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Pedagogy for a Plugged-in Age, Independent Study 2017

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FOR A PLUGGED-IN AGE
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S tudying the future of higher education is particularly important to me as I embark on my journey to lead and reshape Sheridan College’s Design Graduate Certificate Program, where I have been recently appointed Coordinator.

Without doubt, technology will figure heavily in the future of higher education and, more immediately, in the curriculum that I have been asked to redesign and teach. Indeed, our students must effectively harness technical tools to create engaging interfaces and experiences. New media and platforms continue to emerge. Institutions increasingly push for digital course delivery, testing its bounds in both scope and scale. Despite the hype surrounding technology and its large-scale disruption of the educational system, the synergistic union of humanistic values and technological power to advance student learning. In pursuit of this ideal, this Independent Study was designed to fit within a larger academic plan (see below) and aims to lay the theoretical and empirical groundwork for my Major Research Project (MRP): Designing and prototyping a human-centred, future-proof curriculum and framework for online-enabled higher education.

PHASE I: INDEPENDENT STUDY

ACADEMIC PLAN

CURRENT THINKING

Based on my understanding of current pedagogy and technology-driven shifts in today’s education landscape, I undertook a review of seminal works. The research was aimed at gaining an understanding of the current landscape and to lay the foundation for the following phases of the MRP.

HUMAN CONTEXT

The human context for this study is the educational environment. The current state of the educational landscape is characterized by a shift towards online and blended learning, driven by technological advancements and the desire for increased accessibility and flexibility.

HUMAN PEOPLE

The human people involved in this study are instructors, students, and administrators. They have different perspectives and experiences, which are crucial to understanding the human-centred aspects of the educational process.

FRAME INSIGHTS

The frame insights are derived from the synthesis of the current thinking, human context, and human people. They provide a general understanding of the context and the current state of the educational landscape.

PHASE II: MAJOR RESEARCH PROJECT

ACADEMIC PLAN

CURRENT THINKING

The current thinking is based on the frame insights from the phase I independent study. The aim is to refine and deepen the understanding of the current educational landscape.

HUMAN CONTEXT

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METHOD

Primary and secondary sources were tapped to build a knowledge base for this phase of the research. In an effort to achieve balance, breadth, and depth of opinion, secondary sources comprising seminal works, academic papers, and canonical texts (including those from online journals, blogs, and technology keynotes) were split between thought leaders in the fields of education, technology, or both.

This literature review was then validated by primary sources, composed of four 30-minute, semi-structured expert interviews with college-level design educators, administrators, and students (both current and former). For respondent profiles and discussion guides, please see Appendix I and J.

Human-Centred STEEP V

Given this study’s goals of establishing a “lay of the land” to examine technology and pedagogy in the context of higher education, an environment scan using the STEEP V framework (Social, Technological, Economic, Environmental, Political, Values) seemed like a natural fit in the beginning. Upon reviewing existing studies, however, this would have resulted in heavy overlap with past SFI submissions and presented too macro a view of education for my goal of developing a technology curriculum anchored on humanistic values.

To this end, I adapted this method to be more human-centred while keeping its thoroughness, re-focusing on experiences, relationships, and even perceptions between actors in the higher-ed space to yield deeper insights. As such, a political scan that would have given rise to observations about government bodies and regulations, for instance, now speaks to organizational hierarchies, power relationships, and technology as a political artefact seen through the lens of students, instructors, and administrators.

The output of this Human-Centred STEEP V is actionable and threefold: (1) High-level motivations / truths on which to base curriculum design principles, (2) Levers and tensions that designers must capitalize on in curriculum development, and (3) Initial “design dilemmas” or points of view that can spark reframing of digital pedagogy for the MRP.

The exhibit above outlines the Human-Centred STEEP V process followed.
People are more than demographically.” They are emotional beings who engage others and have their own desires, preferences, and personalities. This research uncovered five key social dimensions: Collaboration, Self-Selection, Public Opinion, Isolation, and Interactions that drove the insights below.

Online learning carries a social stigma
Negative educational user experiences and low retention rates (Terras & Ramsay, 2015) plague online schools and cast doubt on the quality of their instruction and credentials. Equally (if not more) damaging, perceived lack of community or sense of the social (Lv., personal communication, August 5, 2017) as well as a sit-and-listen culture marked by forced participation and disengagement (Ch., personal communication, August 5, 2017) portray electronic course delivery and students as operating in a world devoid of interaction and nuance (Kemp et al., 2014), ultimately unfit for the workplace. This characterization extends to online course creators, who are labeled “instructional technologists,” “engineers,” or “technicians” rather than respected “designers” or “architects” (Ely, 1999). Proponentically, Bick (1973) identified a “cultural bias of a society in which technological growth has been confused with technocratic control” (the latter associated with “bureaucracy and teaching” versus “independence and learning”).

The overall effect is a privileging of courses that are taught face to face, with the implied assumption that they are better, when this may not necessarily be the case (Kemp et al., 2014).

Collaboration promotes transferrable skills and employment
Skills do not develop in isolation. “Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers” (Vygotsky, 1978). This cooperative ideal is a common thread among various learning theories. Constructivism proposes that students actively build on their existing worldview and gain new knowledge by interacting with peers and instructors. Connectivism espouses the greater importance of the quest for knowledge and rapid sense-making from networks compared with what one isolated individual currently knows (Farkas, 2012).

In practice, participatory technologies such as forums, blogs, and other content creation tools facilitate network-building and have been shown to hone creativity, reasoning, focus, critical thinking, and analysis (Terras & Ramsay, 2015), all sought after skills in the workplace. Lastly, the soft skills that arise from peer-to-peer learning are crucial to job seekers as employers increasingly demand teamwork and cultural fit from new hires. In part, this may explain why jobs elude even graduates of STEM programs where learning is not necessarily about creativity and play (Swearens, 2017).

Collaboration without planning/infrastructure yields sub-optimal results
Collaborative efforts can fail when the right conditions and expectations are not present. Some students could be distracted or disengaged (M., personal communication, August 4, 2017), while others may not buy into participatory tools (Ch., personal communication, August 5, 2017) and feel that their autonomy is curtailed by being forced to collaborate or use a technology meant only for their personal lives (Farkas, 2012). Traditional logistical or resource issues (e.g. classroom availability, scheduling) can also make collaboration more difficult.

