Digital Literacy and Problem Solving in Technology Rich Environments

A report of a national meeting held by the Canadian Literacy and Learning Network

May 22, 2014

Meeting and Report Prepared by David J. Rosen, Ed.D

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On May 22, 2014 the Canadian Literacy and Learning Network hosted a national meeting in Ottawa of provincial and national leaders from the public and private sector, K-12 and higher education; from community-based not-for-profit and other providers of literacy and essential skills, workplace essential skills, and/or employment skills and career training; from networks serving parents, teachers and journalists; and from foundations. All were invited because of their interest in furthering a national effort to improve Canada's digital literacy and technology problem solving skills for adults, youth and children.

Need for digital literary skills

In their introductions, and throughout the meeting, participants referred to examples of why digital literacy and problem solving in technology rich environments (PS-TRE) skills are so important to Canadians. Digital literacy skills, and easy availability to Internet-accessible digital technology, are needed to apply for jobs, which now frequently must be done online. Job-seekers now often learn about opportunities through online job search databases and through online social networks. Digital literacy and problem-solving skills are also needed to perform many tasks at work. Canadians seeking basic skills or post-secondary education need digital literacy skills for learning tasks, including skills to benefit from online learning. Canadian families need digital literacy and PS-TRE skills to find, judge and use health-related online information, for online banking, to complete government forms, and to communicate with children's teachers. Users of technology – children, youth and adults – also need to develop an understanding of when and how to use technology, when not to use it, how to avoid being taken advantage of, scammed or bullied online, and how to guard their personal privacy.

Some participants suggested that contextualized assessment of digital literacy and PS-TRE skills also needs attention that contextualized assessment needs to be embedded in curriculum, that employers, educators, learners and others do not necessarily have good ways to measure these skills, especially critical thinking and problem solving skills needed for PS-TRE.

Vision

Participants were asked if digital literacy and problem solving in a technology rich environment were to be fully realized in Canada what this would look like. They suggested the following as indicators of success within a five-year period:

Comfort and competence in using technology in daily Living

All or nearly all Canadian residents would have digital tools (computers, smartphones, electronic tablets, etc.), and they would be able to use computer and digital mobile applications effectively in daily living and work, for example to:

- Search for information online, and using critical thinking skills to evaluate its relevance and quality
- Search and apply for jobs
- Search for and evaluate health-related information
- Monitor their health, and communicate vital signs and other health indicators to their health care providers
- Monitor their children's use of technology
- Bank online
- Use social media appropriately

Using technology in education settings

Schools, education programs, and classrooms at all levels of education (K-12, higher education and literacy and essential skills) would, for example, have:

- Instructors (teachers) and students (learners) fully integrating computer technology in all subject areas
- Greater innovation in teaching as a result of integrating technology
- A problem-solving curriculum focus
- Self-directed learning and problem-solving using digital resources
- Incorporation of both baseline and progress, (pre- and post-) technology skill surveys to provide concrete evidence of improvement in students' (learners') technology comfort levels and skills
- Technology embedded in a wide range of curriculum tasks, and relevant and appropriate support for using digital tools while carrying out the tasks

Instructors (teachers) who recognize that many students (learners) find online videos on their own, for example on YouTube, to help them with their learning, and include these videos where appropriate in the curriculum; they also teach students to find and judge the quality of online instructional videos

Instructors and students learning to use technology together

Instruction to help students with writing on a computer and online, for example on standardized tests such as the GED

A paradigm shift in teaching where teachers and students learn new digital tools together, where teachers do not need to be the only experts, and which results in more engaging learning for students

Wide availability of high bandwidth Internet access

Teachers developing communities of learning for themselves

Flexibility to use whatever technology is available. (Now, many schools do not allow mobile devices in class. However, some schools are piloting the use of mobile devices.)

Problem solving with whatever technology is available.

