An exploration of instructors' and students' perspectives on remote delivery of courses during the COVID-19 pandemic

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Abstract
The world-wide pivot to remote learning due to the exogenous shocks of COVID-19 across educational institutions has presented unique challenges and opportunities. This study documents the lived experiences of instructors and students and recommends emerging pathways for teaching and learning strategies post-pandemic. Seventy-one instructors and 122 students completed online surveys containing closed and open-ended questions. Quantitative and qualitative analyses were conducted, including frequencies, chi-square tests, Welch Two-Samples t-tests, and thematic analyses. The results demonstrated that with effective online tools, remote learning could replicate key components of content delivery, activities, assessments, and virtual proctored exams. However, instructors and students did not want in-person learning to disappear and recommended flexibility by combining learning opportunities in in-person, online, and asynchronous course deliveries according to personal preferences. The paper concludes with future directions and how the findings influenced our planning for Fall 2021 delivery. The video abstract for this article is available at https://www.youtube.com/watch?v=F48KBg_d8AE.

KEYWORDS
flexible learning, instructor experiences, online assessments, remote learning, student experiences
INTRODUCTION

Educational technology and IT experts have long predicted an increase in the use of online tools for teaching and learning (EDUCAUSE, 2020), with previous research even suggesting strictly face-to-face course delivery is becoming outdated (Ally & Blazquez, 2014). However, nobody could have anticipated the acceleration in learning online driven by a global pandemic. This unprecedented situation led to learning institutions across the globe to move courses online, but this was not considered traditional online learning (Bond, 2020; Hodges et al., 2020; Marinoni et al., 2020).

The initial move to online delivery was coined “Emergency Remote Teaching” (ERT), which refers to an unanticipated disruption in a school semester, abrupt suspension of in-person classes, and migrating classes to a remote form of delivery that utilizes teleconferencing apps (like Zoom, Teams, WebEx, Skype) and tools in a Learning Management System (LMS) to facilitate teaching and learning (Ali, 2020; Hodges et al., 2020). There are crucial differences between ERT and online delivery of courses (Hodges et al., 2020). Online courses are purposefully designed to utilize the learning tools in the LMS, creating interactions between student and content, student and student, and student and instructor. ERT involved an ad-hoc migration to finish classes during the Winter semester (starting in January and ending in April 2020 for many Canadian post-secondary institutions) without
specific resources for instructors and students to support their continued teaching and learning. Online courses involve an entire virtual ecosystem that takes an average of six to nine months of planning and development (Hodges et al., 2020). This intentional and time-intensive process was not afforded to post-secondary institutions during the sudden migration to a remote delivery format due to the COVID-19 pandemic. Remote delivery, which is the focus of this study, is the type of teaching and learning that came after ERT. It is heavily influenced by ERT and uses the lessons learned from it to thoughtfully adapt face-to-face courses to online courses.

In this paper, we present a report of instructors’ and students’ experiences of remote delivery courses. We asked ourselves, what were the experiences of instructors and students in learning in remote delivery when they did not actively choose to teach and learn online? And what are the expectations of teaching and learning from instructors and students when we return to campus?

Literature review

Since the onset of the COVID-19 pandemic, research on its influences on teaching and learning has substantially proliferated. We have some insight into the extent of this multiplication of published studies on teaching and learning during the pandemic. Some researchers, such as Ferri et al. (2020), documented experts’ opinions around the world on the influences of the pandemic on teaching and learning through qualitative methods. Bond et al. (2021) mapped the breadth and depth of higher education studies that were published between April and September 2020. Notwithstanding important methodological limitations, such as including only articles written in English, Spanish, or German, the authors identified 256 published journal articles and 26 articles in alternate outlets (pre-prints, reports, conference papers, and theses) on teaching and learning during the first several months of the pandemic. Of these studies, most involved online surveys for data collection and descriptive statistics for analysis. In the present study, we also used online surveys for data collection but with a combination of inferential statistics and qualitative analyses to make sense of respondents’ experiences of remote delivery. Though the present study represents the experiences of respondents from one Canadian post-secondary institution, we expect the results to add to an ever-increasing set of data around the world as post-secondary administrators and educators look ahead to post-pandemic educational environments (see Stewart, 2021, and Anthony Jnr & Noel, 2021, for synthesis of data collected, so far, on the diversity of reactions to ERT).