Educators must first set the stage for collaboration to flourish by building a strong sense of community where students feel comfortable engaging and sharing knowledge online (Farkas, 2012) and modifying their practices such as how they evaluate students for collaboration (LaMonica, 2006) or communicate collaboration as a learning outcome (Farkas, 2012).

Social interactions promote accountability and ownership of studies
Whether on- or offline, students are more likely to commit to their studies when they have opportunities to interact with others. Participatory technologies like blogs support autonomy by providing identifiable personal spaces from which students can contribute to a larger knowledge-building community (Farkas, 2012). By fostering a sense of belonging without sacrificing identity, online communities can boost learner persistence and achievement (Hughes, 2009) and promote sharing of one’s ideas in a space where conversation is king (Farkas, 2012).

Outside online spaces, direct relationships enable individualized feedback that helps keep students engaged in their studies (Terras & Ramsay, 2015). Face-to-face contact and impromptu after-class discussions with peers remind students that they have a personal obligation to others to complete group projects as promised (Kemp et al., 2014). How might these same benefits accrue to online learning settings where disengagement and dropout rates are high?

Students can demonstrate their learning in an open way that allows for collaborative assessment, rather than simply receiving feedback from the instructor.”

Meredith Farkas

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**Figures:**

**Figure 2: Social dimensions and motivations**

**SOCIAL CIRCLES**

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**Table:**

<table>
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<tr>
<th>SOCIAL DIMENSIONS</th>
<th>ACTIVE LEARNING</th>
<th>EMPLOYABILITY</th>
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<td>Community</td>
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<td>Relationships</td>
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“What is common to all true master-pupil relationships is the awareness both share that their relationship is literally priceless and in very different ways a privilege for both.” Ivan Illich

Social interactions outside traditional environments promote learning.

The idea of learning outside the classroom is not a new one. For years, colleges have offered internships and co-ops to help students gain experience and lifelong skills. A simple walk with students outside the classroom to practice their photography and receive immediate feedback can result in meaningful, teachable moments (Ma., personal communication, August 4, 2017).

Today, interactions are no longer tied to physical locations as Illich’s vision of learning driven solely by matched interests and peers becomes a reality. Online platforms like Pinterest and MeetUp, certainly radical, where hobbyist and social platforms like wikis or blogs allow students to take part in online communities and are learning environments promote learning whereby a networked service facilitated matching “persons who at a given moment shared the same specific interests.” Today, hobbyist and social platforms like Pinterest and MeetUp, certainly radical by not only their peers but external experts and knowledge networks. Thus, students are armed with a diverse knowledge repository no longer limited to the instructor (Farkas, 2012).

Interpersonal relationships are emotionally satisfying. Much emphasis is placed on students’ intellectual growth and perhaps not on their emotional well being. Illich (1971) writes about the delight and surprise in unexpected questions and how “priceless” and “true” a partnership between master and pupil can be. If we accept that “students leave schools, they don’t leave communities” (Kemp et al., 2014), then accountability and commitment also rest on the fulfillment of emotional needs such as personal interactions and a sense of belonging.

A technical tool such as blogging can reduce students’ feelings of isolation while building an identity in the classroom (Dickey, 2004). It also lends itself well to more personal and informal writing, which leads to greater socialization (Farkas, 2012). The amount of access to educators, both online and in person, can promote a strong sense of community among students, which may improve retention and enrolments (Kemp et al., 2014).

The following table unpacks the social motivations around which to craft course design principles. The insights established in the previous section were dimensionalized visually in parallel structure in Figure 2 to highlight potential areas of intervention (levers) as well as problem reframing considerations (tensions, design dilemmas).

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<th>SOCIAL</th>
<th>HUMAN-CENTRED STEEP STAGE V</th>
<th>SOCIAL</th>
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<td><strong>DESIGN CONSIDERATIONS</strong></td>
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<td><strong>MOTIVATIONS</strong></td>
<td><strong>KEY DIMENSIONS</strong></td>
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<tr>
<td><strong>ACTIVE LEARNING</strong></td>
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<td></td>
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<td>Public Opinion</td>
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**Where do we go from here?**

For future course design to be successful, it must incorporate social principles based on three motivations: Active Learning, Community Building, and Employability.

**DESIGN CONSIDERATIONS**

**MOTIVATIONS**

**KEY DIMENSIONS**

**LEVERS**

**TENSIONS**

**DESIGN DILEMMAS**

- **ACTIVE LEARNING**
  - The pursuit of highly personal learning outcomes through individual drive and co-creation of knowledge.
  - Self-Selection
  - Learning Environment
  - Choice / Need to Succeed
  - Why would students choose who can be part of their class?

- **COMMUNITY BUILDING**
  - An inclusive, well-organized circle that creates emotionally satisfying relationships.
  - Isolation
  - Outside Influences
  - Interaction / Isolation
  - Why does education need social interactions outside the classroom?

- **EMPLOYABILITY**
  - A program that is highly respected and valued by employers, students, and the public.
  - Collaboration
  - Transferable Skills
  - Employment / Fulfillment
  - Why does emotional fulfillment matter in learning?

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  - Why does emotional fulfillment matter in learning?
Technology is certainly not a silver bullet. How the tools are utilized makes all the difference in the world.

John Preston

Do technologies have policies? This research uncovered seven key technological dimensions (Digital Media, Efficiency, Ethics, Function, Immediacy, and Individual Use and Proficiency) that drove the insights below.

Technology lacks emotional nuance

Technology has yet to match the richness offered by face-to-face settings (Fischer, 2014). Subtle nuances (e.g. sarcasm, humour, body language) may not always translate well digitally, resulting in a watered down experience where instructors cannot be themselves or students misinterpret intent (Kemp et al., 2014).

Technological innovation (e.g. greater connectivity, access to resources) aside, “human factor”-driven differentiators that can compete with the ease of smaller in-person classes and the relationships that develop within remain high on the MOOC agenda (Fischer, 2014).

Technology is a means, not an end.

Educational content and intent matter more

Simply having access to the Internet or training educators to use computers is less important than educators’ effective pedagogic use of ICT to benefit learners (Watson, 2001; Ofsted, 2001).

