

Faculty and Student Perceptions of Technology-Enhanced Teaching and Learning at Dalhousie University, 2017-2018

Centre for Learning and Teaching
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A final thank you goes out to the hundreds of faculty and student respondents of these surveys.

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq.

We are all Treaty people.

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Introduction

Universities in Canada and across the globe continue to expand their use of technology to facilitate communication, collaboration, efficiency, accessibility, and engagement.

Classrooms on campus host a range of hardware and software that promotes interactivity and evaluation of learning, from computer and projection systems to students' individual handheld devices. Lecture capture supports accessibility by giving students the ability to review content after the class session is over, while faculty use of Student Response System technologies allows them to check students' understanding of concepts presented in class.

Online technologies, such as the Learning Management System, allow faculty to support their face-to-face teaching or to create fully online, at-a-distance learning experiences. The digital world has expanded students' access to learning materials through e-books, Open Educational Resources (OERs), multimedia, online repositories, simulations, and more to allow deep exploration of content.

METHODS

In 2017/2018, Dalhousie University conducted three surveys of faculty, undergraduates, and graduate students to learn about these trends in technology and university teaching and learning in the Dalhousie University context. The surveys sought to determine attitudes, experiences, and use patterns of institutional technologies, technology-enhanced pedagogy, online tools, and teaching/learning environments.

The research instruments were adopted from surveys created by EDUCAUSE Center for Analysis and Research (ECAR) and had sections that addressed:

- device ownership and use
- use of technology and online resources
- tech-enabled teaching and learning (faculty)
- learning environments
- personal computing environment (students)
- technology for research and scholarship (faculty)

Introduction

The student survey, sent to both undergraduate and graduate students, consisted of 59 questions across six sections (see Appendix A).

The undergraduate survey ran from March 8 to March 25, 2018. It was distributed to 16,122 undergraduate students and received 1,688 responses for a response rate of 10.5%.

The graduate student survey ran from March 11, 2018 to March 25, 2018. It was distributed to 3,495 graduate students and received 298 responses for a response rate of 8.5%.

The faculty survey consisted of 53 questions across six sections (see Appendix B).

The survey ran from May 11, 2017 to June 9, 2017 and was distributed to 1294 faculty members. Three-hundred four (304) faculty started the survey, with 283 faculty members completing it, resulting in a response rate of 22%.

Individual survey responses were anonymous.

Absolute counts and descriptive statistics were calculated for each question's responses, while open-ended question responses were coded by hand and grouped into themes. Unless otherwise specified, undergraduate and graduate student responses were merged for analysis.



Results

The results of the survey were separated into two broad sections: **Technology on Campus**, which explores technology-enabled spaces, tools, resources, and support at Dalhousie, and **Teaching and Learning**, which delves into instructional tools, modalities, approaches, and environments as they intersect with technology.

Technology on Campus

This section of the survey explored student and faculty technology use and experiences at Dalhousie. Survey questions included those related to technology-enabled spaces, connectivity and communication, student devices, online tools and resources, and technology support and preparation.

OVERALL EXPERIENCE

When asked to describe their overall technology experience at Dalhousie, students and faculty respond differently (Figure 1). Almost 68% of students say their overall technology experience is *good* or *excellent*,

compared to less than 50% of faculty. Twice as many faculty (31.3%) than students (15.5%) rate their experience as *poor* or *fair*. A chi-square analysis indicated a statistically significant difference between students' and instructors' overall technology experience.

TECHNOLOGY-ENABLED SPACES

Classrooms

Faculty were asked to rate their overall satisfaction with classroom technologies at Dalhousie. Forty-eight percent (48%) of faculty indicated they were *satisfied* or *very satisfied*, while 31% indicated they were *very dissatisfied* or *dissatisfied*.

Satisfaction with specific aspects of classroom technologies were also explored, including the availability of classrooms with multimedia equipment; reliability and ease-of-use of classroom technologies; and the computers and software of instructor podiums. In terms of availability of technology-enabled classrooms and general ease of use of instructor podiums, 52% of faculty indicated they were *satisfied* or *very satisfied*.

Results

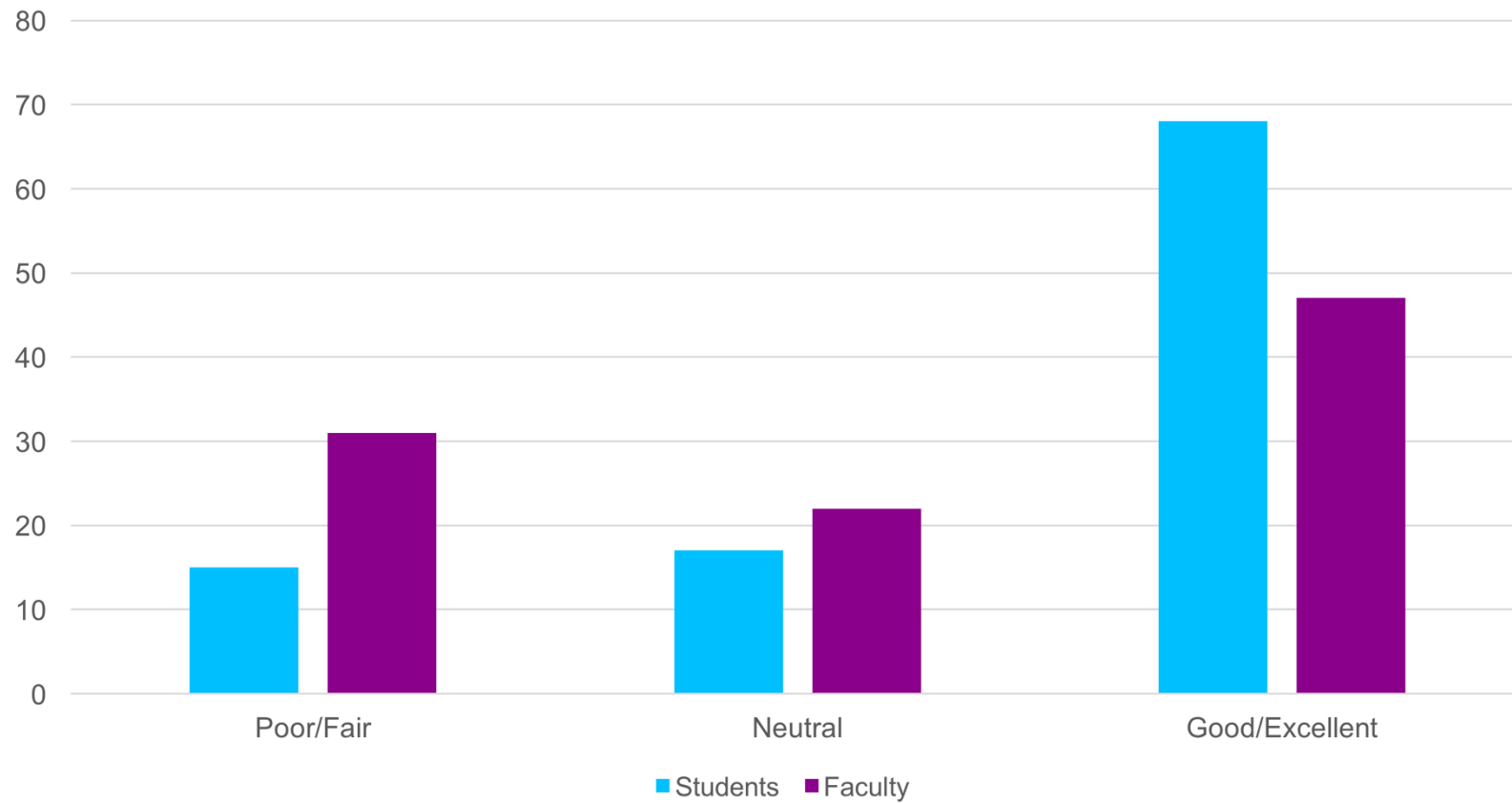


Figure 1. Student and faculty overall technology experience at Dalhousie

Results

Around the reliability of the classroom equipment, 43% of faculty indicated they were *satisfied or very satisfied*, while 34% of faculty expressed they were *very dissatisfied or dissatisfied*.

When asked about the computers and software in the instructor stations, 44% of faculty were *satisfied/very satisfied* with the computers, while almost 50% were *satisfied/very satisfied* with the podium software. Even more faculty, nearly 60%, were *satisfied or very satisfied* with the projection capabilities of campus classrooms.

Collaborative Spaces

Faculty were asked to rate their experiences with collaborative spaces, both physical and online, where they could work with students and colleagues. Faculty rated their experiences with online collaborative spaces higher (45% *good/excellent*) than with physical ones (25% *good/excellent*) (Figure 2).

