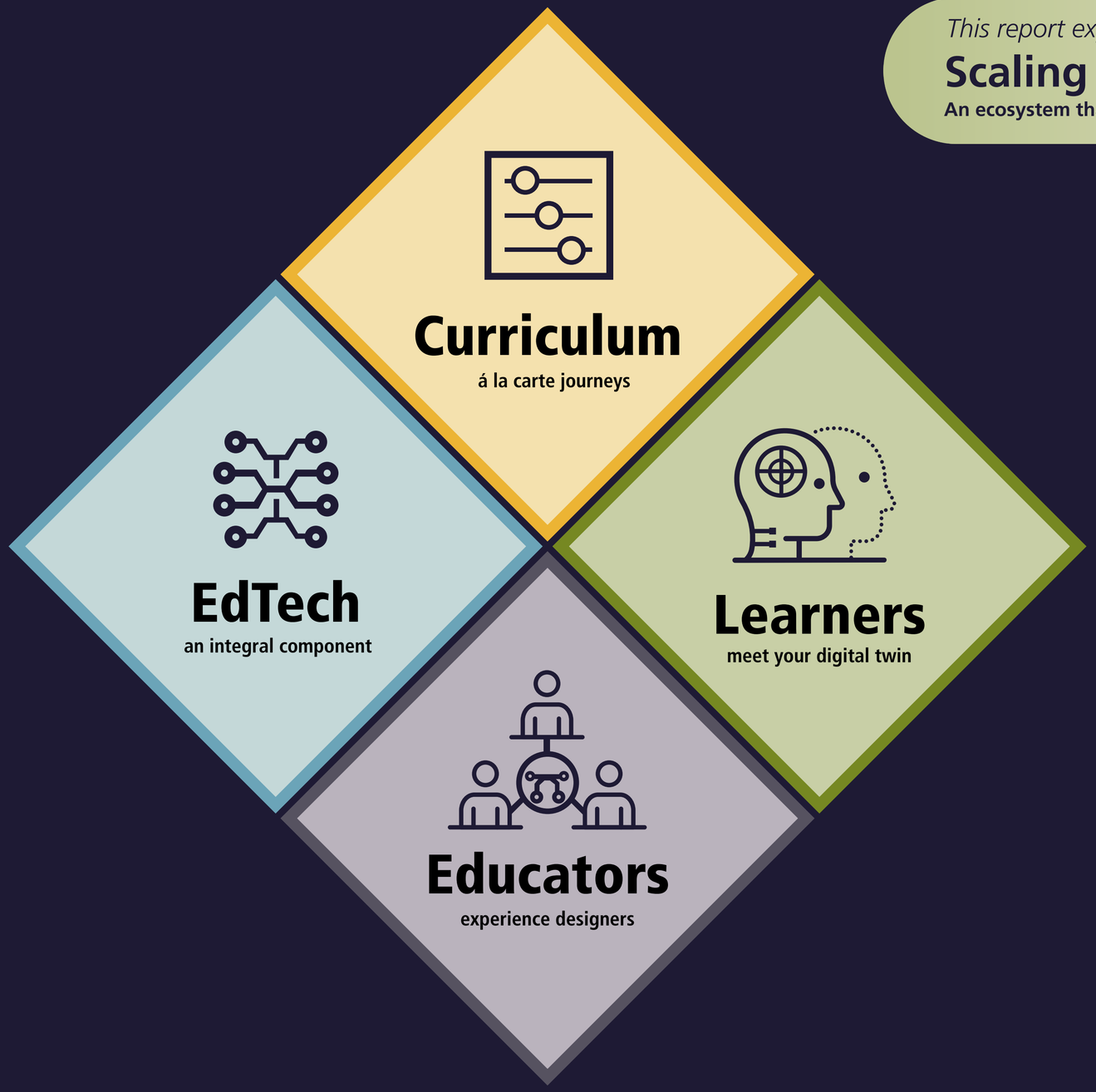
2022 FORESIGHT REPORT

Ubiquitous Learning: From Anywhere, At Anytime

This report explores:

