



STE[A]M IS SM[ART]

A plea to fully integrate the arts and design into the Canadian skilled trades via apprenticeship and educational programs.

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Made in et fabriqué au Canada (a poem in the form of spoken words)

The rich culture of Canada has been
Carved in the boulders of Quadra Island in Cape Mudge in BC
And the petroglyphs near Peterborough Ontario
Woven on the Wampum belt of the Haudenosaunee Peoples
Painted on the side of birch bark canoes by the Anishinaabe Peoples
Inspiring Cornelius Krieghoff to paint
The Royal Mail Crossing the St Lawrence in 1860
While Charles Pachet portrayed the late Queen Elizabeth 2
On a moose

The majestic beauty of the northern landscapes
Moved Lawren Harris and the Group of Seven
In Montreal The Beaver Hall Group
Captured a modernistic view of their world
L'art Canadien continue de changer et d'évoluer
Kim Dorland pays tribute to Tom Thomson with
Non-traditional materials and a lot of thick paint
And Edward Burzynsky captures *Anthropocene(s)*

Margaret Atwood creates stories
That end up predicting the future
And Sarah Polley turns them into films
While Lawrence Hill tells the history of Canada
From a Black Loyalist angle
And Richard Wagamese writes about
A talented First Nation hockey player
Gliding through dreamscapes and traumatic life experiences

Tantoo and Cliff Cardinal globally represents their people on screen and on stage
Where Drew Hayden Taylor confronts Cottagers and Indians
The sculpture by Bill Reid
"The Raven and the First Men"
Takes us on a creation story
Robert Houle revisits the murky side of Canada's history
By hijacking "*Death of General Wolfe*" by Benjamin West
And Christi Belcourt celebrates nature with
Thousands of dots in Water Song
Like music for our eyes

Keri-Lynn Wilson directs the Ukrainian Freedom orchestra around the world
Meanwhile Celine Dion slows down though her *heart still goes on*
Gord Downie will always be praised and hip
And Leonard Cohen will forever be poetic and *dancing to the end of love*

Dancing, Guillaume Côté, is not anymore, but instead
Il chorégraphie
And Robert Lepage directs massive on-stage productions
Of Shakespeare in Stratford in Ontario and all around the world

Hundreds of artists and designers proudly represent Canada
Around the globe
With their elbows up
Helping politicians win elections
Sometimes

Douglas Cardinal, Ian McDonald and Frank Gehry
Design and build spaces for the people
Paul Rowan, Karim Rashid and my friend Miles Keller
Put Canada on the global scene of [industrial] design
And celebrities wear Himikalas Pamela Baker fashion master pieces

From Expo 67 to 86
De la place des arts à Montréal
Au Centre National des arts à Ottawa
From the Banff Centre for arts and Creativity
To the Confederation Centre of the arts in Charlottetown
The arts and design take many contours and many forms

Que c'est beau!

Xavier Massé
June 2025

Introduction

Ask any Artist, designer, writer, actor, craft person and art educator. What is the place where they feel the safest? The answer will unanimously be their studio. When I was a kid, I vividly remember the moments when I felt peaceful and sheltered, and it was undoubtedly when I was drawing, sketching, painting and making art in my bedroom (which is a quintessential gen X moment I hear). Can you imagine a society without performing arts, visual arts, literature, storytelling, design, crafts, media production or music? That is impossible. And it was not possible to imagine even fifty thousand years ago. Think of the cave paintings in the four corners of the world.

Art and design are the mirror of who we are as (supposedly) a civilized culture. It builds identities, it defines our philosophies, it celebrates beauty, it expands our minds, it awakens our curiosity, it fosters our creativity, it tells stories, it innovates and renovates, it provokes, it preserves, it unites, and it also divides, it teaches, and it learns, it evolves, it heals.

So why are institutions like art programs in public schools, art colleges and universities, art galleries and museums, theatre and dance companies or even local neighbourhood art schools struggling to survive? What does the future look like for them in the second quarter of the 21st century?

Canada is facing a unique opportunity to become a world leader in the apprenticeship and skilled trades educational sector. We must provide our future generation with the fundamental skills that will help them become agile and balanced human beings, game changers and future leaders. It brings us to a pivotal question: how to empower Canadian high schools with stronger, better, greater and fully integrated arts programs?

It is time for a major wakeup call about the arts in education in Canada.

Art and design are everywhere

Close your eyes and think of a beautiful inspirational moment you had recently.

You liked that little steel bridge crossing the river near your house

You stared at the jacket on that individual in front of you

You appreciated the lines of the car parked on the other side of the street

You enjoyed the street performance happening at the corner

You loved this particular tune playing on your Spotify

You liked the mix of smoked paprika and cumin in that recipe

You watched the light reflecting in your sunroom

You liked a specific passage in the poem you read yesterday

You loved that final scene in the movie you watched last night
Your favourite colour is purple
and you cannot explain why!

There is a simple explanation. Art and design are everywhere.

Artists and designers are courageous people. They stand on the shoulders of their cultural great grandparents, ancestors and masters and they build upon the knowledge and creativity of those who lived, told stories, and created master pieces before them.