Faculty Space Needs

Faculty were given the opportunity to describe one thing Dalhousie can do with technology-enabled spaces on campus. Responses included the suggestion that the

institution invest in new and better technology infrastructure, hardware, and software. Wireless speeds and capacity were identified by several faculty respondents as needing to be faster and more reliable. Faculty commented that they needed classroom technologies, such as computers, clickers, and A/V equipment, to work more consistently and to be standardized across all classrooms.

Larger, better-equipped computer labs to accommodate larger groups of students were mentioned as a need by faculty. Software specified by faculty included a more powerful, campus-wide videoconferencing solution, lecture capture capabilities in more classrooms, and a system for information storage, sharing, and cross-institutional collaboration.

There were many comments about adopting a campus technology (e.g., student response systems/clickers, Learning Management System/Brightspace, etc.) and then “sticking with it” rather than changing. Faculty noted frustration around time lost with having to learn new systems.

Results

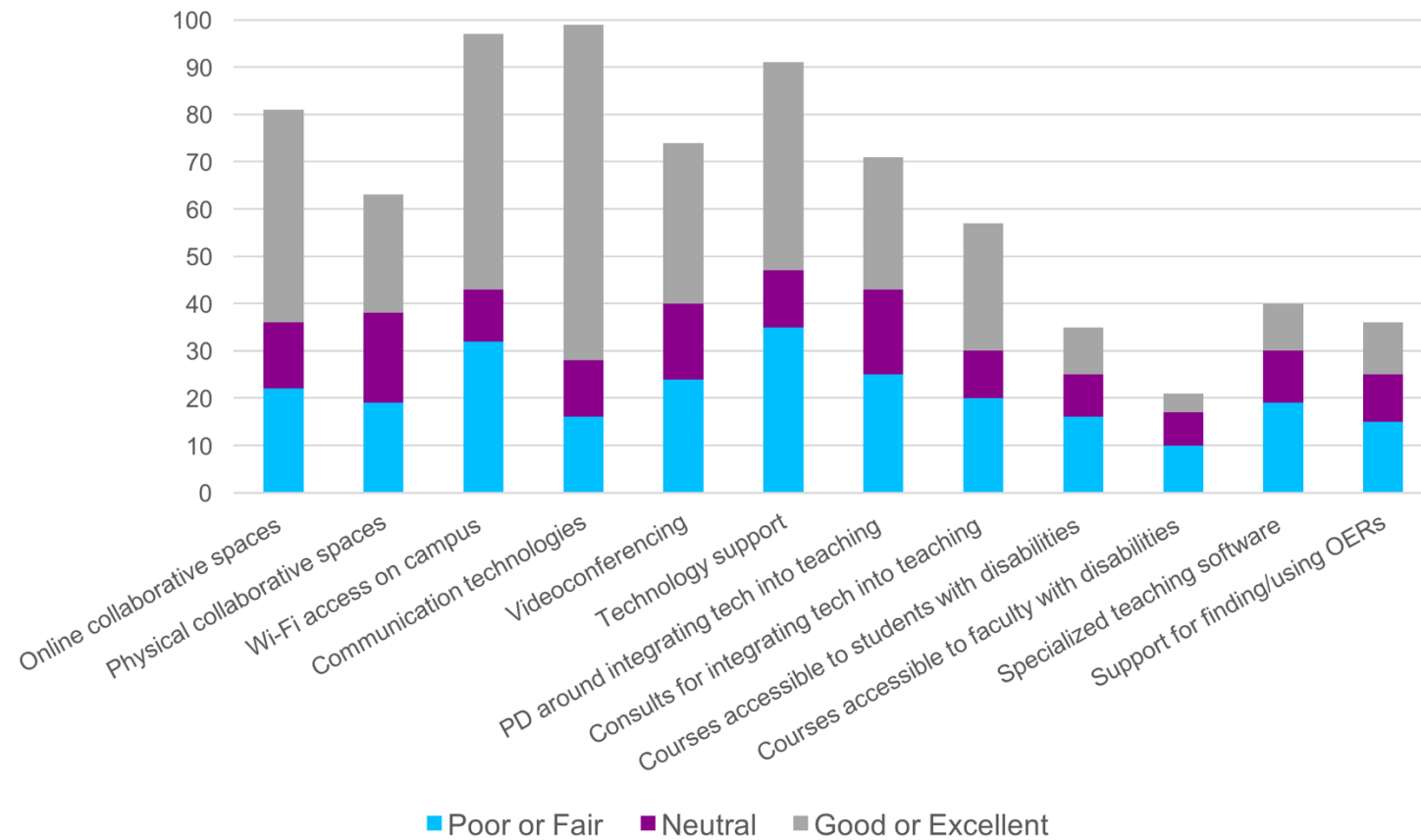


Figure 2. Faculty rating of technology-enhanced tools and services

Results

CONNECTIVITY AND COMMUNICATION

Students overall had a positive experience with the Wi-Fi system at Dalhousie. Seventy percent of students indicated Wi-Fi access in the libraries was *good* or *excellent*, while 61% indicated *good/excellent* Wi-Fi service in classrooms and other instructional spaces. The majority of students had *good* or *excellent* experiences with network performance (speed, no interruptions) and the process of logging into Wi-Fi.

From the faculty perspective, more than half (54%) of the respondents rated reliability of Wi-Fi access across campus as *good/excellent*, while 33% rated it as *poor/fair*. Email as a communication technology and videoconferencing were rated *good/excellent* by 71% and 34% of faculty, respectively.

STUDENT DEVICES

Mobile Devices

For students who indicated they owned a tablet and/or smartphone, 44% felt their device is *very important* or *extremely important* for non-course campus activities,

such as accessing library resources, registering for courses, making tuition/fee payments, and tracking financial aid. A higher percent (60%) felt their mobile devices were *very important* or *extremely important* for course activities (e.g., communicating with classmates or instructors, looking up course-related information, etc.).

Engaging in non-course and course-related activities via tablet and/or smartphone were, overall, more important to the undergraduate respondents than to graduate students.

Student Technology for Academic Work

Students were asked the extent that students used their desktop and laptop computers, tablets, and smartphones for academic work and the importance of those devices to their academic success.

Analysis revealed that in the past year, only 16% of students used a desktop for academic work, while 94% of students used their laptop computers for *most* or *all* of their courses. Ninety-seven percent of students rated their laptops as *very* or *extremely important* for their videoconferencing academic success.

Results

Tablets and smartphones had different levels of usage and importance too. Over 72% of students said they did not use a tablet for university at all in the past year. Smartphone usage was mixed with 22% of students reporting they did not use their phone at all, while at the other extreme, 26% of students indicated they used their smartphone for *all* of their courses.

ONLINE TOOLS AND RESOURCES

When students and faculty were both asked about the usefulness of a variety of online tools, such as guidance about courses to take, early-alert systems, or tools that suggest how to improve performance, most students and faculty indicated that these tools were *not available* or they *did not use* them.

For students who did use early-alert systems designed to catch potential academic trouble as soon as possible, 42% said the tools were *very* or *extremely* useful. For respondents who indicated they use tools that offer suggestions about new or different academic resources (e.g., tutoring, skills-building opportunities) or guidance about courses students might consider taking in the

future, around 40% of students and faculty found these tools to be *moderately* useful.

97%



students believe laptops are **very** or **extremely** important for their academic success

Figure 3. Importance of laptops to students' academic success

TECHNOLOGY SUPPORT AND PREPARATION

Students' Preparation

In the analysis of responses around student and faculty perception of students' technology preparation, results indicate that one-third of students believe they are prepared to use *institutionally specific technology*, such as the course registration system, Brightspace, library search tools, etc., whereas 58% of faculty believe their students are prepared in these technologies. In a similar

Results

set of questions, over 75% of students said they are prepared to use *basic software* (e.g., Microsoft Office), while 73% of faculty their students are skilled in using standard software applications.

Student Tech Support

When faculty were asked whether they feel students look to them or their TAs for technology support to fulfill course requirements, 43% of faculty feel this is the case. Students, on the other hand, report they typically receive technology support or assistance for school-related activities by searching the Internet for answers, asking their friends, or figuring it out on their own. Only a small percentage of students indicated they seek help from instructors (13.8%) or teaching assistants (7.5%).

Faculty Tech and Pedagogy Support

Faculty were asked where they turn for technology support or assistance for work-related activities (Figure 5), choosing up to three options from the list of available sources. Most faculty either figure out the technology on their own or turn to the Internet (e.g., Google search, YouTube tutorials, etc.) for support.

Twenty-one percent (21%) of the respondents indicated seeking help through University help desk services, while 20% asked their peers and colleagues.

