reported that students demonstrated the 21st century outcomes of deeper critical thinking and problem solving skills. The following sample response illustrates the findings: "*My students have an increased level of confidence when accessing technology and feel a greater attachment to the work they produce as they have been a greater participant in the learning process*."
Impact on Instruction	Teachers were eager to share the impact of this work on their classroom practice. Many participants mentioned how their understanding of collaborative inquiry - and of student inquiry - had deepened. As well, teachers named particular tools and technological skills they had acquired during the sessions. Many of them connected those tools to specific learning outcomes. A comprehensive and thorough analysis of the data was completed. The following samples from the survey illustrate these changes: *"As a result of my increased level of confidence in the inquiry based approach has allowed me to release control and allow my classroom practice to be student lead. This has consistently lead to enhanced curriculum delivery and increased student engagement.* *"The project has opened up my learning practices as far as intriguing me to want to know more about technology and how it works with inquiry in the classroom. There is still a lot for me to learn about inquiry and being a part of this project in the future will allow me to do that."*
Impact on System	This initiative, combined with the other parts of the TLF, has enabled us to deepen and spread the pockets of innovation where the board's vision, blueprint, and 21st c student outcomes were supporting student learning. The funding provided both professional learning and release time for teachers engaged in inquiry which helped them to feel empowered and excited by their learning. Our survey data, as well as our observations and exit tickets from the large group sessions, have helped us to identify some successes and challenges of our work in this round. We believe that one of the ways to achieve system scaling is to have school and system leaders more engaged in the work at both the school and system level. In the planning stages we asked the ten principals of the schools invited to participate to identify a project lead and to attend the launch session in April. Our analysis showed some similarities and differences between

	administrators' and teachers' responses that will help us to think about our next iteration of the project. Using Dede's dimensions of scale and reflecting on both the sources of leverage and traps helped the board team to plan changes to the Round 3 project to have a larger impact on the system in Round 4. One of the changes to the consolidation session was having the project teams use Dede's model to reflect on their own work as well as on the board team's inquiry question, theory of action, and evidence in an effort to address Dede's shift and move beyond brand. Continuing to make our learning transparent as a board team, and to include the teams in our thinking and planning, are other powerful ways to help the board project evolve on its way to scale. Emphasizing the connections among the parts of the TLF projects, the innovation project, the board's blueprint, and the student outcomes helped provide coherence and direction for the system. Common themes of self-directed and collaborative learning for teachers and students, time to plan, implement, reflect, and innovate, and active participation from all roles in the school and board emerged from these initiatives and will need to be taken into consideration as the work evolves. Finally, the board will be engaging in renewing its vision and strategic plan. The 21st century blueprint is part of that vision and plan and will be revised accordingly. As well, the board has just released its BYOD policy and will be focusing on our student outcome of Catholic digital citizenship. We anticipate launching a new 21st Century website to share this work and to spread and sustain the work. This project data will support us in shaping and sharing our next steps as we continue to work to scale the learning.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Halton District School Board

Project Title	**The Impact of School-Based Innovation Projects on Student Learning**
Description	Multiple schools (elementary and secondary) are involved in teacher-led projects focused on student learning opportunities incorporating technology. Each school submitted a proposal identifying an innovative idea targeted to increase student achievement and connected to the HDSB Multi-Year Plan (2012-2016). They are following an inquiry approach and will be asked to submit their final reports post sanctions.
Context	*Number of students*: 450 *Number of teachers*: 30 *Number of schools*: 6 *Grades/Program*: Grades 4-12
Impact on Students	*Integrating Inquiry and Technology* • Students were provided the opportunity to further develop their inquiry skills and collaborate during school and after school through cloud-based collaborative learning. There was an increase in peer-to-peer interaction. • Deeping of student learning through authentic and relevant inquiry *Activate!* • Improved attention and participation has led to increased student engagement. *Grade 4 – 6 Pathways: Connecting to the "Real World"* • Changes in traditional student-teacher roles through the inquiry processes as identified in Creating Pathways to Success • Increase in student engagement via the opportunity to explore their passions and interests *Teaming Tables to Improve Student Learning* • This has helped students, especially students who are anxious with presenting, to develop confidence and self-assess their presentation skills. *Small Group Guided Instruction in Math* • Students are developing strategies to work flexibly with numbers and using DreamBox to further represent their thinking with models. • Gamification in the learning technology is connected to increased student engagement. • Adaptive learning technology is promoting engagement in that students are provided learning using technology based on prior learning.

Impact on Instruction	*Integrating Inquiry and Technology* • Increase in teacher capacity to delve into seamless learning environments (organic, spontaneous use of technology and inquiry-based learning • Opportunities for descriptive feedback using cloud-based learning environments (e.g., comment feature) • Availability of Chromebooks supports peer collaboration • Deepening awareness of SEF – "Teaching and learning in the 21st century is collaborative, innovative, and creative within a global context" *Activate!* • Staff is engaged in dialogue around effective pedagogy in this learning environment. • This learning environment is supporting students in their further development of their learning skills. *Grade 4 – 6 Pathways: Connecting to the "Real World"* • Learning partnerships within the school to co-develop learning activities and provide grade team resources (shared via the Cloud) • Conferencing with global "experts" via social media *Teaming Tables to Improve Student Learning* • Teacher assessment processes are impacted as a result of this innovation in that students are provided descriptive feedback by peers and/or teacher on student presentations. • Alternative format/setting for presentations has been a change in teacher practice. *Small Group Guided Instruction in Math* • Explore format for M.A.T.H (i.e., Meet with teacher, At desk, Technology to access DreamBox, Hands on) • Teachers are delving deeply into the Landscapes for Learning mathematics. • Teachers are examining student DreamBox data and using this information to track progress on the Landscapes.
Impact on System	Analyzing the data from the inquiries will help confirm the impact on student learning as well as the efficacy of collaborative teacher inquiry as a learning model. Strategies and resources from the most successful inquiries can be shared and scaled across the system. *Integrating Inquiry and Technology* • Opportunities to engage in teacher moderation in French Immersion programs • Inquiry related to the Social Studies, History and Geography curriculum

	(revised 2013) and French as a Second Language curriculum (revised 2013) • Sharing of embedding aspects of CEFR and pluriculturalism • Work with Instruction Program Leaders to discuss successful strategies *Activate!* • Different schools are visiting the Active learning classroom and discussing the implications for the learning environments across the system *Grade 4 – 6 Pathways: Connecting to the "Real World"* • Learning to be shared at upcoming system-wide PD Day and/or HDSB Symposium 2.0 *Teaming Tables to Improve Student Learning* • Sharing of learning with librarians in the system • Closing the Gap funding implications shared with HDSB and provincial vision for libraries (i.e., Learning Commons) *Small Group Guided Instruction in Math* • Sharing via school-based Lunch and Learn • Staff meeting sharing of data and reflection on actions to engage students and parents *Moving from Me to We Space!* • Sharing of learning with librarians in the system • Closing the Gap funding implications shared with HDSB and provincial vision for libraries (i.e., Learning Commons)

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Hamilton-Wentworth District School Board

Project Title	**Transforming Learning Everywhere - Phase One**
Description	H HWDSB's vision for 21st Century Learning, Transforming Learning Everywhere (TLE), challenges us to create a culture of engaged learners (staff and students) by focusing on instructional practices being used in our classrooms, accelerated by digital tools. Our goal is to improve the essential skills of problem solving, critical literacy, higher order thinking, in addition to foundational knowledge and skills that are required in the 21st century. Central to our vision is the instruction (or pedagogy) that occurs in our schools. Every day educators make critical decisions about how to design, deliver lessons and assess student learning. Educators use both evidence-based approaches and new innovative practices, all while ensuring we meet the key Ontario curriculum expectations. Transforming Learning Everywhere is also about accelerating instruction with technology/digital tools. Our educators are engaged in training and are provided with access to resources to support the development of engaging, rich learning tasks. What will result is instructional practice that will increase student engagement and improved learning outcomes (in foundational skills as well as problem solving, critical literacy and higher order thinking) in both the physical and digital world. There are four projects in Phase One: • All grades 4-8 classes at seven elementary schools in the same geographical region are implementing inquiry based learning with a focus on critical literacy, problem solving, and higher order thinking supported through 1:1 tablet technology for all students and teachers. • All teachers and students at a secondary school were provided with tablet technology to allow for innovative delivery model. Staff and students had access to digital tools and resources through Desire2Learn (i.e., the Hub). • Following an interdisciplinary approach, staff have been working collaboratively to increase the efficacious use of assistive technology with a 1:1 ratio at a secondary school. All teachers and students were provided with tablet technology. • Sixteen schools in one geographical area participated in "New Pedagogies for Deep Learning", a program that involves schools from all over the world. The program involved implementing change by providing professional development and job-embedded support to create new learning partnerships.
Context	*Number of students*: 3500 *Number of teachers*: 240 *Number of schools*: 25 *Grades/Program*: Grades 4-12

Impact on Students	We have learned that our classrooms can be transformed with appropriate supports and when expectations are provided to both staff and students. It can be challenging to accept, by both staff and students, that it is no longer just one person (i.e., the teacher) that holds all the expertise and funnels information to students. Just as we recognize that our students are all at different points on the continuum of learning, so are our staff.
Impact on Instruction	Continuously gathering feedback from staff through surveys, departmental meetings, and focus groups, allowed for staff learning needs to be addressed. Teachers worked in grade, division, department heads, and cross subject teams. Through the use of a self-reflection tool, teachers were provided with an opportunity to reflect on their abilities and recognize the support that they might need. Encouraging staff to take leadership roles in supporting peers, teachers became mentors for other staff within their building. One of the most exciting things observed was the sharing of ideas and solutions. It was clear that many of the challenges reported by teachers were common to all of the schools, but each school had solved these challenges in a variety of ways. Sharing the "successes" from different schools helped all schools think about how they might approach their challenges in a different manner. We have learned that when trusting relationships exist, staff are open to sharing their challenges as well as their successes. For example, when teachers participated in a focus group to discuss implementation of TLE, they were forthcoming with each other regarding challenges they have experienced trying out new instructional practices. In other cases, teachers were very interested in showcasing their learning journey.
Impact on System	We learned the importance of supporting staff prior to the deployment of devices to their students, including introducing them to the resources that are available and how to create blended learning environments that use an inquiry-based approach. The experience of the IIT team during the deployments and subsequent support of iPads in the schools has revealed some key learnings. For example, we learned that the deployment of a large number of iPads within the first two months of school start-up required a lot of staff support, collaboration, and problem solving to ensure each staff and student device was connected to each of their HWDSB credentials (i.e., login and password). We also learned that the level of wireless connectivity, security and internet bandwidth that was provided at these 9 schools sites was sufficient and that little to no downtime was experienced.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Hamilton-Wentworth Catholic District School Board

Project Title	SAMR Learning Model
Description	The purpose of this year's Innovative Research Initiative was to examine the impact of teacher issued digital technology on student learning within the primary and junior divisions. This initiative grew out of key learnings obtained through the HWCDSB 2013-2014 Innovative Research Project, and was in alignment with the goals identified within the HWCDSB Board Improvement Plan for Student Achievement and the overall goals of the Technology Learning Fund (TLF). *Part A – Junior Divisional Project* The Junior Divisional project involved twelve teachers ranging from grades 4 to 6. Each project participant received a technology package consisting of an iPad Air and case, an Epson speaker system, a lightning to VGA adapter, a stylus and iTunes card. Teachers participated in three collaborative learning sessions which incorporated basic iPad training, an introduction to OneNote, apps to make student thinking visible, apps and tools to support assessment, Educreations, and Skype. All sessions included focused discussions on 21st Century skills, the SAMR Framework, the use of technology in assessment, and embedded time for reflection. *Part B – Primary Divisional Project* The primary divisional project was comprised of two groups. The first group consisted of FDK educators from 26 classrooms in 10 elementary schools. Project educators participated in professional development sessions over a three month period during which they used iPads to capture evidence of student learning, apps to create and organize their pedagogical documentation, and desktop computers/laptops to share learning stories within a D2L based virtual learning environment (vLE). All participants were enrolled in the Sample FDK vLE which provided an online community for professional networking, the sharing of resources (QRCs, website links, etc.), and the demonstration of and experimentation with various vLE tools. The second primary divisional project group included additional FDK educators, as well as all Grade 1 teachers and special education resource teachers from all elementary schools. This allowed for capacity building for all FDK and Grade 1 teachers in understanding how documentation supports the implementation of the assessment continuum.
Context	*Number of students*: 6679 *Number of teachers*: 282 Classroom Teachers, 43 Special Education Resource Teachers, & 127 Designated Early Childhood Educators *Number of schools*: 48 *Grades/Program*: Grades K-6

Impact on Students	*Part A – Junior Divisional Project* The impact on student learning was determined through the analysis of participant shared student tasks, involving the use of technology, in relation to the SAMR framework throughout the project (pre-project, mid-project, and post-project). Project findings show that teacher involvement in the project led to increasingly more sophisticated integration of technology. This was evidenced by the decreasing percentage of students tasks deemed to be at the substitution level within the SAMR Framework over the duration of the project. *Part B – Primary Divisional Project* The main focus of the primary divisional project was to build educator learning partnerships and capacity in using technology to support the development of pedagogical documentation. During the project, survey data and the analysis of educator shared samples of pedagogical documentation provided some evidence of how the research initiative impacted student learning. Participant feedback highlighted that educators felt that the classroom iPad and vLE assisted in making student thinking visible to students, parents and educators. These tools allowed students the opportunity to revisit, reflect on, and extend their learning.
Impact on Instruction	*Part A – Junior Divisional Project* 92% (11 out of 12) of junior divisional project participants indicated that their involvement in the Innovation Research Initiative increased their comfort level in using technology to support teaching and learning. [Eight] of the 12 project teachers indicated through the post project survey that the introduction of the teacher iPad in the classroom has already impacted what students are doing in the classroom. Of the remaining 4 participant teachers, 3 indicated that they are still getting familiar with the technology. One teacher identified the iPad as a useful tool to collect student samples of learning and student data and that having the teacher iPad helped solve work flow issues. All project teachers indicated that face-to-face small groups sharing and the Yammer group fostered the development of educator learning partnerships. Analysis of teacher feedback indicated that all teachers found the time designated for small group sharing of how the technology was being used in classrooms to support teaching and learning to be invaluable. It is interesting to note that 10 of the 12 participating teachers commented that the introduction of the teacher iPad into the classroom fostered the growth of teacher-student learning partnerships, even though this was not a focus of the project. Teachers shared that they were learning from their students as the students helped them problem solve with technology, while some shared that the technology was changing the learning environment in that students seemed more eager to participate, share their thinking, take risks and ask questions. In addition, half of the project teachers noted that the iPad allowed for better capturing of evidence of learning and determining next steps for instruction.

	Part B – Primary Divisional Project Through this project, participants discussed the use of iPads to capture evidence of student learning and a variety of apps to generate pedagogical documentation. Data collected from teacher surveys indicate that 77% of post-project survey respondents indicated increased comfort in using technology to support pedagogical documentation. The marked increased in educator comfort level in using the technology to support pedagogical documentation, coupled with the growth in the use of the LMS to assist in making student thinking visible and support student learning led to conclusion that the proposed theory of action did indeed promote the more sophisticated integration of technology into instructional/assessment practices.
Impact on System	*Part A – Junior Divisional Project* The junior divisional project's findings, showed that if we provide teachers with mobile technology, and support them in its use, digital technology will promote the development of educator learning partnerships and instructional/assessment practices that incorporate increasingly sophisticated use of technology. The expansion of the junior divisional project's professional development model will be a key step in supporting system scaling of pedagogically-driven, technology-enabled practices. As more and more teachers become comfortable with technology and engage in the development of deep learning tasks that support the acquisition of 21st Century learning skills we will build capacity among educators. This new learning has driven system action to build awareness of the SAMR Framework and integrate technology into all professional development sessions in an effort to develop system-wide awareness and understanding that the purposeful integration of technology is not simply a classroom event, but a tool ignite and support deep learning. *Part B – Primary Divisional Project* The research initiative has provided clear evidence that pedagogical documentation remain a focus of primary divisional professional development opportunities. The importance and impact of educator learning partnerships in developing educator comfort in using technology to support pedagogical documentation was a key learning from this initiative. As such, efforts will continue to be made to establish and support primary divisional educator learning hubs to further enhance technology enhanced assessment practices that reflect deep learning pedagogy. The use of the LMS within the primary division continues to grow with more and more educators expressing interest in establishing a classroom vLE. As a result, additional small group professional development opportunities will be organized to assist new educator teams in establishing a classroom vLE.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Hastings and Prince Edward District School Board

Project Title	**Google Apps for Education**
Description	The primary focus on moving to the Google Apps for Education (G.A.F.E) environment is one of equality of access; however, the benefits range far beyond that initial focus and include: collaboration, dynamic feedback, and access to a powerful suite of tools. The goal of the project was to introduce staff and students to the new technology and to begin to develop capacity towards a system-wide adoption of G.A.F.E. To that end the project incorporated elements of: • Training for administration, staff and students • Discovery of appropriate third party apps • Exploration of integration with current technologies
Context	*Number of students*: 1000 *Number of teachers*: 80 *Number of schools*: 20 *Grades/Program*: The focus for evidence is 9 - 12
Impact on Students	Students working with GAFE have been impressed that they can now work more effectively with a tool that they have been using for years. The interaction with teachers is a benefit and the potential for *interactive descriptive feedback* is exciting. Sharing with teachers, peers and parents is simple. GAFE removes blocks to student learning and allows students to access resources 'on their own terms'. The descriptive feedback is having an impact on student learning, as students are able to do more with the feedback in a faster fashion, which is helping close the gaps for students. Further, introduction of tools like Google Classroom and Calendar allow students to organize their time, work and assignments in meaningful and dynamic ways. With increased access to technology –in the form of additional Chromebooks in the system- students are able to have choices in the how and when they will be accessing the suite. These additional devices become a support to those without their own personal devices or as an alternative when the work is too heavy for these smaller devices. The ecosystem of a Chromebook is familiar and does not intimidate students in the least. As evidenced by our Administrative Reports, students are using G.A.F.E. to interact, collaborative and create their work. They have become a driving force behind the change in H.P.E.D.S.B. In many cases, our findings indicate that we have more secondary students using the technology, staying engaged in school and earning credits in a variety of learning environments including blended learning, collaborative learning, and self-directed or student inquiry based learning. We have noticed increased task submission, as detailed in our BIPSA monitoring question feedback from a school where Google and Chromebooks were used. We have also noted improved quality of student work where technology has been mindfully integrated into the learning experiences of students.

	We were intentional in a few specific, targeted areas where we used Google Apps and Chromebooks. For our Children and Youth in Care, access to learning through a collaborative environment has been significant in supporting these students in their academic success. Students were able to work in diverse places which increased student engagement, and work completion. As well, we noted in several areas the impact for students who are in the Locally Developed course type. Student learning increased, as did task completion, as students no longer had to struggle with their organizational skills. This helped them to be more successful.
Impact on Instruction	Teachers worked on learning the ins and outs of this powerful and dynamic ecosystem of tools. The impact of working with GAFE isn't just substituting Google Docs for Word, it changes the way teachers can interact with students, deliver feedback and collaborate. Expanding these tools out to the rest of the ecosystem and third-party apps, teachers are being offered a complete toolbox of dynamic, collaborative tools for the classroom. Since September 2014 -when it was first launched- teachers using Google Classroom in H.P.E.D.S.B. has grown to 466. This shows a significant dedication to the kind of collaborative teaching and learning that G.A.F.E. offers our students. In order to use Classroom effectively a teacher needs to be invested in working with Docs, Slides, etc. in order to make full use of the service. G.A.F.E. has more deeply impacted the pedagogy of learning. The collaborative nature of the system is changing the way students interact with teachers, the way teachers interact with students, the entire nature of the traditional model of the classroom. In a G.A.F.E. classroom, the teacher becomes a guide and can provide individualized instruction to students in a safe, convenient and efficient manner. Students feel safe and are willing to take important risks with their learning. The sheer volume of teachers moving over to Classroom and using Docs shows the impact of the tool on the way they approach their interactions with students and with each other.
Impact on System	G.A.F.E. by far has proven to be one of the most dynamic game-changers in Education. When looking at use of GAFE, the February numbers show approximately 79000 shared files; the June numbers show approximately 178000 shared files. This shows an increase of approximately 125% growth in five months. But beyond the numbers, this shows a deeper connection to the G.A.F.E. environment. Not only are students creating and working with files on-line, they are doing so together, collaboratively. Even more information can be gathered when we look at Google Drive and storage is being used. The bulk of Drive is taken up by Google Docs and File Uploads (Videos, Pictures, PDFs, etc.). This shows us that staff and students are turning to G.A.F.E. to produce Google Docs and to store non-G.A.F.E. files. This is an expected outcome and a welcome one as it shows a growing dependence and use of the G.A.F.E. environment. It also shows that non-G.A.F.E. files are being 'shared' through G.A.F.E. again illustrating staff and student growing use of this feature.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Huron-Perth Catholic District School Board

Project Title	**Blended Learning: The 21st Century Inclusive Model**
Description	Our blended learning implementation plan has been extremely successful in supporting increased levels of communication, collaboration, and differentiation in the classroom. At the anecdotal level, we have received feedback from teachers that students with SEA equipment have been positively impacted by the addition of community devices in the classroom. As a result, teachers have reported that students with SEA equipment are actually using their devices more consistently (or the community devices) resulting in an increase in work produced and time on task which will lead to improved achievement. This reflection warrants additional research as the 21st Century classroom that has many different devices in it may be the best way to support students with an LD.
Context	*Number of students*: 2500 *Number of teachers*: 20 *Number of schools*: 18 *Grades/Program*: Grades 4-8, 10
Impact on Students	*Our Summit Series* The Blended Learning strategy promotes the use of technology to become a better communicator and collaborator. The student summit series reached approximately 650 students and our staff summit had over 35 teachers. The goal of these summits was to create a culture of "sharing" of innovation so all students would embrace innovation as a strategic approach to learning. We focused on how each student has a "digital pencil case" that is filled with innovative 21st century tools to help students connect, collaborate, and feel empowered in an inclusive classroom. We feel we succeed in "normalizing" technology use for students….a mindset shift has begun to occur where students hopefully no longer feel isolated or singled out for using SEA equipment. *Comparison of Data* A comparison between the pre and post data strongly indicated that collaboration and inquiry learning is more accessible to all students; that it allowed students to learn at their own pace, increased student engagement, and increased assignment completion. Students' feedback also made it very clear that they want more Chromebooks and expect a stable WiFi connection in the classroom. The data also suggests that by teaching all students, not just students with SEA equipment, the technology became a part of the learning process and assignments rather than just a means to an end (process to do the work). This indicates that the "normalization" of technology use for students with SEA equipment becomes entrenched in community practices. In fact, the trained inclusive educator who led the summits reflected, "I never knew or could tell who the students with learning disabilities were…I just saw a community of highly engaged students." The themes that emerged in the student voice were that about 75% of the

	students indicated the technology made a big difference to their learning. "Having enough devices in our classroom on a daily basis permitted students to work at their own pace, giving each child an equal opportunity to complete his/her best work. Students who are reluctant writers are now able to complete paragraphs on their own." *Case Study* A member of our research team worked in three schools to support and study the project. This invaluable aspect of the project highlights that technology transforms the learning environment for students with a learning disability. A teacher reflected, "Now students are choosing new partners and are no longer overlooking the students with learning disabilities." Another said "When all students are working on different forms of technology, no one necessarily realizes that they may be working a task that is different than his/her peers."
Impact on Instruction	*Our Summit Series* Teacher voice suggested that the Classroom Learning Summits allowed teachers to learn the technology (i.e. Chromebooks, Google Drive, Google Read and Write) with students and to master its use as they were able to go through the summit process twice. This was carried into the classroom as teachers were given examples of how to use the platform for their own activities. In addition to the summit series, teachers in the blended learning project had opportunities of additional professional development to help implement aspects of the project. We created a "coaching program" where highly effective and experienced blended learning teachers received additional training so they could offer more support at their respective schools. *Comparison of Data* Teachers in the focus group indicated that the focus on communication, collaboration and differentiation supported their pedagogy and increased their ability to be effective in these areas. A comparison between the pre and post data strongly indicated that the available technology offered many opportunities for differentiation and repurposing of time, learning was more student-driven, encouraged student independence, allowed for more time to work directly one-on-one with students who needed more assistance, allowed for feedback to be given immediately, allowed more opportunities to meet with small groups as all students were engaged. This data suggests that it was easier to follow through on delivering great pedagogy at the point of instruction in the classroom. The teacher survey demonstrated most teachers felt it is easier to give feedback and support small group instruction when technology is in the classroom. *Case Study* The data also suggests that teachers feel that they are better able to meet the needs of all of their students in their classroom through the natural effects of differentiation that using tools such as Google Read and Write affords. They also feel that students with specific learning needs were now feeling part of their classroom community as their learning strengths could be used to support their challenges.

