A Synopsis of the Final Research Report

Extending the Landscape and Enlarging the Vision: Pedagogy, Technology, and Innovative Practices in a Digital World

A Pilot Study of Local Innovations in Ontario School Boards (Round 2)

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Consistent with the government's ongoing direction to enquire into successful practices for digital learning in Ontario schools, now and in the future, this collaborative research investigation follows from both provincial and global investigations into how to equip schools for 21st Century teaching and learning.

In the 2013 (Round 2) pilot study, all 72 English-language and French-language school boards in the province and one Provincial School participated in projects on effective practices for teaching and learning in a digital world. The intent of this initiative, co-sponsored by the Ministry of Education and the Council of Ontario Directors of Education (CODE), was to build on the work and learning from the 2011-2012 pilot study, *A Shifting Landscape: Pedagogy, Technology, and the New Terrain of Innovation in a Digital World.* As well, the Ministry of Education and CODE were particularly interested in the identification of effective local innovation practices suited to system scaling and sustainability.

The prime innovation focus of projects for Round 2 was on improving, strengthening, extending, and sometimes transforming the instructional core, with students at the heart as important partners and active agents in the inquiry and continuous improvement process.

Building on the research focus of Round 1, a central interest in this study was to gain further insights into the role of technology in changing teaching practice and in strengthening student engagement, learning, and achievement. In Round 2, participating school boards implemented diverse projects that seem to reflect the importance of technology as a support to effective teaching and learning in the 21st Century. A brief description of each project is contained in Appendix A of the final report.

Each project was required to submit both an interim report and a final report that described their focus and outcomes. Along with detailing the data received from each individual project, the research team presented information about the impact of the pilot among and between projects based on the parameters established for the study. The parameters fall into two categories: Category A projects had the theme areas: vision; digital citizenship and literacies; innovative teaching practice; student engagement, culture, and achievement; learning environments; and parent and community engagement. Category B projects focused on the broad headings: pedagogy; learning environments and technology; and leadership.

It is interesting to note that while six theme areas were suggested for study under Category A, school boards particularly focused on the following four areas: digital citizenship and literacies; innovative teaching practice; student engagement, culture and achievement; and learning environments. Some reported on vision indirectly, but that was not as a focus of their project. Parent and community engagement was not a topic adopted by any school board for a project focus, although there were multiple references noted in projects to the importance of being able to communicate directly with parents, using digital technology.

The magnitude of the pilot study is exemplified by the data reported by all projects indicating the potential impact on students, teachers, and schools. The reported data identifies the involvement of over 100 000 students, over 4500 teachers, and over 1600 schools in the diverse range of activities implemented in the school boards throughout Ontario. It should be noted that several pilots focused on teacher professional learning, system organization and policies, and infrastructure, and as such, must be considered when gauging learner impact or interpreting the numbers provided in the project reports.

While the quantitative data provided overall information about the scope and involvement for the initiative, the individual project reports tended to capture details for a richer qualitative description related to teaching and learning in a digital world.

The research team used a collective case study method to report on the theme areas, challenges, and highlights between and among projects. The data analyzed in this final report was drawn from school board responses to the project-reporting template that provided a common and consistent framework for the research team to document individual projects. The research team also utilized project leaders and other participants' responses to the interview questions posed by field researchers that formed the basis of conversations for site visits, as well as information from phone conversations.

In structuring the report for Round 2, the research team returned to the three items that Fullan (2012, 2013) notes as necessary to consider together as we move into a new improvement cycle in education for the 21st Century and which were used as major headings in the 2012 final report. They are **pedagogy**, **technology**, and **change.**

Pedagogy

In general, there was a repeated and accepted acknowledgement that the education community is making inroads that effectively integrate technology, pedagogy, and learning. There was consistent and clear evidence across projects that pedagogy is the driving force for technological innovation. This represents a positive approach to student engagement, student achievement, professional learning, and board-wide systems thinking.

Observations from field researchers noted that educators continue to embrace change and enlarge their vision of teaching and learning. The professional activities are shifting from a focus on teachers understanding how to use hardware and software for instruction to building teacher confidence and sense of efficacy in using digital technology as teaching and learning tools. There seems to be greater awareness that technology plays an increasingly critical role in intensifying student engagement and in amplifying student voice. A number of projects defined a positive learning environment as one that includes facilitative teaching, personalized learning, differentiated instruction, and where 21st Century skills are developed and valued.