Use of educational technology in ERT

The migration of courses from face-to-face on-campus delivery to ERT inherently involves the use, if not greater use, of educational technologies for facilitation (eg, teleconferencing) and assessments (eg, discussion boards). Fortunately, some instructors (and students) may have been effectively using educational technologies for teaching (and learning) before the onset of the pandemic. For example, Oliveira et al. (2021) interviewed 20 students and 10 instructors about their experiences of ERT in Portugal and Brazil. Information and communication technologies hitherto used by instructors and students mediated their positive experiences of ERT. Whereas certain disruptions to learning, such as strike action on campuses, can rupture the routine of learning, Oliveira et al. (2021) highlighted the vital role that ERT served for maintaining a stable, regular, routine for instructors and students. However, personal usage in adapting to this new environment led to challenges including keeping
their attention to the virtual class, mental health, and feeling overworked. One of the unique challenges to remote learning specifically and distance education generally is the enhanced need for self-regulation, as Zhou et al. (2021) show. While it is difficult to determine and demonstrate the specific effectiveness of instructional design through delivery platforms such as Zoom, Microsoft Teams, or LMS platforms, the institutional and faculty-level decisions regarding educational technology use can augment or inhibit self-regulation.

Recommendations from ERT to remote delivery

With the lockdowns and social distancing restrictions remaining in place for the Fall 2020, the spring and summer months of 2020 offered an opportunity for deliberate transition of in-person courses to virtual delivery including restructuring content delivery and assessments to what is now understood as “remote delivery”. One recommended change from ERT to remote learning was to rethink streaming all lectures. Hodges and Barbour (2021) encouraged instructors to consider students’ personal situations especially with an ongoing pandemic. Students may not have the resources or access to technology to join synchronously for every class, so instructors should be thoughtful in what content could be delivered asynchronously and what needed to be synchronous. This approach paralleled with flipped learning. Flipped learning was designed to extend learning beyond the physical in-class experience, providing students with videos and other media to review outside of class time (Karabulut-Ilgu et al., 2018). Hao (2016) surveyed 84 undergraduates who engaged in flipped learning for one semester and reported roughly 60% of students saw the benefits of flipped learning. Karabulut-Ilgu et al. (2018) conducted a systematic review of 62 articles, which documented studies on flipped learning that emphasized how it is was a learner-centred approach, by placing the student at the core focus of the pedagogical technique rather than the instructor.

Assessments in ERT

Hodges and Barbour (2021) also examined the effectiveness of different assessment approaches in remote delivery, recommending written assignments, online discussions, and e-portfolios. Presentations can also help to create a sense of community, which is even more important during remote delivery. Regarding tests and academic integrity, Al Shlowiy et al. (2021) found a disconnect between students and faculty on whether online assessments elevated opportunities for academic misconduct, with the latter group expressing significantly more concern. Dendir and Maxwell (2020) explored the prevalence of cheating without online proctoring software and found that without monitored proctoring students’ exams were higher by a full letter grade. However, Paredes et al. (2021) warned of some of the downsides of proctored virtual exams including concerns with privacy and mental health. Hodges and Barbour (2021) suggest that low-stakes assessments and assignments that require personal higher-order thinking are more effective than investing in technology to prevent cheating, which can contribute to a culture of mistrust between instructors and students. Usher et al. (2021) also suggest that the shift to ERT seems to encourage instructors to make more data-driven pedagogical decisions, including the modification of assessment profiles to fit the ERT learning environment.

Context

Our institution, the University of Guelph-Humber https://www.guelphhumber.ca/, is a close-knit mid-sized university with around 5000 students located in Toronto, Canada. It offers
seven full-time four-year degree programs with almost all courses taught by sessional instructors. Each instructor typically teaches 1–2 courses and may teach at other institutions. In March 2020, all courses at the university had one week to move content and assessments online and delivered through ERT. Instructors live-streamed or provided pre-recorded videos for the remaining classes and exams shifted online. In anticipation of the Summer and Fall 2020 semesters, instructors were hired earlier to transform their courses into remote delivery rather than hurriedly convert their courses online. We offered a variety of trainings for remote delivery including faculty orientation sessions, one-on-one consultations, live and pre-recorded webinars, training videos, and documents. Instructors had flexibility in structuring the content delivery and student assessments for their course. This study examines instructors’ and students’ experiences in remote delivery from Summer 2020 to Winter 2021 (inclusive) and what lessons have been learned going forward.

Research questions

In this study, we addressed three questions: (1) What were instructors’ choice of delivery formats and assessments in the remote learning environment? (2) Based on the remote delivery structure created by instructors, what were students’ experiences and preferences in these learning formats (delivery and assessments)? and (3) What are the expectations for teaching and learning when we return to campus? These interrelated questions explore points of convergence or divergence between instructors’ design choices for delivering and assessing course material and students’ experiences of remote course delivery including their self-efficacy to effectively learn educational material.