Impact on System	Through this initiative we have determined that providing training and technology for ALL students aids in normalizing the use of technology. In light of this, we have seen positive results when aligning this initiative to others in the board. HPCDSB has provided support, professional development, and training to various groups across the system including Principals, EA's, and SERT's. Other board initiatives, such as Cross Panel Math, Student Success, school-based PLC's, SWST work, and our Curriculum support teacher have also been supported by this Blended Learning initiative this school year. This alignment of initiatives and programming ensures coherence, consistent support, and deep, authentic implementation across the district. As we move forward in planning for next year (BIPSA development, portfolio distribution of personnel, professional learning opportunities etc.), we look to build on our successes by continuing to focus on these pedagogical and technological-enabled practices. To that end, we are again dedicating financial resources to ensure that there are enough devices at the point of instruction and that the pedagogical development of teachers matches the technology-enabled learning and teaching goals we have laid out. We will strive to ensure our students requiring technology to access the curriculum and demonstrate their learning will do so most willingly and with confidence given the efforts put forth into normalizing the use of technology for all students. In terms of building capacity and sustaining change, we have added blended learning to our board improvement plan. Moreover, we have identified blended learning as a main enabler to support our cross-panel math and junior math initiatives and our learning disability goal. We have also committed to building principals' capacity of blended learning by offering a webinar series, a "looks-for" tip sheet (on what blended learning looks like in the classroom), and other professional development support at principal meetings.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Huron-Superior Catholic District School Board

Project Title	**Job-embedded professional learning for grades K to 8; Innovative technology-enabled teaching and learning in Mathematics**
Description	Our project focused on technology-enabled teaching and learning for students in Kindergarten to Grade 8, with a focus on Numeracy/Mathematics. Aligned with the purchase of iPads, we provided professional learning opportunities through a job-embedded model. Teachers were provided training, support and in-service on the use of the iPads to develop authentic and deep learning tasks. Three Technology and Learning Special Assignment Teachers were released from March to June, to provide the job-embedded training and support for our elementary classroom teachers with a focus on Numeracy/Mathematics. The roles and responsibilities for the three Special Assignment Teachers included; co-develop the deep learning task(s) with the classroom teachers, teach the lesson with the classroom and debrief with the classroom teacher on the impact on student learning. The use of technology was to provide deep learning tasks to our students, otherwise not available without the technology. We were also looking to provide a means to facilitate teacher-to-teacher sharing and collaboration of the deep learning tasks and the classroom experiences. To facilitate the sharing and collaboration, the Special Assignment Teachers developed a web blog with sample lessons used in their work with classroom teachers, reflections and artifacts from their classroom experiences. Furthermore, the Special Assignment Teachers have contributed to our Board Mathematics Action Plan, embedding technology-enabled teaching and learning deep learning tasks and activities.
Context	*Number of students*: 2300 *Number of teachers*: 100 *Number of schools*: 19 *Grades/Program*: Grades K-8 Mathematics/Numeracy
Impact on Students	Beliefs are shifting towards the idea that by using the right technology, combined with a sound pedagogical approach, teaching and learning can be more engaging for our students resulting in improvements in student achievement. In the post in-service teacher survey, 67% felt that the quality of student work improved during the job-embedded technology-enabled deep learning tasks. Also, evidence of increased student engagement was apparent as students once reluctant to engage in mathematics conversation and tasks, are now sharing their thinking and becoming risk-takers. Data supporting this comes from the post in-service teacher survey, where 77% of responding teachers felt that students who were previously reluctant participants in Mathematics became more engaged and 79% have noticed a positive change to students' approach to learning Mathematics. According to the results from the post in-service teacher survey, 86% of respondents believe that students can communicate and demonstrate their understanding using a variety of technological tools. This scaling up could have profound effects in our rural

	district schools where classrooms are composed of multiple split grades (i.e. 5/6/7/8). Technology can enable students to connect mathematics to the world around them. By providing students with real world, authentic tasks we can are providing our students with a deeper level of learning. Technology enables student collaboration (digital problem-solving and sharing of ideas) across a classroom or a school board in real time. Peer-to-peer feedback in a digital bansho helps inform the language of feedback for the teacher to student-friendly understanding. According to the post in-service teacher survey, 67% of respondents believe that students are now using technology to share their ideas and thoughts with the teacher.
Impact on Instruction	There has been an attitudinal shift among many stakeholders within our board (i.e. Board Administration, School Administrators, Teacher and Students) on the effectiveness of technology in the classroom. In our post in-service teacher survey, 91% of responding teachers report that they now feel that technology (ie: laptop computers and tablets) can improve student achievement and performance, compared to 78% in the pre in-service teacher survey. Through this project we have also noticed a change in teacher's responses to allowing students to bring in their own devices; our board has a BYOD policy. The results from the pre in-service survey indicated 58% of our elementary teachers sampled were reluctance to allowing students to bring their own devices to class. A shift in the attitudes and beliefs towards BYOD was evident as only 27% of sampled teachers were reluctant to allow their students to bring in their own device. Results from the post in-service teacher survey also indicated that 86% of responding teachers say they are more comfortable using various devices (ie: laptop computers, tablets) in their classroom and 74% say they now use a variety of apps, online programs and software on a regular basis in their classroom (Question 5). According to the results from the pre in-service teacher survey, 55% of respondents were using variety of apps, online programs and software on a regular basis in their classrooms, compared. This increased to 78% of the respondents, after the Special Assignment Teacher support and training, according to the post in-service teacher survey.
Impact on System	According to the post in-service teacher survey, over 80% of responding teachers reported having shared and collaborated new teaching practices and strategies involving technology with other teachers, after receiving the support of the Special Assignment Teachers. Teachers are requesting online collaborative tools (i.e. portals within our Learning Management System, Google Apps For Education accounts); to be used for teacher-teacher sharing and collaboration and also teacher-student interactions. More than half of teachers responding to the post in-service survey are more comfortable sharing and collaborating new teaching practices and strategies involving technology with other teachers at system-wide sessions.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

James Bay Lowlands Secondary School Board

Project Title	**Going Deeper: Striving Towards Dynamic Technology Enabled Learning Experiences**
Description	Here in this small, rural northern community, we'd like to push our teaching and learning strategies further into the 21st Century. We wish to embrace new pedagogies that involve deep learning activities, enabled and accelerated by exciting new technologies, so that our students can increase their learning, and be ready life in the 21st Century. Our flexible research question is this: What possibilities will open up if we remove the current barriers to technology enabled learning in our school? These barriers include, but are not necessarily limited to, internet infrastructure limitations, availability of mobile teaching devices, and teacher professional learning in new pedagogies. Our research team will examine the current state of deep learning activities in classrooms. Using surveys and discussions with classroom teachers, we will determine what the specific needs and barriers are, and how our teachers can be best supported in moving towards technology enabled deep learning activities. We learned from our last round of research that the students' engagement was increased when using the online cloud services and the Chromebook mobile devices, but we encountered some significant infrastructure challenges which we plan to upgrade. We will scale up the usage of the devices in the school to include more classes and additional devices.
Context	*Number of students*: 32 *Number of teachers*: 2 *Number of schools*: 1 *Grades/Program*: Grade 11/12 English classrooms
Impact on Students	Teachers found that the use of the Macbooks purchased through TLF funding opened up greater opportunities for project-based learning. As students created small videos together, they worked together to meet the learning goals in a way that would have otherwise been more challenging. Students were given in a choice of research topics (though one class all shared the same topic) and followed their own inquiry questions to dig deeper into the topic. In contrast to a group live presentation where each member can independently be responsible for their part of the presentation, the creation of a short video requires a much higher level of collaboration, communication and teamwork by all team members. The student to student relationship involved far more learning from each other as co-learners. They learned from each other's ideas about content they were presenting, but also about effective methods of communicating, and about the best usage of the tool and editing system. The teachers found that, for most students, there was a deeper level of buy-in and engagement from traditional learning tasks. In one task, students created short educational videos about Residential Schools in Canada. Since the project involved making a video, it opened up possibilities for exploration and depth that

	would be difficult by other means. Students were able to interview senior citizens and have more intimate conversations about the issue than would be possible in a presentation or essay. Students reported feeling more emotionally involved in the project than they expected. One teacher remarked that some students became very interested in the topic intrinsically and no longer were just working for the marks. Students reported enjoying the process of demonstrating their learning through video technology. They felt the more interactive, creative elements in the project helped them become more immersed in the activity when compared to paper tasks. 92% of students reported preferring doing such projects on the laptops rather than creating paper or presentation assignments. The technology accommodated real-time collaboration and teamwork in ways that paper assessments could never. Students were able to work simultaneously on planning the document, took different roles in the filming, and worked together through the editing process. One teacher noticed a change in the power-structures in learning, that the practice of sharing learning through the development of a video "changed who holds the keys." Since this evidence mainly comes from interviews with the two teachers involved, there isn't additional data to attach to demonstrate the effectiveness of the technology. We had prepared a pre and post survey about the internet infrastructure to gauge how such improvements would change student learning and teacher practice, however, these improvements were not finished at the time of the writing of this document, and unfortunately had little impact on learning.
Impact on Instruction	Teachers reported an easier shift to project-based learning with the technology. Since students were empowered to explore their question, … and had enough motivation to self-initiate, teachers found that a lot less instruction depended on them. They were able to become active change-agents from the middle, without guiding precisely where the learning was going. All teachers also reported learning from the students throughout the project. They learned about the tool, the content of the videos, concepts and principles of editing and also received feedback about how to improve the learning activity going forward. Teachers reported a doubling (100%) increase in confidence with using the technology in their classrooms and 100% of the teachers involved will continue to use the technology in their classrooms going forward.
Impact on System	We anticipate that the network improvements will have a significant impact on the scale of the usage of technology in classrooms. The use of the Macbooks will continue and will be scaled up to other classrooms and teachers going forward. We will explore the purchase of additional devices to support the scaling up of this type of activity in classrooms.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Keewatin-Patricia District School Board

Project Title	**Creating a 21C Learning Organization**
Description	Our Round 4 work in KPDSB is a continuation of previous work. Our overall goal is to improve student achievement by creating a culture of learning for all that is connected to our BSIP goal around ensuring that students are able to think and communicate critically. The drivers for this work in our Board continue to be developing precision and expertise in assessment based instruction, supported by technology, transformation in leadership practice, and our ongoing system wide efficacy work. These drivers are transforming our Board as we continue to move forward.
Context	*Number of students*: 5000 *Number of teachers*: 400 *Number of schools*: 19 *Grades/Program*: K-12
Impact on Students	We have seen growth, thorough qualitative data (conversation, observation, and product) in student's ability to talk about and engage in the critical thinking process. There is more evidence of student awareness, goal setting and reflection. Our summative assessment for our 7-10 working group, which was our quantitative measurement mechanism did not occur this June do to job action.
Impact on Instruction	The external efficacy report provides evidence of how teachers are developing the ability to talk about and engage in teaching and assessing the critical thinking process. Digital tools and the use of digital tools for real time assessment, feedback, sharing between peers and school and beginning to compile critical thinking. [This report] has told us that we need to continue to enhance the connections and connectivity of teachers within the Board to further scale this work.
Impact on System	The work over the last 4 years has significantly altered the landscape within our school Board. Our strategic plan, Board Strategic Improvement Plan (BSIP) now contains "21C language", a focus on improving achievement through learning about how to teach and assess critical thinking and communication skills in students. Our one-to-one work is a significant driver in ensuring that the broader work finds its way to every school and classroom in the Board. Our efficacy work has mobilized teachers, principals and support staff to look at and examine what they do, how they do it and to provide significant input to senior staff around ensuring that processes and structures are effective for improved student learning. School leaders have been challenged to build and implement this work into their schools, something that has not always been positive, especially with staff who struggle with change. The concept of a growth mindset has steadily gathered traction throughout the Board.

	The external efficacy assessment report “Keewatin Patricia DSB Final Efficacy Framework Review” (June 2015) is an assessment of the Board’s strategic plan and alignment to the Board Strategic Improvement Plan for Student Achievement, School Improvement Plans and current and future practice in schools and Board support functions. The final report contained 40 recommendations that we continue to implement to assist with system transformation to best create a 21C culture of learning for all. The assessment has proved to be the catalyst for change discussion and implementation in the service of best serving students in a rapidly changing world. The recommendations touch on most aspects of the Board and its operations and will ensure that we are able to create the best conditions to have our students learn and thrive in the 21C and beyond. Much of the work involves a re-think of the ways that we have traditionally done things, with a view on becoming more engaging and relevant to both students and their families.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Kenora Catholic District School Board

Project Title	Ideation to Innovation
Description	Our project this year is intended to measure/evaluate how our two primary innovation supports (IdeaLab and Innovative Technology Teachers) are nourishing innovation within our school Board. The Idealab is our structure and process for grassroots innovation. Approved projects receive critical supports which can include human, resource, and physical backing. All projects are 'stewarded' by IdeaLab staff. Innovative Technology Teachers (ITTs) serve to support and encourage innovation at the school level. These are teachers in 0.25 to 0.33 FTE positions who have daily time to focus efforts on innovative learning. Their role grew from a technology orientated role, but today their scope is far broader. Our ITTs still act as in-class instructional supports for those taking next steps with learning technologies, but their role has been broadened so they can support projects/learning that isn't entirely focused on technology. The *Ideation to Innovation* project represents our intensive attempt to create a sustainable and comprehensive 'mechanism' to promote, foster, support, and scale innovation within our School Board. Our focus is on sustainable innovation throughout the Board. Technology serves two primary roles within our 2014-15 project. Technology serves to empower teaching and learning, and technology serves as a communication medium among staff (and also among staff and students). Most IdeaLab projects involve technology as a component of their work and/or rely on technology as a platform for documentation and communication. Our ITTs also work to ensure that technology is used in purposeful and meaningful ways in instruction.
Context	*Number of students*: 500 *Number of teachers*: 43 *Number of schools*: 5 *Grades/Program*:
Impact on Students	The round 4 initiative we implemented has impacted student learning particularly relating to 21 Century Competencies and Learning Partnerships (student-to-student, teacher-to-student). 21st Century Competencies - ITTs have not focused as much on 21Cs in 2014-15 as in past years as their scope broadens. However, there is clear evidence in their Annual Plans that 21Cs are still being supported and emphasized at the school level. Learning Partnerships - We have come a long way in fostering *Teacher to Student partnerships* in learning, the IdeaLab projects have been instrumental in providing opportunities for staff and students to equally share in the learning. Students are beginning to understand that they are actually making meaningful contributions to the direction of learning within their classrooms.

	• 80% of all ITT Plans included objectives that specifically focused on one or more 21st Century Competency. • 100% of ITT Plans include objectives involving teacher to teacher learning partnerships. • 18 of 24 students felt that they were partners in learning with their teachers. • 22 of 24 students indicated that they used technology for their project. • 20 of 24 students indicated that other teachers worked with their teacher during this school year.
Impact on Instruction	Our project this year has had a direct impact on teacher practice with an emphasis on effective technology-enabled instruction and also in forging new learning partnerships (both teacher-to-teacher, and teacher-to-student). Our ITTs continue to increase their reach working with more and more staff and students every school year, several IdeaLab projects were also focused specifically around the use of technology in instruction. IdeaLab projects involving technology-enabled instruction overall were quite successful in reaching their learning. • 67% of all ITT Objectives have a focus on teaching practice. • 100% of ITT Plans include teacher to teacher learning partnerships. • 40% of ITT Plans include objectives which involve student to teacher partnerships. • 12 Individual IdeaLab Projects involve students as either primary researchers and/or research participants. • 28 individual IdeaLab projects involve teams of staff working together within their own schools. 8 individual IdeaLab projects involve teams of staff working together from two or more schools.
Impact on System	System Plans - We have redirected all requests for system level instructional/academic supports to the Idealab. This is the way we work together to meet the needs of our learners. This included the majority of PD requests and it does include all PLC requests. It has become our mechanism for addressing and validating all grassroots ideas, from small scale initiatives to fairly large endeavours with high impact and risk. Organizational Processes and Structures – IdeaLab has expanded to include our entire Instructional Services Department. 2 Superintendents, 4 coordinators, 4 special assignment teachers are currently IdeaLab staff. IdeaLab meets every week and includes all staff. Idealab staff are assigned to specific projects and become stewards for the duration of each project. Leadership Development – We are currently considering the creation of an Administrator ITT and IdeaLab designated role. This would be a principal who would be an in-school ITT part time and administrator part time. This individual would also be responsible for serving/supporting other school administrators as an ITT.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Kawartha Pine Ridge District School Board

Project Title	**KPRDSB New Pedagogies for Deep Learning Project**
Description	The TLF 21st Century Innovation Research initiative for KPRDSB is to support teachers in using a design protocol that supports the curriculum in the design of authentic learning tasks. Teachers will engage in a learning partnership through the use of a collaborative inquiry cycle. This project will assess the design of a rich learning task through the dimensions of learning partnerships, learning environments, pedagogical practices (learning and teaching strategies), and the incorporation of leveraging digital to enhance student and teacher engagement.
Context	*Number of students*: 879 *Number of teachers*: 46 *Number of schools*: 8 *Grades/Program*: K - 12
Impact on Students	As the project spanned grades K to 12 and across different disciplines and grades the impact on students' learning was unique to divisional and/or individual class trends, yet followed general trends. • Student centred learning increased in frequency and decreased the resultant questions and guidance sought from the teacher. • Students engaged in experiences they had not previously considered e.g., in one grade six class, students embarked on tasks of using social media and writing professional letter to ask community agencies for support in creating a school garden. • Redefinition of student collaboration through the intentional implementation of technology.
Impact on Instruction	• Eight teachers across two schools were involved as two different teaching teams. • Collaborative planning has evolved from non-existent to the pedagogical norm. • Role of teacher as activator (catalyst) has increased in frequency. • Teachers have started sharing through cloud space and continued to create grade repositories for sharing and discussions surrounding deep learning projects.
Impact on System	• Support of innovation and technology driven teaching through the creation of an Instructional Leadership Consultant position focusing on deep learning through innovative and technology use. • Training all Instructional Leadership Consultants in the design protocols and underlying principles of the initiative to create a cohesive approach integrating the deep learning of this initiative into other initiatives in our board. • Continue to support initial schools and grow the project to additional educator teams.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Lakehead District School Board

Project Title	**Teacher and Student use of technology to support deep learning, and new pedagogies**
Description	We are exploring how effective implementation and use of Technology within Assessment for, as, and of Learning practices can impact/drive teachers' planning and instruction with the goal of improving student engagement and achievement. We will promote and support the effective use of technology for the purpose of supporting student success through deep learning and new pedagogies.
Context	*Number of students*: 200 *Number of teachers*: 50 *Number of schools*: 4 *Grades/Program*: Grades 9-12
Impact on Students	This initiative has impacted student learning by focusing on improving students' communication, collaboration, creativity and critical thinking skills. Rich tasks that engage all types of learners have given students flexibility to be creative in how they demonstrate their learning. Using collaborative platforms teachers develop students' communication skills as well as track the progress of student understanding and skill development. Students have engaged in metacognitive skill building by the implementation of the assessment and technology programs. Students are now being challenged to explain their thoughts, when they present mathematical proofs, to their teacher in video clips so the teacher can get a much clearer understanding of the strategies employed by the students and potential gaps in understanding. Students are regularly petitioned to assess their understanding of key concepts and relay this assessment to their teachers using electronic media (email, online tracking sheets or journals, discussion posts, etc.). Students are given the freedom to be creative in their demonstration of their learning which allows them to develop higher thinking skills as they develop products for culminating tasks. Student engagement has increased in all cases where teachers are combining the assessment and technology professional development.
Impact on Instruction	Teachers are incorporating different methods of assessment focusing on capturing student thinking in real-time. This has involved the use of video capture technology being routinely used in day-to-day activities. Teachers are also incorporating different collaborative platforms into their activities so student thinking can be shared and be made visible as it takes place. Teachers are trying out different instructional strategies that are either tech or app based. These strategies coincide with the redevelopment of courses, focusing on skill development rather than solely on content acquisition. By focusing on skill development teachers are experimenting with strategies that allow students to track and manage their progress throughout a course. This is facilitated with electronic platforms (audio/videos clips, discussion boards, online portfolios, etc.)