And some choose to successfully live off their art. At the top of that dynasty stand two artists, British celebrity visual and installation artist, Damien Hirst whose net worth has been estimated at \$700 million, and American celebrity visual and installation artist, Jeff Koon, who is at \$500 million. Artists in general contribute to the making of the cultural identity and the economy of their respective countries. They are the driving engines for museums, galleries, theaters, concerts, performances and bookstores.

You would think that these examples indicate that artists and the arts in general are in excellent shape. Well think again.

Pulse on the current social economical context for the arts and Culture

Everybody loves to pay lip service to the vital role of the arts in society and yet budgets for arts and design education in Canada are shrinking while there is more money being invested in STEM (Science, Technology, Engineering, Maths) programs.

“My fear in Toronto is that we are going to just fully lose an entire generation of Artists, especially recent grads, who are not going to be able to get their foot in the door”
-- Victoria Day, multidisciplinary Artist (Open Studio)

In Ontario, as an example I do know particularly well, the place of arts and Culture historically has never been the province's highest priority compared to other major North American regions. The current economy and the projected growth for 2030 are not stimulating for the young aspiring professional Artists, designers and craftspeople. More students are favouring applied, technical, financial, legal and management careers rather than arts and humanities studies. Among the 13% of Canadian high school graduate students (18 to 24 years old) who choose a college (instead of a university) for their post-secondary studies, how many will select an art school? 80% will select a Science Technology Engineering Math (STEM) based program instead of Humanities and arts. And according to the American Academy of arts and Sciences (AAA&S), the traditional humanities subjects of English, history, philosophy and foreign languages and literature amounted to 4 per cent of postsecondary degrees in 2020.

And yet, there is a false perception that the sector of the creative industries is healthy. Various reports show that the arts, Entertainment and recreation industry has grown in the second quarter of 2025 (compared to the declining manufacturing sector in part due to the tariff war with the USA). But that's only because of the contribution of the Sports and recreation industry. Those reports also say that in 2023 in Canada the culture industry was worth \$63.9 billion a year representing 600,000 Artists and support workers. According to the Ontario arts Council (arts across Ontario) arts and culture in Ontario directly contribute \$27 billion annually to the provincial economy, representing 3.4% of Ontario's GDP.

Looking closer at the financial situation of the arts in Canada, we see that the rising costs of living and the empty post lockdown (Covid 19) financial reserves have generated a reduction of productions, which means that audience numbers are down as well. Meanwhile hesitant philanthropists and distracted corporate sponsors have abandoned the arts and Culture sector for recreation and entertainment and sports. A drop of 45% of gifts by private donors has been reported between 2019 and 2023. In the second quarter of 2025, the Vancouver art Gallery has hit a 15-year low in revenue, thus triggering some staffing cuts.

Added to that, government funding is mostly stagnant except in Québec and Alberta. "There's a real feeling that the current models aren't serving us anymore – and that a new deal is needed," -- Brad Lepp, executive director of the Professional Association of Canadian Theatres (PACT).

As a result, artists and designers more than ever need support and help. The number of applications for funding is exploding, and yet Canada Council for the Arts (CCA) only accepted 16.6% in 2023. It seems that no matter how we look at the situation, the climate is not favourable for the arts and Culture while research shows that it is crucial for the development of our next generation.

What do the ARTS bring to human beings and humankind and why it is crucial in the 21st century.

The Universal Declaration of Human rights, Article 27 by the United Nations says, "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits".

Researchers, academics and experts all agree that the 21st century workforce needs to adapt to rapid technology and prepare students to compete internationally by using e-

learning media. They also agree that the 4 major skills that are most required by employers are creativity, critical thinking, communication and collaboration (aka the 4Cs). In the Universities Canada article *From STEM to STEAM (2016)*, Paul Davidson, president and CEO of Universities Canada, says “while Canada needs young people to be focused on the STEM disciplines, employers and society at large are also sending the signal that STEM on its own will not be enough” and that is not all, those same employers are using different hiring methods. The University World News article, *The rise of skills-based hiring (SBH): What it means for Higher Education (July 2025)*, highlights why competency is the new hiring currency instead of traditional indicators like degrees, job titles or even experience.

To acquire those special skills, one needs imagination to generate ideas and to solve problems by thinking differently and creatively. One also needs emotional intelligence to be able to read social contexts and situations, to communicate ideas and concepts with teammates and colleagues.

In my career the most brilliant and talented people I have ever worked with, such as colleagues, collaborators, faculty and students, were curious about everything.

Many studies like *The Connected Arts Learning Framework by the Wallace Foundation at University of California (2023)* have demonstrated that art education is vital to support the development of emotional balance and social justice to reduce prejudice and discrimination. Art fosters curiosity and agility, develops the understanding of cultures and identities while enriching one’s general knowledge. It also inspires cooperation and collaboration through group projects, musical bands and performances. It presents alternative narratives through decolonization, diversity /equity / inclusivity. For example, the visual artist Kent Monkman from Cree ancestry (re) tells the history of Canada by “decentering the western gaze” with the help of his two-spirit alter ego *Miss Chief Eagle Testickle*, and also the theatre company Obsidian, which produced plays like *Flex (2025)*, develops playwrights to train emerging professionals of the Black voice.