METHODOLOGY

Instructors who taught remote learning courses and students who took remote learning courses in the 2020–21 academic year (Summer 2020 to Winter 2021) were invited to participate in the study. Instructors who only taught Distance Education and students who were enrolled only in fully online programs were excluded as their teaching and learning experiences did not change during the pandemic.

Data collection

Participants completed a 30-minutes questionnaire on Qualtrics, an online survey tool which allows for logical conditioning to present questions based on participants’ responses to earlier questions. The questionnaire covered the following categories: delivery method, assessment method, and teaching and learning effectiveness. The questionnaire included multiple choice, ranking, and short answer responses (see full list of survey questions located via Open Science Framework data repository https://doi.org/10.17605/OSF.IO/GRD2B). Recruitment was conducted using emails and social media advertisements from the end of March 2021 to June 2021. Participants could skip any questions they did not want to answer as agreed upon by our institution’s Research Ethics Board committee. Instructors and students were asked to provide their name and email address if they wanted to enter a prize draw for e-gift cards in a separate survey and were not tied to the data sets. This study was approved by our institution’s Research Ethics Board committee.
Limitations

Limitations associated with self-reported surveys apply to our study, but this data collection strategy facilitated collection of phenomenologically rich data on students' and instructors' experiences of remote teaching and learning by allowing respondents to elaborate on certain responses of interest with open text responses. While the response rates for these open text responses were always less than 100%, due to participants' ability to skip these items, we were able to identify themes and correspond some of the themes with our quantitative data. Our response rates per items, even for the open text responses, were larger than sample sizes in some qualitative studies of students' experiences of remote teaching (eg, Al-Freih, 2021; Petillion & McNeil, 2020).

Approximately 30% of instructors who taught at least one course between Summer 2020 and Winter 2021 participated in the survey, and approximately 2.5% of all students participated in the survey. Each respondent could skip questions meaning that some questions had less than 100% response rate (the number of respondents for each item is reported in the anonymized quantitative data associated with this paper). Another limitation is the lack of immediate pre-pandemic survey data on instructor teaching and student learning in terms of experience with various formats (face-to-face and online), which would inform the discussion, for example, around pre-existing attitudes to in-class learning and its absence during ERT. The final major limitation of the data is that it does not pair students with individual courses or instructors (and, by extension, the specific delivery method in that instructor's course taken by that individual student).

Participant demographics

Seventy-one instructors consented to participate in the study. Sixty-three instructors had taught at least one in-person face-to-face course before Summer 2020 (90% of the 70 instructors who responded to this question), and 7 were new instructors (10% of respondents). One hundred and twenty-two students participated, with a breakdown of the students by year of study shown in Figure 1, illustrating a representative response from each year.
Data analysis

The quantitative data were analysed using R, including computation of frequencies, Chi-square tests for categorical data and Welch Two-Sample t-tests for rating data comparisons between instructors’ and students’ responses. Anonymized quantitative data are provided via the Open Science Framework data repository (https://doi.org/10.17605/OSF.IO/GRD2B). For qualitative data, we used Braun and Clarke’s (2006) framework in guiding our thematic analyses. All written responses were exported into Microsoft Excel with one question per Excel sheet. Using inductive coding, all authors independently coded 10 responses for each question by identifying frequently occurring words and phrases. The authors met and compared the codes with an initial interrater reliability of 91% agreement discussing similarities and differences and coming to agreement on a set of codes for each question. Three of the authors were assigned sections of the responses and coded based on the pre-determined set but also shared any new codes to maintain consistency. One author then reviewed all coding for consistency, and all authors met to discuss frequency of codes and general impressions of emerging themes per question, across data sets, and in response to the research questions. Themes, definitions, and represented quotes are presented in the paper.

RESULTS

The results are presented in four parts: (1) Instructor content delivery methods and assessments; (2) Students’ experiences with delivery method and assessments; (3) Enjoyment of remote learning and (4) Instructors’ and students’ expectations post-remote learning.

Instructor delivery methods

Instructors were asked what type of delivery method they used. Most instructors (see Figure 2) used a combination of asynchronous and synchronous delivery formats, followed by mostly synchronous lectures, mostly asynchronous lectures, and other.

Instructors had the choice of four live stream platforms for classes and office hours: Zoom, Microsoft Teams, Virtual Classroom, and WebEx (see Figure 3). Most of instructors used Zoom for live stream lectures with many commenting on its ease of use, fast connecting speed, and integration into the LMS platform as reasons for using it.

In all live stream platforms had similar features such as webcam video, share screen ability, chat function, and live recording, and based on Figure 4 (panel A), instructor webcam, share screen, and chat function were the three most used features. Among instructors who used a live stream platform, 99% of them posted additional material on the LMS for students. The most common material was lecture PowerPoint slides (see Figure 4 panel B).