Technology used effortlessly and without anxiety

Technology turned off when this is needed

Other indicators of success in using digital literacy and problem solving technology

Less use of paper and pens, and increased use of computers, mobile devices such as smart phones and electronic tablets, electronic white boards and other digital tools in the classroom and in other environments

More use of blended, distance learning, and online courses, blogs, and social media

More use of TV at home with instruction provided by programs such as ArrowMight (http://www.arrowmight.ca/)

Greater ease in moving between self-study and group or collaborative learning

Turning technology off when this is needed

Increase in digital training and assessment

More innovative use of technology in completing traditional education, work and daily living tasks

An increase in jobs that require using technology

Positive energy and excitement – youth aspiring to work in literacy

Changes needed to achieve the vision

Definitions

A clear, widely accepted definition of PS-TRE is needed, one that includes a clear definition of PS-TRE skills

Technology Access

Greater access to the Internet

- Responsibility of government to provide this
- High bandwidth infrastructure required
- Mandated across country, in all areas

Addressing the digital divide: Aboriginal and francophone populations are getting left behind, and this must change

Curriculum that Integrates Technology

More consistent, sequenced and fully integrated digital literacy skills in curricula at every level: currently it is variable, ad hoc and informal

Better integration between employers' needs and what is taught in adult literacy provision

Professional Development

Technology use training/professional development for every teacher/instructor – possibly mandated. Instructors need to improve their own digital literacy/PS-TRE skills

Funding to provide this for teachers/instructors

Digital skills training for teachers/instructors in how to embed technology into curricula

Greater availability of self-directed online training

Literacy practitioners need funding to be able to learn and practice new technology skills.

Assessment

Improved measurement of outcomes for adult learners such as successful job placements and job retention

Prior Learning Assessment and Recognition (PLAR) where assessment recognizes adult learners' skills and shows gaps effectively

Non-formal Education Venues

Funding for workplace basic skills, and community-based adult education

Employers who are knowledgeable about skills that are needed

Help in identifying what skills, including digital literacy skills, employees need

Culture of investment in employee education, including digital literacy skills, from business community

Contextualizing instruction and assessment by having education and training programs working closely with industry

Not just workforce preparation or workplace learning, but teaching uses of technology for seniors ("cyber seniors"), for parents (health literacy, family literacy) etc.

What is a Technology Rich Environment (TRE)?

This needs defining

Technology use could be interpreted differently in an adult literacy and essential skills program; a work environment; and for individual, family or community purposes; work-related needs for technology may be different from learning needs.

It would be useful to understand what training in TRE means, to describe TRE in a learning environment and at a personal level

Problem: learning technology skills where there is no access to computers (in education programs and/or at home). We need to problem-solve ways to solve this.

We need funding to create virtual classrooms that simulate workplaces.

What is TRE with respect to learning standards? Are programs meeting them?

Importance of informal learning needs to be recognized. A lot of learning takes place outside formal education, but it may be difficult to recognize.

Youth need to experience school as a (technology) rich learning environment.

We need to change assessment methods to measure PS-TRE

James Paul Gee's book, (Gee, J. P. 2003), *What Video Games Have to Teach Us About Learning and Literacy?* may help teachers in designing good learning environments. This is often called the *gamification* of learning (designing learning environments so they benefit from what has been learned by video game designers, using game thinking and game mechanics in non-game contexts, to engage users in solving problems) For example, a good game doesn't have one dominant strategy but testing and schools often have a dominant strategy – a single best way to solve a problem. Those not engaged with the dominant strategy may already be at a disadvantage and not motivated.

There is a link between pedagogy/andragogy and assessment – digital technology should not rule how we look at pedagogy/andragogy

In the past there was holistic literacy; now the pendulum has swung to Labour Market attachment and funding focuses on this. We shouldn't be too influenced by trends – certain areas need continuous funding.

Businesses should become learning places, with responsibility to educate their employees.

We need a strong system to get to skills in all areas of a person's life, not just technology or digital literacy skills – depending upon the person's goal.

Employers have a responsibility to allow broad skill improvement not just work skills – they, as members of our society, also have responsibility for a well-educated populace.

Goals for a national digital literacy and PS-TRE Action Plan

The goals below, generated at this meeting, are listed in order of priority. The numbers following the goals indicate the weighted priority of each goal.

1. Provide universal access to broadband: government should be responsible for the infrastructure (32)
2. Adequately resource what is available in a technology rich environment (TRE) for K-12, Post-secondary education, and for literacy and essential skills (LES) programs.