The study *The Impact of arts Education on Workforce Preparation (2002)* revealed that for at-risk youth (a segment of society most likely to suffer from limited lifetime productivity), the arts contributed to lower recidivism rates; increased self-esteem; the acquisition of job skills; and the development of much needed creative thinking, problem solving and communications skills. The paper *Transformative Action on arts Education: RE-invigorating the Seoul Agenda (a UNESCO initiative, 2017)* reported that the arts in education are continuously expanding to include emerging forms of expression and representation alongside more traditional forms, enhancing the capacity to communicate information, inspire new ideas, build bridges between cultures, and maintain engagement among diverse 21st century learners.

Another paper *Teaching History Through Theater: The Effects of arts Integration on Students’ Knowledge and Attitudes* also reported that one potential way for schools to

address their limited resources was to partner with arts and cultural organizations to provide arts learning opportunities through arts integration. By randomly assigning school groups to participate in a program like the infusion of history content with theatre, they were able to draw causal conclusions about its effects. They found that students demonstrated increases in historical content knowledge, enthusiasm for learning about history, historical empathy, and interest in the performing arts.

“Arts not for art’s sake but for academics’ and careers’ sake” *The Connected Arts Learning Framework by the Wallace Foundation at University of California (2023)*.

When I visit high schools and talk to potential students I do not necessarily try to convert them to become a professional artist (though that would be nice), but I try to convince them that by studying art they will be equipped with skills that will help them become agile and sensible human beings who will be creative problem solvers, thus giving them an edge for their future professional careers. A project led by the HEM Business and Engineering School (Morocco), demonstrated that by fostering entrepreneurship and art, orphan children of the organization called Club Bidoua revealed extraordinary talents that gave them a strong voice and possibilities for the future.

Sir Ken Robinson, British author, speaker (you might have heard his famous Ted Talk *Does school kill creativity*) and eternal advocate for the arts in education famously said, “if you’re not prepared to be wrong, you’ll never come up with anything original”.

The arts and design can help address the increasing need to support mental health and personal well-being

Over the 15 years that I have been an educator and administrator in art and Design I can confirm that I have observed a dramatic increased need for mental health support mostly for our students, but not only. Over 5 million Canadians (18%) aged 15 and older met the diagnostic criteria for mood disorders, anxiety or substance use. There were large increases in the prevalence of mood and anxiety disorders, compared to data collected in 2012, specifically among vulnerable populations, women, adolescents and young adults. Administrative health data suggest that primary care providers have seen an increase in visits for mental health concerns since 2020, especially among children and adolescents. Increasing the supply of health care providers who focus on mental health and have specific training in this area is one of many possible solutions to improve access to mental health care in Canada. However, disparities in health insurance coverage for medications and counselling services will also need to be addressed. More than 1 in 3 (36.6%) of those with a mood, anxiety, or substance use disorder reported unmet or partially met health and mental health care. The growing need to treat mental health issues will have a massive impact on the Canadian Healthcare system. *The Centre for Addiction and Mental Health (CAMH)* estimated that the economic burden in Canada will cost up to \$51 billion per year

which would include, health care cost, lost productivity and reduction in health-related quality of life. The Ontario Ministry of Colleges and Universities recently passed Bill 166, which requires every college and university to have student mental health policies and supports in place.

Art Therapy is used to reduce conflicts and distress, improve cognitive functions, foster self-esteem, and build emotional resilience and social skills. It engages the mind, body, and spirit in ways that are distinct from verbal communication. This reminds us of the Indigenous worldview that emphasizes the connection and interdependence of all things in the universe, including people, animals, plants (and the natural world). This perspective, central to many Indigenous cultures, highlights that actions and relationships have far-reaching consequences and that a balance must be maintained within the "Sacred Circle of Life"

According to the National Library of Medicine (US Gov), over the last decade, health psychologists have carefully examined how Art Therapy help heal emotional traumas, enhance awareness of oneself and others, establish self-reflection capacity, reduce mental manifestations and transform behaviours and way of thinking. The research also points to policymakers who should be urged to enhance access to cost-effective treatment for prevailing mental illnesses in primary healthcare settings.

It is essential that each human being develop their connection to humanity and confirm their sense of belonging and purpose. This could be done by exploring their senses through the practice of the arts (like in fully immersed sensory experiences such as glassblowing or acting for example). I have witnessed the transformative power of being immersed in an intense artistic environment such as a glassblowing studio or an Artist blacksmith shop where veterans from the Canadian Armed Forces abandoned their demons while working intensely at their master pieces. I recommend the viewing of the two following documentaries *The Quilters (2024)* by Jenifer McShane, which follows a few inmates in a prison in Missouri (USA) who design and sew beautiful quilts for foster children. And *Porcelain War (2024)* by Brendan Bellomo and Slava Leontyev which depicts the lives of Ukrainian artists Slava, Anya and Andrey who chose to stay behind and find beauty amid the destruction. You will be mesmerized by the humanity that unfolds in front of you.