Striking the right balance (and knowing the difference) between learning about technology and learning how to benefit from it (Fischer, 2014; Watson, 2001) has challenged educators since the turn of the millennium when U.S. and Canadian schools had widespread Internet access (NCES, 2002, p. 3; OECD, 2001, p. 256).

As growing evidence suggests, the use of instructional design process, not specific hardware and software, results in better learning outcomes (Ely, 1999). In education, technology is not the silver bullet (Kemp et al., 2014).

Little is known about students’ personal learning styles, how they actually use technology to learn

Having a fine-grained understanding of how and why students interact with technology to learn is a prerequisite to addressing the practical and psychological barriers in e-learning (Terras & Ramsay, 2015). Notwithstanding, educators grapple with obtaining this knowledge for a variety of reasons.

New technologies have a long history of being treated like Trojan horses. Societies dismissed the written word, fearing it would force students to follow an argument rather than participate in it. He did not foresee “new pathways for the intellect” as his student Plato did (Shrivani, 2015). Similarly, early Massive Open Online Courses (MOOCs) were poorly received as many assumed that their initial, primitive feature sets and the platform itself would not evolve over time. As today’s hyper-connected economy sees innovation cycles shorten and steepen (McGovern & Araya, 2016), new technological uses and contexts soon arise that demonstrate the true value of iterations, be they games used ex-curriculum to identify unusual talent in children otherwise labeled antisocial by school psychologists (Blick, 1971) or Facebook’s pivotal role in the Arab Spring (Kemp et al., 2014). While it may be too early to expect MOOCs to be the answer to educational innovation for everyone, it may also be too soon to completely abandon them (Kemp et al., 2014).

Tech’s experimental, iterative nature causes people to underestimate its potential to effect meaningful change

They may not be asking the right question when focusing on “What should someone learn?” instead of “What kinds of things and people might learners want to be in contact with in order to learn?” (Blick, 1971). For example, the curves for some technologies can be so steep that they take time away from actual learning (Rath and Houghton, 2009), yet educators may not always be aware of this as they deliver content. The sheer size of MOOCs also challenges the feasibility of understanding individual students and creating a learning path in advance that factors in a diverse (and likely unknown) range of competencies and technological literacies (Farkas, 2014).

While the use of big data and simple surveys of students’ learning preferences and experiences have been suggested as means of shaping instructional strategy (Kemp et al., 2014; Terras & Ramsay, 2015), students’ emotional and cultural relationships with technology and each other may prove harder to uncover. When collaborative wiki sites were first used in schools, for instance, students felt uncomfortable with the idea of editing each other’s work, and only after a strong sense of community and friendships in the classroom developed did collaborative writing emerge as intended (Farkas, 2012).

Educators are unprepared for the autonomous, customized learning that technology affords

When technology futurist John Seely Brown argued that educators must change their teaching practices to make each new piece of technology work (La Monica, 2006), one wonders if they were tempted to change professions given the already-high demands of teaching with existing technology and online course instructors’ complaints of having “little to no control over the scope and
Technology fosters dependency, leads people to value immediacy over depth when calculators first become affordable, schools scrambled to develop policies around their use for fear that students would depend on them to forgo analytical skills afforded by mathematics. Fast forward to the Internet age, and dependency concerns run much deeper. Some argue that over-reliance on technology threatens the development of critical and evaluative skills needed for e-learning (Apple, 2003; Terras & Ramsay, 2015). Educators pressured by expectations of accessibility and infotainment may be enabling learners who rely on fast, bite-sized, 24-7 support from their instructors rather than “simmer” and figure out high-quality solutions on their own. (Farkas, 2012; Kemp et al., 2014; Lv., personal communication, August 5, 2017).

Where do we go from here? For future course design to be successful, it must incorporate technological principles based on four motivations: Code of Conduct, Customized Learning, Optimal Use, and People First.

The following table unpacks the technological motivations around which to craft course design principles. The insights established in the previous section were dimensionalized visually in parallel structure in Figure 3 to highlight potential areas of intervention (levers) as well as problem reframing considerations (tensions, design dilemmas).

**CODE OF CONDUCT**
Clear policies on the acceptable use of technology in interactions with people and intellectual property (Kemp et al., 2014; Lv., 2017). Educators may lack training on how to transition a traditional classroom to an online one (Kemp et al., 2014) and assume that face-to-face practices (e.g., focus on faculty content delivery, assess only at course end) (Terras & Ramsay, 2015) will be acceptable in a MOOC setting where participation, autonomy, and constant feedback are more critical to keep students engaged from a distance and stem dropout (Baggaley, 2013; Farkas, 2012).

**CUSTOMIZED LEARNING**
Efficient tools that let students create and pursue learning pathways as unique as they are (Universal Design for Learning, UDL). Relatability is a powerful tool in getting consumers to adopt new technologies. The original Macintosh leaned on skeuomorphosis to provide users with a mental model of how to accomplish a familiar task within its new GUI. The opposite is true in the case of MOOCs. Teaching and learning are made more difficult as tried-and-true bricks and mortar curriculum models are force fit into a new medium (Elh, 1999). Educators may lack training on how to transition a traditional classroom to an online one (Kemp et al., 2014) and assume that face-to-face practices (e.g., focus on faculty content delivery, assess only at course end) (Terras & Ramsay, 2015) will be acceptable in a MOOC setting where participation, autonomy, and constant feedback are more critical to keep students engaged from a distance and stem dropout (Baggaley, 2013; Farkas, 2012).

**OPTIMAL USE**
A culture of learning that embraces iteration and experimentation in the use of technology. Why do schools have difficulty crafting course design principles based on four motivations: Code of Conduct, Customized Learning, Optimal Use, and People First.

**PEOPLE FIRST**
A program that puts technology in the service of students and teachers, not the other way around.
Teachers, like employees in any system, try to ensure their job security by requiring students to be taught subjects they, the teachers, know.”

Ivan Illich

P

eople have individual, not just collective, interest to fuel the economy with their personal skills and experience. Who determines their currency and how is it measured? This research uncovered five key social dimensions (Incentives, Investment, Market Forces, Pockets of Wealth, and Worth) that drove the insights below.