While some school boards reported that the shift in teacher vision from 'sage on the stage' to facilitator is still a challenge, others described school board personnel such as teachers, clinicians, educational assistants, and resource teachers coming together in workshops and professional development sessions to

collaboratively build new skills for student success. In some projects, e-coaches were available on site to give consistent and continuous support to teachers. As well, a number of projects described a shift towards inquiry as a basis for classroom teaching and learning.

Overall observations from the field researchers following their school board interviews for this pilot study indicated a number of changes in teaching practice. They noted that:

- Technology seems to impact all aspects of teaching and learning.
- Teacher's role seems to be shifting to that of facilitator who supports and guides learning.
- Teachers who use technology increasingly see themselves as co-learners.
- Teachers seem to believe that they now have the tools and strategies to better reach and engage every student.
- Technology seems to promote more collaboration among teachers and among students.
- Technology seems to provide partnerships with parents by giving them access to information so that they can support their children's learning.
- Technology is providing opportunities for cross-curricular learning in manageable and efficient ways.
- School cultures seem to be shifting to where teachers respect the differences in the ways students gain knowledge and skills in today's digital world.

Several school boards reported focusing on various papers or reports to support both engagement and instruction. This highlights the fact that school boards are in the midst of searching for frameworks as they move forward connecting pedagogy and technology in innovative teaching practices.

It was clear that the majority of projects focused on student engagement. Because student engagement is central to change strategies for 21st Century learning and because teachers, schools, and systems are in the midst of identifying ways to initiate new and meaningful connections between pedagogy, technology, and change, it may not be surprising that evidence was mixed in terms of successful practices.

In this study, while the majority of projects focused on student engagement, little was reported in the area of concrete or measurable achievement. This outcome aligns with what Fullan & Langworthy note more globally as, "The absence of a robust evidence base that shows how new pedagogical models [mobilize] …for deep learning." (p. 10)

Looking forward, a more focused research investigation may be warranted to focus on the multiple aspects of pedagogy-driven use of technology that involves teacher and student roles in collaboration and in inquiry based learning. Such a study would reaffirm the importance of technology in supporting assessment that guides deep learning.

Overall, the data reported points to the fact that, in these early stages of 21st century learning in these projects, excitement about teaching and learning is a key ingredient in building a sense of empowerment going forward to precise achievement results.

It appears from data gathered in interviews and reported from individual projects, that school boards are at different stages in their thinking and development of strategies for engaging in technology use in their "conceptualizing and operationalizing of the new pedagogy." In spite of this circumstance, the research team believes that the fact that all school boards participated in these projects does indicate an increase in understanding that skills and attitudes for 21st century teaching and learning are of critical importance.

In last year's final report, the research team noted that, "These projects have acted as a catalyst for giving school boards the impetus to inquire into changing how they perceive the marriage of technology and pedagogy." In this study, it seems clear that the "promotion of systemness" has been understood in new and more far reaching ways that reflect a positive move forward in board-wide, holistic thinking that points to sustainable technology-enabled practices.

Technology

From the data reported in this study, it seems clear that school boards are in the midst of grappling with various aspects of technology and its overall use for 21st Century teaching and learning. While many positive changes were noted across projects in terms of technology use in learning environments and teaching practice, the bigger picture surrounding structural and instructional changes for school boards in terms of technological use appears to be in the early stages of being addressed.

A number of school boards reported that their projects were affected by the quality and availability of their wireless networks. One school board reported that impediments to the sustainability of their project included bandwidth to support widespread use of wireless, the age of the technology in the system, and funding. Another described inconsistent bandwidth as a hurdle to completing activities. One school board noted that access to technology continued to be a major issue in classrooms and it was reported by teachers as a barrier to success for student learning.

The data that 67% of the innovation projects had a focus that involved mobile learning indicates the role of mobile technology in supporting, extending and advancing learning, and in changing pedagogical practice. It is clear that school boards are at various points in considering Bring Your Own Device (BYOD) practices and policies. For example, one school board provided mandatory training for BYOD for all schools. The school board has invested significant resources into developing wireless networks in all schools. Another school board reported that they are considering a BYOD environment within the next few years; while in a different school board the prohibitive cost of technology has led them to begin to invest in infrastructure for BYOD and cloud technology.

In terms of equity, a number of projects reported that the discrepancy between students who have their own device and those who do not was noticeable in terms of digital access. Providing 'loaner devices' was reported in several areas as a way to equalize digital access. One school board noted that those schools impacted by socioeconomic factors would be provided with up to 25% more funding over the baseline amounts in the next year.