In her book *Healing through art (2004)* Nadia Ferrara shows how art therapy has been used as a successful form of healing among Cree people. Ferrara examines how individual experience of trauma is perceived, defined, and narrated by Cree individuals and discusses the role of Cree culture and Cree definitions of self, play in therapy. Ferrara, who is accepted as a healer in Cree communities, shows how art therapy became a ritual for her patients, noting that the Cree People often associate art therapy and their experience in the bush, arguing that both constitute a place for them to re-affirm their notions of self.

Tomorrow's art and Design schools will not be just about art and Design, they will also be safe places, therapeutic and restorative havens for people in need of healing from

psychological and mental health related conditions, post traumatic experiences. Art schools and art programs deserve to be regarded as crucial and vital elements of the health care system.

Will the digital transformation change EVERYTHING?

We have not yet fully captured how the digital transformation with Artificial Intelligence (AI) will impact our society. What is AI? What is the difference between Machine Learning (ML), deep learning, generative AI and other types of big data intelligent self-learning systems? Does it matter? What does really matter?

I have spent 25 years of my career in the interactive digital media sector; I caught the techno bug early on and I still have recurrent symptoms. But I am seriously wondering if we are not once more sleepwalking through another devastating transformation. Are we embracing technology with our “d  j   vu” techno optimism which makes us claim high and loud “wait, you’ll see life will be better”? All this in the name of progress whether it is in health, manufacturing, lifestyle living and even sustainability and creativity. And indeed, some AI platforms have fully integrated inclusivity and accessibility in their systems by allowing impaired artists to create their own art with voice assisted tools. Designers using AI upgraded software suites have been able to dramatically cut down design time (front end design, photo manipulation...).

I also believe that the idea of movement toward a developed and improved state (the definition of progress) should always be associated with the idea of movement towards a developed, improved, fair, inclusive and responsible society. That’s the difference between progress and a progressive society aspiring for Social Justice, which gave us, the fight against discrimination with the civil rights movement, the achievement of voting rights, healthcare and access to education as well as the advocacy for DEI.

Today, our politicians and our industrial leaders call loudly to retool and retrain (re-educate) our labour and workforce. Humans have promoted progress, starting 5000 years ago, and ramping up in the early days of the first industrial revolution in the late 1700s. Industrial revolutions have been driving progress, culminating in the 20th and 21st centuries giving us today what we call the “Industry 4.0” synonym of smart (digital + AI) manufacturing which followed the robotization and then the computerization era of the 1980s. But even if we retrained our workforce to become brilliant super users of complex computerized systems powered by AI, would there be enough work for everybody? Are we ignoring, so soon, that there will be lots of skilled workers (of all ages, blue and white collars) who won’t be interested or won’t have the skills to re-educate. Will they lose their sense of belonging and purpose so necessary to be a balanced and fulfilled human being. This reminds me of Maslow’s hierarchy of needs which classifies the various levels of needs that dictate a human being’s behaviour from survival to self-actualisation. Will we

abandon more skilled and competent people to make the techno brothers even richer than they already are (if that is possible to imagine)? I hope the “Broligarchy” will finally listen to the British investigative journalist Carole Cadwalladr (after ruining her life).

The fascination over progress has influenced our leaders to over-emphasize the development of technical expertise i.e. STEM (Science, Technology, Engineering and Math) in the education system. And there is more to be done in that domain, where there is still a significant under representation of women, making up less than 30% of the STEM workforce. The question I am raising is: by focusing on STEM, is the education system running the risk of creating a generation of “unskilled” workers incapable of solving problems, of producing critical thinking analysis and communicating new ideas, which will be necessary to work intelligently with AI?

The solution will come from TE[A]M work

Why do our leaders like to converge towards the zero-sum (game) strategy, where the gains of one side result in the equivalent losses on the other? It seems that our society does not tolerate any subtle refined blended ideas anymore. This is the case for our education system in Canada. In Ontario, for example, the government has announced a \$750 M spending on STEM (Science, Technology, Engineering and Math) programs at universities and colleges, while we have demonstrated earlier that arts programs are not being properly funded. Our government should not be promoting STEM VS THE ARTS, but rather STE[A]M instead. Note that I highlighted the [A]: a little of bias does not hurt.

What is STEAM education? STE[A]M fully integrates the arts and design into STEM education to create learning experiences that foster imagination and innovation, critical thinking and creativity. It aims at preparing students for the future workforce by developing problem solving, agility, communication and collaborative skills. By removing the boundaries between arts and science, we fully open the minds of our future game changers and leaders.

I have made a (too short) list of what I call STE[A]M champions, individuals who through their career erased the frontier between science and arts.

Da Vinci, Artist, inventor and engineer (The GOAT)

Michelangelo, Artist, architect, scientist, engineer

Frederick Banting, pharmacologist, orthopedist, field surgeon and Artist

Samuel Mordase, Artist and inventor of telegraph

Johannes Gutenberg, Artist and inventor of movable type printing

Beatrix Potter, writer, illustrator and conservationist

Anicka Yi, Artist, exploring biology and chemistry

Eunice Newton Foot, scientist, inventor, painter

Anna Atkins, Artist photographer, botanist

Janet Saad-Cook, multi-disciplinary Artist, physicist (light and time)

Neri Oxman, design, material engineering, biology and computing

Santiago Ramón y Cajal, Nobel Prize modern Neuroscience, illustrator painter

And the list goes on...

