

Intentional Shift:
Recommendations for
the University of Waterloo's
Digital Learning Strategy

Digital Learning Strategy Working Group

May 2023

Acknowledgements

The report drew on extensive consultations and thoughtful contributions completed by members of the Working Group (see Appendix A) – beyond what was originally expected. Similarly, we appreciate all those who took time to provide input and feedback. We found a significant level of interest and willingness to contribute. There were extensive consultations and dialogue with stakeholder groups to ensure that the report captured their input, as well as consultations with individuals with unique knowledge both within and outside the university.

This report was initiated by senior leadership at the University of Waterloo, and we are grateful for the support of the Provost and Associate Vice President Academic, including staff time their offices contributed to the project team and willingness to advise and provide feedback.

Everyone the group consulted with saw the value in developing a digital learning strategy. Although there were naturally many different perspectives on the benefits and outcomes they wished to see emerge, there was universal recognition that the pandemic was truly disruptive of the status quo and that the University as a whole needed to reflect and thoughtfully plan its next steps.

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1. Introduction

1.1 Goals of the Digital Learning Strategy Project

Waterloo's educational offerings have used and will increasingly make use of digital resources. The University of Waterloo's 2020-2025 strategic plan, *Connecting Imagination with Impact 2020-2025*, calls on us to "continue to advance an agile, technology-enabled learning ecosystem that supports high-quality, open content and digital learning options." Despite our past accomplishments in digital teaching and learning and our recent extensive experience in digital education necessitated by the 2020-2022 COVID-19 pandemic, the University currently has no comprehensive strategic framework for guiding the development of digital instruction, program design, and the selection of digital teaching and learning tools to support the learning experience.

While the Terms of References did not explicitly define it, for the purposes of this report, digital teaching and learning very broadly encompasses any teaching that makes use of digital technology, software, systems, or tools to deliver, enhance or extend learning, including:

- any use of LEARN, Teams, or other platforms, and physical classroom technology,
- on-campus, blended or online courses, in either asynchronous or synchronous modes,
- materials and functions to support learning outside of courses and programs proper (e.g., from academic support units), and
- teaching and learning activity outside current credit structure (e.g., professional development and WatSPEED).

In response to this gap, the Provost initiated the Digital Learning Strategy Project in April 2022 with the goal of providing **summary information** and **recommendations** in the areas below.

- a. Alignment of projects and investments with one another and with strategic goals**
Several digital learning-related projects are already underway, and more are imminent. A decentralized university like Waterloo runs the risk of trying to advance the same goal simultaneously in different areas of the university, with each unaware that similar work is being done elsewhere. The result may be multiple solutions, each of which requires investment in different tools or strategies to accomplish the same or similar objectives. While some decisions, for example the implementation of digital learning in degree and non-degree learning experiences, are most appropriately made at the program or department level, there is an urgent need for overall coordination and consistency across the University, and to ensure that we work toward the Strategic Plan's goal to "prepare talent to lead in a future that promises great opportunity and waves of disruption."
- b. Decision-making processes that strike the right balance between operational efficiency, a suitable degree of experimentation, and finding local solutions when appropriate**
Waterloo's decentralized structure also has many strengths. In the digital teaching and learning space, it has resulted in a multitude of home-grown local solutions, some of which have seen widespread adoption by the broader university community. However, there is the risk that Faculties, departments, and instructors working in isolation miss the opportunity to leverage these solutions, as well as learn from one another's successes and failures. Waterloo's structure supports agility and cultivates experimentation, but we need to ensure that the resulting innovations are shared across the institution, rather than duplicated, and this commitment to innovation is balanced with consistency of the student experience across platforms and technologies and appropriate vetting for privacy, security, accessibility, and quality.

- c. How digital learning could disrupt the traditional educational marketplace and how Waterloo should prepare

The evolving educational marketplace, including the emergence of private online educational providers, the availability of online degrees at scale, changes in demographics and participation rate, the transformation of the learning resource publishing industry (i.e., what used to be the textbook industry), widespread interest in and availability of open educational resources, and the need for different types of credentials for lifelong learners, prompt us to reflect on how we might adapt. We need to be technologically agile and responsive to change without losing sight of our core mission and values. Key components of this reflection include revisiting credentials and considering our role in the lifelong learning space.

- d. New delivery models and pathways

The expansion of online offerings, either as standalone degrees or as part of a residential experience, will serve both current and future students. Flexibility in delivery allows students to complete part or all of their degree at a distance and will attract those who are not in a position to physically come to Waterloo for the length of a full degree program. This in turn would not only promote growth, internationalization, and global access, but also support traditional student success by providing more flexibility and accessibility in existing curricula.

- e. Developing a digital learning ecosystem

Intentional strategies would inform the identification and implementation of digital tools for teaching and learning and help avoid adoption of unnecessary tools. Work is already underway with the new [EDTECH governance](#) structure, which would provide a decision-making body for educational technology selection and support, and an [EDTECH Hub website](#), which would act as a central information resource for both current and potential future tools. Technology in classrooms should also be considered in this ecosystem, and both digital and physical need to work together to create a seamless teaching and learning experience.

- f. Position Waterloo as a leader in digital teaching and learning

Waterloo has long been a Canadian leader in distance and online education and is proud of its title as Canada's most innovative university. The University can strategically draw on its resources and align its focus to establish itself as a leader in the evolving area of digital teaching and learning, which is much broader than traditional online education.

1.2 Why Waterloo needs a Digital Learning Strategy

The *Waterloo at 100 Discussion Paper* offers that “Waterloo’s future will be one that thrives in the appropriate design, curation, sharing of and access to online and digital modes and resources for working, teaching, learning, and research.” A digital learning strategy is needed to guide these efforts. As an institution, we must avoid *drift* (i.e., a relapse to pre-pandemic practices and/or uninformed pursuit of scattered pandemic practices) and rather pursue an intentional *shift* (informed by institutional goals) in digital teaching and learning.

The use of digital learning was significant at Waterloo even before the COVID-19 pandemic, ranging from use of our learning management system and digital assets (e.g., course reading packs) to support campus courses, to blended courses that combine elements of face-to-face and online teaching, to

highly interactive digital assets and educational resources allowing experimentation, to purpose-built fully online courses.

The pandemic-necessitated shift to predominantly online teaching and learning in 2020 accelerated the adoption of digital tools and modes across the institution. This shift created new capacities and expectations in our instructors and learners, and digital assets created over the course of the pandemic represent significant potential to enhance teaching and learning. The 2020-2022 leaps in digital teaching were necessarily achieved in a rapidly evolving, insufficiently coordinated environment. However, the need for an intentional strategy to guide digital learning was evident before the pandemic; Waterloo has always had a mix of institutionally supported tools, platforms, and home-grown innovations adopted on an ad hoc basis by instructors in the absence of a digital learning strategy. While flexibility in tool choice and the development of home-grown solutions are desirable, they need to be balanced against efficiency, support, and consistency of the student experience. In the absence of a strategy, we run the risk of purchasing multiple tools that overlap in functionality, leading to inefficient allocation of resources and unnecessary friction for learners. Furthermore, currently no coordinated mechanism exists for the evaluation, sharing, and support of made-in-Waterloo solutions.

As noted in the Strategic Plan, “no industry or career pathway will be immune to the changes” and postsecondary education is no exception; indeed, our role is to lead in an environment of change. Our students’ needs have changed, and our teaching must adapt; to paraphrase one stakeholder, *we need to teach the learners we have, not the learners we were*. Students will expect greater flexibility in all aspects of their degrees, whether it be the ability to review content multiple times, to participate in learning opportunities at a distance, or to explore more flexible pathways through a degree itself.

Waterloo’s Strategic Plan reminds us that “learners will have to apply knowledge in contexts we cannot even imagine today.” In the coming decades, learners will develop their skills in ways both familiar and unfamiliar, using tools, strategies and approaches that draw on existing innovations and those not yet conceived. During work-integrated learning experiences and on graduation our students enter a world of work which has increasingly adopted remote and hybrid arrangements; they need to be prepared to effectively operate within a new professional digital culture.

Workplaces continue to shift and change as a result of multiple factors including globalization, demographics, and evolving technology. Our strategic plan sets a goal to “establish a unique Waterloo approach to support learning at various stages of individuals’ professional lives.” Through *WatSPEED*, Waterloo is positioning itself to better serve all learners, not just those in traditional degree-granting programs. Digital offerings are particularly important to compete with the private online providers that aim to compete with traditional post-secondary education to provide job-ready skills.

Increasingly, we are able to use digital learning to help meet multiple challenges, including physical distance and accommodating a range of disability and health concerns (e.g., the ability to catch up after illness or the ability to engage with peers in modes other than face-to-face to be more inclusive to those with social anxiety).

The Waterloo brand embraces innovation, and this must extend to teaching and learning. Failure to maintain our identity as leaders in the highly visible teaching space incurs reputational risk in an educational landscape that has changed dramatically. During the pandemic, many of our peers realized the necessity and benefits of digital learning and used the opportunity to leap ahead in both their institutional capacity and utilization, developing strategies of their own. Such capacity to employ digital

technology effectively is necessary to remain competitive as well as agile in the face of future challenges.