Scaling Ubiquitous Learning

An ecosystem that enables learning from anywhere, at anytime



ecampus Ontario | Ontario

Ubiquitous Learning: From Anywhere, At Anytime

The *Virtual Learning Strategy (VLS)* is preparing Ontario postsecondary institutions for Ubiquitous Learning

The VLS is supporting ongoing and future virtual learning needs at all Ontario Indigenous Institutes, colleges, and universities. The VLS (link here) is built on three key pillars:

Being the Future

Being a Lifelong Learner

Being a Global Leader

By applying strategic foresight approaches, the Ontario postsecondary sector can co-create ubiquitous futures by monitoring emerging and maturing trends and identifying future possibilities. This work aligns with the VLS pillar of Being the Future.

What is a *Foresight Report*?

Foresight reports are tools to support the navigation of uncertain and complex futures. Using strategic foresight (i.e., a research-driven, systematic exploration of possible futures), foresight reports help inform present-day decision-making by identifying patterns of change that may have significant lasting impacts for futures.

Why is Strategic Foresight *important* to Ontario postsecondary education?

Strategic foresight supports institutions in navigating transformation by building awareness of some possible forces of change. Strategic foresight can help address immediate and short-term challenges, while articulating long-term visions for systems level evolution.

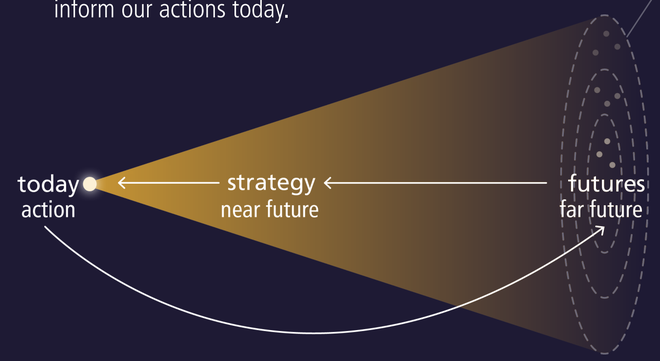
How do I *use* this Foresight Report?

This foresight report is a high-level overview of maturing trends within the postsecondary education sector. We recommend readers to use this report as a map for further exploration. Readers can click on the links provided to learn more about topics of interest. After exploring trends and implications, this report includes a conversation guide to spark futures-facing conversations and explore gradients of impact. It also includes a series of scenarios set in 2027 as provocations to start those future-facing conversations.

FUTURES INFORMING STRATEGIES OF TODAY

Emerging or maturing trends **today** allow us to imagine possible **futures**.

These futures are useful in informing our **strategies**, while our strategies help inform our actions today.



plausibility

The rings represent the level of plausibility of a specific future outcome, ranging from more plausible towards the inner rings, to less plausible towards the outer rings.

Adapted from Joseph Voros, The Futures Cone

Why do we use futures instead of future?

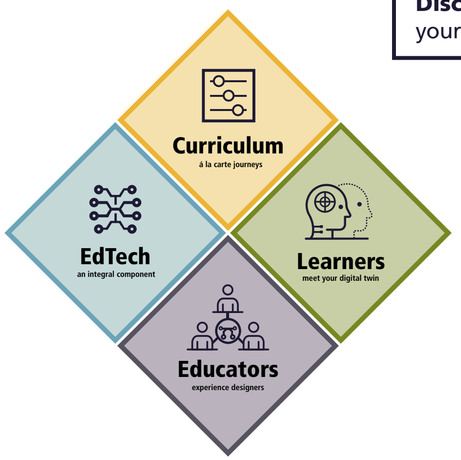
In foresight practice, we refer to the future in plural.

As we cannot predict the future, there is no definite image or vision of it. Thus, the future will always be an infinite range of possible outcomes rather than a single destination.

In this report...