"I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited; imagination encircles the world."

_ Interview of Albert Einstein by Louis Viereck, 1929

As a matter of fact, some psychologists have defended the idea of multiple intelligences (MI). The sometimes-controversial American development psychologist Howard Gardner known for his theory of multiple intelligences (MI), was opposed to model based on the general intelligence factor (g-factor). He challenged the concepts of aptitudes and talents and came up with an alternative model made of 6 intelligences which are music, visual/spatial, linguistic, logical/mathematical, bodily /kinesthetic, interpersonal and intrapersonal. He later added naturalist intelligence and more recently pedagogical intelligence to the original list, and the study to potentially adding digital intelligence is in progress.

The French organization called "De l'or dans les mains" (gold in your hands) was created in 2021 and came up with the catchphrase "l'intelligence manuelle" (intelligence through the hands"). Its mandate is to promote and place "l'Intelligence manuelle" at the heart of the education and apprenticeship system in France. In 2023 the organization was mandated by both the ministry of culture and heritage as well as the ministry of commerce, trades and tourism to drive a pilot project advocating for the Artistic trades (crafts). The objective was to introduce the artistic trades to 35000 middle and high school students, in 2024 the organisation had already worked with 4000 students and 550 artisans, as a result 27% of the students expressed their interest in pursuing a career in the artistic trades.

"De l'or dans les mains" is the perfect example that seeks to establish the necessity and the benefits of fully integrating the arts into an education system. Now Canada, it is our time to equip our own schools with similar programs. This will require some deeper research to convince our leaders that by fully integrating the arts into the STEM education

(STE[A]M) we set our next generation for success.

We are designers and makers

From indigenous arrowheads, clay pots, canoes, long house, kayaks, snow shoes to dog sleds, ship yards, timber frames structures, fur coats, wool sashes, metal roofs , dams (hydro energy), print making, beer brewing, medical innovations, telecommunication systems, transportation machines (snow mobiles), aerospace, universal time systems, software development, smart device manufacturing, fashion, and so much more, the history of technology and innovation runs deep in Canada. It is the result of a strong tradition of design and craftsmanship (artisanry) which is significantly thriving from coast to coast to coast. An artisan is defined as a worker with a skilled trade, especially one that involves making things by hand. As we have seen, there is an incredible type of intelligence that comes from our hands (talented golden hands, and hands-on manual intelligence). De l'or dans les mains.

In the 1920s and 30s the Bauhaus School in Germany formulated the concept of design, the school is known for formalizing the teaching of the principles of design by citing for example: craftspeople + tradespeople working together to describe workmanship driven by design (research, conceptualisation/visualisation and prototyping). When adapting these ideas to the 21st century, and among materials we now include data, the machine, the tool and the craftsmanship are driven by technology, meaning mostly by artificial intelligence but not only.

“Mais qu'est c'est que ce truc, le deezigne?” my mum would ask, and I would try to explain that it is the quest to find the perfect balance between form and function, purpose and esthetics, the useful and the beautiful when creating objects, places, garments and even non-physical things (that one was a stretch). By explaining this to my mum made me realise that simplicity is not simple (something I kept telling my students as well), that successful design comes from many trials and errors, hence why prototyping and user testing are crucial. In the 1970s and 1980s another German designer, Dieter Rams, wrote the final chapter of the design prophecy with his 10 principles of “Good design” stating that “design is as little design as possible”. Much later, in Canada, Bruce Mau developed the philosophy of design as a societal engine to change systemic and complex issues. The American agency, IDEO went further by developing “Design thinking” principles which focusses on user needs and user experiences, which is nowadays widely adopted by the business world to establish their own strategies. An exercise I am particularly an adept of is the Charrette, a French word meaning handcart. A design Charette is a collaborative co-creative intense work period (from a few hours to a few days) that brings participants from various backgrounds to come up with ideas to design and develop a plan and or a low fidelity prototype to solve a wicked problem.

My experience in the sector of interactive media and design as well as material arts and crafts (as a designer, agency director, educator and administrator) has led me to believe that our next generation of designers needs to master the understanding of principles of system design, UX/UI and human machine interaction. I have witnessed amazing creations which came from teams prototyping the future of living in wonderful magical spaces called makerspaces or fabrication (fab) labs, or as I call them, the sorcerer's apprentice dens of the 21st century, where one designs, creates, makes and learns. The ultimate STE[A]M spot.