The residential, face-to-face experience is a key part of Waterloo's identity and needs to be maintained. None of the stakeholders consulted advocated that Waterloo shift to fully online as the predominant mode of teaching. However, they did identify opportunities to use online programming to extend our reach into markets we are unable to adequately serve with face-to-face learning.

The role of universities in society is changing, and an intentional approach to digital learning is a necessary component of managing this change. Our digital learning strategy needs to continue to evolve as society and the educational landscape do; just as "learners will have to apply knowledge in contexts we cannot even imagine today," our approach to digital learning will need to be agile and responsive to the complex future within which we will operate. Finally, while the reasons for a digital learning strategy are clear, some stakeholders and members of the working group noted challenges in developing a digital learning strategy in the absence of a general teaching and learning strategy. While this was outside the scope of this initiative, it is worth considering if situating the DLS within a broader Teaching and Learning Strategy would further amplify the rationale and benefits above.

1.3 Summary of Consultation Process

This report is the product of extensive consultations conducted by members of the Digital Learning Strategy Working Group, which includes representatives from all six faculties, undergraduate students, graduate students, and key Academic Support Unit staff (see Appendix A for Working Group membership).

a. Stakeholder consultations

The DLS Working Group spent April to June of 2022 reviewing existing data related to digital learning at Waterloo collected during the pandemic and designing consultation plans for their respective stakeholder groups (faculty, students and academic support units). While all consultation groups worked toward the same core questions, stakeholder engagement varied out of necessity. Undergraduate students and faculty were approached in the first instance via short surveys either in the Student Life Centre (students) or through an online survey distributed by faculty representatives (instructional faculty and staff). This was followed by small group discussions or individual consultations with those who indicated willingness to participate. Academic Support Units used a mix of small group discussions and individual consultations. Faculty and senior university leadership were invited to individual consultations with the Working Group co-chairs. A summary of completed consultations is provided in Appendix C. Consultations were conducted from late June to mid-October 2022.

The Working Group met throughout this time to share preliminary results and identify areas for further follow-up. In addition, the co-chairs presented an overview of the DLS work at governance and leadership meetings from September 2022 to January 2023, inviting input. The Working Group co-chairs synthesized consultations into the thematically focused strategic directions and associated recommendations. Working Group members reviewed and supplemented draft recommendations in November and December 2022.

b. Environmental Scan

Digital teaching and learning features in the strategic plans of many universities, but only a small number have completed standalone digital learning strategies. In response to a 2022 Educause survey, only 10% of Educause members (primarily U.S.) indicated that their institutions have completed a DLS,

with a further 14% currently in the process of creating one. Common themes across institutions which have, or are in the process of creating, a DLS include an emphasis on technological systems; the creation of a shared vision of digital learning for faculty, staff, students and administration; flexible and equitable pathways for student success; alignment of resources, workforce development, and cultural changes. The foci of this report are consistent with these themes, with additional emphasis on student success, work-integrated learning, and internationalization/global reach. A summary of the DLS status of our competitor institutions is included in Appendix C. Going forward, Waterloo should continue to monitor this space and stay abreast of other institutions' digital learning strategies.

2. Vision and Principles

The Working Group spent extensive amount of time discussing and synthesizing the stakeholder feedback, as well as their own views on digital learning, and developing from that what they believed to be strong strategies for the university. The **Vision** below is an attempt to describe an ideal future state for Waterloo, inspired by what we heard and reflecting the **Strategic Directions** and **Recommendations**. The **Principles** are a distillation of the beliefs shared by the university community that should underpin our plan.

2.1 Vision

The vision below imagines the realization of current goals – such the University's Strategic Plan *Connecting Imagination with Impact*, providing opportunities to “empower students to leverage diverse learning experiences by creating more flexible learning pathways and relevant, authentic experiences that prepare (learners) for a complex future” – as well as future goals, such as those emerging from **Waterloo at 100** - through digital learning.

Digital teaching and learning is, by definition, not distinct from teaching and learning but it does introduce new challenges and opportunities for us as instructors, learners, and leaders, and navigating this new landscape requires intentionality. Remaining true to our underlying principles is fundamental to this vision. Our commitment to quality teaching and learning should not be compromised but rather enhanced as we apply the recommendations in this report. **By intentionally applying digitally enabled strategies in an evidence-based manner, we will support quality and innovation in teaching and learning and enhance the Waterloo experience.**

A vision for digital teaching and learning at Waterloo

The future we envision is one in which Waterloo is characterized by consistent and familiar experiences for both instructors and students, regardless of the mode of learning. Faculty strategic learning plans enable and support program design decisions, while central administration provides institutional-level directions, goals, and key supports to foster innovation. Digital tools help create a welcoming, supportive learning community, where faculty, staff, students, and prospective students can engage in an environment that leverages human interaction strengthened by technology. Technology is a powerful tool used to help meet pedagogical objectives, but integration, intuitiveness, and support is such that it largely fades into the background and allows the focus to be on teaching and learning. With the help of digital teaching and learning, our curricula are more flexible and interdisciplinary, and we embrace and support greater equity and anti-racism, diversity, inclusion, indigenization, and accessibility. Instructors feel empowered, enabled, and well-supported, allowing them to easily employ digitally enabled teaching strategies that optimize teaching and learning, and experience what is best described as “joyful teaching.” Students have access to courses and programs that are designed with the appropriate flexibility in time, place, and modes of delivery to promote equity, engagement, and student success. Waterloo continues to place learners at the centre of everything we do and values community and human interaction in our teaching and learning experiences. By fostering an agile, technology-enabled learning ecosystem and a comprehensive, evolving strategy, Waterloo is well-regarded as a progressive, flexible learning institution, responsive to both current and emerging challenges and opportunities.

2.2 Core Principles

During consultations, participants were asked to identify characteristics and principles that define Waterloo, that should be preserved, and that should underpin a digital learning strategy. The following themes emerged and have been used to help generate and assess the strategic directions and recommendations below; their order of presentation is not meant to imply an order of priority as these principles overlap and interact with one another and underpin all the recommendations in this report.

1. **Put learner-centredness and student success first:** We clearly heard that the needs, interests, and abilities of learners should be the primary consideration and driver of DLS implementation. In a learner-centered environment, the focus is on creating an engaging and interactive learning experience using teaching and learning strategies that encourage students to take an active role in their own learning and to develop critical thinking, problem-solving, and other important skills. Students are more likely to be successful and motivated when they are actively involved in the learning process and when their needs and interests are considered.
2. **Value human interaction and community:** The Working Group heard clearly that Waterloo should not move in the direction of becoming a primarily digital or online institution, and that we should not engage in digital learning that is impersonal and predominantly independent or self-directed. Students should have the opportunity to engage with instructors, fellow students, and learning content activities regardless of the degree of digital learning involved. We also need to remember that humans are a social species and learning is a community-based endeavor, and design accordingly, regardless of the mode of instruction. Digital tools can be used to enhance and extend learning interaction as well as build community.

3. **Focus on quality:** Quality should factor into all pedagogical and design decisions as we pursue digital means of teaching and learning. While there are digital-specific strategies and application knowledge that are required, many principles of good teaching are universal, and thus apply equally to digitally enabled or enhanced teaching. Technology should be regarded as a tool to achieve teaching and learning outcomes, and ideally fade into the background.
4. **Foster equity, diversity, and inclusion, and increase access:** The Working Group heard about opportunities and challenges associated with digital learning and equity, diversity, and inclusion, including various difficulties students and instructors had in accessing technology and participating in remote learning. While many of these issues were precipitated by the pace at which implementation happened in recent years, it is important that we keep all users in mind when implementing digital learning strategies. Digital learning offers opportunities to increase representation and reach traditionally underserved students by making learning more flexible and available beyond the campus, as well as more accessible to many neurodiverse students and/or students with disabilities by providing learning materials in multiple formats.
5. **Develop agility and resilience:** During the pandemic, the rapid shift to remote learning tested our digital limits and demonstrated where and how we could establish more robust infrastructure, capacity, and capabilities with respect to digital learning. Doing so should help to better position the University to respond to future challenges, both known and unknown, large, and small.
6. **Strive for flexibility:** Flexibility for students, instructors (course delivery, pedagogy), programs (scheduling, program outcomes, coordination), and the institution is one of the main desired outcomes of defining a strategic approach to digital learning.
7. **Be intentional:** intentionality is woven into many of the findings in this report, including the overarching goal of the DLS which is to *shift* teaching and learning in an informed, coordinated manner rather than allowing it to drift in a multitude of directions (including regressing to pre-pandemic norms). The pandemic and remote teaching experience led us to re-examine many of the preconceptions and assumptions we held toward digital learning and provided an opportunity to assess the relative strengths of various forms of teaching and learning. The university should clearly articulate the value of the campus experience, and programs should thoughtfully implement (and ideally combine) the inherent strengths of face-to-face and other modes in designing programs and learner experiences.