Schools contribute to skills shortage by keeping students too long / out of the workplace

Higher education keeps young people out of the workforce and adult society in general with lengthy degree programs that artificially suppress labour supply (Ackoff, 2008; Illich, 1971). In the 1950s, a two-year Associates Degree in Nursing (ADN) was the de facto requirement to become a Registered Nurse in the US. However, in 1982, the National League in Nursing declared the four-year bache lor of science in nursing (BSN) as the new minimum level for the field. The impact of that declaration was dramatic. Almost a decade later, The Department of Health and Human Services had to create a commission to address the unprecedented national nursing shortage (Illich, 1971). The Sentinel Watch, (2016), thereby putting a damper on the BSN requirement. In 2010, the Institute for Medicine sparked fears of another nursing shortage with a report calling for 80% of all nurses to hold a BSN degree by 2020.

Experiences and skills = credentials and currency

Educational value chains do not need to account all of one’s formal and informal life experiences. A machine agent-cum-guidance counselor would get to know a learner’s goals, acknowledge what they have done, analyze government data and hiring trends, then return highly relevant employment opportunities or specialized skills training still needed to obtain them. Another concept, put forth by Illich (1971), takes the form of a virtual skills exchange bank that equates experience with currency. People are given basic credits with which to acquire fundamen tal skills, after which those who contrib ute their time by teaching are rewarded with more credits and access to advanced teachers.

Third parties have to subsidize enrichment programs to supplement traditional learning

Schools cannot keep up with industry. Various governmental and bureaucratic hurdles make it necessary for educators to tap third parties to support supplemental programs that round out and update what students learn inside the classroom. Seeing the value of real-life experience to the youth, Illich (1971) suggested larger skill credit to the underprivil eged as well as tax incentives for willing industry partners who take on students in what are now modern-day internships. In the U.S., parental spending on enrich ment activities outside the school system has almost tripled since the 1970s, underlining the need that people see to augment STEM-based learning with in-demand creative and team-based skills even if they have to pay for it themselves. Likewise, independent organizations like Project Lead the Way are also sharing the responsibility of building creative STEM-based programs into schools to help keep them free or at least affordable (Swearer, 2017).

Let market forces and personal mission guide skill acquisition and development

Higher education has long controlled the goal-setting aspect of learning. This has resulted in an unbalanced and narrow market for learners that presents industry with graduates who lack diversity and the relevant skill sets for agile workplaces. In contrast, efficient learning markets would allow anyone to start their lifelong journey at birth and acquire the most in-demand skills inexpensively, at any giv en time and place, and from any person willing to share their skill or knowledge (Illich, 1971).

On the flip side, schools in lower socio-economic areas must deal with pre-pack aged curricula without all the necessary resources to support them (Apple, 2001). Given these limitations, and with curricula developed without educator consultation, there can also be a loss of professional dispositions associated with good teaching, further demarcating the various strata that make up the digital divide (Kemp et al., 2014).

Financial security, incentives elude educators

Higher-education professors appear to be well compensated but, in reality, are “overwhelmingly badly paid and frustr ated by the tight control of the school system” (Illich, 1971). University administrators underestimate the amount of time educators devote to a course outside the classroom, particularly in rapidly changing fields like technology where content requires constant updating to stay relevant. Including office hours, marking, and professional development, the average professor works about 60 hours a week (Kroll, 2013). How are educators financially rewarded for teaching MOOCs, where 95% of students do not attend that university (Fischer, 2014), and administrators assign fewer credits for teaching such courses? The financial picture gets murk ier for adjunct professors, who generally have few benefits and little job secu

Figure 4: Economic dimensions and motivations

ECONOMICS OF EDUCATION
No question that these are big business, they are big education businesses. They are not colleges that are run like businesses, and they are not businesses that are run like colleges. They are big education businesses." (Interview)

Required workplace skills change faster than curricula, no longer guarantee relevant jobs

Created over a century ago, our educational system prepared people with deep specialization to work in hierarchical organizations and solve relatively simple problems. We live in a much different era of dynamic, collaborative workplaces that deal with wicked problems (Swearer, 2017) and, therefore, require new skills. This leaves educators scrambling to update curricula and create new courses. The impact is already being felt as many students graduate already partially obsolete, leaving them indebted, anxious, and unable to practice in their field of study (Ackoff, 2008; Ely, 1999; McGowan & Araya, 2016).

Projects paint a dire picture for students if education maintains its current pace. 65% of children in grade school today will end up in jobs that have yet to be invented. By 2025, one-third of all jobs will be automated. By 2027, 75% of the S&P 500 index will comprise companies that have yet to be created (McGowan & Araya, 2016).

This unprecedented change could necessitate perpetual teacher training and professional development, if not radical reform of educational systems (Ely, 1999).

Where do we go from here?

For future course design to be successful, it must incorporate economic principles based on three motivations: Accessibility, Currency, and Viability.

The following table unpacks the economic motivations around which to craft course design principles. The insights established in the previous section were dimensionalized visually in parallel structure in Figure 4 to highlight potential areas of intervention (levers) as well as problem reframing considerations (tensions, design dilemmas).

**Key Dimensions**

- **Motivations**
- **Levers**
- **Tensions**
- **Design Dilemmas**

**Accessiblity**

Equal opportunity to have and use technology to fuel one’s personal learning mission

**Viability**

A financially efficient business model that does not sacrifice student and faculty engagement

**Currency**

Skills and experiences that are in tune with personal goals and ahead of industry demands

**Technology**

Digital technology can improve education delivery, employability (efficiency)

The use of digital technology for curriculum delivery has tremendous potential to raise the standards of teaching and learning (Watson, 2001). Students benefit from greater flexibility in the number of courses and schedules available (Council of Ontario Universities, 2011; Fischer, 2014), making it easier for them to enroll. Despite MOOCs’ notoriously low completion rates, sheer capacity allows them to graduate more students per instructor than traditional programs in a shorter period of time (Fischer, 2014), thereby broadening the selection of candidates from which employers can choose.

That said, technological throughput comes with opportunity costs, not least of which are significant (and still largely unrealized) betterments of teaching ability and sustained student engagement as learning experiences get dehumanized with volume (Kemp et al., 2014).