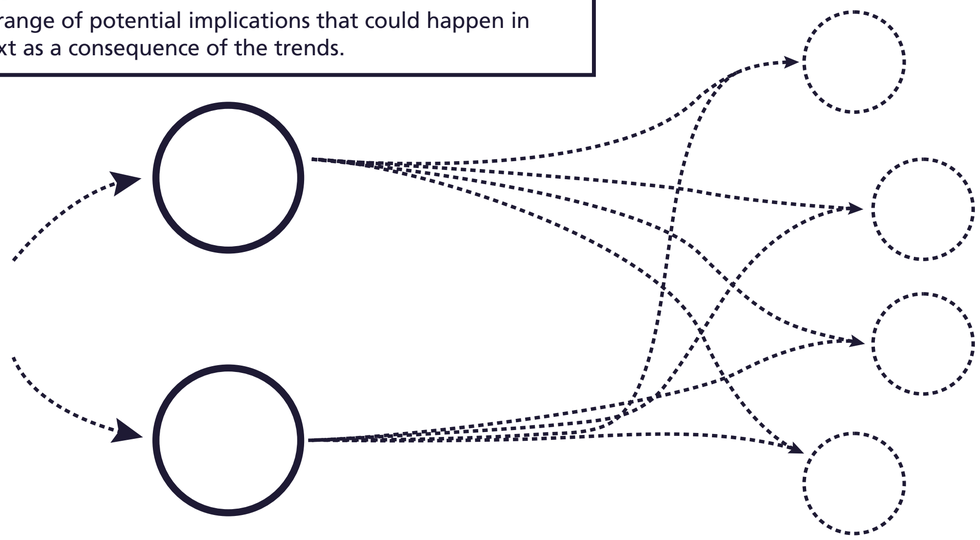
What patterns of change are signaling different directions for learning anywhere, at anytime?

Discover some maturing trends around ubiquitous learning



What implications could result from these trends?

Discuss a range of potential implications that could happen in your context as a consequence of the trends.



What would some possible futures look like?

Explore a range of possible scenarios that visualize how different futures may unfold to challenge assumptions about the present, and explore alternative ways to approach innovation in education.

FURTHER READING

1. **What is Futures Literacy and Why Is It Important?** Medium
2. **What is Strategic Foresight?** Organization for Economic Co-operation & Development
3. **Foresight Reports** eCampusOntario

What do we mean by Ubiquitous Learning?

Ongoing disruptions caused by the COVID-19 pandemic, climate change, and socio-political conflicts are reconfiguring mobility. Additionally, the exponential development of immersive technologies are redefining interactions with physical, digital, and hybrid spaces. These factors are increasing the need for ubiquity in the education landscape and have already resulted in institutions rethinking and reforming policies governing pedagogical approaches, administrative functions, information flows, and curriculum delivery.

As we continue to build the **digital campus** of the future through **digital transformation,** it is important to explore how to approach **ubiquity-by-design** to support scaled access to lifelong postsecondary education. **This report highlights four trends:**

- **EdTech:** an integral component
- **Curriculum:** á la carte journeys
- **Learners:** meet your digital twins
- **Educators:** experience designers

These trends are influencing the direction of how postsecondary institutions can further enable ubiquitous learning: from anywhere, at any time.

Ubiquitous learning environments represent an emergent paradigm that expands education beyond the classroom, totally immersing the learners within a purposely designed learning experience.

Ubiquitous	• omnipresent • ever present • everywhere
Learning	• educational • instructive • didactic • pedagogical
Environments	• surroundings • setting • situation • atmosphere

TECHNOLOGY-ENABLED LEARNING MODALITIES

Ubiquitous learning: Ubiquitous learning involves placing students in an environment that encourages constant stimulation through visualization and comprehension techniques to mimic or augment a real-world situation.

The course content is continuously available, accessible, and interactive. The technology adapts to the learners' needs, providing immediate access to the educational content.

Immersive learning: Constructed using a variety of techniques and software tools, including game-based learning, simulation-based learning, and virtual 3D worlds.