	Our next steps will be to continue to develop local leaders each school who will learn co-teaching, co-planning practices to build their capacity as mentors within their schools. In school coaching sessions, will focus on the use of technology that supports assessment for learning practices (e.g. practices that capture student thinking using innovative methods such as video, student blogs, classroom websites, audio feedback).
Impact on System	Several system wide structures serve to connect the work across the system: • Local school leaders are beginning to work with school administration and school improvement teams to find practices that use technology to support school improvement plans. • School I.T. Champions meet regularly with their administration, board program personnel to connect BIPSA, SIPSA and I.T. Plans. • The Inspire Training Program, an after school system wide training program, will continue to be available to all staff to highlight technology enabled learning practices. • Program Forum, District Leadership Forum and Professional Learning Communities highlight collaboration software (OneNote, Skype etc.) in concert with assessment for learning practices to highlight innovative teaching practice at a system level.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Lambton Kent District School Board

Project Title	**Challenge-Based Learning in the Intermediate Grades**
Description	This project supports the implementation of the LKDSB *Technology Enriched Learning Plan*, LKDSB *Engagement Model* and the LKDSB commitment to the *New Pedagogies for Deep Learning* project. All teachers of grade 7 students were given an iPad Mini, taught the basics of the tool then the many possibilities of enhancing their pedagogy, assessment and evaluation strategies. Each classroom teacher was also given a tub of 5 iPad Mini for student use. One hundred and seven teachers participated in five professional learning sessions each. Many also participated in voluntary after-school sessions. Teachers were introduced to the concept of *Challenge-Based Learning* as one means of introducing the "Big Ideas" of *Ontario Curriculum History and Geography Grades 7 and 8.* Students explored concepts such as Sustainability, Community, Resilience, and Displacement. Collaboration through digital means occurred between students and their teachers, between students and students within their classrooms as well as classrooms in other countries, and between students and experts within their communities and throughout the world. All teachers created an iBook documenting the experiences with *Challenge-Based Learning.* Students captured their learning through a variety of digital means, e.g. videos created in Adobe Voice, Shadow Puppet and iMovie, presentations in Google Slide and Keynote, Blogs and through social media. The primary focus of this project was to provide professional learning opportunities for the teachers of Grade 7 so they became comfortable with the device and the many possibilities for learning that the device holds.
Context	*Number of students*: 1439 *Number of teachers*: 107 *Number of schools*: 53 *Grades/Program*: Grade 7
Impact on Students	Student learning has been enhanced through the use of technology in an authentic, meaningful project. As students were able to have input into the challenge that they embraced, were active participants in brainstorming the many possibilities to address the challenge then carried out at least one of the solutions, the engagement level of the students highly exceeded that of a traditional textbook unit study. The 6 Cs were authentically interwoven into their project as students engaged in critical thinking, communicated in traditional and digital means, arrived at creative solutions, collaborated with a variety of stakeholders face-to-face as well as digitally, and became truly engaged citizens within their communities. The use of technology by students "leveled the playing field" for all as the iPad Mini affords many accommodations (e.g. speech to text) with a touch of the

	screen. No students were left out of the project due to a financial restraint of not owning a device. All students had access to a device and therefore were able to participate fully in the project.
Impact on Instruction	Through professional learning opportunities, teachers' knowledge of the device in general and most importantly, their knowledge of the possibilities for pedagogical change increased throughout the school year. Utilizing the *Apple Education Technology Profile,* teachers' practices utilizing the ***SAMR*** model, were assessed at the beginning and end of the school year. A significant percentage of teachers moved from the "*Substitution*" to the *"Augmentation and Modification"* stages of the model. In addition, this survey revealed that most teachers had moved from needing the technical knowledge of the device to effectively working with the device to support student learning. Change in pedagogy supported by a digital underpinning was evident. At the beginning of the project, approximately 40% of the teachers did not know how to use the iPad for digital storytelling. After attending professional learning opportunities, all but 10% of the teachers were proficient with this skill. As well, 20% of the teachers can support their colleagues in their use of digital storytelling to support the Ontario Curriculum.
Impact on System	The introduction of an iPad Mini to all teachers of Grade 7 students expanded two previous LKDSB 1:1 iPad projects. Now, all teachers of Grade 7 students throughout LKDSB and in the fall, all Grade 7 students will be involved in a 1:1 take-home project. The aspect of equity has been addressed throughout LKDSB and stage 1 of the LKDSB *Technology Enriched Learning Plan* for 2014-15 has been realized. This initiative has provided important learning as we engage our teachers of Grade 8 students in a similar project in September as well as begin professional learning opportunities with our teachers of Grade 9 students.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Limestone District School Board

Project Title	**Going Deeper: Embedding technology in math and literacy**
Description	The Limestone District School Board Project, supports Board initiatives in elementary mathematical instruction in Grades 3 through 6, as well as literacy skill development in English courses in Grades 9 and 10. Technological hardware (iPad and storage solutions in Grades 3 – 6 and Chromebooks in Grades 9-10), software, on-going professional learning and continued pedagogical support is being provided to selected classrooms, based on equity of access to mobile technology, educator mindset, student learning and well-being. The Secondary component of the Project will be implemented beginning in Fall 2015. Classroom teachers in the 3 – 6 math project are being provided with a classroom iPad and release time for professional. During initial sessions the emphasis is on building device efficacy and knowledge, along with best pedagogical practices, as the Connected Technology Team sets the expectations for mobile learning through digital citizenship and digital literacy classroom work. An additional six iPad devices will be integrated into participating classrooms, for a total of seven iPads to allow for 21st Century technology-enabled practices in mathematics. Technology will be the tool to allow students to make their thinking visible, demonstrate creativity and innovation through research-based professional learning opportunities focused on sound pedagogy and grounded in the SAMR model. Technology enabled collaboration of student efforts, teacher-student learning partnerships, assessment practices to support deep learning pedagogy and learning partnerships among our educators is a focus for this project.
Context	*Number of students*: 1250 *Number of teachers*: 57 *Number of schools*: 13 *Grades/Program*: Grades 3-6, 9-10
Impact on Students	This year's work with Collaborative Inquiry groups in a co-plan/ co-teach/ co-reflect format has strived to assist teachers in seeing the deep learning connected with technology integration in the classroom. By focusing on mathematical pedagogy, technology as a tool for collaboration, communication, curation, global connections and creativity has helped teachers to see increased engagement in their students. By guiding teachers to design authentic learning tasks that build mathematical competencies, and allowing students to make choices in how they demonstrate their learning, students become empowered, self-directed learners. Educators who are redefining their practice with authentic learning opportunities that extend beyond the walls of the classroom are enabling opportunities for increased communication, creativity, collaboration, cultural awareness, and citizenship – and engagement is extremely high.
Impact on Instruction	In Round 4, collaborative efforts from the Program, Connected Technology and Information Technology Teams, along with educators throughout the system allowed for shifts in practice and instruction. Having a strong vision that is shared and communicated throughout the system is allowing for advancements in practice, pedagogy and

	technology implementation. A shift in mindsets within schools, due to strong leadership, is occurring – however, there is still much work to do. Learning Technology Teachers, along with other champions of teaching and learning on staff, are in each school and are able to support their colleagues, coupled with released professional learning from Program Team and the Connected Technology Team. School initiated learning is occurring at staff meetings, during collaborative inquiries, at personal interest teacher technology 'clubs', collaborative team teaching, empowered student experts and student technology clubs – all of which are shifting our culture of learning. Feedback from educators indicates that the amount and quality of professional learning: face-to-face learning sessions, video conference sessions, collaborative inquiries, co-planning/co-teaching/co-reflecting sessions, and support through social media, e-mail, Lync and FaceTime is greatly impacting teacher practice to embed technology into daily practice. Qualitative data gathered through teacher interviews, surveys and conversations informs Limestone that a shift in pedagogical practices is transpiring. By providing relevant professional learning and authentic examples of deeper learning in math and literacy throughout the Board, we are creating a steady transformational shift in classroom practice.
Impact on System	This project contributes to LDSB system scaling and sustaining of pedagogically-driven, technology-enabled practices. Our goal is to continue the progress we have made to deepen the power of our innovation model. All invested parties (teachers, students, parents, administrators, trustees, community partners) are recognizing the power of technology for connecting to experts, creating global connections, collaborating with classrooms and as a source of professional learning which allows for new learning partnerships. In order to make our pockets of innovative deep learning sustainable over time and space, we need to create more and more leaders in all facets of our District. We now have voluntary Learning Technology teachers in each school who receive professional learning on technological knowledge and pedagogy to assist their school in effectively embedding technology into daily practice. As we have moved from a computer lab setting in each school to a collaborative culture where technology is integrated with the point of learning, schools need assistance to shift their practice towards this type of learning as they begin to abandon traditional ways. Our Connected Technology and Program team have been deeply involved with Collaborative Inquiries, with a focus on math and literacy, to help support new learning in a commitment to make change happen. Maintaining consequential change over substantial periods of time requires teachers to see the relevance in technology integration. Those who are embracing technology for deeper learning are called upon to lead professional learning for their colleagues at staff meetings, learning series workshops, Summer Institute learning, and Board initiated workgroups, as we grow capacity from within, rather than using a top-down model.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

London District Catholic School Board

Project Title	**Scaling a Culture of Collaboration: Shifting System and Individual Beliefs about the Virtual Learning Environment**
Description	The modelling of the effective use of technology in the classroom, along with a collaborative process of peer to peer mentoring, is critical to student engagement within a 21st Century Learning context. The purpose of this project is to create a culture within the LDCSB that is focused on innovation and collaboration. Central to this is the ability to scale a new culture of change where all teaching and non-teaching staff have the confidence and the ability to use 21st Century learning tools and techniques in the teaching and work places. This iteration of the TLF project is supportive of the BIPSA and *Moving Forward* (2014), the LDCSB's strategic plan for technology. As well, Learning Services is partnered in the TLF with the newly launched Innovative and Collaborative Technology Services (ICTS) under the leadership of an academic SO. The TLF Coordinating Committee consisted of a mix of Learning Services and ICTS staff who were attuned to the objectives of the project. Central to this project is to further expand system knowledge of the vital components of the Virtual Learning Environment (vLE) as outlined in the *Moving Forward* document. The goal of the team has been to (1) develop an implementation plan, (2) have opportunities for staff training in the months of April-June, (3) test the implementation of a new mobile device management system, and (4) review the 2014-2015 results, with the goal of developing specific planning that would support directly student learning in the classroom.
Context	*Number of students*: 0 *Number of teachers*: 97 (including 15 trainers) *Number of schools*: 55 *Grades/Program*: Those teachers (one per elementary school, two per secondary school) who have been identified by system staff and principals as potential "lead learners," all system librarians
Impact on Students	The 2014-2015 project has only indirectly impacted student learning, at least to this point. The premise of the project is that both teaching and non-teaching staff need a consistent understanding of and experience within the vLE in order to make a difference in student learning on a system-wide scale.
Impact on Instruction	From observations, exit surveys, and surveys of the staff who participated in the lead learner training, the majority of staff found that the training gave them an appreciably greater understanding of the vLE. They were exposed to the value of collaborative technology, the supportive network of colleagues that exists within the LDCSB, and the ability to take risks in a safe and welcoming environment. Librarians in particular developed a better understanding of their role in 21st Century learning, including the library as a creative commons and learning hub within the school.

	Trainers in the sessions, through the surveys and collegial dialogue, have been able to reach a better understanding of how to create training sessions that meet staff needs. Training was adjusted and modified based on the feedback.
Impact on System	By creating a consistent understanding of the vLE and the development of more effective training methods, the LDCSB is able to scale staff learning beyond the smaller group of lead learners. This effort will be enhanced by new technologies purchased through the TLF as well as supportive technologies not directly associated with the TLF (e.g. increased bandwidth). There continues to be alignment with current Student Success work in the Building Innovative Practice Initiative, creation of the Board Learning Management System, and the Provincial applied strategy through the Student Success School Support Initiative. This alignment allows the LDCSB to continue its framework for longitudinal studies within the context of the Board vLE. In addition, Round 4 is supportive of the Board's goal to scale technology across the system, as detailed in the BIPSA and *Moving Forward* document. The focus continues to be school and classroom leadership that is focused on innovation and collaboration that will lead to increased student engagement, learning, and achievement.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Moose Factory Island District School Area Board

Project Title	**Building Technology Capacity: Moving Moose Factory Ministik School into the 21st Century**
Description	Our focus is to integrate technology into the Ministik School Health and Physical Education Program, Cree Language Program, Early Learning Kindergarten Program, and in the regular grades 1-8 classroom programs in order to attain the following goals: • Increase student engagement, motivation, and productivity • Promote healthy active lifestyles and cultural integration • Provide student-centered instruction and learning opportunities • Gather authentic assessment data (assessment for as and of learning - ie. student evidence: photo, video, audio, product) to facilitate teacher-student conferencing and to establish next steps for student learning If we use tablets and selected applications to record student evidence (photographic, audio, video) and teacher anecdotal notes, we will positively impact our ability to provide effective instruction and assessment practices for inquiry based learning in Grades K-8
Context	*Number of students*: 300 *Number of teachers*: 18 *Number of schools*: 1 *Grades/Program*: Grades K-8, Health & Physical Education Program, Cree Language Program
Impact on Students	*Unfortunately, due to delays in receiving our technology equipment, poor technology infrastructure and long upgrading delays, and current teacher job action, we were unable to collect data and supporting evidence of our learning.* Brief anecdotal evidence suggests that students using tablets to support their learning are generally more engaged in lessons. Many students have been using the tablets to record and document their learning. Some teachers report using that evidence to make important decisions about the next steps for their instruction.
Impact on Instruction	Some teachers have expressed excitement while using the tablets to record evidence of student learning. They also report using that evidence to make important decisions about the next steps for their instruction. This is especially true for the Early Learning Kindergarten teams as they become more familiar and better equipped for inquiry-based learning. Teachers have been witnessed sharing video clips of student work with other teachers while engaged in rich pedagogical dialogue.
Impact on System	As a system, we are using technology to support our current school programming. We have expanded our project to include student learning and teacher learning; specifically teacher assessment and instructional practices. We initially had two teachers working on the project; we currently have five teachers and one administrator regularly using the technology to support our school learning. We are developing leadership opportunities for teachers in the form of technology lead teacher and professional activity leaders and technology mentors.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Moosonee District School Area Board

Project Title	**Broadening the Assessment Repertoire through Pedagogical Documentation of Student Learning**
Description	Building on the previous year's work with selected Primary students to collect data in order to assess their improvement in reading comprehension skills as a direct result of using iPads APPs, the Enhanced Support component extended the experience to Junior level students. The Research Innovation component was designed to ascertain whether educators' repertoire of assessment strategies would increase and improve as a result of using the same technology. In adopting more technology, teachers will make better use of current assets, plus the newly acquired technology and the learning experiences will be enhanced for students and teachers as partners. The School Improvement Plan provides clear direction to focus on implementing strategies to enhance assessment practices. Specifically, the goal is to enable and create professional learning that establishes learning environments where students are engaged in their learning through assessment practices that include students. Providing technology to create an atmosphere of co-learning and co-teaching within which authentic partnerships lead to the development of teacher and student self-regulated learners displaying confidence and curiosity. Providing professional learning would be a priority as well as encouraging opportunities for teachers to develop partnerships with other educators that have expertise in the use of technology as an effective assessment tool.
Context	*Number of students*: 30 *Number of teachers*: 6 *Number of schools*: 1 *Grades/Program*: Grades 4-6
Impact on Students	The data was not made available to us due to the job action.
Impact on Instruction	This data is only informally available anecdotally; the iPads were delayed in transit.
Impact on System	Our focus on the development of the MYSP which includes technology as a key learning and teaching/assessment tool as one of the four priority areas means that the potential for this research to impact the entire school community is extensive. The review and revision of the SIP, once resumed, will have a clear focus in each of the pillars on technology as an important tool in supporting achievement of the goals. The technology team as established is widely representative of a variety of sectors and offers leadership opportunities to many individuals and partnerships. The parent and student voice are clearly lacking on the team and that needs to be built into future planning. Within the fabric of the school operation, technology should become one central driving force.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Near North District School Board

Project Title	**Transformations: An Exploration of Pedagogical Change and Innovation in Technology-Enabled Classrooms**
Description	The Research project is closely aligned with the Near North: 21 Vision – including the development, implementation and scaling-up of pedagogically-driven and technology-enabled practices. Specifically, the NNDSB *TLF 21st Century Innovation Research Initiative* has established a goal to engage teachers in collaborative inquiry focused on teacher-student learning partnerships, assessment practices that reflect deep learning pedagogy and learning partnerships among educators, enabled by technology – to improve conditions for learning. Participating teachers have contributed to the development and implementation of capacity building resources, online professional learning communities and research instruments including the "Evolution of Thought and Practice" (ETAP) survey (a systemic measure of teacher capacity and practice) and the Quartet Synthesis (an in depth analysis of digitally-enabled classroom activities). Our research project enables teachers to explore the conditions required to optimize learning in a digitally enabled classroom, drawing a focus on the learning environment, pedagogy, technology and learning partnerships as they contribute to the transformation of instructional and assessment practices.
Context	*Number of students*: n/a *Number of teachers*: 204 *Number of schools*: 41 *Grades/Program*: Grades K-12
Impact on Students	This summary report highlights only a limited number of findings from the research. *Leveraging Digital:* NNDSB classrooms are increasingly "technology-enabled". 2015 ETAP data resulted in 53% of teachers responding their students K-12 are using personally owned devices frequently - weekly or daily. This would suggest that enhancements to "open" WiFi access and increased bandwidth are enabling students to use personally owned devices to support learning. 86% of teachers responded that their students use school provided devices/technology to support learning always or frequently - weekly or daily - suggesting that investments in technology for learning (instructional devices) are being used frequently. Cloud services and 'take-home' licenses for Office 365 apps may have empowered a greater number of students to leverage personally owned devices to support learning. As expected, students in the intermediate and senior division are most likely to have access to personally owned technology. 81% of grade 9-12 teachers observed students using personally owned devices to support learning on a "weekly" or "daily" basis. Teachers in the primary division enable students to access school provided technology - almost exclusively. Likewise, teachers of grades 4-8 are also very reliant on board provided technology. A significant majority of teachers in the primary and junior

	divisions enable students to leverage school provided technology at a "daily" or "weekly" frequency. *Developing 21st Century Fluencies/Competencies:* Collaboration: Teachers have observed a significant increase in the number of students accessing online "cloud" tools to work collaboratively – locally and regionally. In 2012, 82% of k-12 teachers acknowledged that students "never" collaborated using online tools – that number was reduced to just 24% three years later (ETAP 2015). Communication: Teachers have observed email as a significant tool for students in grade 9-12. From 2012 – 2015, NNDSB teachers have noted an 18% increase in the number of k-12 students using email on a monthly, weekly and/or daily basis. Critical Thinking: Board investments in online resources such as Dreambox Math and Razkids has resulted in more primary and junior classrooms having access. Teachers have also indicated that Dreambox Math tools have increased student engagement and enthusiasm for learning. Teachers have also suggested "gamification" of learning may also be attributed to this skill development software. Although 2012-2015 has not seen a significant increase in the number of teachers who observe students conducting research using web-based search engines and directories (ETAP 2015), the majority of students in grades 4-12 do so weekly or daily. 82% of students in grade 4-8 conduct research using the internet weekly or daily. Creativity: From 2012 to 2015 teachers have observed a large increase in the number of students that are creating original digital content to demonstrate what they have learned. The number of students who have "never" created original digital content to demonstrate what they have learned has fallen from 74% in 2012 to 26% in 2015. *Learning Partnerships:* Most of the contributing teachers demonstrated a comfort level with student led inquiry and the creation of transparent learning goals and expectation in partnership with students. However, the QS data also suggested that teachers have not yet implemented activities designed to engage in partnerships across schools or beyond our community. Furthermore, teachers indicated that they are either developing awareness or have an emerging practice related to using collaborative processes, tools and measures to engage families and communicate student progress. *Tech Squad* is a credit bearing experience that engages students as leaders, providing capacity building support for teachers. *Tech Squad* students work across classrooms providing support to teachers and students as they integrate technology for learning.
Impact on Instruction	The Technology for Teachers (T4T) initiative enables teachers to choose a device (either, iPad, Windows laptop or MacBook) for personal and instructional use, and engage in ongoing professional learning activities at the classroom, school and district level. In each of the last three years, annual cohorts representing 25% of NNDSB teachers have participated in the T4T program. *Creating Conditions – Teacher Learning Partnerships:* Classroom: The eTech Coach has been equipped with the hardware, resources and time required to support technology related initiatives and job-embedded teacher capacity building at the classroom level. eTech coaches have been the primary source of teacher support related

	to technology-enabled learning – 81% of teachers have benefited from the eTech role. (ETAP 2015) School: Revisions to the School Technology Planning Framework have aligned 21C more closely with the School Improvement Planning (SIP) process – *now completed online in the Office 365 Research and Innovation portal*. Further, schools have been asked to complete their school improvement plans in May and June of 2015. This change will enable central resources to be allocated more efficiently and effectively in September, including the deployment of the "Technology for Learning" (instructional technology) requests. *Pedagogical Practice:* The QS data suggests that teachers are moving toward coherent, intentional, on-going technology-enabled practices. Teachers are actively engaged in designing learning tasks that engage students in deep thinking and foster 21st century competencies. Anecdotal reflections about pedagogical practice include evidence of authentic contexts, and meaningful student voice and choice. *Leveraging Digital:* Teachers are using technology to engage and motivate students. Furthermore, teachers allowing students to select from a range of technologies in order to solve authentic real-world problems.
Impact on System	The 2015 Innovation and Research Project has used the ETAP and QS to identify changes in the conditions for learning, (learning environments, learning partnerships, pedagogical practices and leveraging digital). • Sustained, responsive, meaningful professional learning, within and across schools. • Implementation of a new school/student centric technology planning processes. • ETAP and QS data will continue to be used by system and school leaders to inform the SIP and SEF process. • The QS instrument will be available to schools teams as a means to facilitate collaborative inquiry/professional learning. • The Innovation and Research initiative has resulted in our system having a deeper understanding of teacher learning preferences and learning partnerships. Ongoing efforts to promote the awareness of the NN:21 Vision appear to resulting in an increase in the number of teachers that agree the district has a clearly articulated vision that is shared among schools and the community. The ETAP 2015 data also indicated a significant improvement in the number of teachers that expressed positive opinions related to the sufficiency of school technology for student use. Infrastructure will continue to be a priority moving forward as more devices enter the system (both student and board owned). Enhancements to bandwidth and WiFi will be followed by improvements to the network switches and cables during the July and August 2015.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Niagara Catholic District School Board

Project Title	**Equitable Access to 21st Century Resources**
Description	Two layers of access are being evaluated. The primary layer concerning access concerned Chromebook and Google Apps for Education (GAFE). In addition, we are evaluating the impact of VMWare licenses and whether the thin client approach can provide a seamless experience at the school and at home for educators and students. We are evaluating Chromebook and Google Apps for Education (GAFE) in light of the following questions; • Does the utilization of the device and the GAFE accounts foster 21st century learning and promote sound pedagogical technology enabled learning? • Does Chromebooks integrate well with other technologies and are any incompatibilities negligible? • Can the introduction of GAFE address the equitable access to technology for all students in and beyond the classroom? • Does the device and the GAFE activities protect the privacy of students and teachers? • Can the devices and the GAFE platform be distributed without a significant requirement of training for students and/or teachers? • Does the device and the GAFE service provide an affordable alternative to the existing Microsoft platform for both teachers and students? • Can we prepare and deliver the Chromebooks to schools easily and with little IT intervention as compared to existing practices with Microsoft systems?
Context	*Number of students*: 90 *Number of teachers*: 61 *Number of schools*: 5 *Grades/Program*: Junior -FSL Grades 6-8, but we also did an evaluation in a secondary school
Impact on Students	Overall, the survey results for both educators and students indicated; • They would like to see more Chromebooks in the classroom and they would like to use more Google apps. • They believed the Google platform works effectively on mobile devices. • Google apps are easy to use. • GAFE helps foster 21C skills. • GAFE is a good alternative to the Microsoft platform. • The Chromebook screen size is suitable and the keyboard is useful.