**R&D**

ROI / Overhead matter to education
too

Education is like any other business concerned with its P&L. With domestic enrolment down, Ontario colleges are increasingly relying on international students to fill their revenue gap (Chiose, 2017), in some cases catering to the needs of MOOCs to many schools’ financial agenda.

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Required workplace skills change faster than curricula, no longer guarantee relevant jobs

Created over a century ago, our educational system prepared people with deep specialization to work in hierarchical organizations and solve relatively simple problems. We live in a much different era of dynamic, collaborative workplaces that deal with wicked problems (Swearer, 2017) and, therefore, require new skills. This leaves educators scrambling to update curricula and create new courses. The impact is already being felt as many students graduate already partially obsolete, leaving them indebted, anxious, and unable to practice in their field of study (Ackoff, 2008; Ely, 1999; McGowan & Araya, 2016).

Projects paint a dire picture for students if education maintains its current pace. 65% of children in grade school today will end up in jobs that have yet to be invented. By 2025, one-third of all jobs will be automated. By 2027, 75% of the S&P 500 index will comprise companies that have yet to be created (McGowan & Araya, 2016).

This unprecedented change could necessitate perpetual teacher training and professional development, if not radical reform of educational systems (Ely, 1999).

Where do we go from here?

For future course design to be successful, it must incorporate economic principles based on three motivations: Accessibility, Currency, and Viability.

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That said, technological throughput comes with opportunity costs, not least of which are significant (and still largely unrealized) betterments of teaching ability and sustained student engagement as learning experiences get dehumanized with volume (Kemp et al., 2014).
Environmental dimensions and motivations

Learner-centric environments still need structure, guidance. Even the staunchest critics of traditional schooling believe that educators should set boundaries and assert their authority no matter how motivated or autonomous the student. Specifically, the role of “wise counselor” is appropriate when students require expertise in navigating rough or new terrain (Illich, 1971); are faced with roadblocks or alternative methods (Illich, 1971); or respond better to praxis and feedback than theory (Ad., personal communication, August 3, 2017). Apart from their subject matter expertise, educators have a responsibility to control the learning environment and set students up for success through active and self-motivated learning journeys over finite linear programming (Swearer, 2017; Shives, 2015).

To this end, there are calls for universities to extend the learning experience and come up with “competence maintenance programs” that keep students and alumni abreast of key developments in their industry (Ackoff, 2008). Online platforms expand community resources, “time on task” beyond the campus. Online platforms extend valuable resources, both tangible and intangible. They allow instructors to use communication mechanisms (e.g. Facebook Messenger, portals) to increase contact with students, circulate course materials, or send mass reminders outside designated class hours (Kemp et al., 2014). At their convenience, students can access and review as many times as needed lectures and readings they missed or wouldn’t have had access to (Fischer, 2014). Reach and resource management aside, it remains to be seen how these platforms impact the quality of that extra time between students, peers, and educators. Some say that the teacher-student bond strengthens as time is devoted to those who could not connect with their teacher in class (Kemp, 2014), but the question of dependency on quick hits and whether online interactions have the same “magical or meaningful” quality as in-person ones are up for discussion (Ma., personal communication, August 4, 2017).

Although technology can bring people together, it is not until people have come together in a physical community that ideas and positions coalesce and change happens.”

Joseph Flynn

“uch like our natural environment, the educational climate is rapidly changing. Well-worn practices and beliefs can endanger the learning ecology if left unchecked. This research uncovered four key environmental dimensions (Online Platforms, Curricular Structure, Campuses, and Legacy Organizations) that drove the insights below.

Despite tech’s potential to enrich learning, MOOCs are losing students. Technological advancements should enhance the learner experience beyond the traditional face-to-face model (Kemp et al., 2014). However, with dropout rates as high as 90% (Terras & Ramsay, 2015), MOOCs could not be farther from their potential. Poor incentives to complete the course, issues understanding the content, and a general lack of support or feedback to address these issues have all been offered as possible explanations. What is not inherent in or unique to MOOCs, these weaknesses are starting to define the medium and colour expectations. Others question why or how the traditional, and mostly mental, however, educators themselves do not understand learner experiences, goals, technical literacy, and preferences well enough to keep MOOC students engaged (Kemp et al., 2014; Terras & Ramsay, 2015).

Physical spaces are necessary for tech-facilitated ideas to come to fruition. A compelling tweet can instantly garner thousands of likes but not necessarily action. While online platforms can reach larger audiences efficiently and enable quick information exchange, nothing brings people together, allows new ideas to flourish, and galvanizes change more than a shared physical space. (Kemp et al., 2014; Lopes, 2014). Taking a page from recent Egyptian history, “it was not until people were in solidarity, in the streets and voting booths, that the technology made a difference” (Kemp et al., 2014).

Self-directed learning is much more common online. The 2.0 classroom is a “choose your own adventure” learning experience. Popular in the 1980s and 1990s, the innovative book series allows readers to make choices that determine the plot’s outcome. Similarly, students of tech-enabled courses can chart their own learning paths without familiar constraints like curricula, majors, and degrees (Illich, 1971; Farkas, 2012).

With instructor guidance on learning outcomes, self-motivated students select the technologies that best suit their needs, choose only subject matter that is meaningful to them, and give feedback that shapes course material (Farkas, 2012). In contrast to the closed classroom model’s focus on unilateral knowledge transfer (whether through textbooks or lectures), MOOCs are self-paced. Even the staunchest critics of traditional schooling believe that educators should set boundaries and assert their authority no matter how motivated or autonomous the student. Specifically, the role of “wise counselor” is appropriate when students require expertise in navigating rough or new terrain (Illich, 1971); are faced with roadblocks or alternative methods (Illich, 1971); or respond better to praxis and feedback than theory (Ad., personal communication, August 3, 2017). Apart from their subject matter expertise, educators have a responsibility to control the learning environment and set students up for success through active and self-motivated learning journeys over finite linear programming (Swearer, 2017; Shives, 2015).

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Illich (1971) proposes an arrangement where learners are empowered to choose a topic of interest independent of any pre-programming, find matches in motivated mentors and peers with like interests, share information, and co-construct new knowledge by exploring and debating each other’s point of view (Farkas, 2012). The result is an engaging, congenial atmosphere that recognizes the importance of the individual, not the institution, in charting their path and achieving their social role in life.