3. Strategic Directions and Recommendations

This report presents 12 top-level strategic directions, with associated recommendations to achieve them. These strategic directions and recommendations build on one another and, in some cases, must be achieved in a stepwise fashion, but the ordering is not meant to imply either sequential action or priority.

3.1 Strategic Direction 1: The University should be intentional and evidence-based about the design and application of digital learning across curricula and programs.

In-person teaching and learning has been a core characteristic of most University of Waterloo degrees. Although correspondence, distance and, more recently, online courses have been offered for decades, the COVID-19 pandemic that resulted in near universal remote teaching has indelibly shifted student

expectations and instructor capacity. This experience, coupled with the continued evolution of digital tools and pedagogical practices, requires that we consider digital learning beyond the binary of in-person and online modes.

Waterloo's commitment to advancing an agile, technology-enabled ecosystem that enables high quality digital learning pre-dates the COVID-19 pandemic. With the return to face-to-face instructional modes, we have an opportunity to apply digital teaching approaches to enhance the student experience, create flexible learning pathways, and optimize learning environments. Options range from the inclusion of digital assets in traditional face-to-face courses, through blended course design and online courses in traditional in-person programs, to fully online programs. Historically, decisions on the mode of delivery and the incorporation of digital components have often been made at the course level by instructors on an ad hoc basis. There is a need and opportunity to be more intentional in our application of learning at the course, program, and institutional level to best serve our students and intended program outcomes. More intentionality can ensure that learning is the primary factor when considering delivery modes, while leading to more consistency in approaches and awareness of expectations amongst learners.

Our consultations revealed a broad consensus that decisions on delivery modes are best made at the program level. Pedagogical considerations include a host of factors, including but not limited to the needs of students at different year levels and maturity, balancing offerings across student cohorts, opportunities and constraints related to work-integrated learning/co-op, and professional accreditation requirements. While considerations are best understood at the department and program level, the University plays an important role in setting the overall institutional goals and strategic directions which guide these decisions and providing a supportive environment.

The following recommendations are based on a strategy in which Faculties and institutional priorities are aligned regarding digital teaching learning. Programs should integrate digital strategies where they make sense within their plans, considering discipline-specific (and interdisciplinary) opportunities and constraints. These decisions should align with strategic guidance from the relevant Faculty and curriculum design committees, which in turn should align with university-level strategic plans and considerations.

Degree requirements, programs, majors, and plans

The University of Waterloo's Undergraduate Academic Calendar includes various specialized terms to reflect credentials and the academic requirements to achieve these. All six faculties and Renison University offer University of Waterloo graduate and undergraduate degrees. Academic programs are considered synonymous with academic plans and are "a defined set of requirements that leads to a particular credential", whereas an undergraduate major is "an academic plan that is the primary area of study in a student's baccalaureate degree." Undergraduate academic plans in turn can include credentials smaller than the major (e.g., minors, options, diplomas, certificates) and specify a system of study (regular, co-operative). Students may apply directly into an academic program ("direct entry"), or into an academic program where they will select a major. Programs/plans often align with particular academic units but may be shared among units and even faculties. At the graduate level, program and academic plan are synonymous. In this report, we use the generic term "program" as a shorthand to refer to the combination of primary academic plan and system a group or cohort of students follows. This use can be considered synonymous with a major or direct-entry program as well the curriculum committees or other administrative structures responsible for designing and delivering these primary academic plans.

Recommendations:

- a. Faculties should incorporate digital learning into their Academic Program Plans in a manner that reflects the Digital Learning Strategy recommendations.
- b. Program-level planning decisions should support flexible pathways for students and consider how to employ digital strategies appropriately to enhance flexibility.
- c. Curriculum committees should review programs and map course modalities to optimize the student experience and progression through the program (e.g., the balance of online, blended and in-person offerings; the ideal fit of modes of delivery to courses) and periodically revisit this through the curricular review process. Course delivery modes should be determined by this plan and remain consistent, visible to students, and predictable from term to term, year to year.
- d. The University should consider how digital competencies can be reflected in institutional degree-level expectations, and these in turn would be reflected in program-level learning outcomes.
- e. Curricular design support for Faculties should be expanded as necessary.

3.2 Strategic Direction 2: Develop and provide students with flexible pathways through curricula.

Waterloo's current Strategic Plan commits us to "empowering students to leverage diverse learning experiences by creating more flexible learning pathways" aligned with the future of work and learning. In this context, the intentional design and application of digital learning has the potential to increase flexible pathways and can play a role in fostering interdisciplinarity and internationalization. Flexible pathways can include opportunities to take courses in different modalities with the ability to choose modality where possible, to repeat core courses in a timely fashion, to take a reduced course load where needed, and to be permitted to work toward the academic requirements of a degree during co-op work terms.

Digital tools and strategies enable a variety of flexible learning options, such as the availability of both online and in-person formats, blended learning, and digital assets incorporated into in-person courses. Asynchronous online learning frees students and instructors from scheduling constraints, which in turn facilitates greater interdisciplinary experiences and allows students to complete some academic requirements while on a co-op work term. Waterloo should also make greater use of formats beyond the typical course structures to promote flexibility.

Flexible pathways. Flexible pathways can support student success by providing multiple pathways through the curriculum, allowing for more choice in course sequencing and credit load in a particular term. For example, GEOG 181 Designing Effective Maps is a required course for Geography and Environmental Management and Geomatics Plans. Geomatics students are required to complete GEOG 181, GEOG 281 Introduction to Geographic Information Systems, GEOG 381 Advanced Geographic Information Systems, and GEOG 481 Geographic Information Systems Project. Each course in the series serves as a pre-requisite for the next. Offering GEOG 181 in person in the 1A (Fall) term and online in Winter and Spring terms gives students who struggle with this technical course options to repeat it in the 1B term or complete it during a non-academic term in Spring, and thus stay on track with the sequence. This also allows a reduced course load in the 1A term with an option to catch up during the spring (non-academic) term and gives students a choice of course modality.

Flexible pathways can also foster interdisciplinarity. All six faculties offer courses which have broad appeal to both in-faculty and out-of-faculty students. Offering these courses online has made the courses available to more students as this has removed scheduling conflicts.

Course Structures

The University of Waterloo curriculum relies on a credit system in which most courses assessed at 0.5 units. We have no formal definition of workload expectations per 0.5 unit course; in common practice, 0.5 units translates to approximately 3 weekly class (“contact”) hours over a 12 week term, plus time spent on preparation, assignments and exams. The introduction of blended and asynchronous online learning has further challenged workload expectations. We can and do have heavier and lighter credit weights for courses ranging from 0.13 units to 1.5 for a single “course” and include required curriculum elements valued at 0 units. An alternative may be to move to a modular credit system based on workload, similar to the European Credit Transfer and Accumulation System (ECTS). One credit “point” in the ECT is equivalent to 25-30 hours of learning regardless of mode and considered approximately one sixth of a standard Waterloo 0.5 credit course.

Recommendations:

- a. Continue to develop blended and online courses to intentionally develop flexible pathways.
- b. Make flexible pathways consistently available and easily identifiable to students.
- c. Create course and scheduling options that allow for more flexibility, such as decreased in-person contact time, and alternate course structures beyond the traditional 0.5 credit weight course (e.g., block courses, non-standard credit-weight courses).
- d. Implement a system of open enrolment that allows non-degree learners to enrol in selected courses (e.g., those without or with few prerequisites, likely to be of general interest, that can perhaps be bundled into a credential or that serve as an alternative pathway to admission), providing expanded opportunity for access, especially to fully online courses.

3.3 Strategic Direction 3: Learner-centredness and student success should guide the application of digital learning.

Student success and enhanced learning experiences must be at the center of this DLS. Digital strategies should be evidence-based and focused on pedagogical practices that have a demonstrated ability to improve learning. For example, blended learning, and specifically “flipped classroom” approaches that provide foundational learning online and allow for more application and active learning in the classroom, have demonstrated positive impacts on students’ academic performance, motivation, engagement, and learning management skills. Digital learning provides a means to achieve learning competencies such as those articulated in the recently released [WatSEE framework](#). For example, digital learning communities would allow learners to stay engaged with other learners and learning supports, whether they are on campus, studying remotely, on a co-op work term (the **build relationships** component of the WatSEE framework), and introduction of digital experiences and interaction would also prepare students for the digital workplaces they will encounter in the digital, distributed workplace (*expand expertise*). Digital learning can also enhance the graduate student experience through the facilitation of graduate research group meetings even when participants are in various locations. Finally, flexible pathways and access to lifelong learning further help students to achieve the **develop self** component of WatSEE.

The broader application of digital learning, whether it is within traditional, primarily residential curricula, fully online, or blended programs, also introduces new challenges for students. As students learn online, services provided by academic support units need to be available for learners not physically on campus and with diverse learning needs. At the same time, the integration of digital teaching through blended learning and combining in-person with online offerings in the same term means that some learning occurs online while students are physically on campus, which requires different types of study spaces.