Faculty experience around professional development and individual consultations for using technology in teaching was mixed. Of the faculty who responded to the questions, nearly one-third of faculty rated their experience as *good/excellent*, although some had not sought individualized support (39%) or professional development (25%) in the past year (Figure 4).



Figure 4. Faculty experience with PD/consultation around integrating technology into teaching

Results

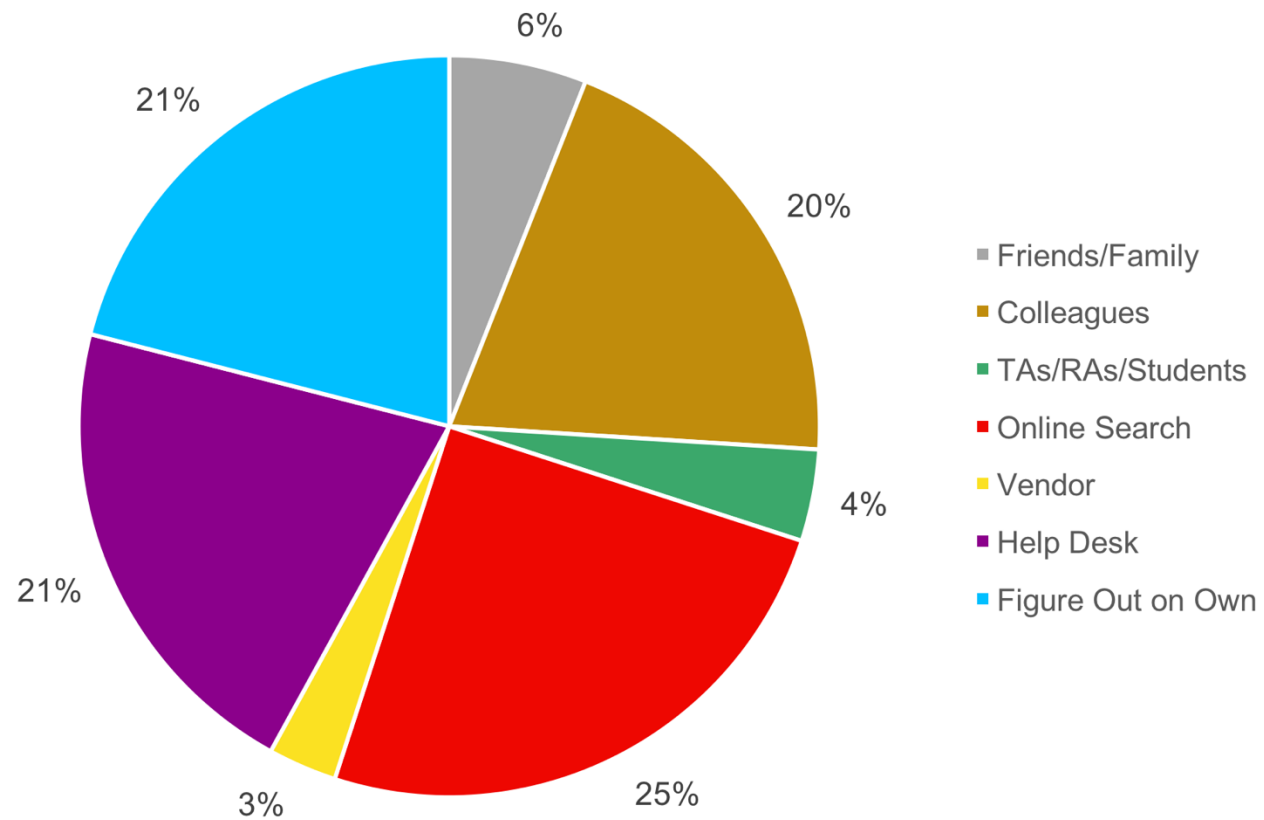


Figure 5. Faculty sources of technology support

Results

Faculty Support Needs

In an open-ended question, faculty suggested that training and professional development around technology would facilitate and support their teaching role.

Faculty specified wanting more opportunities for professional development, individual consultations, and workshops on the available learning technologies (especially newly adopted ones) and specifically in the area of online course development.

Many responses focused on needing more timely and effective IT help resources (ideally having dedicated department-level IT support personnel), including just-in-time classroom support when technologies fail, as well as written how-to tutorials.

Several faculty respondents noted that they have trouble finding information on where to go for help, and suggested all training and support options be available in one central page on the Dalhousie website.



Teaching and Learning

This section of the survey explored learning and teaching on the part of students and faculty. Topics included technology integration, technology-enhanced teaching and learning tools and resources, student device use for learning, awareness and support of adaptive technologies, instructional approaches, and both face-to-face and online learning environments.

INSTRUCTIONAL APPROACHES

Faculty were asked their opinion on a variety of instructional approaches, including competency-based education, badges/digital credentials, online degree programs, gamification, and open educational resources (OER). Results are shown in Figure 6. Faculty are supportive of competency-based education (68.7% *generally or completely supportive*), as well as open content (53.3% *generally/completely supportive*), such as course materials, texts, data sets, etc. Overall, 33% of faculty indicated they were *generally/completely supportive* of online degree programs, while 41% of

Results

faculty are *completely* to *generally opposed*. When asked about gamification or badging/digital credentials, more faculty (27% and 29%, respectively) indicated that they *did not know* the place of these instructional approaches in higher education.

TECHNOLOGY INTEGRATION

Students were asked to think about their experiences in the past year and how many of their instructors integrated technology into their classroom practices. Seventy-five percent (75%) of students reported that most to all of their instructors use technology adequately for course instruction, including 68% reporting using technology during class to make connections to the learning material and 58% reporting its use to engage students in the learning process. However, just over half of the students said *none* to *very few* of their instructors encourage technology use for creative or critical-thinking tasks and online collaboration outside of class.

Just over half of students indicated they *get more actively involved* in courses that use technology. At the same time, 45% of students *agreed/strongly agreed* that they

are more likely to skip face-to-face classes when lectures are made available online.

Faculty were asked to select up to three factors that would motivate them to integrate more or better technology into their teaching practices. Out of a possible 14 factors, most faculty chose “clear evidence that students would benefit”, “release time to design my courses”, and “direct assistance from an instructional design expert.” Faculty indicated that having confidence that the technology will work the way they plan and being assigned a classroom that matches their education technology needs would also be motivating factors to integrate more technology into their teaching.

TEACHING/LEARNING TOOLS & RESOURCES

Students and faculty were both asked to respond to questions on a five-point scale about a specific set of technologies and learning resources, which included items like simulations, in-class polling (i.e., clickers), Brightspace, e-books, and social media.