	• Chromebooks compare favourably to iPads or Android tablets. • Believed most teachers will prefer using Google classroom to the D2L vLE. • Google hangouts represents a positive experience. Student collaboration was a major observation. Students can discuss and collaborate real-time on questions or projects and find answers amongst themselves and then share them with the rest of the class and their teacher. Tools such as chat within google docs or the version history that tracks who said and did what, provides accountability for all participants' Students were able to demonstrate their knowledge and coordinate activities using tools such as a shared calendar or doc or drive folder.
Impact on Instruction	The GAFE platform provided an opportunity for: • Sharing – provide the students the information and resources they need • Communicating – can chat within Google Docs. Can pose questions virtually rather than having to pose the question in class. • Collaborate – the teacher can collaborate with the class or a group of students. Students can collaborate amongst themselves • Research – The apps have a built in research tool so students can see the contexts of words they may be unfamiliar with. • Facilitation and activation rather than presentation. The ability to share the context of information but students are involved in the learning process • Learning coming "from" students not just "to" students Learning can be celebrated because it can be shared virtually as well as physically. For example, teachers can stream information from student Chromebooks through Apple TV or Chromecast not just stream information from their own device. Physical space is no longer a barrier for teachers and their professional learning. PLC's are easily created and best practices easily shared with individuals who are most relevant to their learning growth. Differentiation is possible for assessment and instruction. There are sufficient variety of apps which allow students to demonstrate success and the collaboration process provides feedback and validation of the student voice.
Impact on System	The inclusion of greater wireless connectivity, greater internet bandwidth and the switch to ORION provides the infrastructure required to support the peer to peer initiative of introducing more mobile devices. Access is now extended to Google ID's and hence all the apps associated with it. We intend to provide more devices next year to support the access to the Google IDs.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Nipissing-Parry Sound Catholic District School Board

Project Title	**Learning For All Phase III: Taking It To The Cloud!**
Description	Our project focused on the integration of digital technology in the area of assessment for and as learning to support the achievement and engagement of all students. Teachers and students explored how the integration of cloud based resources including Google Apps For Education (GAFE), D2L resources and devices transforms student learning, instruction and assessment practices. This year's innovation research initiative focused on providing GAFE access to Grades 7 - 12 students and teachers to enable the development of the core practices of assessment. Our research initiative also included select classrooms that piloted a 1:1 Chromebook device and integrated IPADs to foster creativity and collaboration at the elementary level. At the secondary level, three mobile labs of Chromebooks (90) were provided to support the integration of GAFE to enhance student - teacher collaboration and with a focus on developing the core practices of assessment such as descriptive feedback. Technology, in conjunction with effective pedagogy, played a key role in the shift from teacher as the 'keeper of knowledge' to facilitator where students are at the center of their own learning. Over the course of this research project, students and teachers explored cloud based technologies and virtual learning environments where learning and resources were not limited to the school day or by access and could be completely personalized to the student.
Context	*Number of students*: 75 *Number of teachers*: 7 *Number of schools*: 3 *Grades/Program*: 2 elementary classrooms (Grade ¾ & Gr. 7/8), 2 secondary classrooms
Impact on Students	Students were given the opportunity to use Google Chromebooks on a 1:1 basis and Google Apps For Education (GAFE) as a tool to support their learning. The use of these tools has not only increased the level of student engagement but contributed to the development of student-to-student and teacher-to-student partnerships as collaborative learners. In a relatively short amount of time and given the current focus of integrating cloud based resources into instruction students are beginning to develop a high degree of collaboration skills as a result of utilizing cloud based resources (GAFE/various APPS) as a key enabler. Students' quality of work is improving throughout the course of the project as evidenced by baseline tasks, culminating learning tasks and student surveys. Students report that utilizing GAFE on a regular basis improves the collaboration between peers and between students and teachers. Feedback from teachers is timely and ongoing to students utilizing GAFE. For example, teachers and students are collaborating on one document. Therefore, for students the integration of cloud based resources is beginning to have a high impact on their learning. As one teacher reported: "This initiative has changed the way my students look at learning. It has been a "transformation of a classroom". My classroom has students with varying needs. 52% of the students in my classroom have a specific learning need. IPads have brought a cultural shift in my classroom. Using iPads has provided hope and building a student sense of "I CAN".

	Evidence in relationship to achievement is evident in increasing in Levels of Achievement with use of the continuum and co-created success criteria. Students developed problem solving skills and strategies through exploring Apps and integrating the iPad technology to make their thinking visible. Social Collaboration was evident in the partnerships created through using the integration of mobile devices and cloud based technology (GAFE / Apps). Students were teaching each other in the process and also the special needs students were assisted by their peers. It was a true partnership.
Impact on Instruction	One of the greatest changes in teaching practice that was noted throughout this year's innovation research project was in the area of assessment for and as learning. In regards to student work, focus shifted from quantitative to qualitative products. Instead of assigning a variety of tasks that may or may not have been engaging or invoked critical thought, tasks that were meaningful and engaging were developed. The focus was more on the process of student learning as opposed to the outcome. Assessment practices changed from a focus on assessment *of* learning to assessment *for* and *as* learning. GAFE facilitated ongoing communication with students. As students submitted their tasks for feedback, anecdotal notes of their progress were one form of data collection that helped teachers understand the thinking process of each of their learners. Our innovation research focus also impacted teacher practice by further developing differentiated instructional practices. In classrooms, students and teachers recognized all learners have different learning strengths and learning needs. Students were provided choice when demonstrating their learning. When collectively assessing the impact on teacher practice, one of the trends that emerged throughout the course of this learning journey was the release of teacher control. As indicated by one teacher: "As a teacher you do not need to know everything. You need to have the courage to let go and give the students the freedom to explore the digital resources before an assignment is given. … The important thing for me as a teacher is to let the students have voice in creating the learning goals, creating success criteria and deconstructing curriculum expectations.
Impact on System	'Taking It To The Cloud Phase II" has provided a solid foundation for our system to scale up and sustain pedagogically-driven, technology - enabled practices that is rooted in sound assessment for and as learning practices. Our innovation work is directly aligned with and is a key strategy to support the Assessment For and As Learning focus in our Board Improvement Plan For Student Achievement (BIPSA -3 year plan) as well as the achievement of our board ENDS (Strategic Outcomes for Students). A system wide collaborative inquiry will be a next step to begin to build a sustainable model of teaching and learning. As a result of our innovation research initiative our system Teaching and Learning Through Technology Committee (TLTC) have developed the following system vision: As a system we will focus on fostering the following 21st century learning skills of our students: digital fluency, collaboration, problem solving, communication, critical thinking, creativity and innovation. Through this focus, all students will thrive in reaching their full potential, embrace lifelong learning, live the richness of their faith and be contributing members in our global competitive world."

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Northeastern Catholic District School Board

Project Title	**TOPS: Transforming our Practices for Success**
Description	Our project is focusing on how the use of technology, specifically the collaborative tools offered by Google Apps for Education, can increase cooperative, constructivist learning environments and enhanced student achievement and engagement. We are examining whether students' learning about a topic is transformed, using the tech tools provided in the classroom and by collaborating with peers/the teacher (working cooperatively) to further develop thinking skills.
Context	*Number of students*: 35 *Number of teachers*: 2 *Number of schools*: 2 *Grades/Program*: grades 5-6
Impact on Students	We decided to look at active and collaborative learning, as well as the communication between students and students, and students and teachers, while using a pre-determined and accessible online suite of Google collaborative tools. The students were given the choice of tool they used throughout the process. In our post-survey results, the majority of students used the chat tool (30 out of 32 students at 93.8% of respondents). In our pre-survey, students were asked the question, “Do you enjoy working in groups?” 22 out of 32 respondents, or 66.7%, responded with Yes, 10 students, or 30.3%, responded with Somewhat, and only 1 student responded with No. In our post-survey, students were asked the question “Did using the Google tools make it easier for you to collaborate with your team?” 24 out of 32 respondents, or 75%, responded with Yes, 7 students, or 21.9%, responded with Somewhat, and only 1 student responded with No. Additionally, in our post-survey, students were asked the question “During this research project, would you say that working in Research Teams and using Google Tools helped you learn the material better?” 28 out of 32 respondents, or 87.5%, responded with Yes, 4 students, or 12.5%, responded with Somewhat, and none of the students responded with No. These results are particularly encouraging. They indicate evidence of student engagement in terms of using the Google tools to collaborate with each other on a research team, for the purpose of producing a research report. 87.5% of the students perceived the use of Google tools helped them to learn the material better. It is our belief that the students who participated in this research project gained significant insight into a new way of collaborating in group work situations, and a new way to research various topics. The survey results, as well as anecdotal notes taken during the activity, show an impact on student learning, and certainly on student engagement. The results hold promise for future collaborative learning opportunities in the classroom, and also indicate that further research is required across multiple grades and subject areas.

Impact on Instruction	The two teachers who participated in this project are enthusiastic about the potential for technology to transform instructional practices in the classroom, and had been using Google Apps for Education in their classrooms prior to our time together. Both teachers have expressed that they are committed to using Google tools as an online platform for collaborative inquiry projects next school year. The results of this project made an impact on their practices for changing the way they have administered group work in the past. They will provide leadership to others and play a key role in further developing this online platform for collaborative inquiry in virtually any subject area. We have leveraged and utilized technology thoughtfully, with students in mind, and have found that there is enough of an impact to carry forward. Evidence from our research shows that students are certainly ready to use technology effectively and efficiently to collaborate with their peers and their teachers.
Impact on System	NCDSB's Ed Tech Champions will provide leadership in the next phase of this particular research project. When we continue, we will do so with a greater number of classrooms. … the Ed Tech Champions will be able to provide our educators with the support they will need to use these Web 2.0 tools to further facilitate group projects in every classroom. We will broaden implementation of a standard platform (Google Apps for Education) for student and staff collaboration, communication, and creativity. We will use standardized hardware to ensure that students can share their thinking within and beyond the walls of the classroom.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Northwest Catholic District School Board

Project Title	**The Use of iPads as Instructional Devices in Northwest Catholic DSB**
Description	The purpose of our project is to increase student engagement, student directed learning, and differentiation with the 1:1 use of iPads in the classroom. The students are encouraged to use the iPads as a tool to enhance their learning. Focus is put on choosing the best apps to complete an activity which are primarily productivity apps (Pages, Numbers, Keynote, iAnnotate, and iMovie.) Students are also becoming more aware of their learning style, their strengths, and their needs in the classroom when they use the iPads to demonstrate their understanding of a concept in a way that is most appropriate for them.
Context	*Number of students*: 160 *Number of teachers*: 10 *Number of schools*: 6 *Grades/Program*: K, grades 5-8
Impact on Students	Student engagement has increased through the use of iPad technology. Students connection to the curriculum is enhanced through the use of iPad technology because students are able to interact in real world problem solving and experiences As stated in *The Use of iPads as Instructional Devices in the Northwest Catholic District School Board (2014-2015),* • The survey data shows that most students (78%) would want to use the iPads for subsequent grades in school (4% would not). While they report no changes in reading, writing or listening skills, the majority of students consider that organizational skills (72%) and research skills (87%) have been improved. We also see that 65% of students see the iPads as supporting their creativity. Survey data also shows that many students demonstrate their engagement by having positive ideas about how they can improve their own learning experiences, and that of future generations, for example by the addition of key pads or apps. • Students have been strongly supportive of the iPad initiative, with many recognizing that bringing current technology into their classrooms has led to improvements in the quality of their learning, particularly when their research leads to engagement with current information, and their curriculum comes alive.
Impact on Instruction	Teachers indicate preparation and planning time is enabled by the use of technology. As stated in *The Use of iPads as Instructional Devices in the Northwest Catholic District School Board (2014-2015):* • It would be an understatement to describe the potential of the use of iPads in education as a “revolution”, as the potential for “for”, “as” and “of” learning assessment strategies has expanded significantly beyond the

	traditional pen(cil) and paper based classroom. We see students engaged in a whole range of metacognitive strategies where they have the opportunity to choose their own preferred approach to assignments in terms of app, for example Pages or Keynote, and how they research the content through search engines. Teachers have the opportunity to monitor progress in these assignments through the WebDAV system and provide formative feedback. • District and school support for teachers and students is visible in the breadth of inquiry-oriented and personalized activities that occur regularly. • We see significant evidence of student-driven inquiry, both from the survey and the site visit, which also exemplified differentiation.
Impact on System	This initiative has contributed to system scaling because it has enabled more in-depth cross curricular learning. The ability to interact across classroom and our system through peer to peer interactions has sustained and improved our capacity to support tech enabled deliverables.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Ottawa Carleton District School Board

Project Title	**"Learning After Labs"**
Description	The research initiative will study the impact of changing student **access to** digital technology from stand-alone computer labs to individual classrooms on developing rich learning tasks involving collaboration-teacher to teacher, student to student and teacher to student. Each classroom will be equipped with at least 5 digital devices including Chromebooks, IPad/tablets or desktops. Teachers and students have access to Google Docs. Students are allowed to bring their own person digital devices. Various professional learning sessions on the creation of deep learning tasks have been provided to teachers throughout the 2014-15 school year as part of the New Pedagogies for Deep Learning Initiative [NPDL]. Teachers are asked to submit samples of deep learning tasks that will be analysed using the SAMR model as a frame or reference to determine changes of practice.
Context	*Number of students*: 1500 *Number of teachers*: 75 *Number of schools*: 3 *Grades/Program*: grades 6-8 *all subjects, all strands, all tracks (French Immersion and English)*
Impact on Students	Principals of the schools have observed students using a variety of devices in the classroom for a variety of purposes. Because the students have choice they are more engaged in their learning. They are using the technology to create new knowledge rather than just consume knowledge. Two principals of the three sites have reported they see students engaged in student to student learning partnerships enabled through technology e.g. creating videos to share with other students.
Impact on Instruction	At one school the principal has noted a significant increase in teacher use of technology. They have gone from 10% of the staff using technology on a regular basis to 100%, including specialist teachers. This is largely due to the fact that the mobile technology is readily available in their classroom and does not have to be booked in advance. With the NPDL initiative being introduced at this school as well as a recent District Review which recommended the school look at the tasks they give their students, teachers are beginning to create deeper and richer learning tasks enabled by technology. At another school, the principal and vice principal reported that the move towards mobile technology was underway through support from the school council. Teachers were using technology on a more regular basis and the percentage of staff using technology regularly to enhance learning was almost 100%. The principal also noted that the focused PD from NPDL helped staff rethink their task creation around school wide units.

Impact on System	The TLF funding has allowed us to purchase mobile equipment to replace aging desktops. Schools are beginning to dismantle labs in favour of embedding mobile equipment in classrooms at a ratio of 1:5 on average. The Digital Learning Advisory Panels are meetings which promote two way communication between schools and central staff surrounding the use and integration of technology of support of deep learning. Participating schools are encouraged to share good practice and effective use of technology in teaching and learning, K to 12. Two additional elementary schools will be outfitted with a variety of mobile equipment embedded in classrooms. Coaching support will be provided to help teachers shift their practice to deep learning enabled with technology. Five secondary schools will be implementing a lending library of Chromebooks to enable students' access to personal devices for use. We are aligning our coaching model so all departments are working in concert rather than in silos. All departments, Curriculum Services, Business and Learning Technologies, Learning Support Services, Early Learning, Inclusive, Safe, and Caring Schools, will be promoting a culture of inquiry and reflection and modeling deep learning enabled by technology. More schools will closing computers labs and focusing on building a variety of mobile equipment in the classrooms so students can choose the appropriate device for the task at hand. Teachers will be planning more deep learning tasks enhanced by technology.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Ottawa Catholic School Board

Project Title	**Driving BYOD environments through teacher practice change and student initiatives** **(Individual Project: Changing practices with Android tablets)**
Description	There are many initiatives underway but we have selected one on which to report: *Paperless in the Arts*. At one school, students pursuing liberal arts are using technology in their day to day practices to enhance their learning, enhance collaboration, and streamline their learning process. The initial concept around pursuing this change was to move to paperless but the abilities of the technology have dramatically changed the overall impact. The lead educator, saw a way to leverage tablets in music and theatre that would address several issues. In music class, the students were learning many different pieces of music and the differentiation based on student interest and need required numerous sheets of music to be printed and used regularly at home and in class. Technology took on a particular role for this project. The technology used was pen-enabled Android tablets. The pen allowed students to receive their music and then precisely write any notes they might have on it using a Sheets app that kept their individual notes. Teachers and students were able to change their assessment practices in music. By using an App, students are able to make video recordings of themselves playing a piece and then get specific feedback from instructors. Using this app, teachers could provide visual and audible comments on the student recorded videos. In Theatre, students used Google and the tablets to enhance their collaborative script writing, rehearsals and video feedback. The Google platform allowed for easy collaborative development of new material. Once ready, the ubiquitous access to their documents allowed students to use their phones or schools tablets to practise online.
Context	*Number of students*: 75 *Number of teachers*: 3 *Number of schools*: 1 *Grades/Program*: high school level in the music and theatre programs
Impact on Students	Although the initial goal of this project was really focused on moving some of the Art courses paperless, the technology tools in this project help support deeper learning capabilities especially around teacher-student partnerships and assessment practices. The tools provide the opportunity for teacher-student and student-student collaboration, they provide the student with rich assessment capabilities and learning feedback loops, and they provide the opportunity for more differentiation so students can more easily pursue their interests. Students were now provided with more opportunities to work collaboratively online. These docs could then be accessed from any device for rehearsal. These

	docs also allowed for feedback loops that were easily managed. According to a lead teacher: "On the positive side, we successfully demonstrated that it is possible to run an Arts department without paper. Students had a much more engaging experience in terms of assessment practices - they were able to understand how the marks were being generated to a much higher degree than was previously possible. There were learning opportunities created that were previously not available - using apps and websites reliably, allowed them access to a more personalized, directed curriculum. On the negative side, we demonstrated that not all students want, or are ready, for paperless classrooms. Many students expressed frustration with the technology in that it over-complicated tasks that they were used to doing other ways."
Impact on Instruction	Teacher practice changed from paper-based to electronic. Music sheets were now distributed via Google Drive and into Sheet Apps that allowed students to bring up and edit, using digital pens. This also supported more differentiation given that it was so easy now to share music and not lose it. Teachers were also able to more easily work with each other. A student teacher could come in as a shared teacher into the online classroom space within Google and have instant access to all the student works and teacher distributed content. Online assessment capabilities also allowed for creative changes, especially in the areas of music where coaching apps were used to allow students to film themselves and hand in the videos for feedback of both physical and qualitative performance.
Impact on System	This particular program was a pilot program to determine the viability of moving fully to a paperless environment in Music and Theatre and to assess the usefulness of this particular Android technology. The School Board has been looking at moving into Android based devices and the results of this project just further enhance and support that position. With the results [from this pilot] we can now move to introduce this technology and methodology to other schools.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Peel District School Board

Project Title	**Focus, Foster and Flame - Cultivating 21st Century Teaching and Learning Practices** **Leveraging iPads To Support Numeracy**
Description	To assist teachers in creating engaging, effective numeracy strategies using iPads. Au ADE was hired to provide P.S. with ongoing support coming from Board IT/RT's and Math support personnel.
Context	*Number of students*: 1800 *Number of teachers*: 85 *Number of schools*: 30 *Grades/Program*: Grades 4/5, 8/9
Impact on Students	The teachers involved in the project used the strategies they learned from Kyle Pearce to engage their students in Math.
Impact on Instruction	Teachers collaborated cross-panel and within their schools to share strategies, Apps and to look at student work.
Impact on System	Our Board's focus is on numeracy using 21st Century strategies. This initiative supported both goals and we will be examining the data to determine the next steps in the project.