Waterloo's Blended Learning Initiative

The Centre for Teaching Excellence (CTE) defines *blended learning* as the purposeful integration and alignment of online and in person components. The structure of blended learning offerings varies, with some instructors choosing to move lectures to asynchronous online formats and using face-to-face time for active learning, though others build interactive content into online platforms through discussion forums and lab simulations. Since 2021, the Teaching Fellows have been leading an "institution-wide (but faculty specific)" project, the Blended Learning Initiative, focused on the flipped classroom style of blended learning: content is delivered asynchronously online, and in-class time is used for active, face-to-face learning. The Blended Learning Initiative is an example of thoughtfully and intentionally approaching the implementation of one particular style of digital learning. To date, decisions on the adoption of blended learning have largely been left to individual instructors, with little cohort or curriculum/plan coordination in most cases.

Recommendations:

- a. Inform the application of digital learning with evidence, research and established best practices. Strategies should focus on promoting active learning and other high impact practices, achievement of institutional goals (e.g., retention, access, and engagement), and achieving key learner competencies (e.g., as articulated in [WatSEE](#) and the [Future Ready Talent Framework](#)).
- b. Continue to develop self-efficacy and a digital learning culture among students, including best practices for time management, collaboration, interaction, academic integrity, and respectful and ethical behaviour in digital environments. Faculties and student-facing ASUs should collaborate on developing support materials which foster student readiness and preparation for digital learning.
- c. Continue to encourage and support the increased use of evidenced-based blended and flipped modes of learning, supported through the Blended Learning Initiative and other projects, with the goal of utilizing in person time more effectively and increasing active learning in the classroom.
- d. Ensure students have access to the academic and non-academic supports, training, learning tools and technologies required for their success as digitally enabled learning becomes more ubiquitous (e.g., institutional site licenses for core educational software, remote access to labs and specialized technology; spaces on campus that allow students to participate in virtual classes or access virtual supports while on campus; remote access to mental health and student success supports).
- e. Develop institutionally supported digital communities that provide opportunities for students to safely communicate and connect locally and globally for learning and communication, and to enhance and expand the on-campus experience.

3.4 Strategic Direction 4: Ensure a consistently high quality of learning experience across the institution regardless of the mode of delivery.

The underlying principles and aims of good teaching are constant regardless of modality. A digital learning strategy should be firmly rooted in evidence-based, effective pedagogical approaches that can

be adapted depending on the strengths and opportunities inherent in each mode, and that is responsive to program context and the needs of specific student cohorts. Ideally, technology should ultimately fade into the background for both students and instructors, as more mature technology does with in-person courses. There should be definitions regarding modes of delivery to ensure a common understanding. Finally, all modes of digital learning, including those created by academic support units providing resources to learners, should have access to appropriate levels of digital learning design and development support.

Course Modalities

The University of Waterloo is in the process of defining modes of learning including fully online and blended which includes reduced classroom hours. In the proposed Digital Learning Principles and Guidelines, an asynchronous online class has no scheduled meets, may include limited synchronous elements for which equivalent alternatives or flexible options exist. A synchronous online class has regular (usually weekly) scheduled online meets throughout the term.

Recommendations:

- a. Define official digital modalities offered at Waterloo (on-campus, blended, and online; synchronous and asynchronous) and communicate information regarding each mode and related learner expectations (e.g., in-person and online time commitments) to students via scheduling and course selection information.
- b. Establish University-level principles and guidelines to ensure that baseline requirements for digital learning are met and that Waterloo students have consistent, high quality digital learning experiences.
- c. Provide support for all modes of digital learning design, from individual digital assets to full online courses, by expanding access to appropriate services.
- d. Ensure that academic support units (ASUs) involved in student learning are themselves supported in delivering digital services to students.

3.5 Strategic Direction 5: Implement a model of digital learning that is sustainable, efficient, and effective.

An effective institutional digital learning strategy needs to be coordinated centrally to ensure equitable support and resources across Faculties. The overall operational model should be one in which the University provides vision, direction, guardrails, and an environment conducive to digital teaching and learning, while removing barriers to innovation. Program directors and faculty members are key stakeholders in digital learning decisions and need to be involved in associated operational decisions including selection of technology and tools. Faculty workload in the development of new digital resources is a concern, and the University needs to establish clear guidelines for the creation, ownership, sharing, reuse and updating of digital assets and Open Educational Resources (OERs). Sustainability in the lifecycle of digital assets in turn requires adequate and predictable support to create and maintain quality, track trends in the post-secondary sector and ensure compliance with copyright, privacy, and security considerations.

IP for the Digital Age

Policy 73 (Intellectual Property Rights) Section 8 states that IP generated in the course of teaching activities is generally treated in the same manner as that for research activities. It notes that materials required for “course management and administration, such as course outlines, final exams and laboratory manuals is considered an assigned task, and copyright for such material is vested in the University”, but that copyright for detailed teaching materials belongs to the creator. The policy further states that detailed teaching material “which has been printed and distributed or made publicly available should also be available for royalty-free use for teaching and research by other members of the University”. Currently, Centre Extended Learning courses commonly implement a course author agreement which follows 8E of Policy 73: “materials for use in distance and continuing education shall be made available to the University under contract(s) with the author(s)” but this contract typically includes an “exclusive, royalty-free license by the University for distance and continuing education”, and this provision in turn is normally subject to Policy 73’s reference to material printed or made publicly available.

The language of the Policy, which was established in 1997 and last revised in 2000, leaves room for interpretation when it comes to digital assets and courses. For example, it is unclear if uploading an asynchronous lecture to the LMS constitutes either printed or publicly available. In practice, many instructors “own” their digital assets, and sharing of these to other instructors assigned the same course relies on goodwill.

Open Educational Resources (OERs)

Since 2020, eCampusOntario, through its Virtual Learning Strategy (VLS), has been supporting e-learning development and capacity throughout the sector. A significant focus of its efforts and funding have been directed at the creation and adoption of free and openly licensed Open Educational Resources. eCampusOntario estimates that this has saved Ontario students over \$15M in textbook and materials costs during that time (<https://openlibrary.ecampusontario.ca/impact/>) . Our own institutional data suggests that textbook purchase rates can range anywhere from 60% to as low as 30% depending on the class, and lack of access can be a significant impediment to student success. Increased adoption of OERs would also benefit the institution by allowing for more efficient sharing and preservation of learning resources. A 2021 study by the Open Education Librarian at the University of Waterloo Library, supported by VLS funding, identified several campus needs required to support OER, including a repository, licensing and accessibility support, and funding for development – needs that overlap with several DLS recommendations.

Recommendations:

- a. The University should establish a standing committee on digital learning , with representatives from each Faculty, staff, and students.
- b. The University should review intellectual property policy (Policy 73) with special regard to teaching materials, with the goal of making digital assets created in the course of one’s employment readily available for reuse within the institution (e.g., for use in core course, large multi-section courses, or courses serving several programs or Faculties).

- c. The EDTECH governance structure should ensure that the appropriate processes and technology are in place to support the creation, sharing, and life cycle management of digital teaching and learning assets, including a platform that facilitates the sharing and reuse of digital course assets within the University of Waterloo.
- d. The University should incentivize the development of digital materials that can be shared within the University of Waterloo community and, when appropriate, more widely as open educational resources (OERs).
- e. The University should commit to ongoing support for digital learning. This could include funding for students to help co-create digital learning experiences (e.g., online learning assistants during pandemic).
- f. The University should commit to ongoing resourcing in areas such as copyright, accessibility, privacy, security, and digital asset management in ways suited to supporting the important roles each plays in digital teaching and learning.

3.6 Strategic Direction 6: Continue to advance an agile, technology-enabled learning ecosystem that supports high-quality digital learning options.

The institution should provide a seamless ecosystem of physical and digital spaces with guidelines for digital and classroom environments that can combine to optimize both teaching and learning experiences. Faculty, program, and instructor autonomy need to be carefully balanced against measures ensuring that students have a consistent experience across Waterloo. Students cannot be expected to use a different platform for every digital experience, nor can the institution support all technology. Instructors would benefit from more consistency in the technology as well. Reviews of technological tools and platforms that ensure access, privacy, and security, as well as overall reliability, are essential for ensuring a quality digital learning experience. A multi-tiered approach in which the common needs are provided by centrally supported platforms, but allows for Faculty, program, and instructor selected tools to meet needs not fulfilled by these platforms would be ideal. The goal of the nascent [EDTECH governance structure and Technology Hub](#) is to provide an expedient, transparent way to field and assess new technology requests, and implement these when appropriate. However, we should also ensure that there is capacity and responsibility assigned for research and exploration of emerging technology. Future tools should support new and emerging learning frameworks and strategic directions, not just current or common needs. In some cases, “home grown” systems have and will continue to provide vital services and a competitive advantage for Waterloo. These systems require dedicated internal development and operational support. Finally, each operational area should adopt a LEAN/continuous improvement approach to identify system limitations, procedures, standing practices, etc., that hamper innovation and to fully realize the benefits of a digital learning strategy and digital campus.