Hybrid learning: Some learners attend class in-person, while others attend virtually from home. Educators teach remote and in-person students at the same time using tools like video conferencing and other collaborative software.

Mobile learning: Mobile learning, or simply m-learning, is anywhere and anytime learning that is supported by mobile devices which learners use to access the content.

Blended learning: Combines online or digital components with face-to-face instruction. The digital modules are mostly asynchronous although they may be synchronous.

e-learning: Use of Internet technology for learning outside of the classroom.

In-person learning: Classroom learning in physical environments. In-person teacher and peer interactions. Confined by geographic boundaries.

FURTHER READING

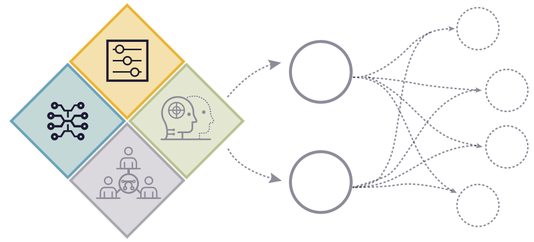
1 **The Postdigital Learning Spaces of Higher Education**
Springer

2 **Differences Between u-Learning, m-Learning, and e-Learning**
ResearchGate

3 **The Hybrid Futures**
eCampusOntario

Trends and Implications

During the early stages of the COVID-19 pandemic, the massive transition to emergency-remote teaching and learning encouraged the expansion of wraparound digital services, including mental health supports, flexible student service delivery models, and flexible course creation and delivery models.



EdTech: an integral component

The COVID-19 pandemic changed higher education's relationship with technology. The rapid shift to emergency remote teaching and learning in March of 2020 resulted in postsecondary institutions significantly expanding the range of services provided by technology. There has been significant growth in the number and size of educational technology (EdTech) providers and the services they offer. A key indicator that technology's role in education will continue to expand is how Big Tech and venture capital have shifted into EdTech, likely broadening its reach.

What's happening and what's emerging?

- Learning Management Systems (LMS) that administer, document, track, report, automate, and deliver courses are in increasing demand; this has resulted in a correlated increase in the financial values of LMS
- Chatbots as Teaching Assistants have been increasingly piloted in Canadian and United States higher education courses and student services, such as in York University (**SAVY**), Georgia Tech, the University of Texas, Seneca College, and St. Lawrence College, among others

Implications for ubiquity in education

Learner expectations have expanded to include a set of digital supports outside of the classroom. *How might these expanded expectations impact the skills needed by administrators and educators?*

The Learner experience is increasingly defined by their interaction with educational institutions' Learning Management Software (LMS). This software can be understood as a 'digital campus'. Other than Learners and Educators, *who else might be affected by this shift to a digital campus and what policies are implicated?*

Technology implemented during COVID may have set the stage for ubiquitous learning, but this technological foundation was not evenly distributed, putting some learners and institutions at risk of being left behind. *How might Ontario's Postsecondary Education (PSE) sector mitigate this inequity?*

Curriculum: á la carte journeys

A greater range of technology has supported a variety of modes of course delivery, structure, and modalities. One of the biggest shifts is how the course content is generated with the pooling of resources across institutions as well as MOOC platforms and the growing landscape of micro-credentials.

What's happening and what's emerging?

- Stanford University has created a 'flipped' classroom: the lectures are pre-recorded, and support is offered one-on-one and in-person
- The Big 10 Alliance has a shared online course catalogue for its students
- Georgia Tech and Queen's University are offering mini masters with flexible course schedules

Implications for ubiquity in education

The move towards more flexible delivery models creates an associated need for flexible and aligned pedagogical approaches. *What support will educators need to learn, evolve, and deliver a ubiquitous learning pedagogy?*

Shifting towards open access course content may change how courses are created and taught. *What implications would open course content have for policies at your institution?*