Results

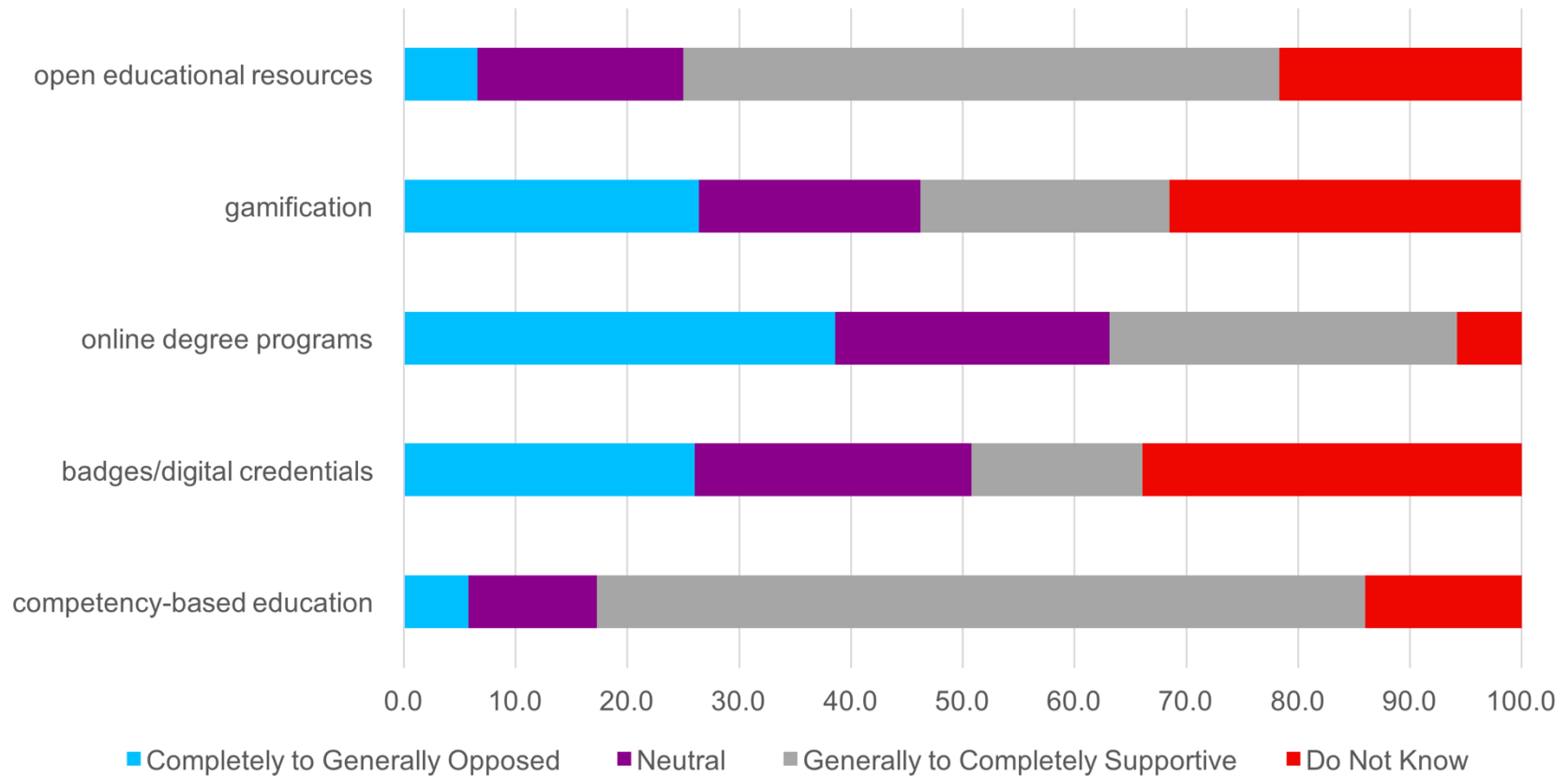


Figure 6. Faculty perceptions of technology-enabled instructional approaches

Results

Students were asked whether they wished their instructors used the specific technology or learning resource less, the same amount, or more; faculty were asked a parallel set of questions: “I could be a more effective instructor if I were better skilled at integrating [technology or learning resource] into my courses.” Analyses were done to see how student and faculty opinion aligned around the use of these technologies and learning resources in the classroom.

Sixty percent (60%) of students said they wished instructors used Brightspace more, and the same percentage of faculty thought they would be more effective instructors if they knew how to better integrate Brightspace into their teaching.

The responses around the use of ePortfolios was the same for students and faculty. Both groups took a neutral position: students do not need instructors to use ePortfolios any less or any more than they already are, and faculty do not think they would be any less or more effective at teaching by knowing how to integrate this learning tools into their instruction.

Nearly 70% of students wished their instructors used free, web-based content to supplement course-related materials (e.g., Khan Academy, iTunes U, YouTube, etc.) more, although only 51% of faculty *agreed or strongly agreed* that they could be more effective if they were better skilled at integrating this type of content. Fifty-two percent (52%) of students would like their instructors to use more e-books/e-textbooks.

A similar split was indicated around the use of lecture capture to record lecture for later use or review: nearly 75% of students want their instructors to use it *more*, while only 48% of faculty *agree/strongly agree* that integrating lecture capture will improve their teaching effectiveness.

In terms of using social media, faculty were split with about 40% *disagreeing* and 35% *agreeing* that being better skilled at integrating social media in the classroom would make them more effective instructors. Only 28% of students wished their instructors used social media more as a tool for teaching and learning.

Results

For the technology-based learning resources such as online collaboration tools, simulations/educational games, video resources, search tools, online publisher resources, and in-class polling tools (clickers), the majority of students and faculty had a positive response. Most students wanted faculty to incorporate these tools into face-to-face classroom teaching more and most faculty felt that being better skilled at integrating these resources would allow them to teach more effectively.

Just over half of faculty had not used specialized teaching software nor sought support for finding and using OERs in the past year, but for those who did, more rated their experiences as *poor/fair* than *neutral* or *good/excellent* (Figure 2).

STUDENT DEVICE USE FOR LEARNING

When asked whether faculty encourage them to use their own technology devices during class to deepen learning, one-third of students indicated that *none* to *very few* instructors do so. The rate was nearly 50% when asked specifically about tablets or smartphone usage. One-quarter of students, both undergraduate and graduate,

indicated *almost all* or *all* of their instructors have them use laptops as a learning tool during class time, although this was almost equal to the number that indicated *none* or *very few* of their instructors ask students to use laptops.

Students were also asked to comment on whether use of mobile devices in the classroom were distracting for them, other students, or their instructors.

Around 50% of students *agree* or *strongly agree* that mobile devices are distracting for them and other students. A higher percentage of students (56%) agreed/strongly agreed that mobile device use in the classroom was distracting for instructors.

ADAPTIVE TECHNOLOGIES

For students who identified as having one or more physical and/or learning disabilities, 56% rated the institution's *awareness* of their needs for accessible or adaptive technologies needed for your coursework as *non-existent*, *poor*, or *fair*, while one-third said it was *good/excellent*.

Results

In terms of the institution's *support* for the accessibility or adaptive technologies needed, 53% of students said support was *poor/fair/not provided*, while 34% rated the support as *good or excellent*.

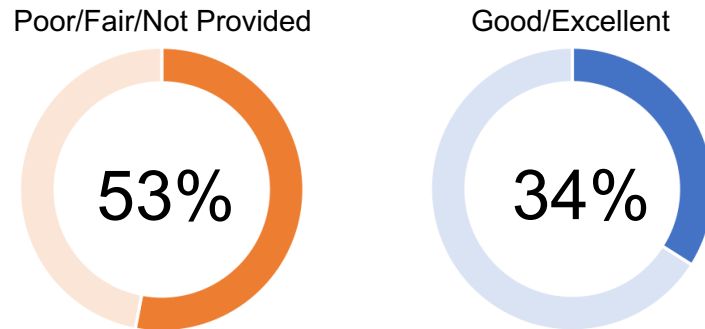


Figure 7. Support for Students' Needed Adaptive Technologies

Although many faculty members had not sought support in the past year for making courses accessible for students (59%) or instructors (72%) with disabilities, almost half of faculty who rated their experience indicated them as *poor* or *fair* (Figure 7). Most faculty respondents to these questions teach courses that are completely to mostly face-to-face, although about 10% of faculty who

rated their experience as *poor/fair* teach mostly to completely online.

LEARNING ENVIRONMENTS

Students and faculty were asked to indicate the environment they prefer for learning and teaching, respectively, with only 6% percent of students and faculty indicating they had no preference (Figure 8). While almost 50% of students preferred learning in a course with *some online components*, even more faculty (64%) preferred teaching in this environment. More than twice the percentage of students as faculty (13.2% versus 5.2%) preferred courses that are mostly or completely online, but these were the least preferred overall by both groups.

Faculty who indicated they only had experience teaching in blended or face-to-face contexts were asked to specify the types of activities and assignments they prefer to have students do in a face-to-face learning environment and explain why.