Supporting local innovation

Outline, a tool developed through Science Computing to support the development and delivery of online course syllabi, is an example of a successful in-house system designed to meet the needs of the university community, including integration with essential information systems. The online platform also has many innovative features, such as providing a “heat map” of students’ busy times, providing instructors with important scheduling information, and providing accessible syllabi. As this

Recommendations:

- a. The University utilizing three tiers of institutional tools: 1) a suite of centrally supported core systems, 2) Faculty-based purchased and supported tools, and 3) instructor-selected and supported special

purpose course tools to help achieve a balance between consistency for students and instructor autonomy.

- b. The new EDTECH governance structure should define a clear, responsive process for the identification, vetting, and implementation of tools, with an ongoing commitment to support current and future central acquisitions. The structure should also assign responsibility and include a mechanism for identifying, researching, and recommending new teaching and learning technologies.
- c. The University should review its procurement process to ensure that it is suited to the efficient selection of optimal technology within the rapidly shifting EDTECH marketplace.
- d. The University should have a team dedicated to support the development, customization, and integration of in-house EDTECH systems for digital learning. This could involve ASU and Faculty collaboration and pooling of resources.
- e. The selection of future tools, such as the learning management system (LMS), should consider both current and future needs, pedagogic frameworks and strategic directions (e.g., WatSEE, the Future Ready Talent Framework, WatSPEED/lifelong learning).
- f. The University should commit to ongoing investment in campus infrastructure to support digital learning on campus (e.g., Wi-Fi, flexible teaching and learning spaces) and develop classroom standards and specifications based on room capacity and function to be employed in new builds or retrofits irrespective of space ownership or management to foster a more consistent technological and functional experience.

3.7 Strategic Direction 7: Leverage digital strategies to enhance and expand work-integrated and life-long learning.

Work-integrated and lifelong learning are key strengths of the Waterloo experience and brand. Our existing curricular structure prioritizes traditional credit hour courses along with professional development (PD) courses and co-op/internship placements. The new credentials framework under development, enabled by digital teaching and learning, can create new opportunities beyond this structure – for example, micro-credentials for existing students and outward facing opportunities for non-traditional learners, delivered through WatSPEED and other means. As our students gain digital skills and competencies beyond the traditional course-based settings, these can be tracked and credentialled via digital dashboards and wallets. Students can be better prepared for the workplaces of the future with more exposure to virtual and augmented reality experiences. Work-integrated and professional opportunities can be enhanced for all students; for example, graduate students will benefit from the expanded reach of research, conferences, teaching and learning opportunities and networking that are facilitated by digital communities and events. The flexibility and access afforded by digital formats have the potential to reach more non-traditional students in the future.

Dashboards to track learning

In 2022, the Centre for Work-Integrated learning launched the PD Major Reflective Report Power BI dashboard (MRR dashboard). The MRR dashboard allows program administrators to synthesize the MRRs, including summaries of co-op learning experiences and how co-op and academic skills integrate. Furthermore, the dashboard asks students to self-assess their Future-Ready Talent Framework skills. While the MRR dashboard is not student-facing and does not yet allow for longitudinal analysis, a similar approach could be taken for students to combine self-assessment with credentialed professional development training over the course of the degree, ultimately leading to verifiable competencies for possible inclusion in digital wallets as per recommendation 7d.

Champions of Teaching and Learning

Waterloo's Teaching Fellows program was initiated in response to [Recommendation of the final report of the Task Force on Innovative Teaching Practices to Promote Deep Learning at the University of Waterloo](#) (2011) Objective 4: Build a Community of Faculty Leaders Focused on Teaching and Learning. Teaching Fellows are tasked with providing leadership in teaching within their own constituencies by developing best practices to enhance student learning. Currently, three of Waterloo's faculties (Science, Engineering, and Health) have unit level Teaching Fellows with a faculty-level lead Teaching Fellow, while the remaining faculties have appointed one Teaching Fellow for the whole faculty. The scope and operations of each faculty's Teaching Fellow(s) vary widely, but all six lead teaching fellows meet regularly to share projects and ideas across faculty lines. Since 2021, the teaching fellows have been championing the Blended Learning Project to help instructors incorporate face-to-face and online components into their courses in an evidence-based, learner-centred way. The Teaching Fellows are a natural conduit to instructors within Faculties. As a result, they are being increasingly called upon to support teaching and learning initiatives, including the DLS, testing the limits of their capacity.

Recommendations:

- a. Employ the credentials framework currently under development to digitally deliver micro-credentials that allow for shorter, stand-alone but stackable credits, which could also be made available to non-student audiences via open enrolment.
- b. Continue to expand WatSPEED digital lifelong learning offerings to cater to the greater demand for online offerings, as well as accessing new markets and repurposing existing (credit course) digital assets where appropriate.
- c. Develop digital learning resources and co-curricular opportunities that support career readiness, particularly for graduate students.
- d. Develop a student dashboard that tracks all for-credit and experiential learning, e.g., the Future Ready Talent Framework competencies that occur in co-op work placements.
- e. Implement a digital wallet to authenticate digital micro-credentials and competencies.

3.8 Strategic Direction 8: Identify and support faculty professional and pedagogical development needs for digital teaching and learning.

Teaching is a fundamental component of Waterloo's mission. Policies 76 and 77 highlight the importance of teaching in hiring, tenure, and promotion. With the increased use of educational technology and demand for digital literacy, Waterloo's instructors should be supported in their pursuit

of excellence in digital teaching and learning. Ideally, technology should be intuitive, integrated, and supported by a team of specialists who make it possible for instructors to focus on pedagogy and let the technology fade into the background. Faculties should determine what models are appropriate within their organization and culture.

Recommendations:

- a. Recognize the time required to develop and integrate digital tools, content, and strategies into teaching and factor this into the equitable assignment of duties.
- b. Develop a certificate in digital teaching and learning for instructors and graduate students.
- c. Expand each Faculty's Teaching Fellows program to provide capacity, support, and reach for digital initiatives.

Coordinating Support

In 2020, Waterloo launched the *Keep Learning Team* in response to the overwhelming need for support related to an institution-wide shift to remote learning. The *Keep Learning Team* recognizes that a co-ordinated approach is needed to advance teaching and learning. The core group – the Centre for Extended Learning, Centre for Teaching Excellence, Information Technology and Media Services, and the Library, meets bi-weekly, with full team meetings including AAS, Academic Integrity, the Writing and Communication Centre and the Student Success Office once per term. *Keep Learning* has updated its post-pandemic mandate to focus on coordinating action and resources on emerging issues as appropriate.

Continue the collaboration among key teaching and learning related academic support units (e.g., Keep Learning) as a means to coordinate and streamline access to resources and support for instructors. Keep Learning should also continue to provide guidance and support for overall directions set by University leadership, Teaching Fellows, and related advisory bodies.

3.9 Strategic Direction 9: Expand our global reach and reputation using digital strategies.

An intentional approach to increased digital opportunities is key to expanding Waterloo's global reach and reputation. Digital learning allows us to overcome limits in space and time and open the Waterloo experience to those who are not able or looking to participate in a traditional residential experience. A robust catalogue of online course and program offerings coupled with a strong marketing and brand development for Waterloo in this space will provide access to global non-traditional learners. Within

existing curricula, structured collaborative opportunities within face-to-face and online courses can support linkages and partnerships with other institutions, and foster internationalization.

Targeted Global Programs

In 2014, the Georgia Institute of Technology, launched the first accredited Master of Science in Computer Science in a "massive online" format for students who may not have been able to attend traditional on-campus classes at a fraction of the cost of traditional, residential programs. In that time, the program has enrolled over 9,000 students from all 50 U.S. states and nearly 120 different countries, making it the largest master's degree program in computer science. Not only has this program become a significant source of revenue for the institution, but it has also opened a highly regarded quality program to new markets of previously underserved students.

Collaborative Online International Learning (COIL)

Collaborative Online International Learning (COIL) builds on the foundation of collaborative learning – learning through interaction with others. COIL initiatives connect classes in different cultural and geographic contexts engaged in similar courses. Through these globally networked classrooms, students go beyond expanding expertise to build relationships and expand cross-cultural awareness and contributing to develop self. While COIL itself requires some instructor investment up front, it is generally an accessible and cost-effective way to develop digital communication skills, internationalize, and contribute to all three elements of the WatSEE framework.

Recommendations:

- a. Identify key markets which are underserved in Waterloo's areas of strength; develop and market scalable online programs, including course-based graduate degrees.
- b. Promote and grow international enrollment of traditional and life-long learners via a strong catalogue of digital offerings.
- c. Create opportunities for every student to engage in intercultural co-curricular linkages, e.g., via Collaborative Online International Learning (COIL) initiatives

3.10 Strategic Direction 10: Employ digital-enabled approaches to support equity, representation, inclusion, and anti-racism goals and initiatives.

The University is actively seeking to increase representation at the institution. Digital tools can increase the diversity of voices heard in the classroom, reach more students with anti-racism competency and capacity building, and expand the expertise and collaborative opportunities available beyond the campus.