Schools are set up to dispense knowledge in pre-defined blocks

Universities have long been compartmentalizing education around well-worn genres, focusing on the accumulation of specialized intellectual capital (Fischer, 2014) and teaching students to deploy those stocks of knowledge within their field of study rather than cross pollinate with other disciplines to solve broader issues (Watson, 2001). Meanwhile, the world has moved on from Industrial Revolution-inspired “learning to do” approaches to more “doing to learn” models of knowledge discovery, which acknowledge that today’s complex problems will be better served not by 30 or 40 classic academic majors but by branching pathways of micro-genres of interest that may not even have names today (Ackoff, 2008; Sweareen, 2017; Watson, 2001).

Where do we go from here?

For future course design to be successful, it must incorporate environmental principles based on three motivations: Adaptive Spaces, Conducive Spaces, and No Bounds. The following table unpacks the environmental motivations around which to craft course design principles. The insights established in the previous section were dimensionalized visually in parallel structure in Figure 5 to highlight potential areas of intervention (levers) as well as problem reframing considerations (tensions, design dilemmas).

### DESIGN CONSIDERATIONS

#### MOTIVATIONS

**ADAPTIVE SPACES**

Fluid environments that mold physically, procedurally, and technologically to student feedback and the outside world

**CONDUCTIVE SPACES**

Student-defined learning environments supported by expert guidance and venues to implement ideas

**NO BOUNDS**

An eye-opening learning landscape that is not walled in by time, space, or orthodoxy

**KEY DIMENSIONS**

- Legacy Organizations
- Slow-Changing Assessment Standards
- Outdated Assessments / Industry Expectations
- Why are organizations slow to update assessment standards?

- Legacy Organizations
- A Centralized Lecture-Delivery Model
- Student Engagement / Legacy Culture
- Why are centralized lecture-delivery models still used by organizations?

- Online Platforms
- Physical Boundaries
- Demand / Availability
- Why does on-demand resource availability matter?

- Online Platforms
- Richer Learning Experiences
- Richer Experiences / Retention Issues
- Why do online platforms suffer from retention issues?

- Campuses
- Physical Communities
- Ideas / Activism
- Why are physical communities needed to galvanize ideas into action?

- Campuses
- Self-Selected
- Personalized Environment / Legacy Culture
- Why are self-selected campuses ideal learning environments?

- Online Platforms
- “Closed Classroom” Models
- Student-Controlled / Legacy Culture
- Why is self-directed learning harder to achieve in a bricks and mortar classroom?

- Legacy Organizations
- Structure and Guidance
- Guidance / Autonomy
- Why are structure and guidance underdeveloped in autonomous learning environments?

- Campuses
- Bounded, In-Class Learning
- Confinement / External Influences
- Why does in-class learning create students with isolated, theoretical points of view?

- Curricular Structure
- Pre-Defined Knowledge
- Learn To Do / Do To Learn
- Why can’t a curricular structure dispense knowledge on-demand?
For centuries of unchallenged rule, higher education’s leaders and administrators are facing resistance from disgruntled students and outsiders who see a better way. This research uncovered six key political dimensions (Administrators, Autonomous Learning, Educational Feudalism, Entrepreneurial Sub-ecosystems, Policy, and Technologies) that drove the insights below.

The road to fully entrepreneurial ecosystems is riddled with obstacles (administrative).

Entrepreneurial ecosystems are difficult to introduce, let alone incorporate cohesively, into legacy environments.

Attitudinally, academics can be skeptical of new technologies and reluctant to adopt changes to established procedures (Watson, 2003; Farkas, 2012). Structurally, there are complications as well. Facilities are housed separately on campus and set up to function in isolation rather than collaborate with other academic sectors and disciplines (Swarer, 2017). Students themselves have been trained to accept hierarchical teaching and administration and may not do well in a flat, fluid, and free learning environment (Farkas, 2012; Swearer, 2017).

Finally, privacy concerns stand in the way of open sharing of information both internally and to outside parties.

Schools are discriminatory to students, teachers.

Higher education is not open to all. Universities require a secondary level of education, which effectively shuts out younger teens who want to learn. While mature students would qualify, the culture is decidedly youth-oriented and can leave older adults feeling out of place.

Under the cloak of standards and fairness, students are mandated to receive pre-determined content in set ways regardless of their individual interests and learning preferences. Instruction is still mostly tied to the classroom and built around the goals and expertise of teachers who, in turn, are subject to specific guidelines of when and where they can teach. As such, instructors are restricted in their ability to share their skills and knowledge even if there is a market for them (Illich, 1971).

Flawed policy, leadership undermine success and change.

Standards for good online education is a case of the “blind attempting to lead the sighted” (Baggaley, 2013). Rather than seek the guidance of interaction designers, online educators, and of course, tech-savvy students, administrators, engineers, and “bricks and mortar heavyweights” stumble as they try to understand and develop a usable online learning platform (Baggaley, 2013). Schools also grapple with dichotomous rationales for teaching technology. While there is a clear focus on the mastery of ICT skills used in the workplace, there is no clearly stated mandate to use this mastery to further the rest of the curriculum, thus creating a silo within a silo. This confusion of purpose reflects the difficulty of implementing flawed policies in schools (Watson, 2001).

Participate and co-create, don’t simulate.

When Illich (1971) met with a high school resistance movement demanding more education, he was struck by their clever slogan “Participation not Simulation,” which was, unfortunately, misunderstood to be a demand for less. The spirit of that motto lives today in instructional technology built on an “architecture of participation” (Farkas, 2012).

Technology up-ends current beliefs, power structures (Tech has politics).

Outside the classroom, Internet technologies have been accused of large-scale circulation and politicization of information, even maneuvering people into “behaving like mass-produced, specialized mechanisms” (Khan, 2007).

As technology is institutionalized in education, the fine line between “teaching and learning online” and “the use of technology to augment teaching and learning” (Kemp et al., 2014) becomes political when interpreted as a win-lose choice between having a pedagogical complement or a competitor. For students, this privileging of technology is already repositioning them as empowered knowledge co-producers (Farkas, 2012; Fischer, 2014). Whether students use technology (or technology uses them) to spark counterculture movements that question institutionally engineered values (Illich, 1971; Watson, 2001) or mobilize around larger issues (Khan, 2007) remains to be seen.