Results

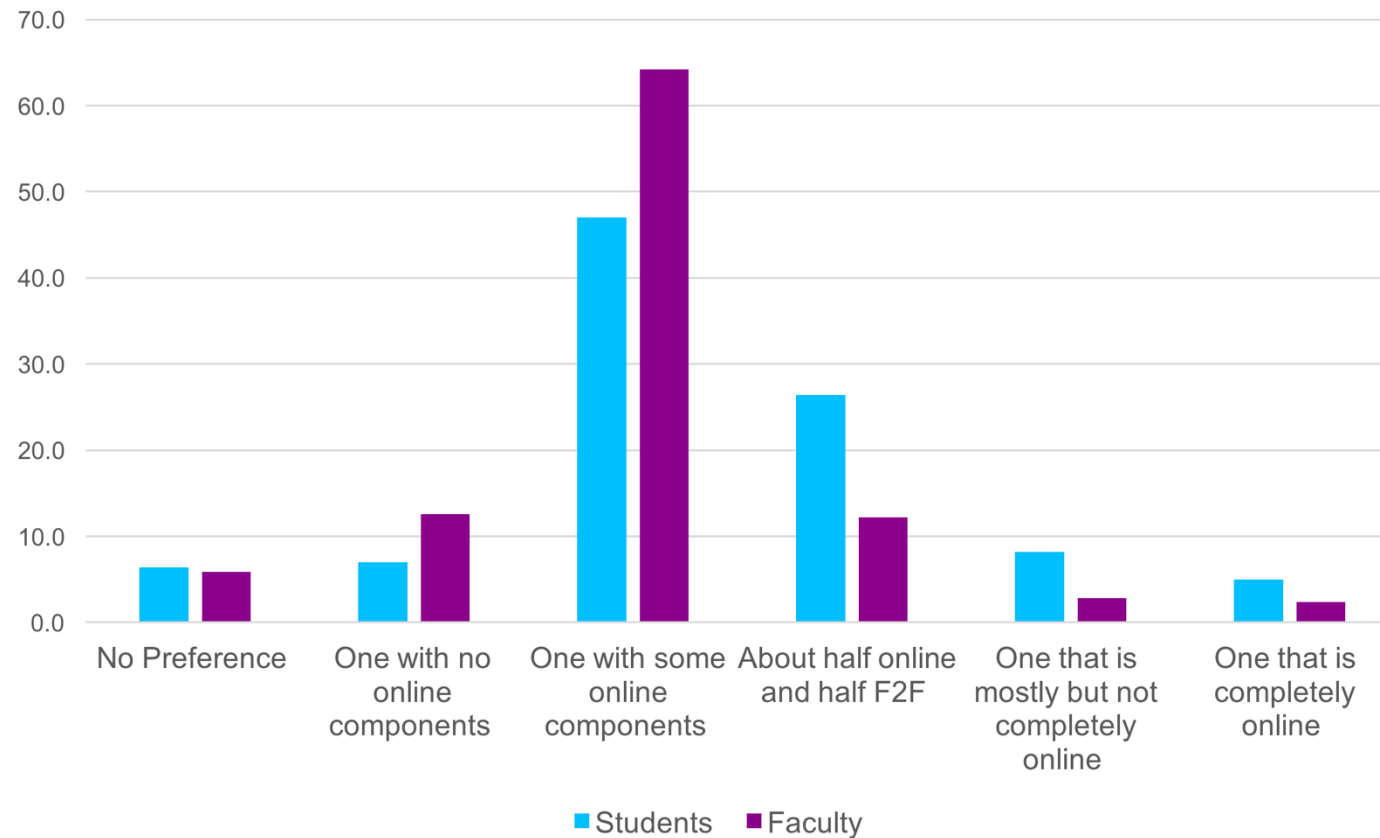


Figure 8. Relative frequencies of student and faculty preference for learning and teaching environments

Results

Faculty respondents specified that hands-on activities, group projects, case analyses, exams, discussions, and lectures as being done best face to face, with the latter two being the “essence of education.” Several faculty members noted that face-to-face instruction facilitates academic integrity, specifically avoiding circumstances where students may be able to cheat on exams. Faculty found in-person teaching more effective and engaging versus parallel activities in online environment (e.g., live lectures versus recorded lectures, hands-on activities versus online simulations, etc.).

Overall, in response to this question, faculty cited activities and assignments that centre on interaction—both between students and their peers, and between students and faculty. Face-to-face instruction was described by faculty as building a sense of community, which is “not as easy to replicate online.” Faculty described student interactions in the face-to-face environment as ideal for peer learning in that “students ‘spark’ off each other.” For faculty, being in person allowed them to identify gaps in learning and provide immediate feedback and clarification. They felt they are more easily able to change content delivery

based on students’ body language, facial expressions, and non-verbal cues.

Online Learning and Teaching

Faculty were asked their level of agreement to a variety of statements about online learning, including its pedagogical effectiveness, where it will make higher education more available or affordable for students, and whether it will reduce the number of faculty and teaching positions in higher education. Forty percent (40%) of faculty *agreed/strongly agreed* that online learning helps students learn more effectively (Figure 9). Faculty had mixed feelings (30% *strongly disagree/disagree*, 36% *neutral*, 34% *agree/strongly agree*) on their level of agreement around online learning leading to pedagogical breakthroughs.



Figure 9. Faculty agreement around students’ online learning

Results

Around online learning making higher education more available to students, 72% of faculty *agreed/strongly agreed*, but only 41% *agreed/strongly agreed* that online learning will make higher education more affordable for students. In terms of online learning reducing the numbers of faculty and teaching positions in higher education, 36% of faculty indicated *strongly disagree/disagree*, while 39% indicated they *agreed/strongly agreed* with that statement.

Online Activities and Assignments

Faculty were given the opportunity to openly describe the types of activities and assignments they prefer to have students do online.

Faculty with blended and online teaching experiences described the online learning environment functioning both as a place for students to engage in pre-class work or as a spot to reinforce work done during class time. The flipped classroom model was specifically noted by a number of respondents. Brightspace served to host “pre-class activities so [students] come to class prepared to interact and to apply material.” Faculty noted that having content, quizzes, and discussions online promotes

self-directed learning and encourages students to take responsibility for their own learning, while concurrently adding time efficiency to face-to-face class sessions.

A few faculty members also mentioned the importance of having a synchronous, online technology (e.g., Blackboard Collaborate) available to hold live class sessions for students at a distance, to facilitate group work, and to host review sessions in preparation for in-class exams.

BRIGHTSPACE

Faculty were asked to indicate the ways they use Brightspace. Most faculty indicate they use Brightspace to post a syllabus (80%) or push out information and/or handouts (78%). Just over sixty percent of faculty use Brightspace to give out and/or collect assignments and for its gradebook features. In terms of using Brightspace for teaching a course, 22% of faculty indicate they use Brightspace to teach partially online, while only 10% indicate they use it for teaching a fully online course.

Results

In response to an open-ended prompt about online learning environments, faculty respondents described the LMS (i.e., Brightspace) functioning as a way to distribute course materials, host discussions and online quizzes, for students to submit assignments, and for faculty to keep track of students' progress and grades. Content faculty make available online includes readings, videos, recorded lectures, lecture notes, and assignment descriptions. Supplemental materials placed in Brightspace served to extend learning or give students opportunities for extra practice.

The discussions function of Brightspace was used in a number of ways. Students could use discussion areas to ask questions ahead of class time to be addressed during class. Discussions also serve as a spot for students to work together in groups on collaborative projects or problem-solving exercises. Faculty noted that the asynchronous discussion format gives students "more time to reflect" on their own and peers' responses, and allows "quieter students a chance to make thoughtful contributions."

About one-third of faculty mentioned using Brightspace for multiple-choice quizzes that could be auto-graded, although some noted cheating as a concern.

Brightspace was also used by faculty as a place for students to submit assignments. Faculty use Brightspace to evaluate student submissions and keep track of students' grades, which was noted as especially useful for large classes.

Satisfaction of Brightspace Functions

Students and faculty were asked to indicate their level of satisfaction with using Brightspace for a number of functions, including those around the content, assignments (managing, dropbox, feedback), student progress, and discussions. In terms of using Brightspace for accessing (students) or posting (faculty) course content, just over 70% of students and faculty rated their satisfaction as *satisfied* or *very satisfied*. A chi-square analysis indicated there was no significant difference between student and faculty perceptions of this function of Brightspace.

Results

Students and faculty, overall, indicated they were *satisfied/very satisfied* with using Brightspace for managing assignments (almost 60%), using the dropbox functionality (72% students; 61% faculty), and using Brightspace for assignment feedback (46% students; 39% faculty). However, in terms of using Brightspace to give students feedback on course assignments, 27% of faculty indicated they do not use this function.

For using Brightspace to monitor student progress, 53% students indicated they were *satisfied/very satisfied*, while only 43% faculty indicated such.

One-quarter of faculty and one-third of students indicated *satisfied/very satisfied* with using Brightspace to engage in meaningful discussions students and instructors, respectively. However, 31% of faculty who use Brightspace do not use the discussion features for engaging with students.

Overall Brightspace Satisfaction

Overall, just over half of faculty respondents are *satisfied* or *very satisfied* with Brightspace, while 19% indicated they were *dissatisfied/dissatisfied*. When asked about the

importance of Brightspace to teaching and learning, 56% believe the LMS is critical to their teaching and 49% believe it is a critical tool to enhance student learning.

Instructor-Only Functions of Brightspace

Faculty were asked questions related to satisfaction with instructor functions in Brightspace, including ease of use in general or from a mobile device, integration with third-party content and other institutional systems, transferring content from a previous offering of the same course, and initial and ongoing training.

Almost 50% of faculty were *satisfied* or *very satisfied* with ease of use of Brightspace in general, but the case was reversed around ease of use from a mobile device (50% very *dissatisfied/dissatisfied*).

In terms of integration with other institutional systems (e.g., for populating classes, grading system), faculty opinion was almost equally divided between very *dissatisfied/dissatisfied*, *neutral*, and *satisfied/very satisfied*, although 46% indicated that institutional system integration with Brightspace was “not applicable.”

Results

Forty-six percent (46%) of faculty respondents were *satisfied* or *very satisfied* with the ability to integrate third-party content (e.g., reusable learning objects, materials from publishers) with Brightspace.

Most faculty (67%) expressed they were *satisfied* or *very satisfied* with the function of importing Brightspace content from a previous offering of the same course.

Although 45% (of faculty were *satisfied/very satisfied* with initial use training and 39% *satisfied/very satisfied* with ongoing training and professional development around Brightspace, nearly one-quarter of faculty were *very dissatisfied* or *dissatisfied* with initial and ongoing training.