Provincial/Territorial governments and the Federal government should provide funding for all Canadians and businesses to improve literacy and essential skills (24)

3. Build practitioner training as a strong component of digital literacy and PS-TRE education, for teachers in schools, colleges and for literacy and essential skills educators. Digital literacy in classrooms should be standardized across all jurisdictions and should be integrated within other subjects. Teaching certificates and courses should have the same standing. Digital skills should be a requirement – e.g. developing curriculum showing good integration of digital technology in all subject areas. (22)
4. Digital literacy should be consistent and fully integrated into curriculum: subject integration in K-12 + and also as a separate subject. There is also need for a hybrid approach (21)
5. Literacy and essential skills should be promoted outside the education field so that Canadians understand why they should care about literacy and essential skills and its impact on their lives (16)
6. Move literacy and essential skills and digital literacy skills into the community. Craft a common vision, and position LES in the market as a player in this digital world (15)
7. Define a technology-rich environment in a way that is platform-agnostic, contextualized, evergreen, and updatable (12)
8. Provide a way for educators to share promising practices online (relevant links etc.) for integrating technology in the classroom (9)
9. Create government policy to develop matrices of workplace skills requirements and an investment in workplace training (9)
10. Develop an age-appropriate online resource that matches jobs with the skills needed for them (6)
11. Identify strategic positions for moving forward (skills needed) – energy and focus (6)
12. Improve the general understanding of LES across the country – an understanding that is integrated to include a range of literacies (financial, health, digital) and that has a unified definition to improve what is a currently fragmented field (5)

Possible Next Steps

The following were specifically suggested as possible next steps:

Ask politicians where they stand on universal implementation of broadband

Form an online group to carry this PS-TRE work forward.

- Media Smarts is creating a digital literacy framework for provinces/territories, K-12. They are interested in collaboration with other organizations.
- On online group might also develop links with an existing online PS-TRE group in the U.S.
- CBDC Restigouche will share their resources with others

Explore: Research Gate http://researchgate.ne and Educators Around the World

As facilitator of this process, David Rosen suggests some additional possible next steps:

When the online version of the PIAAC PS-TRE and other domain assessments are available, participants should take the assessment themselves and discuss its value for Canadians, and how it might best be used/

Ask OECD if PS-TRE groups are forming in other OECD countries, and if so link with them.

Create an online work group, for example using Google Documents or another online collaborative writing platform to define PS-TRE in Canada, to vet the definition widely, and to refine and develop consensus on a PS-TRE definition and the skills and standards that it includes. Involve educators at all levels, business leaders, and student leaders in this process

Choose or develop a competency-based assessment system that will enable assessment of these PS-TRE

Examine the possible use of digital badges for digital literacy and PS-TRE skills, that might also level up to a meaningful certificate for higher education and/or work.

Appendix

List of Pre-Meeting Documents

List of Attendees

Appendix A: List of readings in order of priority

1. PS-TRE Background Information (PS-TRE Background)

2. Computer Use/Digital Literacy and Literacy and Essential Skills(LES) in Canada (Background Document on Computer Use)

3. Computer Use, From Readers' Guide to Essential Skills Profiles (Computer Use _Readers' Guide to ES Profiles)

4. Digital Technology Impacts on Trades (CAF report on digital technology)

5. Digital Technology Snapshot of the Literacy and Essential Skills Field 2013 (digital-technology-snapshot-June-3-2013)

6. E-Learning on the Goal Paths, Resources and Activities to build Self-efficacy (CA) Goal_Paths_bulletin_final_web_6)

Appendix B: Session Participants

name	organization
Jason Seright	SIAST
Linda Wright	Sioux-Hudson Literacy Council-Good Learning Anywhere
Shaun Thorson	Skills Canada
Stéphanie Morin	OLES
Joanne Kaattari	Community Literacy Ontario
Heather Robinet	The Learning Hub, Avon Maitland Dist. S.B.
Georges Bourdages	CBDC Restigouche
Chris Chinien	Compétences/Skills R & D Inc
Mathias Sturm	AlphaPlus
Sarah Anson-Cartwright	Canadian Chamber of Commerce
Ginny Hooper	Saint John Learning Exchange
Matthew Johnson	MediaSmarts.ca
Dr. Dragana Martinovic	University of Windsor
Serena Hopkins	Canadian Career Development Foundation
Nancy Friday	Independent Consultant
Gordon McGregor	Algonquin College
Abdul Ally	SIAST
CLLN staff	
Lindsay Kennedy	
Chris Harwood	
Nilambri Ghai	
Pat Sample	