Instructors who taught the same course prior to the pandemic reflected on changes or modifications they made to deliver their courses remotely. More than half of the instructors indicated making moderate changes (51%), 27% making large or significant changes, and 16% making small and 6% no changes at all. These differences were significant, \( \chi^2(3, N = 63) = 27.73, p < 0.001, \phi = 0.664 \). The degree of changes was personal, and definitions varied from one instructor to another. For instance, updating PowerPoint slides to present live on Zoom was indicated as a small to no change for some instructors, but viewed as a moderate change for others based on their comfort level with using technology. Some instructors indicated creating online exams as a moderate change while others viewed it as a substantial change because they had to manage accommodation requests such as manually extending individual students’ exam time length which used to be done by the test centre.
when exams were completed in person. There were not any defining themes based on the extent of changes, therefore the themes presented are across respondents.

**Replicating in–person learning**

Instructors described attempting to replicate their teaching as close to an in-person experience as possible. This included keeping their start-of-class rituals. As one instructor said:
"As the class was assembling, I played theme music for the week. The selection of music related to the week's content theme. This replicates what I do as my practice in physical presence classes." Many described sharing their screen, providing a PowerPoint presentation, and answering student questions, the same way they would do in class. Another instructor added:

I shared my PowerPoint slides using share screen. We would go over the lesson plan and address any pressing questions from the previous week. Then we would have a lecture. Students can raise their hand to ask questions. Sometimes they would use their mic and sometimes they would type in the chat.

Furthermore, to replicate being in the physical classroom, instructors used tools like breakout rooms, polling, and chat features available on all platforms. For some this mirrored what they would do in class, having students discuss a topic with those around them. For others, this was new, and they thought of ways to engage students further. One instructor reported:

I would start with a typical lecture then we would break and have breakout activities. Sometimes I would engage them in a scavenger hunt of sorts where I would stop lecturing but they would have to find activities through Google. Do a poll or on Kahoot.

**Flipped learning**

As instructors thought about how to maximize students' learning, some tried flipped learning for the first time, requiring redesign of their course material and delivery method. Although flipped learning has been a staple in many disciplines and encouraged as best practice,
many sessional instructors had a challenging time getting students to read material before class. With remote learning, students had more time at home to prepare for lectures and instructors used this opportunity to pre-record lectures to provide to students before the shorter live sessions. As one instructor shared:

Because the students had the lecture material in advance, we could spend the live time together doing activities that are best done synchronously, that is, having good conversations. The conversations tied the content material to their lived experiences, current events, larger societal and cultural questions, and other relevant contexts. Relevancy increases learning immensely. Period. If we, as educators, cannot make the material relevant to students, we are wasting our time and resources and those of the students. To me, flipped classroom is the optimal approach to enable creating relevancy in post-secondary education.

Instructor's views on assessments

Instructors used a range of assessments (see Figure 5 panel A). The most common assessments were essays, group work, and timed exams. Discussions, student presentations, and labs were also used. Most instructors indicated making small to moderate changes in their assessment format as shown in Figure 5 (panel B).

Similar to indications for changes in converting a course to remote delivery, degree of changes made for assessments also varied, as some instructors viewed putting an exam online as a small change while others viewed it as a moderate or large change. Thematic analyses were conducted across respondents to reveal overall themes in changes to assessments.

Figure 5 Panel (A) shows instructors' choice of assessments during remote delivery of courses since and including Summer 2020 as percentages. Panel (B) shows extent of changes made to adapt assessments for remote delivery. Seventy instructors contributed data for panel (A) and 63 instructors contributed data for panel (B).
Paper to digital

Most changes described were around turning in-person/paper submissions into online submissions. The content of the assessment did not change, but the medium did. This included turning paper exams into online exams, paper assignments into online submission folders, and creating online spaces for group work. Others changed weekly participation into weekly reflections completed through discussion boards. For presentations, some continued with the same format and students presented online, while others had students record their presentations and either played the video during a live session or had students post their presentations on a discussion board and students commented asynchronously.

Convenience of online exams

Since exams could not be conducted in person, it was up to the instructor if they wanted to use a digital academic integrity system like Respondus LockDown Browser (https://web.respondus.com/he/lockdownbrowser/) or allow exams to be open book. Instructors who used Respondus LockDown Browser (locks test browser) tended to use it with Respondus Monitor (virtual face-tracking proctoring software) as well ($N = 21, 78\%$) ($\chi^2(1, N = 27) = 8.33, p = 0.004, \varphi = 0.555$). Instructors found Respondus useful in ensuring some level of academic integrity as a deterrent to cheating. Many explained they hoped online exams would continue post remote learning. Said one instructor, “I think Monitor/Respondus together worked well to maintain academic integrity remotely. In post-pandemic instruction, it may be appropriate to permit online exam-taking, from the school (in-class or in the exam centres).”