Autonomy in learning = motivation + accountability.

Flattening the traditional classroom hierarchy shifts the educator’s role to facilitator, presenting new ideas and concepts in a nurturing environment while students take over their own learning (Farkas, 2012) and explore the applications of new knowledge and technologies to their personal goals.

This approach is closer to the “Education for all means education by all” ideal set out by Illich (1971), that is: drawing on peer experience and harnessing technology to create channels of personal and creative expression independent of any institution.

**Figure 6: Political dimensions and motivations**

““Our educational system is the only major institution in our country that officially recognizes autocracy” Russell Ackoff

POLITICAL PERSPECTIVE

Figure 6: Political dimensions and motivations
Entrepreneurial sub-ecosystems are emerging within legacy environments

Supported by faculty and experienced practitioners, students should be designing their own learning experience without the constraints of onerous curricular requirements (Ackoff, 2008). Taking this entrepreneurial approach to the next level, special university teams are partnering with government, not-for-profits, businesses, and other entities to set up innovation and maker spaces within campuses (Swearer, 2017).

“Amazing, scrappy, and crazy” (Swearer, Wisely, teams creatively work around without the constraints of onerous curricular requirements (Ackoff, 2008). Taking this entrepreneurial approach to the next level, special university teams are partnering with government, not-for-profits, businesses, and other entities to set up innovation and maker spaces within campuses (Swearer, 2017).

Democratic dialogue in classrooms promotes learning

An environment that encourages open discussion yields greater learning than one that is solely lecture-based. When instructors initiate informal discussions with students before class, they can gauge student progress to date, gain insight on what students want to learn, and tailor their curriculum and pedagogy with this simple formative assessment (Farkas, 2012). A shift in emphasis from concrete answers and lectures to exploratory questions and debates develops students’ core skills and dispositions as they work with information in a safe environment (Farkas, 2012). Meanwhile, instructors can draw on their knowledge (or address their lack of it) by challenging students to ask controversial questions and actively participate in the dialogue and discourse themselves (Ackoff, 2008; Watson, 2001). Education is feudalistic, one-way

Traditional pedagogy formed in an era when expert knowledge was scarce...
VALUES

Inclusion criteria: Sacred Cows
Orthodoxies
Basic Tenets
Religion
Schools of Thought
Principles
Deeply Held Truths
Guiding Star
“Commandments”

“But what I couldn’t learn was how to think, how to form an opinion, how to argue that opinion. And that was really big.”

Interview

Deeply held truths are highly personal and serve as a compass that guides each individual in their unique journey of learning. Do schools know what makes each student tick? This research uncovered seven key political dimensions (Autonomy, Freedom, Good Pedagogy, Humanistic Values, Knowledge, True Learning, and Wisdom) that drove the insights below.

“Students” should be able to choose their “teacher” (source of learning)

Illich (1971) envisioned a de-schooled society where learners are not pre-assigned any instructors. Instead, they choose their own learning partner based on skill matching and consultations with former students about their own experiences with a particular instructor. This transparent and objective peer rating system creates a level of educator accountability that would benefit higher education.

Education’s output should be wisdom and life skills, not the mastery of transient tools

Too often, instructors fall into the trap of teaching students the latest tools to stay current, only to find these supplant by “the next big thing” come graduation. Pedagogy should be grounded in transferable skills (e.g. collaboration, self-direction, creativity, information literacy) that foster lifelong learning and critical inquiry (Farkas, 2012). Since students acquire so much content already from a myriad of sources, from online to peers (Ma., personal communication, August 4, 2017), a solid foundation that allows them to build wisdom from the consequences of their actions and learn from their mistakes (Ackoff, 2008) may be a more lasting educational legacy.

Technology dehumanizes learning, education

Education has morphed from a humane exchange of ideas to a “technological Leviathan that is slowly usurping the soul of the profession” (Kemp et al., 2014). As education becomes more dependent on technology, a greater concern for the perception of knowledge must be considered. Knowledge is not fixed. It is nimble, adaptive (Fischer, 2014) and is a push for emerging countercultures that need to be understood (Illich, 1971).

Learning is a continuous, lifelong endeavour of (self) discovery

In today’s knowledge economy, what one needs to be considered informed is constantly changing. Knowledge is no longer defined as something learned once, but rather a lifelong endeavor (Farkas, 2012). “We need to get students to move from majors to missions. Passionate personal missions that they pursue throughout their lives” (Swearer, 2017).

A “super teacher” embraces and manages student diversity (skills, preferences, opinions)

Good pedagogy considers each student as an individual. While harder to administer in MOOCs due to their size, the learner autonomy that this platform affords (e.g. choice of resources, pace) makes an educator’s thorough understanding of the skills and psychological capacities of students even more critical so they can support independent learning (Terras & Ramsay, 2015).

Successful online educators also need to be able to moderate a large online community and allow divergent viewpoints to expose learners to a range of ideas and beliefs (Farkas, 2012); curate and position student-generated content, which can be seen as excessive and less valuable than teacher-provided materials (Fischer, 2014); and be on the lookout for new and interesting ideas and beliefs (Farkas, 2012) that drive the insights below.

True learning happens outside the classroom

Schools have taught people the need to learn. This lesson discourages independent growth and closes the door on life’s surprises and teachable moments that aren’t institutionally sanctioned (Illich, 1971). However, “the objective of education is learning, not teaching” (Ackoff, 2008) and a “commitment to developing the whole person” (Shirvani, 2015). Connecting students with others and external environments can be the “permanent field trip” (Ma., personal communication, August 4, 2017) that students can build on to learn for life.

Knowledge is not fixed. It is nimble, adaptive

The perception of knowledge must change from something reliable and changeless to something that is an inquirer and activity (Hrovatka & Rees, 2009). To that end, educational institutions can adopt design learning that, in the spirit of design thinking, pushes formal education to “entrepreneurial dispositions and skills necessary to adapt to rapid social and technological change” (McGowan & Araya, 2016).

Furthermore, universities can focus their efforts on building deep learning mindsets with machine intelligence that will help people “continually navigate complexity over the course of their lives” (Swearer, 2017).