Summary, Conclusions, and Recommendations

As a result of these findings, a number recommendations have emerged to in the areas of classroom technologies, technology-enhanced pedagogy, student device use in the classroom, online tools and resources, OERs, and online and blended learning.

CLASSROOM TECHNOLOGIES

The overall and classroom technology experiences of faculty hovered just below 50% satisfaction for most factors (overall, reliability, hardware, software).

Responses from faculty around how to improve the overall technology experience at Dalhousie included the suggestions that the institution invest in new and better technology infrastructure, hardware, and software, specifically improving the availability and functionality of videoconferencing and lecture capture. Open-ended responses from faculty called on the institution too to standardize equipment across the classrooms to provide for a more consistent experience.

STUDENT DEVICE USE IN CLASSROOM

Mobile device use, including laptops, were described by students as important for academic activities. However, students also said device use in classrooms can be

distracting to themselves, their classmates, and instructors. Students' use of mobile technologies in the classroom has been shown to increase distractibility and lower academic performance (Dietz & Henrich, 2014; Ravizza, Hambrick, & Fenn, 2014).

Dalhousie faculty can use this information to think about how to incorporate students' laptops in classrooms activities (or at least not discourage/ban their use), while realizing too that not every student may have access to laptop computers and other mobile devices.

ONLINE TOOLS AND RESOURCES

Online advising resources like early alert/warning systems, tools that suggest how to improve performance in a course, and tools that offer guidance about courses to take in the future were used by only half of faculty and only one-quarter to one-third of students. When these tools are available, however, most faculty and student respondents found them *moderately to extremely useful*.

In a survey of North American undergraduate students, online tools designed to promote academic success, such as early-warning systems or tools to suggest how to

Summary, Conclusions, and Recommendations

improve performance, were not used as much or found to be as useful as resources that allowed students to track credits and plan their degrees, or conduct student-related business such as registering for courses, checking grades, or managing finances (Galanek, Gierdowski, & Brooks, 2018).

At Dalhousie, when these resources are available, faculty and students need to learn of their existence and be trained on how to use them, as well as be made aware of the overall role these online tools and resources have in promoting academic success.

TECH INTEGRATION WITH TEACHING

Faculty feel they would be more effective educators if they were able to better incorporate technology-based tools and learning resources into classroom practice, while at the same time, students said that they get more actively involved in courses that use technology.

Faculty indicated a need to see evidence that students will benefit by their efforts to integrate more technology into their teaching. This result mirrored the finding of the larger ECAR faculty study (Pomerantz & Brooks, 2017)

where “clear indication/evidence that students would benefit” was the top, motivating factor for faculty to integrate technology into their pedagogical practice.

OPEN EDUCATIONAL RESOURCES

Students want faculty to use more Open Educational Resources (OERs), possibly due, in part, to the rising costs of higher education. In the 2017 ECAR survey of undergraduate students (Brooks & Pomerantz, 2017), OERs, along with early-warning systems, e-texts, and more, are explained as technologies that “give something” (p. 25) to students, such access to information and resources, which have clear connections to their academic lives.

Donovan, et al. (2018) report that just over half of post-secondary institutions in Canada and almost 40% of institutions in Atlantic Canada are currently using open textbooks. At Dalhousie, although faculty are supportive of the use of free, online content, they are calling for more training in best practices around these technology-enhanced tools and resources.

Summary, Conclusions, and Recommendations

In addition to training faculty on OER adoption, strategies for promoting OER use could include building active collaborations between academic librarians and faculty (Davis, Cochran, Fagerheim, & Thoms, 2016) and providing financial compensation to faculty for OER adoption (Crozier, 2018).

ONLINE & BLENDED LEARNING

Both students and faculty see the pedagogical value of using Brightspace, but overall prefer courses that blend face-to-face and online learning. At the extremes—courses that are completely face-to-face or completely online—faculty preference leans more toward face-to-face instruction, while students have a tendency to be more open to online learning (Figure 8).

These results align to previous surveys at Dalhousie where 65% of faculty preferred teaching and 69% of students preferred learning in a blended environment (Sehatzadeh & Le-May Sheffield, 2014a; 2014b). At the same time, the number of faculty preferring instruction that is complete face-to-face dropped from 31% in 2013 (Sehatzadeh & Le-May Sheffield, 2014a) to 13% in 2017. The percentage of students that prefer learning in an

environment that is completely online remained the same at 5% between 2013 and 2017, although fewer students prefer courses that are completely face-to-face, with a drop from 26% to 7% (Sehatzadeh & Le-May Sheffield, 2014b).

Although most faculty believe online learning makes higher education more available to students, there is a resistance to online degree programs, with nearly 40% of faculty being completely to generally opposed. This, however, is a drop from 2013 when 62% of faculty respondents disagreed/strongly disagreed that their department/faculty should offer more online degree programs (Sehatzadeh & Le-May Sheffield, 2014a).

In Atlantic Canada, post-secondary institutions reported that the two biggest barriers to moving to online teaching included the additional effort required of faculty and the lack of knowledge on the part of faculty on how to design and deliver online courses (Donovan, et al., 2018). Faculty at Dalhousie are able to specify activities they prefer to host online, although overall these activities are to support their in-person teaching and extend opportunities to face-to-face students. This “flipping” of

Summary, Conclusions, and Recommendations

the classroom mirrors the way faculty use Brightspace as well, primarily as a way to host content, rather than for its interactive features.

Workshops with specific emphasis on using online discussions to connect with face-to-face students outside of class time and instructor presence in fully online courses may help address faculty resistance to online learning. Many faculty members had not accessed training or individual consultations around pedagogical best practices for integrating technology into their teaching but saw the value in professional development in these areas.



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Appendices

Appendix A – Dalhousie University Student Survey 2018

Questions from 2018 student survey included:

1. What is your age?
2. Which of the following best describes your class standing during the current academic year?
3. How many Internet-capable devices do you own?
4. Do you own any of these devices?
 - a. Desktop
 - b. Laptop
 - c. Tablet
 - d. Smartphone
5. What type of operating system (OS) does your desktop have?
6. What type of operating system (OS) does your laptop have?
7. What type of tablet do you have?
8. What type of smartphone do you have?
9. In the past year, to what extent have you used each device for your academic work?
 - a. Desktop
 - b. Laptop
 - c. Tablet
 - d. Smartphone
10. How important is each device to your academic success?
 - a. Desktop
 - b. Laptop
 - c. Tablet
 - d. Smartphone

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11. How important is it that you are able to do the following activities from a handheld mobile device?
 - a. Course activities
 - b. Non-course activities
12. Thinking about the past year, please rate your institution's support of the following activities you've performed or experienced on a handheld mobile device.
 - a. Accessing library resources
 - b. Checking grades
 - c. Accessing course content
 - d. Using Brightspace
 - e. Registering for courses
 - f. Reviewing transcript
 - g. Making tuition/fee payments
 - h. Tracking financial aid
 - i. Accessing information about events, student activities, and clubs/organizations
 - j. Providing identification to access campus facilities or services
 - k. Verifying/recording attendance for class or campus activities
 - l. Using e-texts
 - m. Communicating with other students about class-related matters outside class sessions
 - n. Communicating with instructors about class-related matters outside class sessions
 - o. Taking notes in class
 - p. Looking up course-related information while in class
 - q. Taking pictures of in-class activities or resources
 - r. Recording your instructors lecture or in-class activities (audio and/or video)
 - s. Answering questions posed in class to generate/tally automatic responses
 - t. Participating in interactive class activities
 - u. Producing content

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13. How would you describe your overall technology experience at your institution?
14. How many devices do you typically connect to wireless networks at the same time when you are on campus?
15. Thinking about the past year, please rate your experiences with wireless networks on campus:
 - a. Reliability of access to Wi-Fi in student housing/dormitories
 - b. Reliability of access to Wi-Fi in campus libraries
 - c. Reliability of access to Wi-Fi in classroom/instructional spaces
 - d. Reliability of access to Wi-Fi in other indoor public spaces
 - e. Reliability of access to Wi-Fi in outdoor spaces
 - f. Ease of login to Wi-Fi network(s) provided by the institution
 - g. Network performance (e.g., high speed, no interruptions)
16. How useful do you find the following online student-success tools provided by your institution?
 - a. Guidance about courses you might consider taking in the future
 - b. Early-alert systems designed to catch potential academic trouble as soon as possible
 - c. Suggestions for how to improve performance in a course
 - d. Suggestions about new or different academic resources
 - e. Degree planning or mapping tools that identify courses needed to complete my degree
 - f. Degree audit tools that show the degree requirements completed
 - g. Online self-service tools for conducting student-related business
 - h. Digital tools that keep a record of services used, advice given, or decisions made
17. Thinking about your university experiences within the past year, how many of your instructors
 - a. use technology adequately for course instruction
 - b. use technology in face-to-face settings to engage you in the learning process
 - c. use technology during class to make connections to the learning material or to enhance learning with additional materials
 - d. encourage you to use your own technology devices during class to deepen learning
 - e. encourage you to use online collaboration tools to communicate/collaborate with the instructor or other students in or