Issues of Internet safety education and having students understand the use or misuse of social media were noted as important factors in using personal devices in and out of school, as was the care and security of personal devices.

Much as was reported in the 2012 pilot study, many aspects of digital citizenship remain in the early stages of considering issues surrounding safe and ethical use of technology in school culture. While the recent white papers referenced in this study suggest that we are moving into a time where it is imperative to build our collective capacity within and across educational systems for 21st Century skills to flourish and evidence of impact to be readily available, it is clear that local issues surrounding the use of technology are still being addressed, and are considered to be critical in building a solid digital landscape. Along with what it means to become a 'digital citizen' other considerations include the writing of acceptable use policies by school boards which include students using their own devices at school; challenges that come with wireless network use; equitable access to hardware; and security of personal devices.

Overall observations from field researchers revealed that, in general, school boards appear to be examining policies and procedures that direct and promote the safe and effective use of technology by students and teachers. They are also investigating how to provide secure storage of students' work and information in the 'cloud' so students can share school board-owned devices and can experience a learning commons environment.

Change

Several comments by school boards in regard to issues of scalability and sustainability of projects offer insight into increased understanding of possibilities for growth and direction on the terrain of system learning. There appears to be a change in understanding of the importance of shifting projects from classrooms and schools to whole system learning – they also are indicative of the cultural shift more globally in terms of embracing system change, as the research team makes reference to throughout this study.

One school board noted that the project allowed them to anticipate the issues and challenges that set the stage for system scaling and sustainability. Another school board reported that a key factor to the sustainability of the project was its implementation model. Rather than focusing on one school, the project was focussed across the system and supported by providing one device for every three students. They found this way of approaching scalability to be financially manageable. Yet another school board said that their next step for sustainability and scalability was to expand their efforts beyond the schools to communicate with and engage their parent community.

Through these projects, school boards are investigating and implementing new organizational structures that embed coordinated approaches to using technology. Also, school boards are in the early stages of aligning departments and jurisdictional responsibilities to enable system-wide approaches to 21st Century teaching and learning. A number of school boards reported that changing the operational structure in some areas was valuable, such as establishing working relationships between IT and curriculum.

School boards seem to be at different stages on their thinking and development of strategies for moving forward with technology use. While some school boards have been engaged with business partners for a number of years, and some have been partnering with other school boards on system-wide projects, others are at the early stages of re-visioning teaching and learning for 21st Century competence.

Embracing a spirit of inquiry and collaboration through increased interaction among students and teachers, students and their peers, and among teachers and their colleagues was noted as a positive step toward 21st Century skill development in several school boards. School boards reflected on the importance of integrating professional development initiatives and curricular directions. There seems to be an understanding that building capacity in digital teaching and learning among teachers and school board personnel will lead to the sustainability of educational initiatives. In this way, projects will increasingly become scalable across schools, school boards, and the province as a whole.

There is a sense in the construction of the pilot projects in this study that school boards and schools have moved beyond trying out various digital tools and programs in classrooms as a means of incorporating technology into their pedagogy, to a deeper understanding of what the shift toward 21st Century teaching and learning encompasses on a more holistic scale.

One pilot said that they found tech coaches invaluable for both sustaining and scaling technology use in their project. Another pilot found that their move to e-Tech coaches was building capacity in teaching by working with teachers and administrators in their school to develop a plan of action to align existing technology and resources with collaborative inquiries, School Improvement Plans or professional learning cycles. This project also reported that because e-Tech coaches were willing to take a leadership role in their initiative that the implementation of a 21st Century vision of teaching and learning was accelerated and a culture of collaboration and innovation was sustained.

It appears that school boards are trying multiple ways of providing necessary support for teachers as they move forward in implementing 21st Century skills in their classrooms. Some school boards tried embedded approaches to teacher training such as technology coaches who supported teachers with both the pedagogy and technology of their projects. Other pilots used the teaming of teachers working collaboratively for ongoing training, and one school board reported that tech-teams of students were the go-to-group for support in using technology in the classroom and school.