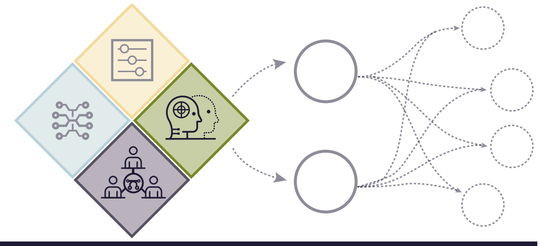
Flexible course structure that integrates open access course content requires an adaptable, fluid tech strategy. *What adaptable strategies can you build upon in your current environment?*

FURTHER READING

1. **The Hybrid Campus: Three major shifts for the post-COVID university**
   Deloitte
2. **How Technology is Shaping Learning in Higher Education**
   McKinsey

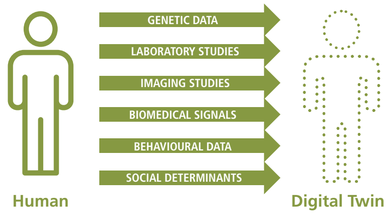
Trends and Implications

EdTech growth, aided by traditional technology companies investing in the education space, has increased the amount and nature of digital data about the learner. This expansion of EdTech is also shifting the role of the Educator from content expert to designers the Learner experience becomes more complex with the expanding role of technology.



Learners: meet your digital twin

With the hybridization of education, all learners have an online presence that generates real time data about their educational journey. Ubiquitous learning environments generate large amounts of real time data by creating a digital twin that grows further with data supplied by users' online activity. When predictive analytics are applied, vendors and other observers can infer user preferences and activity, resulting in privacy concerns. This expanding digital presence gives rise to increased concerns around data privacy and personal safety.



What's happening and what's emerging?

- iSchoolCloud built their technology foundation with Google Cloud and partnered with Google for Education. With their platform up and running, iSchoolConnect went from 10,000 users to millions between 2018 and 2020
- Udemy uses data analytics through Business Intelligence to provide instructors with relevant insights about learners' performance to improve their courses
- Testbook uses Machine Learning and data analytics to help recommend the most relevant competitive exams to students by assessing their current level of subject understanding
- Meta partnered with VictoryXR, a VR education software company, to launch 10 digital twin campuses as part of its $150M commitment to build up VR technologies

Implications for ubiquity in education

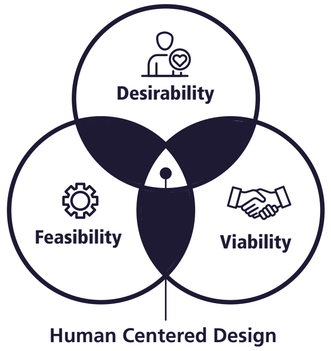
Data analytics have the potential to help Educators create a customized and supportive experience for Learners. *What skills does your institution need to provide this kind of Learner experience?*

The growth of predictive analytics and their associated bias has the potential to create unique risk in an educational setting. *How might you think about your future policies to mitigate bias in artificial intelligence?*

As the role of big technology and their ownership of student and course data expands, the power dynamic between educational institutions and private sector technology may change. *What might your institution do to understand this shift?*

Educators: experience designers

As higher education increasingly relies on technology, educational designers have gained greater significance. Several institutions in Canada introduced new technologies to create immersive learning experiences prior to the pandemic, and this trend was accelerated with the shift to remote learning during COVID. This technological complexity increases the need for design expertise to connect the different technologies to the Learner's experience.



What's happening and what's emerging?

- The application of Universal Design for Learning (UDL) Principles is increasing. Products and environments with UDL are accessible, usable, and inclusive. The "Teacher for Learning" module of the eCampusOntario Extend program is focused on UDL.
- Inclusive design, design justice frameworks and strategies are increasingly required.
- MohawkCollege in Ontario has adopted new AR and VR technologies for their interactive media lab experiences.
- BCIT and Vancouver Community College are implementing emerging technologies to improve affordability and access for students.