Those who opted out of virtual proctoring retained assessments online for convenience in grading and provided feedback electronically to reduce students’ stress in a sterile exam environment. Since they did not monitor students, they created application type questions in an open book format. Many reflected on what the assessments truly assessed and whether alternative methods of assessment needed to be considered. One example: “We need to change the way we assess. Summarize project instead of exams allow students to demonstrate application of knowledge instead of recall skills.”

Students' experiences with delivery methods

Since instructors had a choice of platform, students were likely experiencing more than one platform and we wanted to know their platform preference. Like instructors, 80% preferred Zoom, 14% Microsoft Teams, and 6% Virtual Classroom. Although most respondents selected Zoom, the tools they liked existed across all platforms. Students liked seeing their instructor on webcam, viewing the screenshared PowerPoint, and the chat feature (see Figure 6).

The thematic analyses for open ended questions revealed two themes: ease of use and having access to the recordings.

Ease of use

Students described their preferred platform as user-friendly, containing accessibility features, enhancing communication, and easy to navigate for both themselves and instructors. One student who preferred Zoom explained:
I prefer to use Zoom as a platform for attending live lectures because it is really easy to use. Also, it has a lot of features that make learning easy such as screen sharing, having polls to make the class interact with the course material.

Many students shared how breakout rooms and chat functions allowed them to communicate with their peers in a safe environment compared to talking in a full classroom. Another student stated, the “hand raise” option in platforms could be used to indicate agreement: “I like the raise hand option for when student have questions and don’t want to interrupt a point as well as when professors ask students to raise hands to agree when asking questions.”

Access to recordings

Regardless of platform used, students emphasized the importance of accessing lecture recordings after the live session. Zoom and Virtual Classroom recordings would appear within the LMS in the same location as the live meeting links. For Microsoft Teams, the recording would appear in the meeting chat which some instructors then posted on the LMS. Recordings allowed students to review lectures at their own pace, as a refresher before an exam, or if they missed a class they could catch up. This gave students flexibility and control in their learning, as one student stated, “I enjoy being able to revisit previous knowledge and lectures.” Recordings also contained auto closed captioning which students found very helpful: “Zoom allows easy-to-access recordings of lectures to watch afterwards and adds auto-generated captions which are extremely helpful.”
Students' experiences with assessments

Students reported being assigned a variety of assessments methods during remote learning, with quizzes, group work, exams, and essays as most common (see Figure 7). As reported in the instructors’ results, most assessments were following the structure of in-person classes and simply moved the submission from paper to virtual. We asked students to explain their ideal assessment weight for remote learning. 60% preferred a blend of small and large assessments, 33% preferred frequent smaller assessments, and 7% preferred fewer, more heavily weighted assessments such as a midterm and final exam. Students experienced smaller assessments as less stressful as they could make mistakes and to do better on larger assessments. As one student explained:

Small, weighted assignments [weren’t] as stressful and if you got a bad mark on an assignment or quiz it wasn’t going to drop your grade drastically and you have more assignments to make up the poor mark. Whereas heavily weighted assignments impacted your grade significantly if the grade wasn’t what you hoped for.

Academic integrity

Since nearly all the students reported experiencing some form of quiz or exam, they were asked how they thought academic integrity could be ensured in an online environment. Surprisingly, most comments supported use of Respondus LockDown Browser. They saw it as deterring peers from cheating, as one student noted, “Lockdown Browser is perfect
because it allows us to be filmed and voice recorded to prevent academic misconduct.” Another added:

Personally, I felt confident that Respondus maintained academic integrity and fairness through remote learning. However, some of my peers shared concerns over privacy. More information provided to students through the university on where/how these videos are stored, who has access to them would better address these concerns.

Some students suggested the root of issue with academic integrity was not about proctoring software but that students felt compelled to cheat. One student reflected:

Most students will feel the need to cheat if they do not feel prepared or confident in the content being tested or how it will be tested. An idea is to have instructors post practice questions or actual quizzes that reflects the style of how their mid-terms/exams will be like.

**Enjoyment of remote learning**

Overall, instructors ($M = 3.88$, 95% CI [3.62–4.15]) reported greater enjoyment of remote delivery than students ($M = 3.15$, 95% CI [2.91–3.39]), Welch Two-Samples $t(163.515) = 4.028$, $p < 0.001$, $d = 0.593$. A comparison of the two data sets is visualized in the violin plot in Figure 8. The difference in enjoyment rating can be explained through different perspectives on flexibility in learning, self-efficacy in learning, and feeling connected.