 Learner autonomy + self-motivation = achievement

Teaching cannot produce learning without motivation (Ackoff, 2008). It is a driver that cannot be forced on students but comes from a genuine desire to learn, typically to ignite one’s career or satisfy a thirst for knowledge (Ad., personal communication, August 3, 2017). Adding learner autonomy to motivation can make for a powerful combination. Student achievement has been shown to improve with a greater sense of responsibility (McLaughlin and Lee, 2008).
Define learning by missions, not majors
People are looking for educators who can translate today's complexity into meaningful skills like critical thinking and how to be better self-learners (Ma., personal communication, August 4, 2017). Educating the whole person will serve as a foundation to help prepare young people for a world of multiple careers or careers that do not yet exist (Shirvani, 2015).

To that end, more flexibility can be built into the educational system by waiving undergraduate degree requirements and reserving exit requirements only for students who need certification (Ackoff, 2008). Freedom to fail is key to success. Just do it
If the consequences of failing were minimized, students would often challenge themselves to work on their weaknesses (Ackoff, 2008).

Freedom to fail is key to success. Just do it
If the consequences of failing were minimized, students would often challenge themselves to work on their weaknesses (Ackoff, 2008; Swearer, 2017).

HUMANISTIC
A celebration of each student as a unique, whole being who wants to achieve

FLUIDITY
A readiness to embrace the unknown and quickly change course in the name of progress

LIFELONG MISSION
A tireless quest of self-discovery that doesn’t stop at graduation

CHOICE
The confidence to put students in the driver’s seat of their education

Table: Design Considerations

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As this independent study comes to a close, I could not help but notice the similarities between what I wrote about in the preceding pages and my own experiences as a student conducting this research. Going in, I had mentally placed technology and Pedagogy in separate (presumably opposing) silos that I could compare and contrast cleanly with parallel questions. Surely, thought leaders would fall squarely in one camp or the other. As in life, I soon found myself with parallel questions. Surely, thought leaders would fall squarely in one camp or the other. As in life, I soon found myself with parallel questions.

The design dilemmas posed at the end of this independent study come to a close, I could very well consider the ideological basis for how technology and pedagogy would be designed in the course I am spearheading at Sheridan College. The design dilemmas posed at the end of this independent study come to a close, I could very well consider the ideological basis for how technology and pedagogy would be designed in the course I am spearheading at Sheridan College.

The answers will provide rich underpinnings for the curriculum design principles that will inform the reframing, concept exploration, and prototyping stages of my MRP. This independent study has been truly eye-opening for me. The journey continues.

**Academic Papers**


APPENDICES

A: SORTING UTTERANCES–LEGEND

B: SORTING UTTERANCES–SOCIAL

C: SORTING UTTERANCES–TECHNOLOGICAL

D: SORTING UTTERANCES–ECONOMIC

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APPENDIX A: SORTING UTTERANCES–LEGEND

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Legend for Sorting Utterances Appendix B to G


collaborative, principles, transformative, skills, and assessment...

Online learning carries a social stigma...

The source of learning is increasingly seen as self-selected...

Social interactions promote accountability and ownership of learning...

Social interactions outside traditional environments promote learning...

Interpersonal relationships are overwhelmingly self-select...

Technology lacks planning/infrastructure, lacks six-shooter refresh...

Technology is an extension of the person, not a replacement...

Middlers are understood for their enthusiasm & sustained learning, their technology affects...

Technology is a means, not an end...

Educational context affects and should matter more...

"Technology is known about..." students' emotional, social, and life trajectories... They actually use technology to learn...

Technology is a means, not an end

Technology fosters participation...

Technology encourages democratic participation...

Why is new is old again...
APPENDIX I: DISCUSSION GUIDE FOR EXPERT INTERVIEWS - EDUCATORS

INTERVIEW DISCUSSION GUIDES: EDUCATORS

Professor (Code: Ch)

Technology plays a big role in teaching. What do you consider technology?
Follow up depending on the answer (day to day life or in education)

How has College bureaucracy been a barrier to something that you tried to implement in the program or curriculum?
What are the tensions?

Is there an example where they supported you?
Do you consider the College a big business?
Acting too much like one or not enough?

Can you recall an inspiring figure or teacher that made a lasting impact?
Please describe an example

What if one of your studio courses was taught online, any comments?
If you could create the ideal teaching environment, what would that be like for you?
Please describe an example

Professor (Code: Ma)

Technology plays a big role in teaching. What do you consider technology?
Follow up depending on the answer (day to day life or in education)

Students come in with varying levels of technical proficiency, especially in first year. How do you manage with this?

What do you think the biggest challenges that students face based on your experiences with them?
Can you speak to an example of successful collaboration in the classroom?
Any examples where collaboration led to sub-optimal results and why?

What if one of your studio courses was taught online, any comments?
If you could create the ideal teaching environment, what would that be like for you?

APPENDIX J: DISCUSSION GUIDE FOR EXPERT INTERVIEWS - STUDENTS

INTERVIEW DISCUSSION GUIDES: STUDENTS

Graduate, Sheridan College Web Design Graduate Certificate Program (Code: Ad)

What counts as technology to you?
Follow up depending on the answer (day to day life or in education)

Why did you choose the program(s) that you did? What were you trying to accomplish?

What do you think of the idea that one of your old studio courses would be taught online?
Probe: What would work? What wouldn’t work for you? Why / not?

Thinking of your experiences at Sheridan, which aspects do you think prepared you the most for your current job?
What were you not ready for? Probes: technology, life skills, team

What do you think were the biggest challenges your instructors faced during your time?

If you could change one and only one thing about your higher-ed experience, what would that be and why?

Graduate Student OCAD University (Code: Lv)

What counts as technology to you?
Follow up depending on the answer (day to day life or in education)

What are schools still doing that is way past the best-before date?

Would you describe your undergrad experience as collaborative? Why? Why not?
Probe: What role did technology play in that collaboration?

Do you feel your experience with educators has been a one-way relationship?

Do you feel your education has prepared you for the future?
Probe: Role technology could have played in preparing you (helped you/hindered you)

If you could change one and only one thing about your higher-ed experience, what would that be and why?