Implications for ubiquity in education

Open access course content and reliance on technology increases the need for digital skills in postsecondary Education. *What other related skills might also be needed?*

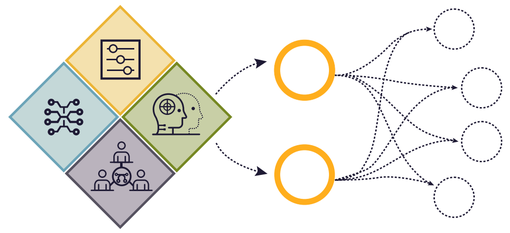
A customized learner experience bridging the physical and digital worlds, increases the focus on equity, diversity, and inclusion. *How might this focus affect your policies for Educators and Learners?*

Ubiquitous learning has the potential for a significant increase in the amount of technology used by institutions and, in turn, the potential for significant impact on the environment. *How might your institution mitigate the environmental impact of increased technology?*

FURTHER READING

1. **You, Your Human Digital Twin and the Higher Ed Metaverse**
   Inside Higher Ed
2. **What does UX in education look like?**
   Alex Britez
3. **Equal Access: Universal Design of Instruction**
   Skip to main content DO-IT Disabilities, Opportunities, Internetworking, and Technology

Conversation Guide: The Futures Wheel



What implications could result from the trends previously explored? What else would change as a direct or indirect consequence?

The Futures Wheel, created by Jerome Glenn, is a method for graphic visualization of direct and indirect future consequences of a particular change or development. With it, you can discuss long-term implications of a trend is a structured way. The use of interconnecting lines makes it possible to visualize interrelationships of the causes and resulting changes.

The Futures Wheel can act as a conversation guide to develop a set of initiatives and plausible directions that are based on the potential futures that might emerge and map new areas of focus, implications, and effects of any trend or driver on the existing system.

To illustrate the use of the Futures Wheel, we used the trend "Learners: meet your digital twin" as the spark to map changes and future implications on postsecondary education. By listing possible implications, we can create new initiatives and avenues that address the rising change.

How to use the Futures Wheel?

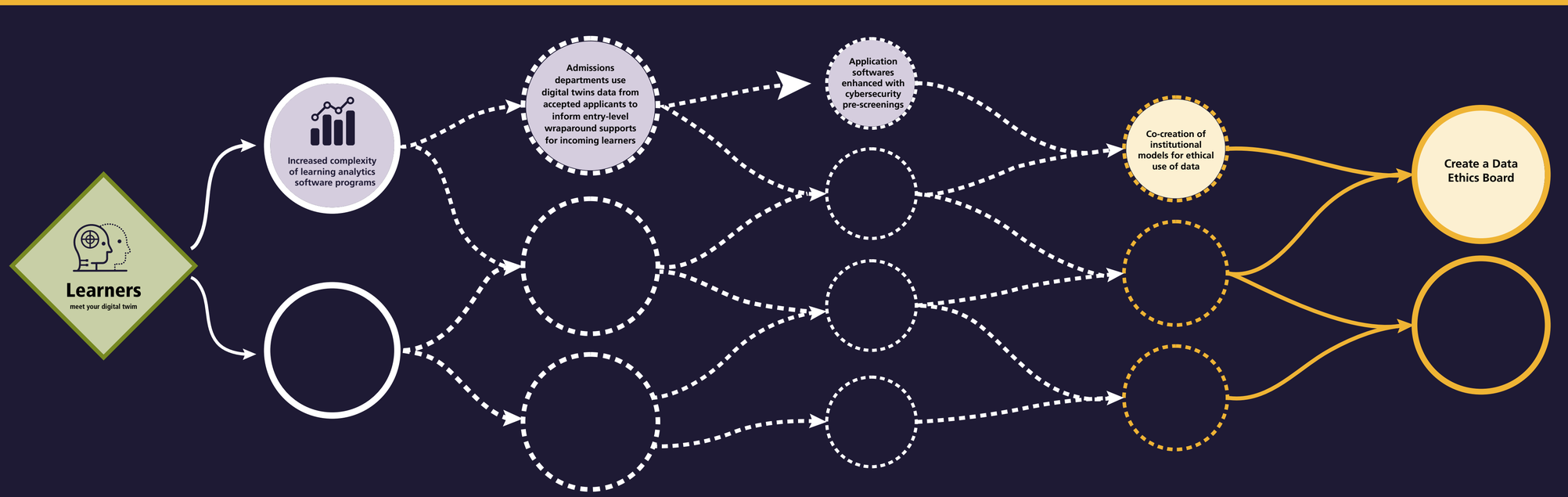
- Choose a trend that you would like to analyze
- Brainstorm possible direct, first-order consequences of the selected trend for you roles/context/department/institution/sector, etc.
- Brainstorm indirect, second-order consequences of the first-order consequences.
- Brainstorm indirect, third-order consequences of the second-order consequences.
- Brainstorm actions that would be relevant to address any level of the implications brainstormed.
- Synthesize initiatives that would be key to connect present and future needs given your long-term analysis of implications and relevant actions.