Project Title	**Focus, Foster and Flame - Cultivating 21st Century Teaching and Learning Practices** **Video Conferencing**
Description	Implement Video Conferencing and Collaboration within the Board and Classroom to provide the ability to connect and collaborate at a Teacher – Teacher, Teacher-Student, Student-Student and Classroom- Classroom level. With the technology purchased we are currently building out use cases for a 21st century classroom by leveraging video conferencing and other collaboration tools that we hope to roll out shortly. We have rolled out Video Conference technology at our field offices and administrators and teachers are now able to connect to meetings remotely. This has dramatically reduced travel time and meeting participation.

Project Title	**Focus, Foster and Flame - Cultivating 21st Century Teaching and Learning Practices** **21st Century Skills and Software Inquiry**
Description	To explore a 21st century approach to professional learning, a small group of educators was selected to participate in one of three inquiries. The topics were chosen as they were areas we authentically wanted/needed to explore further.

	• The Power of an Image exploring how we could better engage a visual culture and learners that are avid Instagram users and selfie takers. • Maker Ed in the Classroom: Having many library learning commons integrating maker ed as an option for learners in their building we wanted to explore further how we could take the principles of designs and creation and bring them to the classroom, linking to the big ideas in the curriculum. • Minecraft in the Classroom exploring different ways we could capitalize on student interest in Minecraft to explore and more deeply understand big ideas in the curriculum. Unfortunately due to the ETFO and OSSTF job action we were unable to complete the project. [Our intent is to complete the project during the 2015/16 school year.]
Context	*Number of students*: 1000 *Number of teachers*: 37 *Number of schools*: 23 *Grades/Program*: Grades 1-8

NOTE: Information in the summary is taken directly from the data contained in the final project report.

The Protestant Separate School Board of the Town of Penetanguishene

Project Title	**Globally Connected and Technologically Engaged**
Description	Our project focussed on new learning partnerships among educators, enabled by technology so that students could develop higher order 21st century competencies. • We believed that if students had a voice in the implementation of BYOD, then they would have an enhanced sense of ownership and self-governance in their 21st Century classroom environment. • We believed that if teachers and the technology coach worked together on an inquiry project that spoke to the interests of students (Minecraft) and was integrated into the revised Social Studies curriculum, student engagement and access to the curriculum for all learners would increase. • We believed that once teachers were educated on Google Classroom and felt comfortable using this platform, students would be more engaged in making their learning visible and better able to articulate their strengths as learners and share their knowledge.
Context	*Number of students*: 170 *Number of teachers*: 9 *Number of schools*: 1 *Grades/Program*: Grades 4 and 7
Impact on Students	Evidence of student learning and partnerships included: • Students saying, "face timing with another school was so cool because we could see how their experiment worked and if our structure was better or not." "I love social studies now…I never thought medieval times could be so much fun." • Teachers saying, "Wow, did I ever learn a lot from my students. Their knowledge blows me away."
Impact on Instruction	Teacher and Coach collaboration resulted in increased teacher confidence and efficacy as demonstrated through increased use of programs and technology. Assessment for and as learning through pre-project demonstration of awareness with technology and the specific program. Descriptive feedback was given throughout the process and summative assessment tasks were given (differentiated) where students and teachers co-created the success criteria.
Impact on System	Teacher efficacy and leadership have deepened throughout the school and will be shared as we move forward. Enthusiasm and an increased willingness to learn is becoming evident through conversation and sharing of practices. Additionally, engagement by all students, particularly FNMI and student receiving special education programs has increased.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Sagonaska Demonstration School – Provincial School

Project Title	**Beyond BYOD - moving from engagement to fluency with your personal device**
Description	Technology is engaging for students but we must ensure the use of technology moves past engagement and supports deep learning. Staff at Sagonaska are using personal devices to "level the playing field" for students with severe Learning Disabilities. BYOD is not enough, students need to LEARN and USE their devices to see them as a true learning tool. If we continue to provide rich and authentic learning opportunities/challenges (transformative learning experiences) for students and teachers to explore and complete using their personal technology, will our students and teachers choose personal technology as the "go to" tool to support their learning?
Context	*Number of students*: 40 *Number of teachers*: 10 *Number of schools*: 1 *Grades/Program*: Grades 6-10
Impact on Students	Student work shows greater depth of understanding, ability to communicate thinking independently has increased - students show a greater understanding. Students are making use of specific techniques to enhance their work. Students show understanding of how various media forms [can be used] to demonstrate understanding. This is typically done through the use of their personal tech. Students demonstrate confidence and independence.
Impact on Instruction	We are seeing increased teacher confidence with technology and increased collaboration as teachers plan and share together and deliver lessons. Teachers work with Google docs to better collaborate and share learning and feedback. Teachers no longer [need] to be in the same room to collaborate, even when staff are absent they will still continue to add ideas or feedback to lesson planning and unit ideas.
Impact on System	We are working with another school to include them in our project. The school is creating their project based on the same 3 goals of the Sagonaska School Project. They will begin to add artifacts for the project in the next phase. Sagonaska is sharing information on our project with other provincial schools. We are currently developing a project involving the use of Chrome Books at all 3 Demonstration schools.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Peterborough Victoria Northumberland Clarington Catholic District School Board

Project Title	**Leveraging Technology to Support Learning and Leadership**
Description	Our board has invested our focus on New Pedagogies for Deep Learning. A major component to this project is to recognize the new learning partnership that arises between and among students and teachers when digital tools and resources become pervasive. Through this project we are improving our capacity among principals, teachers and students for using technology to capture Critical Deep Learning. We have allowed for 6 days for Principals and Teachers to share best practices and ideas as to the successes of using New Pedagogies for Deep Learning. Our Board is determined to create a more teacher-student learning partnership and real world, authentic learning tasks enabled by technology. Alongside this focus we believe that Providing Professional learning about assessment practices that reflect deep learning pedagogy are at the root of our Initiative.
Context	*Number of students*: 2477 *Number of teachers*: 38 *Number of schools*: 12 *Grades/Program*: Grades 1-6, one Secondary school
Impact on Students	The impact on student learning has been very positive. Our sheer numbers suggest that our use of technology has impacted our ability to increase the number of critical thinkers. The communication skills of our students have taken a 21st Century look as classrooms are interacting with other classes and teachers. The most successful piece to our project has been our new awareness of how impactful learning partnerships are. The use of student-student learning and teacher – student learning and student – teacher learning has become a common practice in all schools that have been part of this program.
Impact on Instruction	Our Research initiative has impacted over 40 teachers in our board which in turn has impacted over 2400 students. The use of technology-embedded in instruction has become a standard practice with these teachers. They have had many opportunities throughout round 3 and 4 to share best practices and then take what they've seen from other teachers and administrators and bring it into their classroom. The greatest impact has once again been with our learning partnerships. The immediate feedback and continual learning with teacher and student is very obvious. Teachers are seeing how this has impacted student learning and want to be part of the process.
Impact on System	When we look at the impact the initiative had on our system scaling it is obvious that in round 3 we impacted 1150 students and in that increased by 100% in round 4. To support this the system has looked at the BYOD policy. How we can best support our staff and students as we embrace technology and all its wisdom. Also, from an administrative perspective we will have continual PD in the area of NPDL and the use of technology to develop affective practices to impact higher order 21st Century competencies such as critical thinking, communication, collaboration, creativity and entrepreneurship.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Rainbow District School Board

Project Title	**Supporting Engagement, Deeper Thinking, and Math Talk With Technology in Mathematics Classrooms**
Description	Rainbow DSB encouraged and supported project participants to explore differentiated learning, inquiry-based learning, and open ended questions which promote deep thinking by students. Two full-time 'learning coaches' were hired to help guide teachers in their journey towards a technology-enabled, deep thinking pedagogy. The technology used to enable this learning was similar to that used in previous projects but with an overall increase in scope. During the 2012-2013, Rainbow DSB started with 39 tablets shared among seven teachers. For 2014-15 the project grew to include 418 iPads shared among 31 teachers and a wealth of supporting technology such as Apple TVs, charging carts, and high quality productivity and mathematics applications. As the technological scope increased, so did the opportunity to build on past successes and to further address the Technology and Learning Fund's four key areas of focus by continuing to expand on teacher-student and teacher-teacher partnerships, enhance student-to-student learning, and address deep learning pedagogy enabled through technology. Rainbow DSB teachers participated in province-wide work action that led to a full and partial withdrawal of services. This work action limited the opportunity to collect and analyze data for evidence-based findings.
Context	*Number of students*: 700 *Number of teachers*: 31 *Number of schools*: 11 *Grades/Program*: Grades 1-8, 9-12 mathematics
Impact on Students	Increased Student Engagement and Achievement Evidence of increased student engagement was found through classroom observations by teachers, learning coaches, and students. Anecdotal data collected from teachers through surveys tools and conversations with learning coaches also provided evidence that supported increased student engagement. [Student comments] *"It made math fun and entertaining and easy for me to understand"* *"It was a new way of learning that caught my eye"* *"The iPads motivated me to keep going"* [Teacher comment] *"Students were always engaged with the iPads. Seemed more interested in any task when using the iPads"*

	[I]tems were created during lessons that were specifically designed to use the tablets in a manner which engaged the students and provide differentiated, deep-thinking learning opportunities for students. *Student Attitudinal Shift Towards Mathematics* [P}roject teachers and project support staff indicated that some students who had very little confidence in their ability and/or lacked enthusiasm towards mathematics experienced an attitudinal shift during the project. Teachers stated that witnessing changes in their reluctant learners was one of the most encouraging outcomes of their participation in the project. *"They took pride and ownership in their work because it was being recorded." (Learning Coach)* *"I had some teachers tell me that some students that had never really participated in class before were submitting work that was above what they had contributed previously." (Learning Coach)* *Development of 21st Century Competencies in All Students* The variety of access to 21C tools and technologies to assist student learning is an area of inequity for many students in the Rainbow DSB. Through the 21C projects and the significant technology purchases connected with them, this inequity has been somewhat moderated, and essential 21st Century skill opportunities can now be provided for a greater number of students. *Collaboration and Deep Thinking* The technology acquired and implemented during the 2014-2015 project enabled students to experience learning mathematics in new ways. This included the opportunity to engage in student-student learning partnerships and collaborate with peers using technology. Guided and supported by their teachers, students were also enabled by technology to inquire and think about mathematics on a deep level. Specific applications such as Explain Everything also allowed teachers to change their assessment practices to reflect this new, deeper learning pedagogy.
Impact on Instruction	Anecdotal evidence and teacher feedback has shown that project teachers were very willing to try new technology enabled learning and teaching strategies in their classrooms and quickly integrate those strategies on a regular basis into their classrooms. They did so for the purpose of promoting deep thinking in their students and using assessment techniques that reflected this deep learning. Workshops and professional development activities, technology acquisitions, and tools such as Google Applications for Education have given teachers a variety of opportunities to collaborate and create teacher-to-teacher learning partnerships across the board.
Impact on System	*Rainbow DSB Learning Networks* Informal professional learning networks have been created through the Rainbow DSB 21st Century Teaching and Learning projects, and teachers and administrators continue to collaborate on developing a technology-enabled 21st Century learning model for the

	board. Feedback from stakeholders across the board indicates a desire to scale up these professional learning networks system wide. *Learning Coaches* Technical Integration Facilitators had previously been used in Rainbow DSB 21C projects, however the roles and responsibilities of a tech coach continue to evolve. The Tech Coach role continues to have more of a pedagogical support focus, and in 2014-2015 Rainbow DSB decided to create a 1.0 permanent position where a mathematics teacher was seconded. The name Technical Integration Facilitator has been changed to Learning Coach to better reflect the evolving role of the position. *Rainbow DSB Teachers as Technology Leaders* 21st century learning projects that have increased student engagement enabled by tablet technology have now been conducted in over twenty Rainbow DSB schools and over a thousand students have participated. Teachers and students who have taken part in these projects have become leaders in technology enabled learning and teaching, and are championing the development of 21st Century learning strategies at their schools. Other subject areas are being incorporated into the work of the project, as we move forward.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Rainy River District School Board

Project Title	Teaching and Learning in a Digital World
Description	Rainy River District School Board will be selecting sites that are best suited to the intervention. All grades 1-3 teachers and students across the board will be involved in the project. These grades were strategically chosen as we know that targeting our youngest learners will have the most impact and help sustain the practice and build capacity as they progress through their schooling. We will also be continuing the round three initiated training with grade 10 teachers to further embed peer-to-peer learning enabled by technology using apps such as Google Apps for Education.
Context	*Number of students*: 512 Elem, 246 Sec *Number of teachers*: 24 Elem, 60 Sec *Number of schools*: 14 *Grades/Program*: Grades 1-3, Grade 10
Impact on Students	Students learned how to use appropriate apps in order to demonstrate their thinking and deepen their understanding of various curriculum content (shadow puppet, pic collage, etc.). They also use the technology for peer-to-peer learning and to foster collaborative thinking skills.
Impact on Instruction	This initiative has had a positive impact on teacher practice, self-efficacy, and learning partnerships. Many teacher-to-teacher connections have been made as a result of the facilitated professional development provided through this initiative. Same grade teachers have been collaborating and sharing resources through online platforms, thus fostering rich discussion between educators.
Impact on System	Our TLF- 21st Century Learning action plan clearly aligns with the following goals outlined in the Director's Annual Operational Plan: • Develop and implement best technology practices with students, whether one-to-one, many-to-one, and/or Bring Your Own Device initiatives within classrooms. • Enhance "Student Voice" throughout the system. • Further develop strengths-based learning approach throughout the District. • Continue the focus on supports for students with special needs. • Support staff in the promotion and development of 21st Century skills. • Provide personalized support for teachers through the School Support Services Referral and Request process.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Renfrew County Catholic District School Board

Project Title	**Building Strong Pedagogic Practice on a Foundation of Technology Rich Classrooms**
Description	The 2014-2015 21st Century learning project builds upon the foundations set over the previous two years. The project consisted of several pillars of examination with a strong focus on secondary schools and student voice. *21st Century Teaching and Learning in the Secondary Classroom:* How can new and innovative models for teaching and learning technologies be effectively used to drive the development and delivery of sound pedagogically based instruction and assessment practices at the secondary level? The development of a Networked Learning Community between departments of two high schools focused on lesson design, instructional strategies, and assessment practices. *Rethinking Assessment Driven By Student Voice:* How can teachers use Growing Success to re-examine student created digital learning artefacts? Teachers formed a working group that reflected upon current assessment practices, examined current research and Ministry documents, as well as took into consideration findings based on student voice. *Through Their Eyes: Documenting Literacy and Learning in Kindergarten:* How does the integration of mobile devices and additional supportive technology enhance pedagogical documentation, student learning, and parent communication in our Early Year's Classrooms? This project will support the purchase of technology for an existing Provincial Knowledge Exchange (PKE) project that includes 56 educators from across the Board.
Context	*Number of students*: 1904 *Number of teachers*: 81 *Number of schools*: 18 *Grades/Program*: Grades 4-8, Grades 9-12 in Math, Science, English, Social Sciences and the Arts
Impact on Students	Teachers in all three of our projects responded that using technology and 21st Century approaches in their teaching practice has definitely impacted student engagement, 21st Century competencies and learning partnerships. In regards to student engagement, many teachers reported that students now had the ability to create, collaborate and communicate with each other like never before which increased their overall level of engagement.
Impact on Instruction	Through a series of conversations, observations, and responses gathered via Google Forms we have collected evidence that indicates that the various projects positively impacted teaching practice in a variety of ways. Teachers reported increased: confidence and comfort level with the use of technology for teaching and learning, increased understanding of how pedagogical

	documentation can be used for assessment *for, as* and *of* learning, and ways to foster greater student and parental engagement. Furthermore, participants and their principals reported their teachers feel more engaged, inspired and excited about their new technology, new learning, new connections and new ways to make learning come alive in the classroom. Many also reported that they have increased their leadership roles within their divisions and within their schools, as they are feeling more confident to share their learning and to help others to use technology in the classroom.
Impact on System	Here are a few specific ways the initiative it has helped with scaling up: • Assisted with building a strong infrastructure across the system • Allowed us to purchase more technology for both students and teachers • Creation Networked Learning Communities to assist with supporting the teachers as they begin to rethink their teaching practice • Provided the funding to assist with the necessary professional learning to promote deep learning at the classroom level. By focusing on both professional learning around the integration of technology and effective use of technology for both teaching and learning we have been able to make great gains in this area. Now heading into our third year of this strategy we have educators at each of our schools that have the technology and a well-developed level of training, contributing to our ongoing efforts to support system scaling.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Renfrew County District School Board

Project Title	**Using Technology to support Assessment for and as Learning**
Description	The focus of this project is to explore how technology can enhance ongoing assessment practices and the use of documentation. Participants engaged with the Ministry monograph "Pedagogical Documentation Revisited" to provide a context for intentional documentation and collaborative analysis (for both teachers and students) of the documentation. 60 educators, ranging from kindergarten to grade eight, have been provided with iPads for this purpose and will have two days of release time to pursue their inquiry in this area beyond our initial meetings together. The mini iPads are being used for the collection of evidence of learning. The ePortfolio app from D2L is being explored.
Context	*Number of students*: n/a *Number of teachers*: 60 *Number of schools*: 14 *Grades/Program*: K-8
Impact on Students	Due to work action, we were unable to assess the impact on student learning.
Impact on Instruction	We were able to complete a pre-survey with 20 of the prior to work action. Despite our limited responses to the pre-survey and inability to complete the project, the evidence that we did gather causes us to consider our next steps to support the use of the iPad and other technologies in order to support pedagogical documentation and learning.
Impact on System	The survey results allow us to reflect on how we distribute supports in the system and how we differentiate this support based on educator needs. In addition the results allow us to reflect on educators' understanding of assessment and in a more technical sense, how many educators are using ePortfolio. This data is important to us as we proceed in our implementation of Creating Pathways to Success.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Simcoe County District School Board

Project Title	**Innovation Hubs:** **1. Transforming Assessment through Technology** **2. Leveraging Digital Tools for Deep Learning**
Description	As part of our continued learning around the impact of digital tools and resources on learning and teaching, we are engaging in two K-12 collaborative inquiries. The first, *Transforming Assessment through Technology*, will focus on how educators and students can authentically leverage digital tools to support the collection and analysis of triangulated assessment. An emphasis will be placed on students as partners in the assessment process leading to more autonomous learners. The second, *Leveraging Digital Tools for Deep Learning*, will engage educators and students in leveraging digital tools and resources to create deep learning experiences that have meaningful audiences and relevant purposes for students. All learners will work to develop 21st Century learning skills including; collaboration, creativity, critical thinking, citizenship, character and communication. A variety of digital tools and resources supported the learning this past year including; iPads, iPods, document cameras, projectors, Google Apps for Education and a 3D printer.
Context	*Number of students*: 2400 *Number of teachers*: 200 *Number of schools*: 40 *Grades/Program*: Grades K-12
Impact on Students	Our learning in this round of the 21st Century Innovation Research Initiative has had an impact on student learning in two significant areas, student agency and making student learning visible. The Innovation Hubs and Student Innovation Hubs have used a Genius Hour approach to self-directed learning. Given a wide range of digital tools and resources, students determined and carried out their own inquiries. Through the use of iPads, GAFE and Blogger, students were able to document their own learning and publish it to a wider audience and create learning portfolios. This authentic purpose and audience combined into a powerful motivator for student autonomous learning.
Impact on Instruction	The impact of these projects continues to spread from a concentrated group in rounds one and two, to a much wider audience in rounds three and four. The Innovation Hubs provided the tools (iPads, document cameras, projectors, etc.), the support (Program and Innovation Resource Teachers) and the time (release days) for staff to learn. The work was founded in teacher inquiry using Plan, Act, Observe and Reflect. The power of co-planning and co-teaching created a safe environment for staff to try new strategies.