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outside class

- f. encourage you to use technology for creative or critical-thinking tasks
- g. have you use your tablet as a learning tool in class
- h. have you use your smartphone as a learning tool in class
- i. have you use your laptop as a learning tool in class

18. Which resources/tools do you wish your instructors used less or more?

- a. Brightspace
- b. Online collaboration tools to communicate/collaborate
- c. E-portfolios
- d. E-books or e-textbooks
- e. Free, web-based content to supplement course-related materials
- f. Simulations or educational games
- g. Lecture capture (i.e., recording lectures for later use/review)
- h. Student laptops as learning tools for course-related activities
- i. Student tablets as learning tools for course-related activities
- j. Student smartphones as learning tools for course-related activities
- k. Social media as a teaching and learning tool
- l. Software to create videos or multimedia resources as a learning tool for course-related activities
- m. Early-alert systems designed to catch potential academic trouble as soon as possible
- n. Search tools to find references or other information online for class work
- o. Publisher electronic resources
- p. In-class polling tools

19. Please indicate your satisfaction with using Brightspace to perform the following activities:

- a. Accessing course content
- b. Managing your assignments
- c. Checking course progress

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- d. Accessing information about your institution's news, events, or activities
 - e. Submitting course assignments
 - f. Engaging with other students
 - g. Collaborating on projects
 - h. Study groups with other students
 - i. Engaging with your instructors
 - j. Receiving feedback on course assignments
20. Please tell us about your personal devices and online account security practices.
- a. I sometimes let other people use my mobile devices unsupervised.
 - b. In general, I secure access to my computer, tablet, and smartphone with a password or PIN.
 - c. In general, I use a combination of alpha, numeric, and symbol character passwords for my online accounts.
 - d. I have given the password or PIN for my computer, tablet, or smartphone to another person in the past 12 months.
 - e. I have given my password or PIN for an online account to another person in the past 12 months.
 - f. I have let someone log in as me to a college or university service, system, application, or website in the past 12 months.
 - g. I have had a computer, tablet, or smartphone stolen in the past 12 months.
 - h. I have had an online account hacked in the past 12 months.
21. Does your institution provide mandatory or optional information security training?
22. In the past 12 months, have you participated in your institution's information security training?
- a. How useful was the information security training?
 - b. Why do you think your institution's security training was not useful?
23. In what type of learning environment do you most prefer to learn?
24. In what type of learning environment do you think you learn best?
25. In the past 12 months, including the current term, how many for-credit courses have you taken or are you currently taking?
26. In the past 12 months, including the current term, how many for-credit courses have you taken or are you currently taking in each of the following categories?

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27. Which of these would you include on your résumé?

28. To what extent do you agree with the following statements?

- a. I get more actively involved in courses that use technology.
- b. I am more likely to skip face-to-face classes when streamed or recorded lectures are available online.
- c. I am more likely to skip face-to-face classes when materials presented in class are available online.
- d. I am concerned that technology advances may increasingly invade my privacy.
- e. My institution sufficiently prepared me to use institution-specific technology when I started college (e.g., the course registration system, the learning management system, the library search system).
- f. I was well prepared to use basic software programs and applications when I started college (e.g., MS Office, Google Apps, etc.).
- g. Use of mobile devices in face-to-face classes is distracting for me.
- h. Use of mobile devices in face-to-face classes is distracting for other students.
- i. Use of mobile devices in face-to-face classes is distracting for instructors.

29. What is ONE thing you would like your instructors to do with technology to enhance your academic success?

30. What is ONE thing you would like your institution to do with technology to enhance your academic success?

31. When you need technology support or assistance for school-related activities, what do you typically do? Choose up to three items.

- a. Ask your friends
- b. Ask your family
- c. Ask your instructors
- d. Ask teaching assistants
- e. Search Google, YouTube, or another online source
- f. Contact the company or vendor
- g. Use the college/university help desk services
- h. Figure it out on your own

32. Thinking about your future, to what extent do you agree with the following statements?

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- a. Technology will play an important role in my chosen career after college.
 - b. Technology that I use in my courses now will prepare me adequately for my chosen career after college.
33. What types of course activities or assignments do you prefer to do online?
34. What types of course activities or assignments do you prefer to do face-to-face?
35. What is your typical experience with the following devices in face-to-face classes?
- a. Smartphone
 - b. Tablet
 - c. Laptop
36. How have you typically used [smartphone/tablet/laptop] in your face-to-face courses? Select all that apply.
- a. Use to take notes
 - b. Use to engage in non-class activities while in class
 - c. Use to make other connections with the learning material while in class
 - d. Use for instructor- directed in-class activities
 - e. Do not typically use in class
37. Do you have a physical or learning disability that requires accessible or adaptive technologies for your coursework?
- a. How would you rate your institution's awareness of student needs for accessible or adaptive technologies needed for your coursework?
 - b. How would you rate your institution's support for the accessible or adaptive technologies needed for your coursework?
38. To what extent do you agree with the following statements about distractions in the classroom? I get distracted during face-to-face classes because I...
- a. use social media
 - b. text
 - c. read email
 - d. play games on a laptop or mobile device
 - e. access websites not related to class

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39. Demographic questions, including:

- a. Gender identity
- b. Degree sought
- c. Major
- d. Full time or part time student
- e. Ethnic identity
- f. Living situation
- g. Are you the first person in your immediate family to attend college?
- h. Are you eligible for Canada Student Grants Permit (CSGP)?
- i. Technology use in high school

Appendix B – Dalhousie University Faculty Survey 2017

Questions from the 2017 faculty survey included:

- 1. How many years of experience do you have in each of the following positions?
- 2. Do you work with...
 - a. Undergraduate students
 - b. Graduate students
 - c. Professional students
 - d. I don't typically work directly with students.
- 3. I am currently:
 - a. Tenured
 - b. Not tenured, but on a tenure track
 - c. Not on a tenure track (ongoing appointment)
 - d. Not on a tenure track (temporary/fixed-term appointment)

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4. Which of the following best describes your academic rank during the current academic year?
5. Do you personally own—or does your institution provide you with—any of these devices?
 - a. Desktop computer
 - b. Laptop
 - c. Tablet
 - d. Smartphone
6. What type of operating system (OS) does your desktop computer have?
7. What type of operating system (OS) does your laptop have?
8. What type of tablet do you have?
9. What type of smartphone do you have?
10. Rate your experiences with the following resources/services/spaces provided by your institution:
 - a. Classroom-based technology resources
 - b. Laboratory or research-based technology resources
 - c. Online collaborative spaces in which your students or colleagues can work synchronously or asynchronously on projects or assignments
 - d. Physical collaborative spaces
 - e. Access to institutional resources while working from home
 - f. Access to institutional resources while traveling, and/or living in other states or countries
 - g. Ability to get my work done while working from home
 - h. Ability to get my work done while traveling, and/or living in other states or countries
 - i. Reliable access to Wi-Fi networks throughout campus
 - j. Communication technologies (e.g., e-mail, instant messaging, social media, etc.)
 - k. Videoconferencing technologies
 - l. Online or virtual technologies (e.g., network or cloud-based file storage system, web portals, etc.)
 - m. Remote access (as opposed to locally installed) to commercial software applications
 - n. Technology support (e.g., desktop support, classroom technology support, course media production support, etc.)

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- o. Professional development around the integrated use of technology in your teaching, whether face-to-face or online
 - p. Support for making courses accessible to students with disabilities
 - q. Support for making teaching courses accessible to faculty with disabilities
 - r. Professional development and training opportunities around the integrated use of technology in your research
 - s. Individualized consultations for using technology in teaching
 - t. Individualized consultations for using technology in research and scholarship
 - u. Specialized teaching software
 - v. High-performance computing/research computing services (e.g., supercomputers and clusters)
 - w. Access to data scientists, other data analysts, and visualization specialists to help with data analysis, management, and visualization
 - x. Institutional repository of intellectual output
 - y. Digital preservation and curation of research data
 - z. New models for global research collaborations
 - aa. Support for finding and using open content
11. How would you describe your overall technology experience at your institution?
12. Please tell us how much you agree or disagree with the following statements about data/information privacy and security:
- a. I have confidence in my institution's ability to safeguard my personal information.
 - b. I have confidence in my institution's ability to safeguard student information.
 - c. I have confidence in my institution's ability to safeguard my research data.
 - d. In general, I have confidence in my institution's information security practices.
 - e. I understand relevant university policies about data use, storage, and protection.
 - f. My institution's privacy and security policies impede my productivity.
13. Does your institution provide mandatory or optional information security training?
14. In the past 12 months, have you participated in your institution's information security training?
- a. How useful was the information security training?
 - b. How can your institution make information security training more useful?