In addition to representation, learners are diverse in needs – they learn and demonstrate learning in multiple ways, their backgrounds and support needs vary, they may have accessibility requirements, including neurodiversity, and geographic, physical, and economic access to a campus may be an issue. Flexible pathways and varying delivery modes enabled by digital learning can support the wide-ranging needs of our student population.

Applying Universal Design for Learning

Universal Design for Learning (UDL) in post-secondary education focuses on eliminating barriers to build access to a wide range of users. UDL is built on three principles: multiple means of representation, multiple means of expression, and multiple means of engagement. Multiple means of representation can include traditional face-to-face lectures in addition to recordings, narrated slide decks or text-based asynchronous content. Using various forms of representation in turn makes learning more accessible for those who struggle with the linear progression of a traditional lecture, allows those who must miss class for any reason to progress, and enables alternate pacing for all. Multiple means of expression and engagement include not just written projects and oral presentations, but the range of expression enabled by digital means (e.g., podcasts, short videos, web formats, online discussion groups). These multiple ways of learning, engagement and expression are designed to give students flexibility and the choice to pursue learning in the medium that most resonates with them or meet their needs. Digital approaches greatly increase the modes of engagement, expression, and representation available in teaching and learning.

Meeting New Accessibility Standards

The Final Postsecondary Education Standard Recommendations Report on the development of proposed post-secondary education standards under the Accessibility for Ontarians with Disabilities Act (AODA) was released in April 2022, comprising 185 recommendations that address 9 barrier areas. The recommendations are wide-ranging and touch every aspect of publicly assisted universities' operations. Eleven of the 169 recommendations explicitly address teaching and learning, with a further nine focused on digital teaching and learning itself. While digital formats can help achieve some of the AODA PSE recommendations (e.g., Recommendation 45, Student requests for accessible formats), we note that use and expansions of digital technologies itself introduces new challenges for accessibility (e.g., the Report's Recommendation 74, Accessibility of technology).

Recommendations:

- a. All areas of the University should utilize digital learning as an important (but not exclusive) means of supporting Universal Design for Learning (UDL) campus initiatives, recognizing that the availability of digital formats and the flexibility afforded by digital teaching and learning go a long way in supporting UDL goals.
- b. The University should provide centralized support for achieving AODA post-secondary education standards.
- c. The University should promote flexible pathways to underserved, international, and non-traditional students in order to recruit more underrepresented students.
- d. The University should develop digital modules in EDI-R that can be embedded in the curriculum or offered as micro-credentials.
- e. Programs should leverage digital formats as a means of introducing indigenous elements into the curriculum, including providing the flexibility to do so, and the University can use online modules as a means promote awareness and action regarding indigenization and reconciliation.
- f. Programs should use digital tools to bring more underrepresented voices into the classroom (e.g., guest lecturers, advisors, mentors, etc.)

3.11 Strategic Direction 11: Lead in teaching and learning that exploits the combined and unique strengths of technology and human interaction.

The *Waterloo at 100* discussion paper envisions “delivering on the value of engaged interaction to deepen learning, inquiry, and work while leveraging digital technologies, pedagogies, and services to complement an excellent experience. Waterloo has a deep culture of innovation, and we need to apply this mindset to the transformation of teaching and learning through digital means. Incentives and support, including through emerging mechanisms like the Teaching Innovation Incubator (TII), will promote innovation and agility, as will creating an environment in which successful innovations are disseminated and shared. Mitigating the risks associated with the pursuit of transformational change will help engage faculty in digital teaching innovation.

Incubating New Ideas in Digital Learning

The University of Waterloo Teaching Innovation Incubator (TII) is envisioned as a means to develop and enable bold new approaches to teaching and learning. The TII will serve as a mechanism for experimentation, fostering pilot projects of new ideas from our existing complement of faculty and staff. The TII is, as of early 2023, still in its beta phase, with three projects in development. One of the key points in the development of the TII is that, while innovation in teaching is happening, it can be challenging for individual innovators to operate outside institutional rules and navigate administrative structures or bring together the resources to implement and scale transformative ideas. Furthermore, innovation comes at a risk, and a Teaching Innovation Incubator can help mitigate some of the concerns associated with high-risk, high-reward teaching innovations. While the TII is not explicitly about digital teaching, digital teaching and learning is increasingly becoming a part of the teaching and learning landscape. Indeed, two of the three beta TII projects draw on or are likely to include some elements of digital teaching.

Recommendations:

- a. The University should provide structure and support for digital teaching innovation and make fostering digital teaching innovation one of the foci of the Teaching Innovation Incubator.
- b. The University should ensure that there is ongoing proactive exploration and research into emerging technologies and their potential application in teaching and learning (e.g., AR/VR, AI driven tools).
- c. The University should develop better mechanisms for recognizing and diffusing innovation across the institution (e.g., faculty community of practice, digital learning exemplar website). Evaluation of success should be a required component of any University-supported project.
- d. The University should define institutional objectives and key results (OKRs) as appropriate for the recommendations in this report, including measures of student success and student satisfaction (e.g., from student course perceptions surveys, NSSE results, term surveys).

3.12 Strategic Direction 12: Engage in a broader transformation initiative and develop a vision for a fully digitally enabled university that appropriately leverages technology to enhance all university services.

A digital learning strategy needs to be embedded within a larger institutional digital transformation to Waterloo as a digitally enabled campus. Digital learning will be most successful if other student supports and services are available in a flexible manner. Many of the recommendations above also pertain to all the digital interactions our students have with the University (applying, registering, communicating, etc.)

There should be consistency among University systems and the user experience should be as seamless as possible. The digital learning technology ecosystem needs to work with other institutional systems and processes, and the ability to access and share data across the institution is a key enabler of this interoperability, as well as enhancing overall institutional efficiency, optimization, and informed decision-making.

Recommendations

- a. Improve sharing of institutional data and establish open data standards.
- b. Continue gathering data on current and prospective students' needs, preferences, and drivers of success.

4. Conclusion and Next Steps

This report is the result of extensive consultations from June to November 2022. While the consultations were influenced by the challenges and lessons of the pandemic, the Working Group and the stakeholders who contributed were asked to focus on intentionally and strategically approaching digital learning. While it is obviously not possible to capture every idea and suggestion that emerges in such a process, overall, we believe this to be a comprehensive report of the findings, and one which accurately captures the essence of the consultations.

This report aims to be consistent with the strategic plans and frameworks which guide our work at Waterloo, chief among them, our strategic plan, *Connecting Imagination with Impact*. However, the recommendations as presented here are intended to form the basis of a Digital Learning Strategy for Waterloo, and perhaps also become a facet of the vision for **Waterloo at 100**, mapping a longer-term trajectory for Waterloo.

To facilitate reference, discussion and action, the Working Group have created a briefing document to accompany this report that summarizes the Strategic Directions and Recommendations, along with current activity, areas of responsibility and potential timelines. This could serve as an action plan of sorts. In Recommendation 5.a., the report recommends forming a committee or similar mechanism to both implement the current recommendations and develop future strategy, as developing strategy should be an ongoing process. Finally, as noted above, the focus of this investigation was on digital learning, so Waterloo may want to focus next on developing a comprehensive Teaching and Learning Strategy, as well as initiating a broader institutional digital transformation that considers all manner of university services and operations.

Appendix A: Project team

Team member	Role	Faculty/Unit
Johanna Wandel	Co-lead	Environment (Associate Dean, Undergraduate)
Aldo Caputo	Co-lead	Centre for Extended Learning (Director)
James Skidmore	Faculty representative	Arts
Robert Hill	Faculty representative	Science
Diana Skrzydlo	Faculty representative	Mathematics
Peter Johnson	Faculty representative	Environment
Tamara Maciel	Faculty representative	Health
Carolyn MacGregor	Faculty representative	Engineering
Stephanie Ye-Mowe	Student representative	Waterloo Undergraduate Student Association
Kevin Bonnell	Student representative	Graduate Student Association
Mary Power	ASU representative	Centre for Teaching Excellence
Pam Fluttert	ASU representative	Instructional Technology and Media Services, IST
Victoria Chu	ASU representative	Library
Kari Weaver	ASU representative	Library
Alisa Sivak	Communications/Research	Office of the Associate Vice-President, Academic
Wendy Hague	Project Manager	Project Management Office (IST)

Additional support was provided by the following stakeholders:

Jill Knight	Student representative	Waterloo Undergraduate Student Association
Jordan Daniels	Student representative	Waterloo Undergraduate Student Association
Tolulope Alayande	Student representative	Graduate Student Association
Anton Mosunov	Faculty representative	Mathematics