A makerspace or fab lab is a place where coexist digital design and fabrication (including computing and software development), with traditional tools and materials, where projects are driven by modern prototyping methods, where computer stations with suites of software are connected to laser printing, 3D printing, laser (CNC) cutters, vacuum forming machines and more. The same makerspace can also welcome multimedia equipment (cameras, green screens, audio...) and video game design stations and studios with motion capture as well as VR/XR technologies and equipment (software and headsets). The computing design and software development tools bundled with coding and microcontrollers (Arduino, Raspberry Pi, Makey Makey, Micro:bit...) allow 21st century geniuses to imagine and create the future of living while mixing artificial intelligence (large data models) with traditional machines and tools and materials like sewing machines, embroidery machines, tables saws, planers etc. This is a place where soldering, glueing stations and workstations are covered with prototypes from small objects to larger environments, blending physical materials and digital technology resulting from design sprints, charettes and rapid prototyping sessions.

I recall when we upgraded the makerspace at George Brown College School of Design from a small closet to a large and dedicated space which became ultra popular on day 1. My favourite station was the toy lab equipped with Lego, Kinect, Kapla and more interactive toy systems, which gave faculty and students the opportunity to ideate in 3D. Today I observe first-hand the pivotal role of a makerspace at the Fleming Haliburton School of Art + Design, where it has turned into a community hub connecting students and faculty with local businesses to explore, create, make and learn.

Canada faces the unique opportunity to promote its own mentors and apprentices of the 21st century. Statistics Canada reported that apprenticeship registrations in a certified/registered training program with an employer showed strong signs of recovery in 2023, an upward trend which started in 2021 (post Covid-19 disruption). In some cases, 2023 numbers are reaching of surpassing pre pandemic levels, except for Québec. This leads me to believe that there is an opportunity to use makerspaces to connect apprenticeship programs with businesses in the trades, while working as well with school boards (dual credits, OYAP), work integrated learning (WIL) programs like BHER, as well as with post-secondary institutions (Co-op).

Intersections

In 1951, the prime minister of Canada, Louis St-Laurent, appointed the Royal Commission on National Development in the arts, Letters and Sciences, which was chaired by Vincent Massey. The Massey Commission (as it was tagged) issued the *Massey report* with key findings and insights after conducting 114 public hearings and consulting with 1200 witnesses. At the time the Canadian culture was challenged by vast distances and a scattered population, which was heavily dependent on culture coming from our southern neighbour. The “arts and culture in Canada are in a state of anemia” the report said. Ultimately the report argued in favour of national support for the arts.

Some of the recommendations were implemented right away like increasing fundings to Canadian universities. Years later the Canada Council for the arts was created, the construction of the National Gallery (now Library and Archives Canada) started, and the National Film Board was expanded. Also, in 1980 the Mulroney government issued a paper entitled *Vital Links Canadian Cultural Industries* which said “While the arts are thriving as never before, the industries that sustain them are fragile. The Government of Canada wants to build stronger cultural industries to ensure the healthy development of Canadian culture.” But since then, there have not been any federal initiatives to study the status of the arts in education, probably due to the regionalization (provinces and territories) of the education systems in Canada. With each province and territory evolving in its own ways, it is hard to generalize and hard to act in concert to promote the arts across all jurisdictions. For instance, the arts curriculum in Ontario was updated (revised) in 2009 for grades 1 to 8 and in 2010 for grades 9 to 12. Since then, the world has changed, and STEM took over. In Alberta, the fine arts curriculum in kindergarten to grade 6 was updated in 2022 and in Senior High school (grades 10 to 12) fine arts courses are now part of the core courses.

The report by Calgary's Arts Commons Transformation project shows that parents identified the key reasons for the absence of enrollment of their children in arts related activities as lack of considerations (as a career), lack of awareness of opportunities and lack of accessibility due to cost or other limiting factors.

The impact of demographics on students' access to art is unbalanced thus creating an urban / rural divide. In rural areas both schools and college face more challenges than their urban counterparts in providing arts education (*People for Education – 2018 Paper*). It makes me wonder, is the loss of a generation of Artists looming, if we have fewer art Schools and programs offered? Is the Canadian arts and Culture identity and Artistic expression at risk? Are there too many arts and Design schools in Canada, and are they sharing an obviously diminishing market? When it comes to arts budgets, size does matter.

With so many new technologies and ways of connecting, there is no reason why arts education should remain inaccessible in the 21st century says the report *Transformative Action on arts Education: Re-invigorating the Seoul Agenda* by the CNAL / RCCA. It also highlights that “The potential of learning in the arts on an equitable basis across the globe remains in jeopardy (...). There is a clear and pressing need for governments and

stakeholders to take measures to overcome these deficiencies (...). There needs to be some kind of training for art educators, for artists and teachers”.

While there are many after-school STE[A]M programs, those are increasingly rare in regular public schools. As stated earlier, there is a great need to empower and professionally train our educators and teachers in STE[A]M, as they will be the enablers and knowledge providers.

There are also numerous local, national and international organizations representing and advocating for the arts. Are they too many? Are they too disjointed? There is a fundamental need for a unified and unifying language to carry the message and bring awareness about the vital role of the arts in education not only to the public but also to our leaders.

How can we achieve this?