Projects reported on aspects of professional development across the school board, school, and teacher levels. One noted that sustainability was positively impacted by the support offered to teacher learning teams by instructional coaches. These “lead-learners” were able to model a growth mindset for their colleagues and were personally available to ensure that teacher teams’ work stayed focused and engaged. In yet another school board, it was found that the Assistive Technology coach role provided a unique professional development opportunity in the area of special education in that support with technology ‘in the moment’ was made available for teaching and learning opportunities. Professional development for administrators was noted as an interesting outcome in several projects. One school board found that the

most significant factor positively impacting the project was the support of principals and school board administrators.

It seems clear from the reporting in all these projects that there is repeated and accepted acknowledgement that we are at a new cross roads in terms of incorporating technology into pedagogical understanding in teaching and learning. The difference the research team notes from the 2012 study is that there is an increased sense of excitement and enthusiasm. As well, there is more concrete direction emerging in terms of sustainability and scalability across the panorama that comprises the convergence of pedagogy and technology in a diverse provincial landscape.

Moving Forward

In the final reports, school boards were asked to state their successes, challenges, and key findings, and to identify their next steps and planned directions based on their experiences and learning from the pilot. With rare exceptions, the school boards identified that their intention for the coming school year was to continue, expand, complete, or adapt the project based on their findings. Frequently identified next steps were directed at activities that continue to have pedagogy drive the use of technology, doing so with an aligned focus on the structural and organizational factors that can sustain and scale systemic actions. A summary of each project's report is contained in Chapter 3 of the final report.

It is interesting to note that many of the challenges highlighted in this study are similar to the ones reported in the 2012 study. However, it appears that many of the questions reported under those challenges have transformed over the course of one year to a more informed vision of what it means to engage in 21st Century teaching and learning.

Overall, there is an indication that school boards are solidifying their vision and basing their thinking and next steps on an increasing body of research literature about digital teaching and learning and the central importance of 21st Century skills. It is noteworthy too, that many aspects of these local projects and the vantage point the research team reached at the conclusion of this study align with recent literature that substantiates necessary changes and directions moving forward for 21st Century system learning in a more global context. Combining the overall directions of change indicated in this study with that described in the literature more globally, may help point the way to a clearer vision for going forward in this digital learning landscape.

It appears to the research team that issues emerging from results of projects at various levels across school boards are congruent with recommendations for necessary future direction provided by Fullan & Langworthy (2013). They note the importance of adequately developing the following four elements to connect theory and practice for deep learning that lies ahead:

- Policies and system-level strategies that enable diffusion
- Accepted ways of measuring deep learning
- Adoption of new pedagogical models that foster deep learning
- Knowledge of how students adopt deep learning practices.

Judging from the results of this pilot study, these four areas are in the beginning stages of investigation across the province using a variety of technologies as tools for advancement. It seems clear that, to varying degrees, school boards are engaged in:

- Writing new policies that incorporate issues that surround technology use
- Examining ways of measuring student engagement and achievement
- Exploring new pedagogical programs and incorporating strategies that combine pedagogy and technology; and
- Inquiring into how students are learning given these new parameters.

Fullan & Langworthy (2013) offer insights into the institutional aspects of change noted above: They write: "It may sound like a subtle distinction, but effective and sustainable change happens when there is a consensus among all stakeholders that the new goals are a moral imperative. When there is this kind of system-wide shared purpose, collective will becomes the core driver, and change becomes much easier than previously thought… This orientation toward system-wide diffusion of new pedagogies begins with cultural coherence and initial engagement, and then brings in tools and programs to support realignment" (p. 7) The projects as whole provide evidence that school boards are engaged in moving along this continuum as they build capacity for technology-supported pedagogy.

In Conclusion

In concluding this study, it is interesting to reflect on how much has changed in the realm of 21st Century system learning over the past year in comparison to the initial pilot projects that took place in the 2011-12 school year. At the provincial level, all the school boards across Ontario are now actively engaged to varying degrees in a shift toward connecting what Fullan (2012, 2013) has described as essential forces coming together to create the ground for 21st Century learning: pedagogy, technology, and change. Similarly, school boards and schools have demonstrated growth and development in understanding the nature of the changes required for successful student engagement and then on learning.

Given the nature of changes in direction in pedagogical practices driven by the digital environment, it seems clear that these pilot projects were situated in an important time when clarity and compelling insights into our technological future are needed to continue system reform initiatives that can move teaching and learning forward into the 21st Century. In a recent interview about his book Stratosphere (2012), Fullan noted that we are at the beginning stages of an improvement cycle in education where pedagogy, technology, and change need to be addressed together to connect the 'natural affinity' that students bring with them to their studies in schools from their 24/7 world of information for learning.