	Our Kindergarten and DECE teams are terrific examples of the use of technology for pedagogical documentation. Through the use of iPods and iPad Minis, these dynamic teams provided students with a mechanism to record their learning and share with each other, their parents and beyond. Our work with New Pedagogies for Deep Learning continues to impact teacher practice in three areas: 1. New learning partnerships with students, parents, the community and teachers around the globe, 2. New opportunities and strategies to leverage digital tools and resources to accelerate learning, and 3. A renewed focus on six deep learning goals (creativity, collaboration, communication, critical thinking, character and citizenship).
Impact on System	Through the new learning generated by our 21st Century Innovation Research, we have had a renewed focus on assessment and pedagogical documentation. Assessment is an integral component of our Essential Practices document and figures prominently in our revised Board Learning Plan for Student Achievement and Well Being and our professional learning opportunities for 2015-16. As part of our new School Learning Plan for Student Achievement and Well-Being, co-authored "Learning Stories" will document the learning of every professional learning opportunity. Each of these learning stories will be accessible to the system providing transparency and accountability as well as monitoring and moderating opportunities. These learning stories are written in real time by the participating staff in the collaborative inquiry. We are moving away from summative reporting on what we learn to more reflective and timely feedback. Having administrators, superintendents and central staff moderate the SLPSA-WB during the learning, allows for a richer discussion and probing questions for reflection. Another learning opportunity which became clear during this round is that school administrators required continued support in order to leverage digital tools in school improvement planning and documenting the learning of staff. The use of Google Apps for Education and specifically Google Classroom became a regular component of Regional Principal meetings and Principal/Superintendent PLCs. Providing administrators with a working knowledge of the tools teachers and students use in classrooms allows them to confidently enter into discussions and to model its use for others.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Simcoe Muskoka Catholic District School Board

Project Title	**Learning In The Cloud**
Description	Our innovation project is examining student engagement and self-regulation when they use GAFE as a learning tool. We are also examining the change in teacher practice – instruction and assessment – when teachers have regular access to GAFE and have technology in the classroom all day, every day to support instruction and learning. Although this is what defined what started our project it became evident, from past experience and new evidence, that support needed to be provided that would improve student self-regulation when using technology as a collaboration tool (defining and modeling effective Digital Stewardship).
Context	*Number of students:* 360 *Number of teachers:* 14 *Number of schools:* 7 *Grades/Program:* Junior /Intermediate classrooms (Literacy), Intermediate / Senior English Courses
Impact on Students	Opportunities for peer-to-peer review of written and project work were enabled by technology. Students used the "Comment" tool in Google Docs to provided descriptive and constructive feedback. Students were also encouraged to use the "chat" feature when synchronously collaborating with peers on a project or assignment outside of class time. One of our participating teachers polled students with regards to the use of Google Technology to help improve the learning: *"Overall, it appears that the Chromebooks have had a positive impact on the students and most are using their Google account more frequently. Personally, I have benefitted tremendously from having the Chromebooks and have learned a vast amount in the short time I have had to get acquainted with the Chromebooks and Google Apps for Education. Thank you for the opportunity to partake in this initiative!"*
Impact on Instruction	Using the collaborative Google tools allowed teachers to co-construct tasks and success criteria with their students (and peers). As a result there was a definite increase and focus on formative assessment. Teachers found that students were completing and submitting work which allowed them to provide a better picture of a student's abilities. Teachers also found they were more confident with using communication and observation as an assessment tool. On how teaching practice has changed: • *We are being challenged to create deep thinking projects; ensure that students are thinking critically, collaborating and using the technology to create something that they wouldn't be able to make/share without the technology.*

	• *We are becoming more comfortable with the idea that we are the facilitators of learning, not the 'knowledge holders'.* • *It's much more about learning and much less about teaching.* Although the project focus was on using Google Apps for Education, many teachers ventured off and discovered other online tools to help improve learning. Teachers began using "Poll Everywhere" to help gauge the learning of her students. Other used "Padlet", Google Scholar, Google Research and CreativeCommons.org help stretch their limits when incorporating technology in the classroom. Learning partnerships were developed using the Google Classroom portal. Although teachers were separated by time and space, they were able to share experiences, resources and support.
Impact on System	The success of the "Learning in the Cloud" project, now in Phase 4, has helped shaped Simcoe Muskoka Catholic's new "Engage and Transform" technology plan. Our Education Leadership Team has endorsed Google Apps for Education (GAFE) as our primary classroom productivity tool. Gmail will become our corporate communication tool by September 2015. All teachers will be assigned a laptop and engage in GAFE training which will focus on the tools ability to promote "Collaborative Contributors". The board is also considering the purchase of "Read&Write" for Google which will provide all students and teachers the assistive technology that is good for all, but necessary for some. Our project has also helped change the way hardware is imaged and delivered to the schools. Chromebook orders, once processed, are sent directly to the vendor who images and prepares the device and then ships directly to the schools where they can be immediately used once unpacked. Our ICT support staff has also committed to the Ontario GAFE consortium which will provide administrative training on the Google Dashboard, as well as a variety of technical supports.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Superior North Catholic District School Board

Project Title	**Collaboration and Communication: Creating a Common Understanding of GAFE**
Description	The focus on SNCDSB's research is on whether Google Apps for Education (GAFE) will change the way that students and teachers collaborate and communicate with one another. Specifically, we are looking to see whether classroom use of the Google tools will give teachers more opportunities for innovative instruction and deeper assessment. In turn, we are also looking to see whether GAFE has provided our students with leadership opportunities within their classes, schools, and communities. The technology (the "cloud" services provided by GAFE) has a significant role in this research; these tools provide the portal through which our students and teachers are able to collaborate and communicate with one another.
Context	*Number of students*: 41 *Number of teachers*: 3 from focus classrooms, 40 for knowledge mobilization, 9 Volunteers *Number of schools*: 3 focus sites, 8 for knowledge mobilization *Grades/Program*: Grades 3-8
Impact on Students	With respect to learning partnerships, we had our students as the lead learners of the GAFE tools in our school board. Students who attended the Student Google Summit were empowered to teach their classmates and other students/teachers in their schools how to use these tools. A number of our students also helped teach parents and community members how to use GAFE during after-school learning sessions. These students became the champion "teachers" of GAFE. Some of our students also had the opportunity to teach learners outside of their schools how to use Google Tools. Three students at our first focus school taught the Board Office staff how to use Google Drive, Slides, Forms, and Docs. Students from the second focus school facilitated a learning session for the staff and board members of their local Adult Learning Centre. Finally, a student from the third focus school presented at a Google Summit in Kitchener alongside her classroom teacher. This student taught the teachers in her breakout session how to use their Google Drive Whereas allowing students to be the lead learners of GAFE has provided them with leadership opportunities that support student well-being, actual use of the Google Apps themselves has also had an impact on student learning and achievement. For example, when using Google Drawing, a student was able to create a professional-looking poster that communicated her knowledge of the topic. Finally, communication between students and teachers has improved by the use of the GAFE tools. 85% of students in the focus classes have collaborated in a Google Doc with other students or their teacher. One student commented: "I liked working with my group on Docs because everyone could edit and communicate."

Impact on Instruction	Similar to the impact on student learning, use of the GAFE tools has also had a positive impact on teacher practice. Teachers in 8/9 schools participated in a Google Learning Day. One teacher from each school facilitated a half-day session for educators across the system. The facilitators were asked to provide any observations they have noticed in change in teacher practice since the session. Below is one example. *"A number of teachers have used Google apps in the classroom since the training. One Grade 7 teacher developed a test on Google forms, while a Grade 1/2 teacher added extensions from the Chrome Web Store to the class Promethean Board. Students and staff are all using Google Drive more and having success. Teachers share observational notes, activities, and calendars with each other."* There have been other impacts on teacher practice that fall outside of our planned research. For example, all Special Education Resource teachers have recently had training on a new IEP generator. The Special Assignment teacher from SNCDSB who will be supporting the Special Education Resource Teachers with implementing this new resource, created a Google Hangout for questions and answers.
Impact on System	In order to spread the innovation work, we realized that we would need a physical presence in each school. This year, we established Digital Learning Volunteers (DLVs): classroom teachers in each school who helped create awareness and build capacity with respect to learning via digital tools. With the Innovation funding, we were able to release these teachers for a half day once each month. During this time, the DLVs met over Adobe Connect and Google Hangouts with the Technology Enabled Learning and Teaching Contact. By working with Digital Learning Volunteers throughout the year, not only are we creating a system-wide group of leaders in terms of technology-enabled learning, but we are also providing an in-school go-to person for each of our schools. [H]aving the in-school support was a major factor in promoting system change. 100 % of the Digital Learning Volunteers found the monthly meetings valuable, and 100% of the volunteers think that this professional learning network should continue next year. In addition, the Google Learning Days that occurred in 8/9 [schools] created awareness across the whole system with respect to GAFE. Educators, including teachers, principals and educational assistants participated in these Google Learning Days. At the beginning of the innovation, 29% of the participants had an understanding of how GAFE can help students and teachers collaborate with one another. After the Google Learning Day, 90% of the participants have an understanding of how GAFE can help students and teachers collaborate with one another.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

St. Clair Catholic District School Board

Project Title	**Leveraging Digital for Deep Learning and Student Engagement**
Description	In this project we are connecting the learning from previous rounds of the TLF Research Initiatives. We learned that we need to build capacity in our teachers to better support our students with IEPs and that using technology more effectively, ensuring that students have access to the tools whenever needed, will lead to greater success for these students (Round 2 learning). We also learned that our teachers need much support in using technology and understanding 21st Century teaching and learning concepts (Round 3 learning). We chose to target a group of teachers where we find that these two key areas of our learning come together – that is, Applied courses in secondary schools. These courses have a high percentage of students with IEPs, and we find that the use of technology in these courses is less than optimal. Students with IEPs who need assistive technology do not always have quick access to the tools and are often reluctant to use them due to their discomfort in being identified as having a disability. Another issue in our Applied courses is the lack of rich tasks as teachers hold firm to the belief that the students cannot meet the challenge of more cognitive demand and intellectual engagement. By increasing their understanding of rich tasks, and learning more about integrating technology effectively, and by a deeper understanding of the capacity to learn of their students with IEPs (especially when using their digital tools to assist), teachers will see that students in Applied courses are more than capable of deep learning and intellectual engagement.
Context	*Number of students*: 525 *Number of teachers*: 21 *Number of schools*: 2 *Grades/Program*: Grade 9 Applied English, Science, Geography and Religion
Impact on Students	In reviewing the Google Slides that were posted by each teacher, we have identified that student learning has been positively impacted. Teachers have reported that students were fully engaged in using the technology, and that many more students completed the tasks and on time than in previous tasks. Students achieved higher grades in the tasks as well. Students have commented in many of the examples posted, that they enjoyed using the technology, having more choice in tasks, and in working collaboratively with peers. Teachers noted that students could complete tasks more efficiently using the technology.
Impact on Instruction	Teachers were much more aware of what students needed for learning. They noted the engagement of students and offered much more choice in their assessment tasks. Assessment tasks were developed to reflect deep learning. Teachers became more responsive in their instruction as they were very interested in learning whether or not the change in their practice would work. Some of the teachers recognized a shift in their role as director of the learning and developed true partnerships with their students.

	The Special Education teachers who assisted the team in this project were able to continue developing stronger partnerships with the classroom teachers. This has not been past practice and we are encouraged to see this development. In one of our secondary schools, the special education model is being revised as a result. Teachers noted that creating rich tasks was a challenge, and they do need more time to fully understand all components of the Qualities of a Rich Task. They are becoming more comfortable with using the Google tools that were suggested for the tasks and are anxious to learn more about other tools as well. Subject specific teachers from both of our secondary schools have continued to communicate and collaborate using the shared Google Drive folders for the first time and are sharing ideas and resources. They are learning more about how to co-create success criteria for student tasks, and after reviewing some of the samples, it is apparent that there is much more to do in developing their understanding of success criteria. Teachers have commented to our support team that they now have a much better understanding of the IEPs for their students and are now much more confident of the ability of the students to be able to complete the rich tasks.
Impact on System	In one of our secondary schools, as a result of the collaboration that took place between the special education teachers and classroom teachers during this project, a new model of support is planned. Each special education teacher in the school will be assigned to work with the classroom teachers in the departments of the project, for a specific block to time each day for co-teaching in the classroom. This has been an unintended, but exciting consequence of the project and we look forward to the impact of this partnership on student and teacher learning and will share the results with our other secondary school (as well as elementary schools). This project was implemented simultaneously with our New Pedagogies for Deep Learning (NPDL) project and a result, we now have over 60 educators involved in incorporating deep learning, technology and 21st Century competencies in our system. The results of both projects are highlighted in the monitoring plan of our Strategic Plan and BIPSA in order to ensure that we continue to spread this learning beyond the project groups. School administrators will be shown the results of this project during their Leadership meetings in early fall in order to highlight the impact of the teacher and student learning.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Sudbury Catholic District School Board

Project Title	**Creating a Collaborative Culture**
Description	Overall, the Sudbury Catholic District School Board will be enhancing and deepening colleague-colleague, teacher-student and student-student collaboration using technology by providing all stakeholders with access to collaborative technological tools (Microsoft Office365) in tandem with the transformation of Secondary School Libraries into Learning Commons to allow for equitable access to a variety of technological devices and tools by students. At present, we have been working on enhancing colleague-colleague collaboration. To facilitate this, The Innovation Research Team has completed the following activities: • Created a Microsoft Office Steering Committee. • Created a 'Microsoft Office at Sudbury Catholic Schools' Support Site. • Created a 'Learning Support Services' Site for the Learning Support Services Department at the School Board. • Begun creating School 'Sites' (to enhance school-level collaboration between colleagues and between school administrators, educators, and support staff). • Have begun to create Grade-Level and 'Subject' specific Sites (e.g. 'English' to provide opportunities for subject-specific teachers to collaborate in synchronous and asynchronous ways through the use of technology.). • Created a series of 'Support Documents' to assist staff members. • Completed a 'pilot' project with one high school teacher and 3 classes of students to acquire a sense of what the student experience will be.
Context	*Number of students*: 59 *Number of teachers*: 437 *Number of schools*: 21 *Grades/Program*: K-12
Impact on Students	Given the scale of our research initiative and the strict timelines, we are unable to give a lot of concrete evidence on how this research will impact student learning; however, an early pilot project involving one educator and her three Business classes did reveal that providing students with a uniform set of collaborative tools results in a shift in pedagogy and student learning. The teacher was also able to share a class 'OneNote Notebook' with the students for whole-class synchronous and asynchronous collaboration. According to the teacher, there were, unfortunately, some technical difficulties involving hardware (the computer lab she was working in needed to be upgraded) and WiFi connectivity. As a result, we made infrastructure improvements to improve the experience for the teacher and students.

Impact on Instruction	We are also anticipating a change in assessment practices, particularly in the area of descriptive feedback. Educators will be able to provide 'live feedback' on shared documents. Students will also be able to access this feedback as soon as it has been completed by the educator. We are also seeing the beginnings of an impact on educator learning partnerships with the creation of our first curriculum related Site: Secondary English Teachers Site. This Site is still in the development stage but will be the access point for all secondary high school English teachers at SCDSB who will be involved in an assessment Collaborative Inquiry during the 2015-2016 school year.
Impact on System	This Research initiative is tied to the Board's Innovation vision which is: "we are committed to increasing student engagement and achievement by providing more opportunities to demonstrate knowledge, skill and understanding through the use of technology". Microsoft Office 365 will provide more opportunities for students to become engaged in and demonstrate their learning, and will provide more opportunities for descriptive feedback (through 'shared documents) and improved assessment practices as teachers use Microsoft Sites to collaborate within schools, the elementary and secondary panel, and in transition planning. With Microsoft O365, teachers will be able to collaborate in an on-going manner through the various 'Sites' and shared documents. Additionally, this research is aligned with and deeply rooted in the Board's "Technology Integration Plan" which has been written in draft this year by several members of the Technology Learning Fund Research Team and will be implemented at the beginning of the 2015-2016 school year.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Superior-Greenstone District School Board

Project Title	Supporting Student Transitions
Description	The focus of our project was to provide all grade 8 students within Superior-Greenstone with the opportunity to access the vLE and digital resources to support the acquisition and development of 21st century skills so that they can have a more seamless transition to the secondary panel where there is the increased expectation that students will come prepared with these skills. As well students will have a familiarity with the vLE in grade 8, which with ongoing vLE opportunities, will allow students to make informed choices about e-Learning in their senior year to support their pathway destination by providing flexible, robust timetable options.
Context	*Number of students*: 161 *Number of teachers*: 10 *Number of schools*: 10 *Grades/Program*: Grade 8
Impact on Students	All grade 8 students in Superior-Greenstone District School Board have access to the vLE and they have opportunities for increased familiarity and use of the vLE tools. Students will be greater prepared for navigating blended learning upon entering the secondary level.
Impact on Instruction	Unable to report with Data due to current ETFO labour situation. Informal feedback during and after PD sessions was overwhelmingly supportive and, as evidenced by the request of an additional 14 blended learning courses for the gr.8 teachers, there was support for the project. The creation of the additional courses indicates that teachers see the value in implementing technology embedded teaching and learning in their best practices.
Impact on System	The project formalizes the efforts of Superior-Greenstone District School Board to support technology enabled teaching and learning across the Board. It ensures that at least one teacher in each elementary school has vLE capacity and can support and encourage other educators in the school to engage in this practice. Implementation is less sporadic and less defined as target groups are identified and supported (Gr.8 teachers and students). A greater number of teachers and students have developed capacity in the area of the vLE. Although the scope of the project targeted grade 8 teachers and their students, all eligible grade 8 teachers accessed the vLE for their additional classes, which increased the scalability and spread of technology embedded teaching and learning. The initiative provided mobile learning centers to each elementary school to support the integration of technology into teaching practices in every elementary school.

	Board planning supports technology enabled teaching and learning and is promoted within Senior. Administration and the Board Leads. Champion tech teachers will be established in each school to support the development of leadership in this area across our Board and to support student and teacher learning needs as necessary. Gr.8 teachers will continue to access the vLE to support their learning and time and resources will be provided for them to meet as a group to enhance their skills and understanding of the use of technology embedded learning and teaching to develop pedagogy.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Thames Valley District School Board

Project Title	**Cloud-Based Collaboration and Inquiry**
Description	Our inquiry focus question, "How do D2L and GAFE facilitate c***ollaborative inquiry***?", was designed to get teachers thinking about what collaborative inquiry looks like in their classrooms, and have them consider how D2L and GAFE can help them to facilitate this. There were 15 Chromebooks provided to each of the 94 schools to help support them in the use of technology. They were also provided with a cart to store and charge these devices and to allow for easier mobility. These 94 schools were divided into 5 groups of 18-20 schools. Each of these groups were together for 1 full day between March 5 and March 12, and then were further subdivided into small groups of 4-6 schools for 2 additional half-day sessions in April/May and May/June. These days were used to provide teachers with the knowledge they would need to help facilitate collaborative inquiry in their classrooms. It also afforded them an opportunity to reflect, collaborate, plan and share amongst schools and each other in regards to collaborative inquiry and the technology being used in this project. The 5 mentors from the Fall Project (Round 3) worked with 10 newly identified teacher mentors who were participants in the Fall Project to help ***build leadership capacity.*** From there, the idea was that the 3 teachers from each school would help to build capacity in their own school for the purpose of growth and sustainability. The inclusion of Instructional Coaches and Subject Learning Coordinators in the project was an intentional way to help schools grow and sustain this new learning, and offered teachers additional ***in-class instructional supports*** in the areas of collaborative inquiry and cloud-based computing. The work done in GAFE supported teacher-teacher, student-student, and teacher-student collaboration across schools and in classrooms. GAFE also naturally supported the SOLE classroom environment that promotes collaborative inquiry and teachers and students working together. In addition, teachers were also asked to monitor one student throughout the project - a 'marker' student - for the purpose of determining student engagement.
Context	*Number of students*: 7,050 *Number of teachers*: 282 *Number of schools*: 94 *Grades/Program*: All Grade and Subject levels - both elementary and secondary
Impact on Students	Each teacher in the project chose to follow a 'marker' student throughout the project. Observations were gathered and shared at the Mid-Project Session as well as the Wrap-up Session. Findings include: • Students are more engaged when doing inquiry-based tasks and when using technology • Students who typically don't participate or who are unmotivated are now producing some results

	• Student 'tech' leaders are emerging - some students are finding increased opportunities to lead as a result of their interest in the use of the cloud-based AND mobile computing options Some ideas related to "impact on learning": • Students are taking more risks with their learning. • There is a noticeable increase in student engagement when using the technology and the inquiry-based approach to learning. • There is more collaboration in the classroom (student-student, student-teacher).
Impact on Instruction	There are two main areas that have impacted teacher practice/instruction through the project: 1. Teachers have increased their knowledge and use of Google Apps for Education as a way to collaborate (teacher-to-student, student-to-student) and share their learning. 2. Teachers' knowledge of inquiry-based learning has increased as a result of this project. Their confidence has increased in terms of asking BIG questions and allowing students the opportunity to guide their own learning. When we started the project, most teachers (73%) rated themselves as average or above average in their knowledge of inquiry-based learning. However, only 55% of teachers rated themselves as average or above average when it came to self-assessing their knowledge and application of cloud-based computing in the classroom. At the April Regional session, 87.2% of teachers rated themselves as average or above average in their knowledge of inquiry-based learning (up 12.2% from the Kick-off Session). Over the same time period, the number of teachers rating themselves as average or above average when it came to their knowledge/use of cloud-based computing rose to 80.1% (up 25.1% from the Kick-off Session). Within the first 4-6 weeks of the project, a significant impact on teacher practice in the realms of inquiry-based learning and cloud-based computing were already becoming evident. [P]articipants were also asked to assess their own "growth" from the Kick-off to the Mid-Point (April Regional Session) and then from the Kick-off to the Wrap-Up (June Regional Session) as it related to inquiry-based learning and cloud-based computing. Observation: In the span of 4-6 weeks, almost 40% of respondents (out of 247 respondents) indicated that their knowledge of inquiry-based learning has increased significantly. Virtually everyone in the project noted 'some' growth. Due to only secondary school participation at our wrap-up sessions, we were unable to gather results across all 94 schools that would provide information on growth from the March Kick-off to the June Wrap-up Sessions. However, the following data was taken from the 18 secondary schools (n=38) participating in the June Wrap-up. Observation: In the span of about 10 weeks, the 'growth' in understanding/use of cloud-based computing is showing that the secondary respondents have seen significant growth (as compared with the group at the project mid-point).

	Some ideas related to "impact on instruction": • Teachers need time to feel more comfortable with the technology and inquiry approach but there was some acknowledgement that students can help to take a lead in this area. • Teachers have concerns about 'curriculum coverage' and 'assessment' related to inquiry-based learning. • It is difficult coming up with good "BIG" questions (for both teachers and students).
Impact on System	Both Rounds 3 and 4 of the CODE project have provided valuable insights that have helped to inform and shape directions regarding the roll-out of Google Apps for Education on a system level, the purchase of mobile technology, and the movement to SOLE classrooms and Learning Commons models. We have a large percentage of our TVDSB schools embracing the idea of SOLE classrooms and looking for ways to operationalize this in classrooms where teachers are indicating readiness. The IT department has been instrumental in supporting the introduction of Chromebooks into our system since September 2014. This directly supports the CODE Project, as well as the TVDSB ICT Strategic Plan (2015-2018) to increase the use of mobile technology in schools. We now have over 4000 Chromebooks throughout the system. To ensure a more robust infrastructure to manage the wireless needs in schools, IT has taken two critical steps. First, they introduced the TVDSB Wireless network in the fall of 2014. Second, IT is working with a small number of schools to update their network infrastructure (Internet and Intranet) to gauge improvements that will then be applied on a large scale across the system. In the June Wrap-up Session, secondary teachers who attended were asked to develop a Plan of Action for their school - essentially, they were tasked with discussing how they will scale-up the approaches to inquiry-based learning facilitated by cloud-based computing that were part of this project.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Thunder Bay Catholic District School Board

Project Title	**Educating for the Future – Preparing for the World: Learning Partnerships enabled by Google Apps for Education**
Description	During the 2014-2015 school year, the TBCDSB invested in a cloud environment called Google Apps for Education. The purpose of the project is to support technology-enabled learning and teaching by providing teachers and students with access to cloud-based learning environment (GAFE). A professional learning plan was developed to introduce students, teachers, principals and instructional leaders to Google Apps for Education (GAFE). Professional learning opportunities for teachers included workshops, sustained learning through collaborative inquiry, embedded support provided by technology resource teachers, funding and release to attend GAFE summits and support to complete the GAFE Educator certification exams.
Context	*Number of students*: 3500 *Number of teachers*: 280 *Number of schools*: 5 *Grades/Program*: 7-12
Impact on Students	The report "Educating for the Future – Preparing for the World" included the following highlights related to impact on students. • Students were able to complete tasks more independently and happily. • Students had a positive experience with technology for learning. • Students accessed assignment information and communicated more using multiple devices. • Students could complete assignments when away from class. • GAFE enhanced timely and diverse feedback to students regarding their work.
Impact on Instruction	GAFE most frequently had a positive impact on teachers' ongoing professional learning, assessment and evaluation of student work, responding to needs of individual students, teacher resources for planning learning for a learning community, and teacher resources for planning learning for an individual student. The report "Educating for the Future – Preparing for the World" included the following highlights related to impact on students. • Student-Teacher learning partnership changed, with increased independence, student-centeredness, communication, and feedback. • Responsibility in the Student-Teacher learning partnership became more clear and distributed. • Student-Teacher learning partnership involved more opportunity for different types of communication between teachers and students. • Teachers found is easier to collaborate with other teachers using GAFE.