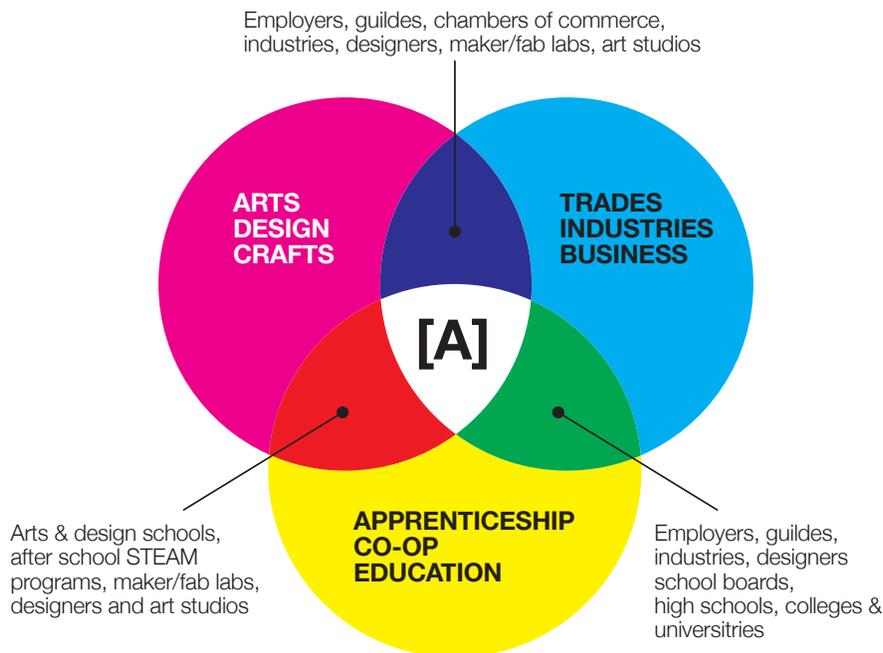
Not unlike what the Massey report did for the arts and culture in 1951, Canada needs a national report investigating the state of the arts in the Canadian Education systems in each of the provinces and territories.

Anticipating some of the findings, I do strongly believe that Canada needs a centralized enabling body, gathering intelligence and lobbying for the full integration of the arts in education i.e. STE[A]M, at the highest level of government with the HERITAGE, CULTURE, ARTS + DESIGN, INDUSTRIES, TRADES, LABOUR, SCIENCE, RESEARCH and EDUCATION agencies and governmental departments.

This transversal (s)team will have a clear mantra, STE[A]M is SM[ART], and a focussed mandate.

- 1) Educate our leaders by demonstrating the long-term benefits of STE[A]M for the Canadian society and economy, with the next generation of Canadian game changers.
- 2) Lead a transversal TE[A]M coordinating actions between different ministries and agencies (heritage, culture, industries, research, science, labour, trades)
- 2) Inform the public (the parents essentially) with awareness national campaigns to advocate for the arts + design in education.
- 3) Coordinate actions on the ground by linking the trades (designers and artists, businesses, guilds, etc.) educational providers and provide ready-to-use resources and programs to educate the educators (access to makerspaces).

I call them, the STE[A]Mers, les STE[A]meures



STE[A]M IS SM[ART]

Conclusion

The arts and design are everywhere and are an essential and integral part of humankind, of our human experiences, it shapes individual identities, our collective cultures and our economies. The arts and design are one of the pillars of our national identity and unity. It is in the Canadian DNA. A society that values and supports artistic expression and craftsmanship is not only about cultural preservation but also about nurturing social justice, humanity, mental health, well-being, and progress in the 21st century. Innovation comes from the intersections and juxtapositions of ideas and influences. By embracing STE[A]M education, which integrates the arts and design into science and technology, engineering and math we will provide our future generation with essential skills like critical thinking, problem solving and creativity which will prepare them to navigate and innovate in an increasingly complex world. But despite its deep impact and the critical benefits it provides, arts, design and culture remain underfunded and undervalued within the Canadian society. However, where there is a gap there also is an opportunity. To secure a vibrant role of the arts and design in trades and industries via apprenticeship and other educational programs, it is essential that Canada adopts a coordinated, transversal, national approach with a uniting and unifying voice, a team of gatherers, des rassembleurs, STE[A]Mers, at the highest possible level of the Canadian federal government.

It will take some TE[A]M work.

Resource list

Ontario curriculum for the arts

<https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-arts/grades/grade-8/context/approaches-to-education-in-the-arts>
<https://www.edu.gov.on.ca/eng/curriculum/secondary/Arts910curr2010.pdf>

Alberta Fine arts

<https://curriculum.learnalberta.ca/home/en>

TAEA Canada report

<https://taeacanada.ca/wp-content/uploads/2024/08/TAEA-Impact-Report-July-2024.pdf>

The role of art in the development of critical thinking

https://www.researchgate.net/publication/383553136_The_Role_of_arts_in_Education_Enhancing_Creativity_and_Critical_Thinking

Arts in education – People for education

https://peopleforeducation.ca/wp-content/uploads/2018/04/arts_2018_For-web.pdf

Steam school (Ampere) by Pinguag (uplifter after school program)

<https://steamschool.uplifterinc.com>

Steameducation / Steam Centre, St Thomas ON

<https://www.steameducation.ca>

Queens Journal article

<https://www.queensjournal.ca/we-shouldnt-have-to-choose-between-stem-and-the-arts/>

De l’or dans les mains

<https://www.delordanslesmains.com>

Boston arts Academy

<https://bostonArtsacademy.org/program/academics/steam/>

Georgis Tech GoSTEAM

<https://steam.ceismc.gatech.edu>

NGA Centre for Best Practices

The Impact of arts Education on Workforce Preparation

<https://www.americansfortheArts.org/sites/default/files/050102ARTSED.pdf>

Sage Journals

Teaching History Through Theater: The Effects of arts Integration on Students' Knowledge and Attitudes.