Appendix B: Summary of Consultations

Stakeholder group	Nature of consultations
Students	
Undergraduate students	“Intercept” surveys Focus groups
Graduate students	Focus groups
Academic Support Units	
Centre for Teaching Excellence (CTE)	Group consultation
Centre for Extended Learning (CEL)	Surveys Group consultations: copyright/editorial, LSS, Exams, Developers, OLC, Systems, LMS/QA teams
Library	Group discussions with: University Library, Print and Retail Services, AFIW Libraries, Executive Team
Writing and Communications Centre	Small group consultation with Clare Bermingham and Elise Vist
WatSPEED	Individual consultation with Sanjeev Gill Individual consultation with Peter Carr
Work-Learn Institute	Individual consultation with Anne Fannon
Centre for Work-Integrated Learning	Individual consultation with Andrea Prier
Academic Integrity and Quality Assurance	Individual consultation with Amanda McKenzie
Information Systems & Technology (IST)	Group discussion with IST Exec (Directors, Chief Information Officer, Executive Officer) Group Discussion, Instructional Technologies and Media Services (ITMS) group Group discussion (open invite) for other IST staff
Faculty Computing User Support Group (FACCUS) and Computing Technologies Services Committee (CTSC)	Email invite to combined group for discussion
Student Success Office	Group discussion with Heather Westmorland, Mike Chee, Angela Rooke
MUR	Small group discussion with Kari Pasick Stewart and Jody Berringer
Keep Learning (CTE, ITMS, Library and CEL)	Small group discussion with Keep Learning team
Instructional faculty/staff	
Arts	Surveys (n=38) Individual consultations and small group interviews (n=10) Focus group session (n=15)
Science	Surveys (n=50) Group discussion (n=13)

Environment	Surveys (n=20) Group discussion (n=13) Individual consultations (n=2)
Engineering	Surveys (n=59) Individuals consultation (n=1) Group meetings with Faculty Operations Advisory Committee (FOPS) (Associate Deans: Undergrad; Co-op Education; Outreach, Diversity and Equity; Teaching; Director of Admissions, academic program leads, liaisons; n=21) Group discussions with: Teaching-Learning Champions (n=9), 3 group discussion sessions (n=8, n=12, n=11), email responses (n=3) Note: group discussions included a mix of students, faculty, technicians.
Math	Group discussions (n=33) Individual consultations (n=9) Email consultations (n=2) Note: sessions included instructional support coordinators
Health	Surveys (n=1) Individual consultations (n=4) Email consultations (n=1)
Faculty Leadership	
Deans	Individual consultations with Lili Liu, Mary Wells, Bob Lemieux, Bruce Frayne, Jean Andrey, Mark Giesbrecht
Faculty of Arts leadership	Group consultation with Sheila Ager, Marty Cooke, Anna Esselment, Robert Park
Associate Deans, Undergrad (and related)	Individual consultations with Brendon Larson, Monica Barra, Laura Deakin, Leeann Ferries, Benoit Charbonneau, Peter Wood, Dan Davison
Associate Deans, Grad	Individual consultations with Peter Deadman, Martin Ross, Bertrand Guenin, Brian Laird, Siva Sivothaman
Associate Deans, Computing	Group consultation with UCIST subgroup: Stefan Idziak, Marek Stastna, Robert Park, Fred Zhu
AFIWs	Individual consultations with Kristiina Monteiro (Renison), Carol Anne MacGregor (St. Jerome's)
Senior Leadership	
AVP International	Individual consultation with Ian Rowlands
AVP Academic	Individual consultation with David De Vidi
AVP Graduate Studies and Postdoctoral Affairs	Individual consultation with Jeff Casello
AVP Innovation	Individual consultation with Sanjeev Gill
AVP Cooperative and Experiential Education	Individual consultation with Norah McRae
Special Advisor to the Provost, WatSEE	Individual consultation with Marlee Spafford

Chief Information Officer	Individual consultation with Bruce Campbell
Registrar	Small group consultation with Cathy Newell-Kelly and Jennifer Coghlin

Secondary Data from Previous Surveys

Instructor Survey Data

- Spring 2021 Held With Survey Instructor Qualitative Analysis
- Winter 2021 Instructor Survey
- Faculty of ENG Instructor Software Needs Online Teaching Survey Results

Student Survey Data

- Spring 2020
- Winter 2021
- WUSA Fall 2020 FINAL Teaching and Course Quality Survey Report
- WUSA flexible_remote_options winter_2022

Appendix C: Environmental Scan

A number of U15 and Ontario universities have or are working towards some variation of a “digital learning strategy,” but what that looks like varies significantly by institution. The following table summarizes the results of an environmental scan, indicating which schools have or are in the process of developing a strategy, broadly noting the type of strategy, and identifying the primary role or office that appears to have initiated the development of a strategy. This scan is limited to the information that was available online for each institution and therefore may contain inaccuracies.

Strategies were broadly categorized as addressing:

1. **Virtual learning** – a focus on development of virtual learning resources (e.g., online courses, open educational resources, guidelines). Ontario universities developing their virtual learning capacity received specific funding from e-Campus Ontario.
2. **Digital teaching and learning** – a focus on development of digital capacity supporting teaching and learning, touching on campus administration and infrastructure where relevant
3. **Digital campus** – focus on digital infrastructure (often led by campus IT team)

U15 Universities	Status	Type of Strategy	Initiated by	Methods
U Alberta	Yes (2013)	Digital teaching and learning	President	SWOT analysis
U British Columbia	In progress	Digital teaching and learning	Provost and Vice-President, Academic	Consultations
U Calgary	In progress	Virtual learning	Institute for Teaching & Learning	n/a
Dalhousie U	Yes (2021)	Digital campus	Provost and Vice-President, Academic	Consultations
U Laval	No		n/a	n/a
U Manitoba	No		n/a	n/a
McGill U	Yes (2020)	Digital campus	IT unit	n/a
McMaster U	In progress	Teaching & learning strategy	Provost and Vice-President, Academic	Consultations
U Montréal	No		n/a	n/a
U Ottawa	In progress	Digital campus	Information Technology unit	Consultations
Queen's U	Yes (2018)	Digital campus	Unclear	Environmental scan Consultations
U Saskatchewan	Yes (2018)	Digital teaching and learning	Learning Technologies unit	n/a
U Toronto	In progress	Digital teaching and learning	Digital Learning Innovation unit	n/a
Western U	Yes (2020)	Virtual learning	Provost	Environmental scan
Ontario Universities				
Brock U	In progress	Virtual learning	n/a	n/a
Carleton U	In Progress	Digital campus	Information Systems Executive Committee	Consultations
Lakehead U	In progress	Virtual learning	Associate Vice-Provost, Academic	n/a

Laurentian U	In progress	Virtual learning	n/a	n/a
Nipissing U	In progress	Virtual learning	n/a	n/a
OCAD U	Yes (2018)	Digital teaching and learning	Technology Enabled Learning Committee	Consultations
Ontario Tech U (UOIT)	Yes	Digital teaching and learning	Office of Learning and Innovation	Strategic Plan
Toronto Metropolitan U	Yes (2017)	Virtual learning	Provost	n/a
Trent U	In progress	Virtual learning	Trent Online	n/a
U Guelph	In Progress	Digital teaching and learning	IT	Consultations
U Windsor	In progress	Virtual learning	Office of Open Learning	n/a
Wilfrid Laurier U	Yes (2019)	Digital teaching and learning	VP, Research and VP, Finance & Admin	Consultations
York U	In Progress	Digital campus	AVP, Teaching & Learning and IT	Strategic Plan

Appendix D: Overview table (to be completed as part of a workplan)

IP – in progress / SR – short range / MR medium-range / LR long-range

	Recommendation	Related recommendations	Responsibility	Time frame			
				IP	SR	MR	LR
STRATEGIC DIRECTION 1: The University should be intentional and evidence-based about the design and application of digital learning across curricula and programs.	a. Faculties should incorporate digital learning into their Strategic Plans in a manner that reflects the Digital Learning Strategy recommendations.	1b, 1c, 1d					
	b. Program-level planning decisions should support flexible pathways for students and consider how to employ digital strategies appropriately to enhance flexibility.	2a, 2b					
	c. Curriculum committees should review programs and map course modalities to optimize the student experience and progression through the program (e.g., the balance of online, blended and in-person offerings; the ideal fit of modes of delivery to courses) and periodically revisit this through the curricular review process. Course delivery modes should be determined by this plan and remain consistent, visible to students, and predictable from term to term, year to year.	1a, 2c, 4a					
	d. The University should consider how digital competencies can be reflected in institutional degree-level expectations, and these in turn would	1a, 1c, 7b					

	be reflected in program-level learning outcomes.						
	e. Curricular design support for Faculties should be expanded as necessary.	1e					
STRATEGIC DIRECTION 2: Develop and provide students with flexible pathways through curricula.	a. Continue to develop blended and online courses to intentionally develop flexible pathways.	1b					
	b. Make flexible pathways consistently available and easily identifiable to students.	1b					
	c. Create course and scheduling options that allow for more flexibility, such as decreased in-person contact time, and alternate course structures beyond the traditional 0.5 credit weight course (e.g., block courses, non-standard credit-weight courses).	1c, 3c, 7a					
	d. Implement a system of open enrolment that allows non-degree learners to enroll in selected courses (e.g., those without or with few prerequisites, likely to be of general interest, that can perhaps be bundled into a credential or that serve as an alternative pathway to admission), providing expanded opportunity for access, especially to fully online courses.						