Impact on System	Technology-enabled learning practices we are scaling up include providing opportunities for students to: • Use technology to articulate their learning • Recognize how to improve their work • Engage in inquiry-based learning • Think critically, make deep connections • Reason and communicate effectively • Make links to their lived world Plans for scaling up the initiative: 1. Actions we are taking to DEEPEN the power of our innovation model: • Develop a comprehensive professional development plan to build knowledge and understanding of technology-enabled learning and teaching. • Foster a culture of co-learning and collaboration. • Facilitate the development of resources in the school board to support technology-enabled learning and teaching. • Ongoing evaluation and research to understand and enhance causes of effectiveness. 2. Actions we are taking to make our innovation model SUSTAINABLE: • Support principals in developing leadership capacity for technology-enabled learning and teaching. • Encourage and support professional learning communities focused on technology-enabled learning and teaching. • Ensure teachers have access to support mechanisms throughout the system, including a supportive professional community of colleagues in the school. • Continue to use a sustainable funding model for hardware purchases to ensure students and teachers have access to necessary resources. 3. Actions we are taking to SPREAD our innovation model: • Provide teachers, principals and other educational leaders with ongoing, professional learning and opportunities to collaborate and share. • Include technology-enabled learning and teaching in school and system monitoring. 4. Actions we are taking to facilitate SHIFT and EVOLUTION of our model: • Encourage teacher leadership for technology-enabled learning and teaching. • Foster a culture of co-learning, collaboration and innovation. • Continue to include principals and teachers on planning and decision-making committees. • Include students on planning and decision-making committees.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Toronto Catholic District School Board

Project Title	**iPad Integration in the Math Classroom**
Description	The "iPad Integration in the Math Classroom" initiative was the result of collaboration between the TCDSB Math and 21st Century Learning Departments, who planned and delivered 12 2-day sessions to TCDSB grade 6 teachers from all areas. This year, this initiative started with its first session on March 9, 2015 ending with its last session on May 4, 2015. Through this project, we encouraged grade 6 teachers to explore the use of the iPad to engage and support students in the learning of Mathematics. An in-class follow up session was also offered to all teachers, who wanted to plan and implement a Math lesson incorporating iPads. Resource teachers spent the day co-planning and supporting classroom teachers as they implemented the lesson.
Context	*Number of students*: 125 (in follow-up classroom visits / 4500 total) *Number of teachers*: 180 (attending workshops) *Number of schools*: 4 (visited schools for follow-up sessions / 168 total) *Grades/Program*: Grade 6 Teachers / Students in Math
Impact on Students	In the follow-up session it was evident that the students were very comfortable using the iPads. They were able to use the apps and iPad features to solve problems and document their thinking. They worked with partners, demonstrating that initiative encouraged collaboration with their peers. Using the Apple TV and the iPad to share solutions with each other and with the teacher helped students to see a variety of different ways to solve problems. As the teacher used the technology to project student work during consolidation, it made student learning visible for everyone. Subsequently, it helped students to be engaged and involved in the co-construction of learning goals and success criteria.
Impact on Instruction	For teachers who were fully comfortable with the iPads, it was easier for them to highlight and discuss the different solutions and ways to solve the same problem. This helped to shorten the consolidation part of the 3-Part Lesson. On the other hand, teachers who were new to iPads took twice as long to consolidate the learning during the lesson. Regardless of the amount of time, they were still successful in using the technology to engage students in mathematics.
Impact on System	The TCDSB has a 5 year plan for 21st Century Learning based on our NeXt Lesson Framework. The NeXt Lesson outlines 6 essential 21st Century Learning Competencies that students need to succeed. The framework of the NeXt lesson has been central to the professional development workshops delivered by TCDSB21C and the collaborative work we have done with all of our other curricular departments. This project, like all other TCDSB21C initiatives, had at is focus the NeXt Lesson, in particular competency of the Use of ICT For Learning. Teachers involved were exposed to the NeXt Lesson, in support of our 5 year plan.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Toronto District School Board

Project Title	**Learning Today for Tomorrow: Innovation in Teacher-Student Technology-based Learning**
Description	*Education for Social Innovation* Using a Blended Professional Learning model, participating teachers design learning for their students where design and entrepreneurial thinking are combined with social innovation processes so that students will use e-technologies in challenge-based inquiry that address local and global issues. Central to the learning is the co-construction of learning between teachers and students using e-technology to collaborate, learn, and work. Apps and web 2.0 technologies used as learning tools to make students learning and thinking visible for documentation will naturally increase metacognition, in particular learning how to learn. *Using Entrepreneurial Thinking to Establish New Generation Learning for Grade 7-12 Teachers and Students* This teacher and Principal led initiative embeds the competency of entrepreneurial thinking into the professional work of intermediate and secondary teachers and into the curriculum for students in Grades 7-12. This is accomplished through co-creating entrepreneurial thinking challenges and tools which change the conditions of learning, leveraged by the use of e-technologies. The added intent of this initiative is organizational leadership at the school level and the capacity to deliver change through innovation, collaboration, design and systems thinking. It highlights opportunities for social innovation and global citizenship; and builds new pedagogies based on learning partnerships, deep learning tasks, and digital technologies and resources.
Context	*Number of students*: 2040 *Number of teachers*: 118 *Number of schools*: 37 *Grades/Program*: Grades 1-12
Impact on Students	An in-depth evaluation of the impacts on participating students' learning and well-being will be conducted in the 2015-2016 school year as the student achievement and school engagement data becomes available. This area on overall impact on learning will be continue to be studied as in light of the TDSB K-12 STEM Strategy as outlined in the Technology and Learning Fund 2015-16 Action Plan
Impact on Instruction	*Education for Social Innovation* Guided by the Toronto District School Board's (TDSB) generic framework for evaluating the effectiveness of teacher professional learning, we found that after the professional learning, the vast majority of participants considered themselves as having "expert" or "competent" knowledge/skills for inquiry-based teaching and learning. Participants also improved the level of proficiency

	in their teaching practice for generic classroom teaching and significantly for inquiry-based classroom teaching and student learning. They also had very positive attitudes and beliefs about classroom teaching and student learning. In addition, the majority of participants were satisfied with the level of support they received from their schools or from the TDSB. *Using Entrepreneurial Thinking to Establish New Generation Learning for Grade 7-12 Teachers and Students* This research study focuses on evaluation of the first phase of this program through the analysis of surveys designed to elicit feedback on participants' perceptions, attitudes, knowledge and practices regarding Entrepreneurial Thinking (ET) teaching and learning, as well as the quality and effectiveness of the professional learning activities and resources offered in the program. We identified an improvement in teachers' practices as a result of Professional Learning in the areas of inquiry based teaching and learning frameworks through the Technology and Learning Fund (TLF) research initiatives. We present the key findings of the study below under the three major headings corresponding to the main survey sections: *Entrepreneurial Thinking and Entrepreneurship Education Attitudes, Perceptions and Knowledge* • The majority of participants agreed that entrepreneurship should be integrated into a wide range of school subjects. • Teachers made rich connections between their own practice, current TDSB initiatives, and the new tools and strategies introduced in the ET program. *Teaching Entrepreneurial Thinking Skills and Practices* • The majority of teachers indicated high levels of self-efficacy with regard to teaching ET. • Approximately half of all participants felt they were able to use effective assessment strategies, while the other half did not. *Professional Learning and Organizational Support* • ET modules were overwhelmingly perceived as informative, useful, and impactful. • Approximately half of all participants believed that other teachers in their school were open to change, while the other half of participants did not. *Policy Implications and Recommendations* • Policies are needed to support sustained professional learning to enable effective spread and scale of ET throughout the school board. • Strong school-community partnerships are a marker of countries demonstrating effective school-to-work transitions.

Impact on System	Guided by our learnings from Technology and Learning Fund (TLF) that effective, high quality professional learning improve educators' knowledge, skills and practices as well as their self-efficacy in the teaching and learning with educational technology we identified STEM strategy as one of our system initiatives to: • Move away from teaching subjects in silos and linking real world issues to classroom teaching and learning. • Promote problem-based learning and STEM skills to allow students to stay current, explore, inquire and actively engage in relevant issues. • Encourage scientific discovery and technological innovation to shape how future citizens work collaboratively to provide creative and viable solutions to today's and tomorrows' real-life problems.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Trillium Lakelands District School Board

Project Title	**Learning Together Through Inquiry & Innovation**
Description	A. As our district moves forward with integrating technology in the classrooms, consultants are being requested to help support teaching staff with taking the technology that they have to create lessons/activities that go beyond enhancement, to transformation levels. To meet the growing demands, we hired an extra consultant for the last 3 ½ months of the 2014-15 school year. With this consultant, the team was able to provide more opportunities for teacher-to-student and teacher-to-teacher learning around critical thinking, problem solving, collaboration, communication, creativity and entrepreneurship, in the classroom with the use of technology. B. In every elementary school, we have one classroom with 15 laptops. In the 2014-15 school year, we replaced the laptops in 18 classrooms with Dell Chromebook 11s. C. To give a voice to our teachers on what type of technology they felt would be the best tools to use in their classroom, they were able to apply for an Innovation and Inquiry through Technology (IIT) project. 64 applications were received for the 2014-15 school year. 23 projects were approved. D. One teacher from each of our secondary schools, including one representative from our Alternative Education and Training Centres and one from our Virtual Learning Centre (online high school), assist the ICT department in keeping staff informed of all the numerous initiatives happening within the department. These teachers are referred to as the "Secondary Champions". With the help of our Secondary Champions, we are able to move our secondary schools further.
Context	*Number of students*: 3347 *Number of teachers*: 149 *Number of schools*: 58 *Grades/Program*: Grades JK-12
Impact on Students	A. Our new Integrated Learning Technology Consultant has visited 51 classrooms. He has worked with 539 students. He has returned to work with 88% of these students at least once. The largest portion of his training has focused on the Google Apps For Education (GAFE) environment. B. In our Digital Learning Classrooms (DLC), 504 students have access to Chromebooks. We found that the students had little to no trouble transitioning from regular laptops to Chromebooks. Students found access to their Google applications very simple and easy. C. Successful applicants to our Innovation and Inquiry through Technology (IIT) projects completed a mid-year report in February. IIT teachers have reported the following about student learning in their reports: • "…students are more independent in their learning."

	• "Having iPad technology in our classroom on a daily basis has meant that our learning (teacher AND student) has expanded much beyond our original proposal. iPad technology is regularly incorporated in Language, Math, Science/Social Studies, even Gym!" • "Many of my students have moved up at least two grade levels in reading since September while some have moved up three grade levels." D. All of our Secondary Champions felt that they had made an impact on student learning. The biggest impact they feel that they have made is using our GAFE environment.
Impact on Instruction	Successful applicants to our Innovation and Inquiry through Technology (IIT) projects completed a mid-year report in February. IIT teachers have reported the following about teacher practice/learning in their reports: *"Specifically the data pertaining to student reading (Fountas and Pinnell) allowed me to use the Chromebook to help improve student comprehension as well as provide levelled texts to students. In addition Google Classroom has become my primary communication tool based upon the positive reception of students and parents."* *"The program is assisting us in providing a window into our classrooms for parents."* All of our Secondary Champions felt that they have made an impact on teacher practice. They completed a survey in early June and comments included: *"I shared multiple resources discovered at meetings and employed them myself as well as directed other teachers to these resources. I was not part of direct implementation of them but felt I was a vessel of dissemination to fellow staff members."* *"Teacher practice is impacted through occasional learning lunches that highlight new tech resources and introduce the resources to teachers."*
Impact on System	A. Having a fourth Integrated Learning Technology Consultant is meeting the needs in our district. Teachers are eager to learn best practices in integrating technology in the classroom. B. 504 students have used the Chromebooks for the latter portion of the school year through our Digital Learning Classroom initiative. From our visits to the schools and reading the blog posts by teachers, it is clear that these devices are intuitive to use and easily adopted into the regular routines in the classrooms. C. The Innovation and Inquiry through Technology initiative has provided teachers with training and support. There have been two meetings to provide the successful applicants with the information on how to integrate technology with the focus of using tools such as the TPACK and SAMR With the help of our board's Program Officer we were also able to provide more training on the different types of data they can collect; the various methods of collecting data; and the reliability and validity of the evidence they collect D. The Secondary Champions help to provide support for the staff/students on how to embrace technology enabled learning. We will continue with this initiative in the 2015-16 school year and considering expanding the Champion program.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Upper Grand District School Board

Project Title	**Using Adaptive Learning Technology to Engage Students in Math**
Description	The Upper Grand DSB has identified gap reduction and identification in primary mathematics as an area of need. Through our research, we have identified a web-based program called Dreambox as a dynamic technological tool to help address that need. This tool provides both diagnostic and formative assessment to teachers, as well as on-going feedback to students as they progress through a variety of interactive modules. Unlike many other programs, Dreambox also adjusts its next steps based on how students understand the concepts they're working through. The project was aimed at three main groups: Students, Teachers and Parents. For students we aimed to embed technology into a subject that traditionally does not utilize a lot of digital tools. Students explored a variety of math tools in a digital format for at least an hour a week using various platforms (iPad, Chromebooks, Laptops, etc). For teachers, we aimed to embed the use of technology to collect data and inform instruction. Teachers were given training on how to access this information and how to utilize it to inform their whole-class and small-group instruction. For parents, we aimed to engage them in their child's mathematical learning through the use of technology. In addition to committing to allow their children at least 30 minutes of Dreambox time at home, parents had the option of signing up for an account to track their child's growth and understanding of math concepts.
Context	*Number of students*: 2600 *Number of teachers*: 125 *Number of schools*: 40 *Grades/Program*: Grades 2-3
Impact on Students	Student engagement with the Dreambox service has been consistent over the course of this project to date. Using the program at school and at home, student's knowledge and skills are quickly assessed leading to a highly customized program for every child. Through regular and persistent interaction with the tool each student's progress is tracked and reported providing immediate feedback to both the student and teacher. This formative assessment process provides rich actionable data allowing a teacher to adjust their small group instructional practice or to modify the small group's composition. Our first measureable outcome was an increase in student understanding of the curriculum, as determined by Dreambox. As evidenced by the data collected, student conceptual understanding has increased over time. Our second measurable outcome was evidence of sustained use of technology in math. … teachers are using Dreambox, on an average of 2.5 hours/week with their class. What is more telling, however, is that students are going home and using Dreambox for an additional 30-55 minutes each week. This information is impressive when the fact that this has been continuing for three months is considered.

	We were hoping to use the attitudinal surveys from EQAO to help inform student engagement in math in general. However, we asked teachers to poll their classes and the response was overwhelmingly positive, with all teachers reporting that their students enjoyed using Dreambox, and 100% indicating that their students were engaged with the program. 82% of teachers surveyed indicated that they saw an increase in student conceptual understanding in math, which was made evident during regular math instruction. 75% of teachers surveyed indicated that Dreambox 'sometimes' helps inform their regular math instruction.
Impact on Instruction	We believe that we are at the beginning of a change in practice but need to support that change with further training to better use the technology. Most teachers indicated that they are using Dreambox data to help inform their instruction. When asked about how this data is being used, teachers generally indicated that it is being used as diagnostic information to help determine where they should be starting their math lessons. The next step is to help teachers identify the information they can use from Dreambox to form and instruct small groups. We feel that we have more work to do with teachers and the use of the Dreambox reports. While 75% of teachers indicated that they use the reports to inform instruction, no teacher indicated that they do this consistently. Additionally, no teacher indicated that they regularly use Dreambox to form small groups, with only 37% indicating that they sometimes use the data to form small groups.
Impact on System	This project contributes to our overall goal of creating a comprehensive virtual learning environment that provides access to databases, productivity tools and dynamic, content-specific learning tools. Dreambox builds on the introduction of these tools by providing real-time feedback to students and teachers. This is important to our system scaling objectives because it increases teacher confidence with digital tools and also introduces the concept of data literacy to help inform instruction. This project is only possible because of past work that has been done in building digital capacity within our system and is now looking to leverage that capacity to change the way that teachers collect and use data to inform their instruction and close gaps for students.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Upper Canada District School Board

Project Title	**Tech Coaching Project – Embedding Technology into Teaching and Learning**
Description	Our Tech Coach Project was founded in the belief that **IF** 21st century competencies are leveraged through the use of technology in a collaborative peer tutor model in the classroom, **THEN** the use of technology will result in increased student engagement, increased student achievement, increased student voice, increased ability for students to demonstrate their learning in a variety of ways which better complement their learning style and increased teacher and student efficacy with technology enhanced learning and teaching. Our focus for this school year was to pilot the Tech Coach Project in 4 different intermediate/secondary schools. Within those 4 intermediate/secondary schools, "Tech Coach" courses were offered for senior level students. "Tech Coach" students worked with a variety of classes in a leadership role to assist the students and teachers in learning how technology may enhance their learning and teaching.
Context	*Number of students*: 142 *Number of teachers*: 12 *Number of schools*: 4 *Grades/Program:* Grades 8 - 12
Impact on Students	The students and teachers in the participating classroom and the student and teachers in the Tech Coach Classes perception of student engagement differed. The teachers and students who lead the Tech Coach classes saw an increase in student engagement whereas the actual participating classrooms pronounced a change. The parent survey results seem to support this finding. • There was a role-reversal between the Participating Classroom Teachers who were learning from the Tech Coach Students. • The Tech Coach Teacher and the Tech Coach Students were co-learners throughout the Tech Coach Project. • Student voice increased, giving students more ownership over what they are learning and how they are learning. • The use of technology enabled Participating Classroom Students to demonstrate their learning in a variety of ways. • In some cases, Participating Classroom Students felt that the Tech Coach project increased their ability to choose the topic and be a part of creating the content which was being explored. • Tech Coach Students, placed in a leadership position, were given the opportunity to decide on suitable technology and then share their learning with the Participating Classroom Students.

