**Suggested Use**

This document provides background information to the Maker Movement and its tie to Education. You might want to review this document and share it with your facilitators and colleagues.

**Making a Case for Making**

We have a need to make. It stems from our curiosity with the world and our basic human desire to make things and then make those things better. The Do-It-Yourself movement is evidence of this – from cooking channels to home improvement shows, we have been knitting, tinkering with cars, renovating our homes, and making gifts for friends for ages.

Now, we are reclaiming this need and formalizing it into a movement. We are creating shareable workshops (maker spaces), providing hours of instructional videos (You Tube, Instructables, etc.), and offering workshops (e.g. Home Depot – How to Sessions), reclaiming the model building kits from our recent past and adding 3D printers and robotics. And, educators have a role to play.

**Background**

North America is in an interesting place. We currently have three generations in our work force. Fifty per cent of the content we access is cloud based. Approximately 95% of 12 – 17 year olds are regularly online, 76% of them use social networks, and 77% have cell phones. Globally, there are over 1 billion smart phones, and the sum of human knowledge, in the form of Wikipedia, is available offline in a downloadable format. We appear to have few problems accessing information or finding opportunities connect.

Basically, we are in a time where digital fluency is an essential skill and we have the potential learn, formally and informally, at any time, place or in format we need. Learning opportunities have probably never been more ubiquitous and flexible.

All levels of education are calling for knowledge skills situated in learning environments that are:

* Learner-centred: highly focused on learning but not as an alternative to the key role for teachers
* Structured and well-designed: needs careful design and high professionalism alongside inquiry & autonomous learning
* Profoundly personalised: acutely sensitive to individual and group differences and offering tailored feedback
* Inclusive: such sensitivity to individual and group differences means they are fundamentally inclusive
* Social: learning is effective in group settings, when learners collaborate, and when there is a connection to community (OECD, 2011)[[1]](#footnote-1).

These learning environments are consistent with what Pink (2005)[[2]](#footnote-2) calls our current Conceptual Age – a time where logical and linear thinking is valued, especially when it is coupled with creativity and innovation. Exploration, visual aesthetics, problem find and problem solving have been identified as essential skills in this age.

Hatch (2014)[[3]](#footnote-3), author of the ***Maker Manifesto***, suggests that as part of this Conceptual Age, we are actually entering a new industrial revolution. If the first revolution was fuelled by factories powered by steam and the second by electricity, our new age is to powered by unlimited access to information, the development of increasingly reasonably price, powerful tools, and the ability to obtain a range globally sourced materials and resources with which to make things. Hatch suggests the Maker Movement is actually an Internet of Physical Things (p. 3) claiming it is actually bigger because it consists of physical objects connected via sensors to the Internet.

Running parallel with this new age and Internet of Things is “the largest untapped human resource on the planet … the space time, creativity, and disposal income of the ‘creative class’ ” (Hatch, p. 52). This group was identified by Richard Florida[[4]](#footnote-4) in ***The Rise of the Creative Class***. Florida suggests this class is an “amalgamation of engineers, artists, lawyers, programmers, designers, and other who have the educational or professional propensity to ‘create’” (Hatch, p. 52). He suggests this class is fostering the majority of contemporary innovation and is moving into advanced manufacturing which in turn is supporting an economic recovery, new employment options, and the rapid growth of the Maker Movement. In 2010, the United States alone, it was estimated there at 40 million Americans in the creative class – 50% of the employed workforce, controlling $474 billion in disposable income (p. 52). This income is increasingly being directed to creative and imaginative work, often using Maker Spaces for prototyping and networking.

Oddly, at the same time, we are questioning where all the skilled workers are in Canada? (Mason, Oct. 18, 2013)[[5]](#footnote-5). Mason states

Once upon a time, shop class was mandatory in most high schools. There was a belief that even if a student wasn’t intent on becoming a mechanic or carpenter, having some basic life skills in these areas wasn’t a bad thing.

Over time, however, shop began to look dated and irrelevant and was given less status. Somewhere along the way, it was drilled into students that the only way to get ahead in life was to go to university and earn a degree.

The complete Mason article is reprinted with his permission in section four of this tool kit.

**Taking Making Into Class**

The Maker Movement and classrooms seem perfect partners. Inquiry based learning, problem base learning, constructivism, experiential learning, Reggio Inspired learning all cry out for hands-on approaches to making learning visible.

Sylvia Martinez and Gary Stager[[6]](#footnote-6), in their highly lauded book ***Invent to Learn***, explain making is an authentic way to bring STEMx (Science, Technology, Engineering, Mathematics and Design) into the classroom. Reading ***Invent to Learn: Making, Tinkering, and Engineering in the Classroom*** (2013) is a first step. Chapters include a background to the Maker Movement and the educational leaders who have embraced its principles; a link to current educational theories and practices (constructivism and constructionism), descriptions of good projects to Maker and how to design them, suggestions for classroom design, and suggestions for resources and references.

Making is a pedagogical orientation that integrates imagination and creativity with design thinking, problem solving, and even more importantly, problem finding. We have watched schools turn their libraries into Learning Commons, embracing more than print materials. We are now at the stage of actively turning our art, shop, and learning commons into Maker Spaces. Spaces that have simple hand tools, cardboard, robotics, and 3D printers.

Also, refer to the links in this resource (Designing a Problem Sketch and Annotated Reference List) for ideas and support. Mark Hatch’s ***The Maker Movement Manifesto*** is an excellent introduction to the Maker Movement and community based Maker Spaces.

Bringing making into the schools is NOT about adding another course or discipline to an already overcrowded curriculum. Rather, it is an intentional way of integrating STEMx and supporting personalized constructionist learning across the curriculum. It is also a way to encourage ALL students to explore Trades and Technology as a course of study, reclaiming “Shop” as a valuable place to turn theory into practice, ideas into design, design in prototype. Making in the schools could just begin to answer the question of where the skilled workers are … they are probably right there in our classes just wanting an opportunity to explore their creating and make something new and meaningful!

**References**

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2. Pink, D. (2005). *A whole new mind*. Retrieved from <http://www.empathyed.org/index.php?option=com_content&view=category&id=34&Itemid=60> [↑](#footnote-ref-2)
3. # Hatch, M. (2014). *The Maker Movement Manifesto: Rules for Innovation in the New World of Crafters, Hackers, and Tinkerers*. NY: McGraw-Hill.

   [↑](#footnote-ref-3)
4. # Florida, R. L. (2002). *The Rise of the Creative Class: And how It's Transforming Work, Leisure, Community and Everyday Life.* New York: Basic Books.

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5. Mason. G. (Oct. 18, 2013). *Skilled workers: Where’d they go?* Retrieved from <http://www.theglobeandmail.com/commentary/where-did-all-our-skilled-workers-go/article14909494/> [↑](#footnote-ref-5)
6. Martinez, S. & Stager, G. (2013). *Invent to Learn:* Making, tinkering, and engineering in the classroom. Torrance, CA: Constructing Modern Knowledge Press*.*  [↑](#footnote-ref-6)