STRATEGIC DIRECTION 3: Learner-centredness and student success should guide the application of digital learning.	a. Inform the application of digital learning with evidence, research and established best practices. Strategies should focus on promoting active learning and other high impact practices, achievement of institutional goals (e.g., retention, access, and engagement), and achieving key learner competencies (e.g., as articulated in WatSEE and the Future Ready Talent Framework).	1b, 1d					
	b. Continue to develop self-efficacy and a digital learning culture among students, including best practices for time management, collaboration, interaction, academic integrity, and respectful and ethical behaviour in digital environments. This should be done at the institutional and Faculty level, including programs and academic support units.	2a					
	c. Continue to encourage and support the increased use of evidenced-based blended and flipped modes of learning, supported through the Blended Learning Initiative and other projects, with the goal of utilizing in person time more effectively and increasing active learning in the classroom.	2c					
	d. Ensure students have access to the academic and non-academic supports, training, learning tools and technologies required for their success	1a					

	as digitally enabled learning becomes more ubiquitous (e.g., institutional site licenses for core educational software, remote access to labs and specialized technology; spaces on campus that allow students to participate in virtual classes or access virtual supports while on campus; remote access to mental health and student success supports).						
	e. Develop institutionally supported digital communities that provide opportunities for students to safely communicate and connect locally and globally for learning and communication, and to enhance and expand the on-campus experience.	7c, 3e					
STRATEGIC DIRECTION 4: Ensure a consistently high quality of learning experience across the institution regardless of the mode of delivery.	a. Define official digital modalities offered at Waterloo (on-campus, blended, and online; synchronous and asynchronous) and communicate information regarding each mode and related learner expectations (e.g., in-person and online time commitments) to students via scheduling and course selection information.	1c					
	b. Establish University-level principles and guidelines to ensure that baseline requirements for digital learning are met and that Waterloo students have consistent, high quality digital learning experiences.						
	c. Provide support for all modes of digital learning design, from individual						

	digital assets to full online courses, by expanding access to appropriate services.						
	d. Ensure that academic support units (ASUs) involved in student learning are themselves supported in delivering digital services to students.	1e					
STRATEGIC DIRECTION 5: Implement a model of digital learning that is sustainable, efficient, and effective.	a. The University should establish a standing committee on digital learning, with representatives from each Faculty, staff, and students.		University				
	b. The University should review intellectual property policy (Policy 73) with regard to teaching materials, with the goal of making digital assets created in the course of one's employment consistently available for reuse within the institution (e.g., for use in core course, large multi-section courses, or courses serving several programs or Faculties).		University				
	c. The EDTECH governance structure should ensure that the appropriate processes and technology are in place to support the creation, sharing, and life cycle management of digital teaching and learning assets, including a platform that facilitates the sharing and reuse of digital course assets within the University of Waterloo.	6a, 6c	EDTECH Governance				
	d. The University should incentivize the development of digital materials that can be shared within the University of	1e, 6e	University				

	Waterloo community and, when appropriate, more widely as open educational resources (OERs).						
	e. The University should commit to ongoing support for digital learning. This could include funding for students to help co-create digital learning experiences (e.g., online learning assistants during pandemic).	1d	University				
	f. The University should commit to ongoing resourcing in areas such as copyright, accessibility, privacy, security, and digital asset management in ways suited to supporting the important roles each plays in digital teaching and learning.		University				
STRATEGIC DIRECTION 6: Continue to advance an agile, technology-enabled learning ecosystem that supports high-quality digital learning options.	a. The University utilizing three tiers of institutional tools: 1) a suite of centrally supported core systems, 2) Faculty-based purchased and supported tools, and 3) instructor-selected and supported special purpose course tools to help achieve a balance between consistency for students and instructor autonomy.	5c, 6c, 6d					
	b. The new EDTECH governance structure should define a clear, responsive process for the identification, vetting, and implementation of tools, with an ongoing commitment to support current and future central acquisitions. The structure should also assign	5c	EDTECH Governance				

	responsibility and include a mechanism for identifying, researching, and recommending new teaching and learning technologies.						
	c. The University should review its procurement process to ensure that it is suited to the efficient selection of optimal technology within the rapidly shifting EDTECH marketplace.	6a	University				
	d. The University should have a team dedicated to support the development, customization, and integration of in-house EDTECH systems for digital learning. This could involve ASU and Faculty collaboration and pooling of resources.		University				
	e. The selection of future tools, such as the learning management system (LMS), should consider both current and future needs, pedagogic frameworks and strategic directions (e.g., WatSEE, the Future Ready Talent Framework, WatSPEED/lifelong learning).						
	f. The University should commit to ongoing investment in campus infrastructure to support digital learning on campus (e.g., Wi-Fi, flexible teaching and learning spaces) and develop classroom standards and specifications based on room capacity and function to be employed in new builds or retrofits irrespective of space						

	ownership or management to foster a more consistent technological and functional experience.						
STRATEGIC DIRECTION 7: Leverage digital strategies to enhance and expand work-integrated and life-long learning.	a. Employ the credentials framework currently under development to digitally deliver micro-credentials that allow for shorter, stand-alone but stackable credits, which could also be made available to non-student audiences via open enrolment.	2c					
	b. Continue to expand WatSPEED digital lifelong learning offerings to cater to the greater demand for online offerings, as well as accessing new markets and repurposing existing (credit course) digital assets where appropriate.	1d					
	c. Develop digital learning resources and co-curricular opportunities that support career readiness, particularly for graduate students.	3e					
	d. Develop a student dashboard that tracks all for-credit and experiential learning, e.g., the Future Ready Talent Framework competencies that occur in co-op work placements.	1e, 10d					
	e. Implement a digital wallet to authenticate digital micro-credentials and competencies.	1d, 8d					
STRATEGIC DIRECTION 8: Identify and support faculty professional and	a. Recognize the time required to develop and integrate digital tools, content, and strategies into teaching		Faculties				

pedagogical development needs for digital teaching and learning.	and factor this into the equitable assignment of duties.						
	b. Develop a certificate in digital teaching and learning for instructors and graduate students.	8d					
	c. Expand each Faculty's Teaching Fellows program to provide capacity, support, and reach for digital initiatives.	7e	Faculties				
	d. Continue the collaboration among key teaching and learning related academic support units through Keep Learning as a means to coordinate and streamline access to resources and support for instructors. Keep Learning should continue to provide guidance and support for overall directions set by University leadership, Teaching Fellows, and related advisory bodies.	8b	Academic Support Units				
STRATEGIC DIRECTION 9: Expand our global reach and reputation using digital strategies.	a. Identify key markets which are underserved in Waterloo's areas of strength; develop and market scalable online programs, including course-based graduate degrees.						
	b. Promote and grow international enrollment of traditional and life-long learners via a strong catalogue of digital offerings.						
	c. Create opportunities for every student to engage in intercultural co-curricular linkages, e.g., via	3e					

	Collaborative Online International Learning (COIL) initiatives						
STRATEGIC DIRECTION 10: Employ digital-enabled approaches to support equity, representation, inclusion, and anti-racism goals and initiatives.	a. All areas of the University should utilize digital learning as an important (but not exclusive) means of supporting Universal Design for Learning (UDL) campus initiatives, recognizing that the availability of digital formats and the flexibility afforded by digital teaching and learning go a long way in supporting UDL goals.		All				
	b. The University should provide centralized support for achieving AODA post-secondary education standards.		University				
	c. The University should promote flexible pathways to underserved, international, and non-traditional students in order to recruit more underrepresented students.	1b, 2a, 2b	University				
	d. The University should develop digital modules in EDI-R that can be embedded in the curriculum or offered as micro-credentials.	7d	University				
	e. Programs should leverage digital formats as a means of introducing indigenous elements into the curriculum, including providing the flexibility to do so, and the University can use online modules as a means promote awareness and action regarding indigenization and reconciliation.		Programs				

	f. Programs should use digital tools to bring more underrepresented voices into the classroom (e.g., guest lecturers, advisors, mentors, etc.)		Programs				
STRATEGIC DIRECTION 11: Lead in teaching and learning that exploits the combined and unique strengths of technology and human interaction..	a. The University should provide structure and support for digital teaching innovation and make fostering digital teaching innovation one of the foci of the Teaching Innovation Incubator.	8c, 8d	University				
	b. The University should ensure that there is ongoing proactive exploration and research into emerging technologies and their potential application in teaching and learning (e.g., AR/VR, AI driven tools).		University				
	c. The University should develop better mechanisms for recognizing and diffusing innovation across the institution (e.g., faculty community of practice, digital learning exemplar website). Evaluation of success should be a required component of any University-supported project.		University				
	d. The University should define institutional objectives and key results (OKRs) as appropriate for the recommendations in this report, including measures of student success and student satisfaction (e.g., from student course perceptions surveys, NSSE results, term surveys).		University				

STRATEGIC DIRECTION 12:	a. Improve sharing of institutional data and establish open data standards.						
Engage in a broader transformation initiative and develop a vision for a fully digitally enabled university that appropriately leverages technology to enhance all university services.	b. Continue and better coordinate communications and data gathering on current and prospective students' needs, preferences, and drivers of success.						