<https://journals.sagepub.com/doi/10.1177/2332858420902712>

CNAL / RCAA

Transformative Action on arts Education: Re-invigorating the Seoul Agenda

<https://www.eduArts.ca/sites/default/files/civicrm/persist/contribute/files/Position%20Paper%20on%20Re-invigorating%20the%20Seoul%20Agenda.pdf>

Statistical insights in the arts

Nearly twice as many Artists in Ontario in 2021 as in 1991

<https://statsinsights.hillstrategies.com/p/Artists-historical-ontario>

Art Commons Education

<https://www.Artscommons.ca/hubfs/ArtsEducation-BenchmarkSurveySummary.pdf?hsLang=en>

Artsper

Artists net worth Artsper magazine

[https://blog.artsper.com/en/lifestyle/richest-artists-in-the-world/#:~:text=While%20much%20of%20his%20\(%20Jeff%20Koons,in%202023%20is%20Owell%20over%20\\$500%20million.](https://blog.artsper.com/en/lifestyle/richest-artists-in-the-world/#:~:text=While%20much%20of%20his%20(%20Jeff%20Koons,in%202023%20is%20Owell%20over%20$500%20million.)

Statistics Canada

Mental disorders and access to mental health care

Stephenson, E., 2023, Statistics Canada September 2023

Women in STEM, 2024

The Globe and Mail

- Why business needs the humanities: Focussing on STEM degrees has its own economic cost – January 27 2024

- State of the arts - June 07 2024

- Colleges and institutes embrace STEAM – April 27 2022

American Academy of arts and Sciences (AAA&S)

Art education is vital to support emotional and social development
<https://www.amacad.org/publication/case-for-arts-education/section/3>

The Ontario arts Council

Arts across Ontario

<https://www.arts.on.ca/news-resources/news/2024/arts-across-ontario-study-reveals-billion-dollar-impact-on-ontario-gdp-by-oac-funded-organizations>

The Canada Council for the Arts

<https://canadacouncil.ca>

US National Library of Medicine

Role of art Therapy in the Promotion of Mental Health: A Critical Review

<https://pmc.ncbi.nlm.nih.gov/articles/PMC9472646/>

Commission on Excellence in Education

MIT Press

Art School: (Propositions for the 21st Century)

University of Toronto Press

Healing through art: Ritualized space and Cree identity

Easter Island

<https://www.americanscientist.org/article/rethinking-the-fall-of-easter-island>

HEM School

https://www.linkedin.com/posts/imane-maher-7046272a5_creativitaез-projetentreprenurial-ugcPost-7343716171155726336-zihb/?utm_source=share&utm_medium=member_ios&rcm=ACoAAAFIUqQBBxTWLAudLOV9jjZ7KdKwfAPazAM

Kent Monkman

<https://www.kentmonkman.com>

https://en.wikipedia.org/wiki/Kent_Monkman

Massey Commission

<https://www.thecanadianencyclopedia.ca/en/article/massey-commission-emc>

Federal Government Policy on arts and Culture

(PDF) 2008

Integrating arts with STEM and leading with STEAM (...) by the International Journal of STEM Education (2022)

Wallace Foundation – University of California

The Connected Arts Learning Framework by the Wallace Foundation (2023)

Ontario creates (ON)

<https://www.ontariocreates.ca>

ArtStarts

in the school (BC)

<https://artstarts.com/about> Canadian Society for education through the art (QC)

<https://csea-scea.ca>

Western University

STEAM education in Ontario, Canada: A Case Study on the Curriculum, and instructional Models of four K-8 STEAM programs (2019)

https://ir.lib.uwo.ca/cgi/viewcontent.cgi?params=/context/etd/article/8350/&path_info=STEAM_Education_in_Ontario_Canada_A_Case_Study_on_the_Curriculum_and_Instructional_Models_of_Four_K_8_STEAM_Programs.pdf

Universities Canada

From STEM to STEAM (2016)

<https://univcan.ca/news/from-stem-to-steam/>

Figaro Magazine

<https://etudiant.lefigaro.fr/article/vie-etudiante/les-travaux-manuels-font-leur-retour-au-college-avec-l-association-de-l-or-dans-les-mains-20250522/>

University World News

The rise of skills-based hiring: What it means for HE

https://www.universityworldnews.com/post.php?story=20250709084819922&utm_source=newsletter&utm_medium=email&utm_campaign=COMMNL8043

Multiple Intelligences

https://en.wikipedia.org/wiki/Theory_of_multiple_intelligences