**FIGURE 8** Plot of respondents’ average ratings of overall enjoyment of remote course delivery. Circle shows the mean rating. The density on each plot represents probability estimates of the data for the different average ratings. Sixty-nine instructors and 120 students answered this question.
Flexibility in learning

Both populations reported enjoyment of online flexibility. Instructors and students emphasized the amount of time saved in not commuting and appreciated greater autonomy in scheduling. All live synchronous components needed to take place during the scheduled timeslot, but what instructors did during that period was up to them. Most instructors recorded part or all of their lecture and then posted it for students to view. The live lectures were then used for short discussions or office hours. As one instructor shared, “I enjoyed not commuting and I enjoyed not being so tied to a clock (a little longer one week, a little shorter another to better fit the content I was delivering).” This in turn allowed students to decide when they wanted to view the lectures. One student commented: “I liked creating my own schedule and not being tied down by commuting time. The mix where some classes were live while others were recorded/self-directed learning allowed for a good balance as well.” Some used this free time to allocate more time to studying. One student reported: “The extensive free time allows me to dedicate more time to my studies as opposed to spending that time commuting or ‘wasting time’ while on campus.” Others were able to schedule their learning time around their work time: “A majority of my professors either record lectures or post slideshows, this allows me flexibility in working if I need to work a certain shift during class time.”

Self-efficacy in learning

As illustrated in Figure 9, both instructors and students recognized the impact remote learning had on requiring students to take agency for their learning. As one instructor suggested, “Remote teaching provided an opportunity for the students to take responsibility for their learning. Lectures are recorded and available for students to review. In person, if you miss a class that is it. Online you never miss information.” The student responses reflected the same theme, how it challenged them to schedule their study time and determined how they learned. As one student stated:

It has taught me a lot about my learning style and pace. I find that I learn best when listening to the professor’s talk during the pre-recorded lecture. For my learning style it allows me to process what was said and then when I go to the Zoom lectures, I feel more prepared to ask questions.

Having autonomy for their own learning made them feel empowered:

I loved being in charge of my own learning. I could choose when I wanted to listen to a lecture which was so much better for my work and sleep schedules (better quality sleep and more opportunity to make money). Being able to review pre-recorded lectures was such a blessing as you could pause to take notes and watch the information as much as needed. When required to write written responses, I felt like I put more effort into my learning rather than rambling on about a topic [in person]. Also, it made me realize how I can be an independent learner, which was very empowering.

Instructors noted that not all students were successful in gaining self-efficacy in learning, as one instructor pointed out:

The biggest challenge [in remote learning] is for those not independently motivated to work. I had one student contact their program advisor saying I hadn't
provided anything in the course site for content. I checked the student, and they had only accessed the course for a total of 3 minutes (in the first 5 weeks). I realized that for some students, having live classes means they will be there.

We performed two-sample equality of proportions with continuity correction (two-sided) tests on the self-efficacy data (see Figure 9). These tests specifically tested differences between instructors’ and students’ perceptions of student development of self-efficacy attributes, competencies, or skills during remote delivery of courses. These perceptions converged in terms of the percentage of instructor and student respondents who believed the attribute, competency, or skill was developed on six (Became an independent learner; Developed problem-solving abilities; Plan, monitor, regulate, and evaluate learning; Attain knowledge of learning strategies; Able to assess own strengths and weaknesses; Attain knowledge of why and when to use a given learning strategy) of eight we included in our survey. All non-significant $p$ $\geq$ 0.111.

A greater percentage of instructor respondents (75%) perceived student development of Knowledge of oneself/themselves than student respondents (49%), $\chi^2(1) = 10.723$, $p = 0.001$, mean percent difference = 26% (95% CI [11.16%–41.36%]), and a greater percentage of instructor respondents (69%) perceived student development of Acted on feedback provided than student respondents (40%), $\chi^2(1) = 12.328$, $p < 0.001$, mean percent difference = 29% (95% CI [12.84%–44%]). These results might suggest differences in understanding the meaning of the items (eg, knowledge of oneself as a learner or as a person across life domains) or expecting action and real (in)action (on feedback in the process of learning).
Connectedness

Instructors and students rated their feeling of connectedness to each other. Instructors reported feeling more connected to their students during remote delivery of their courses ($M = 3.737$, 95% CI [3.474–4.000]) than did students ($M = 3.117$, 95% CI [2.948–3.286]), $t(118.76) = 3.891$, $p < 0.001$, $d = 0.609$. The difference in connectedness can be attributed to what is perceived as a meaningful interaction. Many instructors felt students participated more during remote learning through chat functions on platforms and attended more classes than in person lectures. The richness of discussions was not sacrificed, as one instructor experienced: “There was some great discussion still, in both audio and in the chat.” Some attributed this to feeling less judged online, “Students participated more especially with cameras off. Students indicated less peer pressure when their peers were not visible.” However, students saw this differently, and although may have participated more frequently, they described the quality of interactions as lacking with instructors. This was especially for first year students, as one described:

Peer-to-peer interactions and some connections with our professors were limited. As a first-year student that was hard to deal with and often it feels like the first-year students have no community or support within the classroom. It is also hard to get in contact with certain professors, especially when they are inconsistent with live class times (ex. only do drop-ins now and then). Even with emailing, it is difficult to get prompt responses, but this is understandable since many students are trying to contact them.