SCENARIOS

In the following pages, you will find four distinct scenarios, or fictional narratives that explore possible situations in the year 2027.

The scenarios are based on extrapolations of implications from the four trends explored in this report.

You can use them as prompts to guide a Futures Wheel brainstorming.



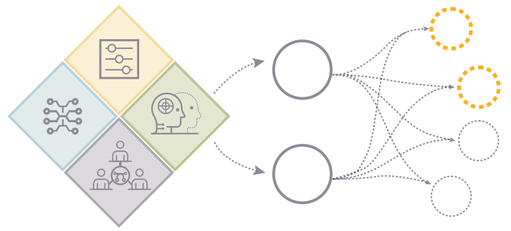
How will the initiatives address equity, sustainability, openness, and digital transformation?

FURTHER READING

1. **The Futures Wheel: Identifying Consequences of a Change**
   Mind Tools
2. **The Future of Higher Education**
   KPMG

Futures Scenarios

Future scenarios combine possible long-term implications of evidence of change (trends) with fictional elements to expand our imagination and visualize how trends might evolve into the future. The intention is not to predict what will happen, but to explore how different futures may unfold, challenge assumptions about the present and explore alternative ways to approach innovation in education.



Digital Security is Campus Security

In 2027 a catastrophic cyberattack disables University of Futuretown's Learning Management System, closing the university indefinitely.

Dr. Mariah Black, VP Academics at the University of Futuretown, looked at the news headline on her phone with dismay: "University of Futuretown remains closed indefinitely due to cyber attack". Dr. Black recalled the rancorous debate with the Board and other university leaders about whether to resource new student residences and expand the professional faculties or invest in security for the Learning Management System (LMS). Many of Dr. Black's colleagues argued the priority was to attract more students and that more students would, in turn, provide the funds for cyber security. Dr. Black recalled trying to explain "it's 2027, not 2020, and the core experience for both our Educators and our Learners is grounded in the LMS. We must protect it, because without the LMS we are no longer a university."

And now, it is too late -- viruses and trojans have infected the LMS and all of the databases connected to it. Online Learners cannot login to class, Educators cannot access course material, and Administrators cannot access any finance information. Personal staff and Learner information has been exposed and stolen, resulting in significant hardship. In short, while the physical buildings remain, the University of Futuretown has ceased to exist.

Dr. Black's colleagues have scheduled a meeting a to discuss what to do next but she has no idea how to rebuild the university.

Feeling Connected in the Virtual World

Feeling alone in the digital classroom, instructor Lin looks to learning analytics to create a community for their classroom.

It was 11:00am on Saturday and Lin rushed to put on their VR headgear, enter their virtual classroom and start teaching the Data Sciences course for Futuretown College's Continuing Education program. Lin's course was part of the education requirement for Canadian Permanent Residency: Canada had a shortage of data scientists. Because of the residency incentive, this course was very popular and students from all over the world were working across time zones in a fully immersive, personalized learning environment.