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15. To what extent do you agree with the following statements about online learning?
 - a. Online learning helps students learn more effectively.
 - b. Online learning will lead to pedagogical breakthroughs.
 - c. Online learning will make higher education available to more students.
 - d. Online learning will make higher education more affordable for students.
 - e. Online learning will reduce the numbers of faculty and teaching positions in higher education.
16. What is ONE thing that your institution can do with technology to better facilitate or support your faculty teaching role?
17. When you need technology support or assistance for work-related activities, what do you typically do? Choose up to three items.
 - a. Ask your friends
 - b. Ask your family
 - c. Ask your peers or colleagues
 - d. Ask teaching or research assistants
 - e. Ask your students
 - f. Search Google, YouTube, or another online source
 - g. Contact the company or vendor
 - h. Use the college/university help desk services
 - i. Figure it out on your own
18. To what extent do you agree with the following statements?
 - a. My students are prepared to use institutionally specific technology (e.g., the course registration system, the LMS, the library search system).
 - b. My students are prepared to use basic software programs and applications (e.g., MS Office, Google Apps, etc.).
 - c. My students look to me or my teaching assistants for technology support to fulfill course requirements.
19. How useful do you find these online services provided by your institution for your teaching and advising?
 - a. Guidance about courses students might consider taking in the future
 - b. Alerts if it appears a student's progress in a course is declining

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- c. Suggestions for how to improve performance in a course if a student's progress is substandard
 - d. Suggestions about new or different academic resources for your students (e.g., tutoring, skills- building opportunities, etc.)
20. I could be a more effective instructor if I were better skilled at integrating this technology into my courses:
- a. Brightspace
 - b. Online collaboration tools to communicate/collaborate
 - c. E-portfolios
 - d. E-books or e-textbooks
 - e. Free, web-based content to supplement course-related materials
 - f. Simulations or educational games
 - g. Lecture capture (i.e., recording lectures for later use/review)
 - h. Students' laptops as a learning tool for course-related activities
 - i. Students' tablets as a learning tool for course-related activities
 - j. Students' smartphones as a learning tool for course- related activities
 - k. Social media as a teaching and learning tool for course-related activities
 - l. Software to create videos or multimedia resources as a learning tool in class or assignments
 - m. Early-alert systems designed to catch potential academic trouble as soon as possible
 - n. Search tools to find references or other information online for class work
 - o. Publisher electronic resources
 - p. In-class polling tools
21. Select up to three factors that would motivate you to integrate more or better technology into your teaching practices or curriculum:
- a. More/better technology-oriented professional development opportunities
 - b. A monetary or other value-oriented incentive
 - c. Tenure decisions and other professional advancement considerations
 - d. Release time to design/redesign my courses

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- e. Direct assistance from an instructional design expert to design/redesign my courses
 - f. Direct assistance from IT staff to support the technology I choose to implement
 - g. Assigning me a classroom that matches my educational technology needs
 - h. Working in a faculty cohort or community that is adopting the same types of practices
 - i. A better understanding of the types of technologies that are relevant to teaching and learning
 - j. A better understanding of how to use student-owned technology during class for teaching and learning
 - k. Confidence that the technology will work the way I plan
 - l. Increased student expectations of technology integration
 - m. Increased institutional expectations of technology integration
 - n. Clear indication/evidence that students would benefit
22. In what type of learning environment do you prefer to teach?
- a. One with no online components
 - b. One with some online components
 - c. About half online and half face-to-face
 - d. One that is mostly but not completely online
 - e. One that is completely online
 - f. No preference
23. In the past 12 months, including the current term, how many for-credit course sections have you taught or are you currently teaching?
24. In the past 12 months, including the current term, how many for-credit course sections have you taught or are you currently teaching in each of the following categories?
- a. No online components, completely face-to-face components
 - b. Some online components, mostly face-to-face components
 - c. About half online and half face-to-face
 - d. Mostly online, some face-to-face components
 - e. Completely online, no face-to-face components

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25. What types of activities or assignments do you prefer to have students do online? Why?
26. What types of activities or assignments do you prefer to have students do face-to-face? Why?
27. Which of the following best represents your opinion of the following instructional approaches in higher education?
 - a. Competency-based education
 - b. Badges or digital credentials
 - c. Online degree programs
 - d. Gamification
 - e. Open educational resources (OER)
28. Rate your satisfaction with the following classroom technologies at your institution:
 - a. Availability of classrooms with multimedia equipment
 - b. Reliability of equipment available
 - c. General ease of use of instructor stations
 - d. Computers in the instructor stations
 - e. Software on the instructor-station computers
 - f. Computer projection
 - g. Audience response systems (clickers)
 - h. Wireless access
29. Rate your overall satisfaction with classroom technologies at your institution:
30. Do you use Brightspace?
31. Please indicate how you use Brightspace. Select all that apply.
 - a. To post a syllabus
 - b. To push out information, such as handouts
 - c. To push out and collect assignments and/or assessments
 - d. To promote interaction outside the classroom by using discussion boards To teach partially online courses
 - e. To teach completely online courses For the gradebook
 - f. For committee work

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32. Please indicate your satisfaction with the following aspects of Brightspace:

- a. Ease of use in general
- b. Ease of use from a mobile device
- c. Engaging in meaningful interactions with students
- d. Initial use training
- e. Ongoing training/professional development
- f. Creating or posting content
- g. Importing content from a previous offering of the same course
- h. Managing assignments
- i. Monitoring or managing enrollments
- j. Entering student progress information
- k. Receiving course assignments reliably
- l. Giving feedback on course assignments
- m. Integrating third-party content
- n. Integration with other institutional systems

33. Please indicate your overall satisfaction with Brightspace:

34. Please indicate your level of agreement with the following statements about Brightspace:

- a. The LMS is critical to my teaching.
- b. The LMS is a critical tool to enhance student learning.

35. What is your typical in-class policy for the [smartphone/tablet/laptop] devices?

- a. Ban students from using it in the classroom
- b. Discourage students from using it in the classroom
- c. About equally discourage and encourage its use in the classroom
- d. Encourage students to use it in the classroom
- e. Require students to use it in the classroom

36. To what extent do you agree with the following statements about your institution's support for your research?

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- a. I receive adequate and appropriate support from IT staff to conduct my research.
 - b. I have access to IT staff with specialized knowledge about research computing in support of my academic discipline.
 - c. I have access to the specialized software/applications I need to conduct my research.
 - d. I have access to the high-performance computing/research-computing services I need to conduct my research. (e.g., supercomputers and clusters).
 - e. I receive adequate support for federally funded IT and cyberinfrastructure resources (e.g., Open Science Grid, XSEDE, iPlant, EarthCube, NCBI, etc.).
 - f. My institution makes electronic laboratory notebooks (ELNs) available to those whose projects require them.
 - g. I receive timely support from IT staff to conduct my research.
 - h. My institution has appropriate procedures in place to ensure that faculty doing research are provided ongoing technology support throughout the promotion and tenure process.
 - i. My institution provides effective technology support for grant-funded projects
 - j. My institution provides adequate technological resources to support cross-institutional research collaborations (e.g., Electronic Laboratory Network, Globus).
 - k. My institution provides adequate technological support for depositing materials in an institutional repository.
 - l. My institution provides adequate technological support for data curation.
 - m. In general, I am satisfied with my institution's technological support for my research needs.
37. What is ONE thing that your institution can do with technology to better facilitate or support your faculty research role?
38. Do you conduct what you consider to be data-intensive research?
39. How much data do you generate per year?
40. To what extent do you agree with the following statements about your institution's support for your data-intensive research?
- a. I have adequate network bandwidth available to conduct my research activities.
 - b. I have adequate data storage for my research initiatives.
 - c. Most of my research data are stored in a cloud-based/virtual environment.
 - d. IT professionals are proactive rather than reactive in responding to my research computing needs.
 - e. The wait time for research computing consultation assistance is satisfactory.

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- f. IT professionals play an integral part in providing research computing services for me/my research team.
- g. I have enough computational resources at my disposal to conduct my research.
- h. My institution provides adequate resources for data backup and data restore in the event of loss or corruption.
- i. I am generally satisfied with the provision of research computing technologies at my institution.

41. Demographic Questions

- a. Gender identity
- b. Age
- c. Faculty/department
- d. Ethnicity



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