	• The use of technology allowed for increased group work and collaboration among students who helped each other explore the new technologies and how these new technologies could be integrated it into their learning. • Participating Classroom Students learned from their peers (Tech Coach Students) who demonstrated and modeled the appropriate use of the technology. • Tech Coach Students and Participating Classroom Students indicated that they used varied methods of communication amongst their peers and teacher. • In some cases, Tech Coach Students indicated that Participating Classroom Students benefited by having to share a device because it put them in a collaborative space. • Participating Classroom Students felt that the Tech Coach Project enabled new learning partnerships amongst their peers.
Impact on Instruction	• In some cases, Participating Classroom Teachers started thinking about changing their teaching practice towards including technology-enabled instruction. • When the Tech Coaches were present in the Participating Classrooms, the teacher's role shifted to one of a co-learner. • Participating Classroom Teachers became more aware of how technology can give students more choice in how they demonstrated their learning. (product-based). • Participating Classroom Teachers and Tech Coach Teachers formed learning partnerships to problem-solve various classroom issues.
Impact on System	Although this was a secondary project, many of our Tech Coach classes formed learning partnerships with elementary schools and Grade 7/8 classes in their building to facilitate Technology Enabled Teaching and Learning. Exposure to the Tech Coach model in elementary grades was found to build 21st Century Competencies before students reach high school. • 142 students and 12 teachers were exposed to various methods of Technology Enabled Teaching and Learning. We hope that this exposure will encourage adoption of a growth mindset in the school. • 142 students and 12 teachers were exposed to the benefits of shifting the teacher's role to that of a facilitator and co-learner. • It was demonstrated to classroom teachers that students were willing and capable of taking on leadership roles to further their own learning and the learning of their peers.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Waterloo Catholic District School Board

Project Title	**Education Innovation Projects**
Description	Teachers use Chromebooks and the Google Apps for Education suite to facilitate their own learning as they design activities and collaborate on 21st century learning projects with their students and colleagues. Through the professional learning opportunities provided via collaborative inquiry, teachers identify a problem of practice for their project and examine the changes in instruction that are required and the 21st Century tools that can be used in order to attain higher levels of student engagement. Educators use the artefacts of student learning they collect to analyze the effect of their interventions and to determine what kinds of interactions had the greatest impact on student engagement and achievement.
Context	*Number of students*: 2900 *Number of teachers*: 116 *Number of schools*: 46 *Grades/Program*: K-12
Impact on Students	The information that is being provided in this section is preliminary, as a comprehensive analysis of the data will be conducted over the summer by the researchers that are working on this project with us. They will produce a research report that will include supporting evidence for the following statements. *Learning Partnerships* • 78% of gr 4-12 students agreed or strongly agreed that using new applications allowed them to work collaboratively with other students • 76% of gr 4-12 students agreed or strongly agreed that using new applications allowed them to work collaboratively with teachers • 77% of K - gr 3 students responded that they liked working in groups with technology *Student Engagement* • 76% of gr 4-12 students agreed or strongly agreed that they concentrated and stayed on task while using technology in class. • 90% of K - gr 3 students responded that their brain works hard when they use technology in class. *21st Century competencies* • 76% of gr 4-12 students agreed or strongly agreed that they were able to be creative in the classroom when using • 93% of gr 4-12 students agreed or strongly agreed that technology gave them opportunities to learn many new things Some student responses to the question, “What I like best about using the technology for learning “

	"That we could work with other students from different schools and students from our own school. Also it is easier to present my ideas on an electronic device than typing." *"I really liked how technology let me share my thoughts in a creative and interesting way. It let me share my thoughts in an organized manner, unlike how I would if I was writing on paper."*
Impact on Instruction	*Connection to Practice and Pedagogy (technology-enabled instruction)* • 68% of teachers reported that using the project planning template had a significant impact on their ability to design an activity that uses technology to address a specific problem of practice with their students • 79% of teachers reported that during the PD sessions they significantly enhanced their application of the professional learning cycle to inform their practice as an educator when making decisions about integrating instructional technology *Learning Partnerships* • 79% of teachers reported that during the community building activities in the PD sessions they significantly improved their understanding of how collaborative learning can be used to support their practice as an educator when integrating instructional technology. *Technology Utilization* • 100% of teachers reported that during the PD sessions they significantly improved their understanding of how technology can be used to support the achievement of 21st century learning outcomes Some teacher responses to the question, "What changes will you make to your educational practice as a result of this professional development?" *"I have embraced the approach of student and teacher learning together. I am much more comfortable being able to teach not as the 'expert' of a subject or method, but as a facilitator to having students utilize technology and tools available depending on the needs of the student or requirements for an assignment or curriculum area."* *"Through this project I saw how important it was for my students to be self-directed learners. I found that they really understood the concepts that were presented to them and were extremely engaged."*
Impact on System	Through our Technology Learning Fund projects we are able to introduce the use of innovative teaching tools and strategies to educators in many of the schools throughout our Board. As our teachers work on their projects collaboratively (face to face and virtually) they help to create and deliver division-specific professional development resources, strategies and examples for 21st Century teaching and learning. The ownership of the format and resources for professional development is shifting to our TLF leaders in order to build the capacity to sustain, spread, and deepen our reform initiatives. We create project groups consisting of educators (primary, junior, intermediate, senior, special education, FSL, itinerant) that engage in a collaborative inquiry and adapt our generic project planning & reflection templates to provide a clear picture of what 21st Century Teaching and Learning looks like for their particular division and context.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Waterloo Region District School Board

Project Title	**The Change Process: Scaling and Refining a Digital Learning Strategy to Support Achievement of the BIPSA**
Description	The focus of the project this year has been to support the Board Improvement Plan for Student Achievement (BIPSA) through the refinement and implementation of a Digital Learning Strategy. The Digital Learning Strategy is a system initiative that provides an opportunity to better understand the change process and the conditions for improved learning and instruction through the utilization of technology and student/staff collaborative inquiry. It is focused, through the use of technology, on analyzing the change process, developing a learning organization that can respond to change, and identifying the factors and conditions to support scalability and sustainability. This project/strategy aligns with the BIPSA that explicitly identifies the "Vision of Student" that includes the contemporary higher order skills and habits of mind (i.e., 21st century skills) such as collaboration, creative thinking, communication skills, critical thinking, becoming a positive character, and becoming a contributing citizen. In addition, the strategy implements the specific target areas, identified in the BIPSA, of collaboration and mathematics along with a "Vision of Educator" as collaborative, promoting student voice and choice, differentiating instruction, and being a reflective practitioner. The Technology Learning Fund (TLF) was used to acquire technology to accelerate the 21st Century Innovation Research Project, as well as, support the BIPSA by focusing collaboration and mathematics. It was also used to purchase technology to scale the project to other schools, subject areas, and grades (grade 11 English and Geography). The outcome of this scaling was an increase in the level of collaboration that developed; collaboration and the ability to provide teacher-teacher learning partnerships (e.g., learning cycles) is seen as key to scaling the Digital Learning Strategy. Technology was critical in "disrupting" the teachers' instructional practices, providing the impetus to be innovative, and supporting cross-school teacher and student collaboration. Technology is central to the work in the project since there are expectations requiring students to participate in both synchronous and asynchronous communication, establish a digital footprint, and participate in collaboration with classes in other schools. Because of the cross-school work a lot of discussion occurred regarding effective assessment practices.
Context	*Number of students*: 2835 *Number of teachers*: 114 *Number of schools*: 21 *Grades/Program*: Grade 10 English, Careers and Civics, Mathematics, Geography
Impact on Students	During interviews with Futures Forum Project students, the students spoke favorably about collaboration and having more voice and choice. They indicated that collaboration allowed them to take charge of learning because the teacher

	became a facilitator in these situations and students were more active in their learning. They enjoyed communicating with students within their own class and with students in other schools because, as some suggested, it seemed to provide them with a real audience and purpose. The focus on collaboration for all of our projects would suggest that using collaboration as an instructional strategy caused more engagement for the reasons suggested by the interviews – authentic audiences and purposes, teacher's acting as facilitators, and technology being used as a tool to communicate and collaborate. Another focus of the project was to encourage more student voice and choice in the instructional and assessment practices of the participating teachers. The students felt more ownership and therefore more responsibility towards their work when they had a choice of what they did or voice in how they demonstrated learning. Indications are that engagement increases when students have choice and for teachers that offered more voice and choice it represented a shift from being the class lecturer to being a learning facilitator.
Impact on Instruction	Common across all of our projects involved in the research was the impetus that the teachers go back to the curriculum to build their instructional and assessment plans; the overall expectations were more carefully reviewed and clustered. With a focus on more student collaboration and offering students more opportunities for choice, teachers collaborated to revisit and revise how their courses were taught. The projects caused teachers to plan more collaboratively. The technology served as a disruption to their normal way of teaching and so when they began to revisit past practice in light of new technology, the opportunity was presented to insert collaboration and choice into their practice. We also found that board wide initiatives with monthly professional learning sessions helped to develop system wide teacher collaboration whereas without these projects teachers would work in their schools and not share. The support created system wide conversations and sharing of best practice not normally seen.
Impact on System	The BIPSA targeted collaboration this year and the projects all focused on collaboration as a central tenant of engaging students and causing change in instruction and assessment. Besides increasing student engagement through the use of collaboration, the teachers involved in the research are also becoming school and system leaders allowing us to develop trainers that can speak to using collaboration as a teaching strategy in staff meetings and department offices. As a result of the research, the board will be moving to provide 1-1 mobile devices to students starting in grade 9 at three of the sixteen secondary schools.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Wellington Catholic District School Board

Project Title	**Exploring Innovative Pedagogical Practices and Universal Accessibility**
Description	[The purpose of the project is] **e**xposing teachers to Google Apps for Education and Chrome's Accessibility tools (i.e. Read & Write for Google) to support universal design principles, our boards Foundations of Best Practice (Assessment Drives Instruction, Critical Literacy, Inquiry-Based Learning, Student Engagement, Differentiated Instruction, Gradual Release of Responsibility, and Flexible Groupings) and engage students in tasks they would not be able to complete without the use of technology. The project focused on engaging students with the use of technology and de-stigmatizing the use of text to speech and speech to text software by making it available to all students…….BLENDED LEARNING. Chromebooks and iPads made available to classroom teachers and students allowed for equity of outcomes and access to Google Apps for education and accessibility tools.
Context	*Number of students*: 300 *Number of teachers*: 10 *Number of schools*: 7 *Grades/Program*: Grades 7-10, Literacy-focused courses
Impact on Students	The teacher who participated in the project noted students who had previously been disengaged completing assignments and using tools such as speech to text or text to speech were much more engaged. Many of our teachers engaged students in descriptive feedback work using Google Docs and the comment feature embedded within this app. Here, students were commenting on their own work related to success criteria, commenting on the detail (or lack thereof) of other student's work and responding to teacher feedback within the comment feature forum. Teachers reported that student engagement and task completion was much greater than had they done the task by traditional means (i.e. pencil and paper). When students were asked at the conclusion of the project to comment on how GAFE had an impact on their work habits (learning skills) student responses were varied, but the majority indicated that there was some impact on a learning skill.
Impact on Instruction	Several teachers commented on the value they saw in the whole day Professional Learning sessions that were offered where teachers would share the learning and progress that took place in their classrooms. Teachers saw value in hearing from other educators from different backgrounds. At times, teachers took comfort in the fact that all educators were on a learning curve and struggles existed in each and every classroom.
Impact on System	Several actions … demonstrate the impact this project has had moving to a broader audience. We have hosted after school Google sessions for interested teachers outside of the original project. We have also hosted information

	sessions for our administrators, program department, SERTs and EAs that outline the work being done in the current technology-enabled project and the vision moving forward based on research-based findings. We have re-organized our digital team. Our team is now composed of a Digital Coach who will work closely with elementary CODE classrooms and SERTs. Our Technology-Enabled Learning Teacher will promote findings from past CODE projects and promote them more widely in a secondary CODE classroom setting while developing e-learning courses and teachers. Our Digital Lead will oversee an FDK Pilot project involving android tablets and act as a liaison between tech services and the digital team. When selecting participants for our digital projects, we ask principals to approach teachers who are enthusiastic about new learning, but who may not have a strong technology background. “Mid-Adaptors” have proven to have the most social capital among staff at their site and we have seen enthusiasm explode when these target teachers speak of the work they are doing in their classrooms with their colleagues. We need to be device agnostic moving forward**.** Google Apps for Education provides the platform by which we do not have to choose one device for our entire district. We need to enhance our student to device ratio without moving into a one to one ration. Our initial project started with devices that satisfied a 1 to 5 device to student ratio. While teacher participants appreciated any number of devices in their classroom our feedback indicated more Chromebooks were needed (in intermediate classrooms) to enhance the learning experience. Future projects will see devices distributed to teacher participants in an approximate 1 to 3 ratio. There is still a stigma attached to accessibility tool use. Student use of “assistive technology” sat at approximately 3% going into this project. At the conclusion of the project student use of tools such as Read & Write for Google was up to 33% of those surveyed. While this data demonstrates growth, we are still seeing stigma attached to the use of some of these tools. In September 2105 our board will have Read & Write for Google available to every student across the district. Promoting the use of this tool will support universal design principals and is an attempt to support enhancements to student achievement.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Windsor-Essex Catholic District School Board – Project 1

Project Title	**Leading Student Achievement and Supporting Pedagogical Documentation in Grade 7 and 8 Numeracy**
Description	In the Windsor-Essex Catholic District School Board there is an inquiry based initiative for grades seven and eight math teachers and some grade nine applied math teachers dealing with assessment and student engagement in mathematics (MathTalk). These teachers were supported with technology in order to capture student learning. This was done by video recording as a way to identify misconceptions and exemplary thinking with mathematical problem solving. Traditionally, a teacher only sees the end product or is able to talk to one or two groups about their work. With MathTalk, teachers can see the entire learning process from beginning to end for all groups as the work is being recorded. Capturing student learning (thinking) has traditionally been done by individual meetings between a teacher and student(s). When technology is used to capture what students think it is much easier to identify misconceptions that students have and thus makes it easier for teachers to intervene and redirect student learning on a more regular basis. The iPads are an ideal device to capture and record the learning process. By using apps like Explain Everything, students can create their solutions on the device while simultaneously narrating their thinking throughout the process. The interface on the iPads makes it easier for students to capture and record all the steps as they problem solve.
Context	*Number of students*: 600 *Number of teachers*: 20 *Number of schools*: 7 *Grades/Program*: Grades 7 and 8 math students, Grade 9 MFM1P and select Grade 9 MPM1D students
Impact on Students	The students were naturally drawn to using the iPads. The iPads made it easier for students to problem solve. The students were not reluctant to participate since the recordings were not meant to be a polished presentation but a reflection of their actual thinking process (which is usually non-linear). Beyond using Explain Everything, students were comfortable using other apps in class.
Impact on Instruction	Teachers struggled at first to incorporate the iPads as they were unsure about how to seamlessly use them in class. As comfort level grew, many teachers claimed that the movement was positive: “We changed from a teacher approach to a self-learning approach” and “I could tell the students appreciated that I mixed up the structure of our math classes.” With support, teachers started to let students work with the iPads more independently. For example, in this task, grade nine students were given several equations of graphs. They were asked to graph them and sort them in any way they saw fit. As observed, students were more than capable in performing the task and teachers were able to pick out things that were incorrect and speak with students directly to address student errors.

	Continued support and training will increase teacher proficiency and confidence in the instruction leading to the teacher driving the project and not the facilitator.
Impact on System	In year one of the program four schools and 12 teachers were involved. This year we increased to seven schools and 20 teachers. Next year, we plan to double the number of schools involved, increase the number of iPads available to students in order to reduce sharing and provide more training for teachers. This process has jumped to the pedagogical documentation.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

Windsor-Essex Catholic District School Board –Project 2

Project Title	**Leading Student Achievement and Supporting Pedagogical Documentation in Kindergarten**
Description	We would like to grow the capacity of Full Day Kindergarten Teams to document the learning evident in a kindergarten classroom through capturing thinking using technology. Such documentation will enhance the ability for the educator teams to analyse the learning evident in their classroom allowing them to respond and modify the environment to enhance further learning.
Context	*Number of students*: 2159 *Number of teachers*: 91 teachers, 77 Early Childhood Educators *Number of schools*: 35 *Grades/Program*: Grade K
Impact on Students	When students become aware of the learning that they are engaged in the kindergarten classroom they develop an enthusiasm and ownership of their own learning. That enthusiasm is infectious and they share their enthusiasm with their classmates and educators very freely. The pedagogical documentation that has taken place as a result of this initiative has promoted an awareness of the individual interests of the students in the classroom allowing educators to adapt the environment to include and extend these interests. Such modifications allow for a more robust learning environment that engages students in more meaningful, rich learning opportunities.
Impact on Instruction	Educator Teams have engaged in the gathering and analysis of artefacts and learning moments in the Kindergarten classroom. Educators have become aware of the need to deeply observe, deeply listen while young children are engaged in play and inquiry in the kindergarten classroom. Gathering these artefacts and evidence using technology has "lifted" learning moments in the kindergarten classroom for a deeper analysis by educator teams - Early Childhood Educators and Teachers. Capturing these moments has been made much more efficient and impactful using technology which allows educators to deeply analyze the learning that has taken place. This analysis allows the team to identify gaps in student learning as well as the need for enhancement which informs modifications to the learning environment. It also allows educators to deepen their knowledge and understanding of the expectations in the Full Day Kindergarten Program.
Impact on System	The pedagogical documentation iPad project has afforded us the opportunity to deeply explore the process of documentation. This has allowed us to develop policy and procedures that will support the gathering and archiving of documentation of student learning. This learning will inform our direction in the Creating Pathways - All About Me Portfolio as well as capturing student learning in classrooms Grade One through Grade 12 which will impact assessment and evaluation of student learning.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

York Catholic District School Board

Project Title	**Expansion of Blended Learning (with D2L as the LMS) from Kindergarten to Grade 8**
Description	This innovative research project sought to test the impact of a capacity-building model on the adoption of a learning management system (i.e., Desire2Learn) by teachers within the elementary panel as a catalyst for the expansion of "blended learning" practices from Kindergarten to Grade 8. This Round 4 Innovation Research Project was undertaken as a follow-up to our Round 3 project, with an emphasis on the "spread" of ONE particular technology tool to large numbers of teachers across grades and schools, K-8. This project was limited to teachers from 41 elementary schools where there was no history of training on the Desire2Learn (D2L) platform and no classroom accounts. Our capacity building model was characterized by the following: 1. A four-person, cross-divisional team of teachers from each of the schools 2. A full-day, hands-on in-service 3. Follow-up, site-based support (as requested). Workshops were planned for September 2014 for elementary principals to familiarize them with the power and potential of Desire2Learn (D2L). Principals were then provided with an information sheet to help assess the school's readiness for training and information to post at their schools to enable teacher-volunteers to make an informed decision about their involvement. Each of the 41 principals selected a four-person team to attend a full day training session.
Context	*Number of students*: 4025 *Number of teachers*: 175 *Number of schools*: 41 *Grades/Program*: Grades K-8
Impact on Students	The primary focus of this Innovation Research Project was to test a professional development model aimed at "spreading" the use of a specific learning management system to support blended learning approaches from K-8. As such, our findings focus mostly on the "spread" element among teachers (i.e., system scaling). To the extent that our data helps us understand the impact on student learning, findings include: • 45% of respondents indicated their students were using D2L in the classroom • 45% of respondents indicated their students were using D2L at home • 44% of respondents observed their students viewing the calendar • 27% of respondents observed their students accessing course content and links • 21% of respondents observed students using the Drop Box to submit work

Impact on Instruction	The primary focus of this innovative research project was to test a professional development model aimed at "spreading" the use of a specific learning management system. To the extent that our data helps us understand the impact on teacher practice: By June 2015, findings included the following with regards to their use of D2L: • 78% felt confident using the Calendar feature; • 57% reported using this feature "Occasionally" or "Frequently" • 75% felt comfortable using the News feature; • 59% reported using this feature "Occasionally" or "Frequently • 58% felt comfortable creating Widgets; • 47% reported using this feature "Occasionally" or "Frequently • 62% felt comfortable inserting Files; • 55% reported using this feature "Occasionally" or "Frequently • 31% felt comfortable using Discussions; • 21% reported using this feature "Occasionally" or "Frequently • 25% felt comfortable using the Drop Box feature; • 26% reported using this feature "Occasionally" or "Frequently Respondents reported their primary use of D2L as follows: • 39% indicated they use D2L as a Communication tool • 26% indicated they use D2L as a Demonstration tool • 25% indicated they need additional training before they can introduce D2L
Impact on System	Teachers were surveyed before and after their training: • 16% indicated they "know a little about D2L but do not feel comfortable explaining how to use it" – a pre-post **decrease of 23%** • 53% indicated they "know a fair amount about D2L and understood how to use it" – a pre-post **increase of 44%** • 23% indicated they "know a lot about D2L and have shared how to use it with my colleagues at my school" • 12% indicated they "know a great deal about D2L and have helped colleagues in my school use D2L" Note - The latter two figures indicate that 35% of respondents report having played an active role in "spreading" their enthusiasm and knowledge to others; thereby contributing to system scaling. An analysis of unique system user data within D2L indicates the following: • From November 2014 to March 2015, 175 teachers from 41 elementary schools received direct D2L training from our Board's Technology Enabled

	Learning and Teaching Contact as part of this research project. • There were 175 “Teacher Activations” within D2L to enable the teacher-volunteers to participate in the training that formed the basis of this research project. • By May 2015, the total number of “Teacher Activations” at those 41 schools had increased to 608. • Between November 2014 and May 2015, 433 “Teacher Activations” were initiated at the 41 schools for teachers who DID NOT receive direct D2L training from the Board’s Technology Enabled Learning and Teaching Contact.

NOTE: Information in the summary is taken directly from the data contained in the final project report.

York Region District School Board

Project Title	**Inquiry Based Learning in a Modern Learning Framework (CODE Project)**
Description	The Digital Literacy Resource Teachers worked with Teacher Leaders & Learners in their respective schools focused on collaborative inquiry into effective modern learning pedagogies/ 21st Century Learning pedagogies. Some of the elements of Modern Learning and 21st Century Learning included: Fullan's Six Cs, Innovative Teaching and Deep Learning, Student Centred Pedagogy, Experiential Learning, Flexible Structures, Student Voice. Each school team participated in an orientation session and collaborative work to explore teaching strategies that incorporated elements of modern learning. At the end of the two collaborative sessions the teams were provided a half day to reflect on the work they have done and develop an action plan to share what they have learned with other teachers in the school and the larger Leaders and Learners community. Expectations of involvement in this year's project included: • Participation in online community. • Participation in some format of teacher collaborative inquiry. • Build capacity with cloud based collaboration (GAFE). • Share the process/results within their schools and to the broader community. • Participate in evaluation of impact.
Context	*Number of students*: 2500-3200 *Number of teachers*: 96-128 *Number of schools*: 32 *Grades/Program*: K-12
Impact on Students	A feedback survey by a sample of the schools that were involved in the project provided observational and conversational data. A summary is provided below for our secondary schools ONLY due to job action. • Technology was used to empower student voice. • Student voice shared with staff on preferred learning styles. • Students report better collaboration of online functionality. • Students appreciate the embedded research functionality of some online tools. • Improvement on student assessment completion. • Increased use technology to foster student engagement and learning. • Increase collaboration between students. • Increased use of digital assessment and evaluation.

Impact on Instruction	This evidence was provided by secondary teachers participating in the project. Due to the job action we were not able to collect data for elementary schools. As outlined by the sample schools we were able to survey, the following impact on classroom instructions was evident: • Teachers are exploring student suggested and preferred tools to support instruction. • Students are receiving online feedback, with peers and teachers. • Students receiving more detailed and differentiated feedback using online tools. • Teachers are re-designing assessment tasks to incorporate technology. • Teachers are embracing frequent feedback opportunities. • Teachers are more comfortable embedding technology into their practice. • Teachers became more familiar with various applications that they can leverage to foster student understanding and engagement. • Increased use of Google Drive and Google Classroom. • Tools created allowed teachers to monitor students' progress and work one on one with a variety of students.
Impact on System	The following summary, as provided by the sample secondary schools, indicates impact on the schools: • Student and staff voice are now included in purchase/distribution of technology. • Staff are more willing to use GAFE tools to foster student engagement. • Increased staff comfort of using digital tools in Cloud Computing. • Diffused leadership of school technology initiatives, as staff are more comfortable in becoming lead learners. • Increased acceptance of Cloud Computing opportunities. • Increased student voice in providing information about program elements to staff. • Building effective and authentic learning tasks. • Building capacity and diffused leadership within schools. System actions that are a result of this initiative: • The teachers that participated in the CODE project will continue to be supported through professional learning sessions and release time. • We will continue to support the Leaders and Learners online community for teacher professional learning. • Connections will be made with teacher participants and our Technology Lead Teachers within our schools to help support teachers 1:1 in schools. • Some teachers will be provided leadership opportunities to continue exploring and contributing to system integration of online collaborative tools.

NOTE: Information in the summary is taken directly from the data contained in the final project report.