Watching their students interact with Jill the robot teaching assistant for the course, Lin felt disconnected and lonely. They wondered if their Learners also felt lonely working by themselves. Knowing that Futuretown College tracked a lot of Learner information, Lin logged into the learning analytics database and saw that the Learners were also craving connection and community.

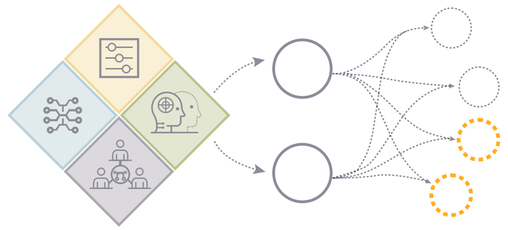
Lin realized this was a fantastic opportunity for Futuretown College to create a ubiquitous environment that provided a sense of community for both the Educators and Learners and that they could start with the information in the learning analytics as the foundation to sketch out the project. They switched functions on their VR headgear and immediately started making audio notes on the plan.

How is your Indigenous institute/college/ university thinking about your Learning Management System which, today, functions as a 'digital campus'?

How might Indigenous institutes/colleges/ universities enhance their role as a place for community and social experiences in the future?

Futures Scenarios

Future scenarios combine possible long-term implications of evidence of change (trends) with fictional elements to expand our imagination and visualize how trends might evolve into the future. The intention is not to predict what will happen, but to explore how different futures may unfold, challenge assumptions about the present and explore alternative ways to approach innovation in education.



Increased Wraparound Supports and a Personal Learning Path

Augmented reality and wearable technology provide broader support and personal learning path for Arjun, who experiences anxiety.

Arjun was feeling anxious. That was nothing new because he felt anxious most of the time. School made him feel the most anxious, even though he was about to start a on a diploma in Experimental Media at Futuretown College. In the classroom, he felt like everyone was looking at him, which made it harder to concentrate on the material. He wondered if he was going to be able to make it through the new school year, with college's higher workload and more demanding content. However, his academic advisor reassured him: "We have a leading edge approach that is highly immersive and adaptive at Futuretown College. Many students experiencing anxiety have found it beneficial." Arjun was doubtful but prepared to try it.

On the first day, Arjun put on the smart glasses containing his personal learning path. He was surprised that he didn't have to go into a classroom - the glasses interacted with the environment around him. The school provided shirt that contained sensors monitored his emotional state and interacted with the smart glasses to prompt rest or emotional coaching when needed.

Six months later, Arjun completed the diploma. He had been told most Learners took nine months to understand the material, but with support for his anxiety, Arjun was able to focus more effectively. For the first time in his life, Arjun is excited about school.

Human Limit of Technological Change

Dr. Bhatia considers how the pace of technological change is defined by people's ability to learn and adapt.

Working on her proposal for digital transformation project for the University of Futuretown's Anthropology department, Dr. Sarita Bhatia considered the continued resistance of the faculty members. She wondered if the change fatigue was rooted in the COVID-19 epidemic seven years ago. On the other hand, some of the other faculties, like business and technology, had moved forward with digital transformation, so maybe there were other reasons for the resistance. Some of her Anthropology colleagues told her they needed more support with the added work and that they needed to focus on getting tenure and didn't have time to learn more technologies, never mind integrating the technology into their teaching.

Dr. Bhatia switched from her proposal to answering Learner inquiries: "When was the Anthropology department going to catch up to the rest of the world and digitize?" they asked. Dr. Bhatia paused, not knowing how to answer their question. She felt defeated because she had been tasked with growing the number of Learners in the department and Learners were expecting digitization, which she was unable to offer.

Getting up to make herself a cup of tea, Dr. Bhatia felt tension in her forehead. She tried to balance how overwhelmed the Educators in her department felt, unable to take on more changes in technology, and Learner demands for improved technology.

What area of your Indigenous institute/ college/university would be best suited to pilot a ubiquitous technology pilot?

How can your Indigenous institute/college/ university support Educators in adapting to new technology, particularly in faculties with less resources or predisposition to educational technology?

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Overview

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