Instructors' and students' expectations post-remote learning

Having experienced remote learning, we asked instructors and students what they hoped teaching and learning would be like going forward when we returned on campus. What lessons could be learned from this year online? Both students and instructors emphasized flexibility in how lectures are delivered and how content is assessed and having a standard platform.

Flexibility in recording and live streaming class

Overwhelmingly, students want all live lectures to be recorded, whether the lecture was delivered online or in person. As one student said:

> Having the ability to revisit the lectures to create a better understanding of a certain subject that I could’ve not understood properly in class and understand that independently without needing to wait until another class to ask about it to a professor.

Others added recorded lectures allowed them to catch up on lectures they missed for personal reasons: “I'd like to see lectures recorded so that I can review course material or stay at home and learn if I am feeling ill.”

Although some instructors were hesitant about recording lectures when they returned in person; they fear low attendance, though most agreed this was something students would be expecting. One instructor stated, “I think students are going to demand recorded lectures—they’ve learned how useful they are in terms of review. They can rewind the instructor instead of relying on their notes/memory.” Ideally, the classroom would be set up to
allow the recording of lectures and live stream to bring in guest speakers. As one instructor commented:

I would like to bring in virtual guest speakers. Guest speakers wouldn't have to worry about commuting to campus or staying for multiple sections. They can join virtually or as one instructor suggested they could pre-record the conversation once and play it during class for multiple sections.

Furthermore, instructors wanted also to be able to record lectures from home on days they could not come in or pre-record lecture components and have students continue to engage in flipped learning. As one instructor planned:

I would like to have the “heavy” parts of the lecture pre-recorded for students to watch and understand and have cases studies in-person. I would consider breaking down the nearly 3-hour block into smaller chunks to allow students to participate in smaller sessions.

Flexibility in taking exams from home

After experiencing taking exams from home, students wanted the option to do quizzes and exams online from home or in person. Many described feeling less stressed compared to doing an exam in a large exam hall. As one student stated:

Being able to do tests from home would be a good option… as it can be quite nerve-wracking doing exams and quizzes in person…When I did exams in like the big hall, I was so much more stressed, and it is always better to do a test in an environment you’re comfortable in.

At the same time, some students stated they did not have a private space conducive for taking exams and needed the option to take it on campus.

Instructors also liked having exams online as they could set up auto-grading for multiple-choice exams, a feature that was easily activated and grades were automatically recorded in the grading system. As an instructor stated, “Online tests from home would be amazing—the marking is infinitely faster.” Another added that online exams reduced the need for administration to be involved, “I really liked the online exam and felt this was perhaps even better than a crowded exam room for academic integrity. I could post the exam and did not need any administrative assistance to print or grade.”

DISCUSSION

Despite the challenges of the pandemic, our instructors and students were able to continue teaching and learning virtually from home with positive results utilizing live stream platforms, flipped learning, a variety of assessment formats, and online proctoring systems.

In addressing our first and second research questions on instructor and student experiences in remote learning, overall teaching and learning replicated in-person experiences through live lectures, discussions, office hours, and assessments moved from paper to digital format. This was partially because of the thorough trainings and resources available to faculty to re-design and plan their course delivery and assessments as recommended by Oliveira et al. (2021), and the flexibility provided to instructors in how they wanted to teach
their course in remote delivery. Both instructors and students preferred platforms that were easy to use with tools that allowed them to simulate in-person learning experiences including seeing the instructor, sharing slides or content, built in tools for asking questions, small group work through breakout rooms, and polls. Many instructors took this opportunity to modify their course to a flipped learning design, which led to rich learning and interactions consistent with other studies on flipped learning (Karabulut-Ilgu et al., 2018; Ting et al., 2020). Aligning with findings from Hodges and Barbour (2021), our instructors continued to provide a variety of assessments formats many of which may have contributed to a sense of community such as discussion forums, virtual breakout rooms, presentations, and group work. Students and instructors reported increased development in self-efficacy through remote learning, and consistent with the literature those who did not have high self-efficacy in learning had a challenging time in this learning format (Hao, 2016). Like content delivery, assessments were also reflective of the in-person experience, with the continuation of essays, student presentations, and exams. Although potentially controversial, face-tracking proctored exams were used, most students did not have issues with it and welcomed being able to use it to take exams from the comfort of home. Instructors agreed that online proctoring systems helped to increase academic integrity, and for those who choose not to use online proctoring, they changed their assessments to essays or open book exams.

