

Final Knowledge Synthesis Report

Dominant Technological Paradigms: Impacts for Education Systems and Policy

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Summary

New digital technologies are changing the way we work, play and live in wide reaching and increasingly complex ways. With a focus on research knowledge developed within the past 10 years, this knowledge synthesis uses an intersectional framework to explore how new technologies are changing work and society in Canada, and how education can best prepare students for the realities of the perpetually evolving and potentially enigmatic knowledge based economy.

Broadly speaking, technological changes can be understood within one of two paradigms: technology is replacing work through automation and digital taylorism; and technology is changing communication, collaboration and knowledge creation. In this report, the two dominant technological paradigms are explored independently, followed by a discussion of the realized and potential collective impacts for education systems in Canada. Throughout, the social, economic and political contexts that shape and are shaped by the development and implementations of new digital technologies are also surfaced and critically evaluated.

DOMINANT TECHNOLOGICAL PARADIGM 1

Digital Taylorism: Technology replacing/simplifying work

New digital technologies and increasingly intelligent algorithms are expanding the reach and scope of technological displacement beyond low skilled jobs into employment areas that were previously thought to be immune to automation. A growing number of white collar, middle

class professions, such as in media, education, healthcare, social services, financial management, legal occupations, information and communication technologies, and countless others, are at risk of their jobs being outsourced or of becoming obsolete via digital taylorism (Lewchuck & Lafleche, 2014; Beck, 2000). That diverse individuals within civil society develop an awareness of, and the capacity to, understand and engage with the forms and applications of new technologies as they emerge, will be crucial for identifying and critically evaluating the potential and realized environmental, economic and social impacts of technological progress and expanding labour arbitrage.

Key Ideas:

- Increased automation and digital taylorism highlights the need to develop uniquely human abilities;
- Engaged, informed, critical awareness and reflection of technological progress are essential to overall wellbeing and prosperity.

Dominant Technological Paradigm 2

**Information and Communication Technologies are Changing/Expanding
Collaboration, Crowdsourcing and Globalization**

Digital internet technologies have opened up new avenues for communication and collaboration “with diverse others across globalized transnational spaces, multimodal texts, and distant, heterogeneous, and interactive audiences” (Hull & Stornaiuolo, 2014, p. 16). Individuals are now able to not only consume but produce media, blurring the boundaries between public/private, expert/novice, and objectivity/subjectivity. Further complicating matters,

algorithmic software programs are now writing formulaic, but original content, often indiscernible from and more readily trusted than human authors (Clerwell, 2014). ICT are rapidly becoming better and cheaper, transforming and growing the types of work that can be done remotely for less (Brown et al. 2008; McAfee & Brynjolfsson 2016), while the governments of emerging economies, such as China and India, are proactively investing in advanced ICT and engineering education. Fragmented work arrangements parceled out over vast distances (i.e. crowdsourcing) have become more common and accessible for employers, producing precarious jobs, downloading the responsibility for benefits, training and skills enhancement to individual workers, and challenging the fundamental notion of work as a primarily market driven activity. Undoubtedly, moving forward, digital technologies and collaborative networks will be integral to understanding and addressing social, economic and environmental issues.

Key Ideas:

- Globalization of work is expanding;
- Collaboration in digital platforms is blurring the lines between work and play;
- Innovation will depend on interdisciplinary and an evolving understanding of communication platforms.

Recommendations for Education

An essential first step toward making effective and sustainable improvements to education systems is to surface and evaluate the following underlying ideological assumptions:

- 1) Meritocracy as the primary effective means to the middle class (Loveday, 2015), which for education means higher skills equals better jobs and a better economy, and that

individuals are, and should, be independently responsible for their own wellbeing and success (i.e. neoliberalism) (Corman & Luxton, 2007)

2) Progress, including technological progress, is inevitable, thus taking away the responsibility of society to actively engage in making decisions about the future (Hornborg, 2014).

We recommend the following to improve education systems in Canada:

- Reduce standardized testing and create district-wide digital learning portfolios.
- Place “soft skills” and inter/intrapersonal development at the forefront through student centered approaches that encourage the interests, creativity and agency, in consort with collaborative decision making and democratic engagement.
- Integrate social and emotional learning outcomes into the curriculum and education policy, and develop courses specifically designed to advance innovation, collaboration and social and emotional learning.
- Implement a holistic, threshold concept approach to curriculum development that focuses educational policy and practice on the complexity and transdisciplinary nature of knowledge.