We also explored differences between instructors’ and students’ experiences of remote delivery during the COVID-19 pandemic. Firstly, instructors reported greater overall enjoyment of remote delivery of courses compared with students. Secondly, we found instructors’ and students' perceptions of students' development as learners converged on most attributes, competencies, and skills which we included in our survey. Divergence was evident for Knowledge of oneself/themselves and Acted on feedback provided whereby a greater percentage of instructors perceived students, in general, developed these components of self-efficacy. Though our data does not permit us to make firm conclusions as to the reasons for these divergences (or convergences), we speculate that instructors and students had different understandings of these items (knowledge of oneself as a person across life domains vs. knowledge of themselves as a learner) or realities (i.e., instructors’ expectation of acting on feedback they provided and students’ limited, if any, use of feedback instructors provided). Lastly, instructors reported feeling more connected to their students than students felt connected to their instructors. This might also explain the discrepant scores of overall enjoyment in addition to common utterances of greater need for flexibility (e.g., recorded lectures). We consider these results as preliminary indicators of flexibility as an important feature in any plans for integrating lessons from the pandemic in the post-COVID post-secondary experience.

Our third question looked at what expectations of learning post-remote learning, and our instructors and students had similar perceptions with the desire to continue with various aspects of remote learning including having the flexibility to learn and teach from home, recording lectures, and the option to take exams and other forms of assessments from home. Remote learning demonstrated choice and flexibility were possible and required little additional work on the part of the instructor. However, feelings of connectedness to peers and faculty came at a cost and is similar what other researchers like Petchamé et al. (2021) found as the aspect that suffered the most during the pandemic. Although in-person interactions cannot be completely replaced by virtual formats, interactions and learning could still occur to some degree outside of the live in-person situation and the richness of the interaction can be captured in a different sense such as students participating through chats and polls rather than raising their hand in person to contribute to discussions. Future studies could examine whether these perceptions differed by students' year of study and by instructors' comfort level with using technology.
Conclusion and future direction

As we conducted analyses for this study, we were already in the process of implementing the lessons learned from the data for Fall 2021. Due to the on-going pandemic, it still was uncertain whether social distancing measures would be lifted and whether students would be comfortable or able to return to campus. As a result, over 100 course sections were offered as hybrid flexible or HyFlex courses, providing students the flexibility of choosing to attend courses from home or in-person on a session basis. Our model was loosely based on the HyFlex instructional approach of Beatty (2019) providing students with the flexibility they asked for in the surveys (see also Hodges et al., 2020). We expect the fusion of face-to-face and remote learning opportunities for learning will enhance the feelings of connectedness between instructors and students by providing additional options for students to communicate with their instructors (see Ferri et al., 2020). Most instructors also chose to record their lectures for students to view later. All classrooms were quickly equipped with a webcam and mic, allowing the instructor to live stream and record their video, audio, and screen to those at home, see Figure 10 for photo of classroom set up. In a sense this was our version of “emergency HyFlex” delivery.

When registration opened, sections for learning virtually filled up instantly, demonstrating the desire for students to learn from home as the uncertainty of the pandemic's course persists. This led to additional instructors who were teaching strictly in-person courses to turn their courses HyFlex delivery, allowing students to unofficially join from home or review the recording. Future research should examine any long-term influences of remote course delivery on students' learning and instructors' teaching effectiveness as post-secondary institutions consider modalities for delivering courses in the post-COVID-19 education environments. What remote delivery has shown us is that our instructors and students are resilient, and even through challenging times we are able to adapt and continue effective teaching and learning.

![Photo of the Hyflex classroom set up. Podium has a large computer monitor [A], a webcam [B], allowing for Zoom or Teams to be used for live streaming and recording of lectures [C]](image)
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CONFLICT OF INTEREST
The authors have no conflict of interest to report in this work.

ETHICS STATEMENT
Humber College Institute of Technology and Advanced Learning is the institutional Research Ethics Board (REB) for University of Guelph-Humber. The Humber College ITAL REB gave ethics approval for this study (REB # 0199). Participation in this study was completely optional for instructors and students.

DATA AVAILABILITY STATEMENT
Anonymized quantitative data are provided via the Open Science Framework (OSF) data repository (https://doi.org/10.17605/OSF.IO/GRD2B). The instructor and student surveys can also be found at the OSF link.

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