Impact of the Bimodal Format on Teaching and Learning at the University of Ottawa

Report 2 — Faculty Member Perspective

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Office of the Vice-Provost, Academic Affairs in collaboration with Teaching and Learning Support Service (TLSS)

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Executive summary

This research study – part of a larger inter-university comparative project in partnership with Carleton University, Brock University and UBC Okanagan – explores the perceptions and impacts of bimodal/HyFlex courses on post-secondary teaching and learning in the 2021-2022 academic year to identify pedagogical considerations and practice recommendations.

In February 2022, invitations to take part in the study, including surveys, interviews, focus groups, and class observation, were sent to all University of Ottawa faculty and students taking part in bimodal courses during the 2021-2022 academic year. Of students who received the invitation, 1,425 students completed the survey and 70 students participated in the focus groups. For more information on the student perspective, please see the report on student perceptions of bimodal learning. Of instructors who received the invitation, 93 completed the survey and 30 took part in the focus groups. Fourteen classes were observed online and in person.
Key findings

Participant characteristics
- The study involved 40 full-time faculty, 33 part-time faculty, and 19 faculty who were either postdoctoral fellows or paid support staff. Overall, the results show a slightly more positive view of bimodal teaching among part-time faculty than among full-time faculty.
- Of the participants, 43% were women and 57% were men. Of the 35% of participants who identified their gender, race and/or ethnicity, only one participant identified with ethnic minority groups and one with gendered groups. It was therefore not possible to make statistically significant comparisons from participant demographics.

Characteristics of courses with feedback
- Courses in the Faculty of Social Sciences were the most represented, followed by courses in the Faculty of Arts and the Faculty of Law. The School of Psychology and the Department of English were the most represented departments, followed by Criminology, Civil Law and Common Law.
- Second-year (35%) and first-year (28%) undergraduate lecture courses were the most represented courses in the study.

Reasons for delivering a bimodal course
Departmental request (73%), a desire to return to campus (46%), and giving students the opportunity to attend both in-person and online classes (42%) were the top three reasons why faculty chose to teach a bimodal course.

Comments on technology
According to faculty involved in the study, classroom technology did not work very well. About half of participants found the classroom equipment somewhat difficult to use and only about half of participants thought the technology was reliable. At the same time, only 31% of participants said it was easy to use their own equipment to facilitate classroom activities.
- **Videoconferencing tool**: Of participants, 56% confirm that they had no difficulties using the videoconferencing tool.
- **Microphones**: Only half of faculty members reported that they could hear the online students properly.
- **Cameras**: Only 9% of participants reported being able to see their online students properly and only 30% of participants reported that the cameras were able to capture their blackboard/whiteboard notes well enough so that both online and in-class students could see them.

Comments on the techno-pedagogic experience
Overall, participating faculty members reported a rather negative techno-pedagogical experience. They found that planning and managing bimodal classroom activities was a
challenge. However, more full-time faculty (64%) had complaints about managing the bimodal class than part-time faculty (53%).

- About 70% found it disruptive to have students both online and in class.
- Three-quarters of participants found it difficult to facilitate discussions, small group work and working in pairs.
- Three-quarters of participants also found it difficult to manage course activities requiring participation, such as polls, questions and answers.
- About 65% of faculty members found it very difficult to connect with online students in the course.

**Overall faculty satisfaction with bimodal courses**

Only 36% of faculty members said they had course experience in their bimodal course (8% strongly agree and 28% somewhat agree). Thirteen percent neither agree nor disagree, 16% somewhat disagree and 35% strongly disagree.

When asked “If you had a choice, would you teach another bimodal course?” only 10% said “yes, absolutely,” 16% said “yes, with some improvements,” 35% said “probably not,” 32% said “absolutely not” and 8% said “I don’t know.”

Dissatisfaction was higher among full-time faculty (37%) than among part-time faculty (20%).

**Qualitative analysis of interview comments**

Preliminary qualitative analysis of the survey comments as well as interviews with 30 faculty members identified themes from two groups: the first group, representing the majority of participants, did not support the bimodal format, and the second group, representing the minority, had a good experience in their bimodal course and were supportive of the format.

**Faculty who did not support bimodal teaching**

**The challenge of interaction**

Qualitative analysis of the first group’s comments highlighted the challenges faced by faculty when interacting with online students. **Problems with technology** (1), the **unsuitable space** or features of some rooms for bimodal course delivery (2), **random student attendance**, both in class and online (3), **cameras being turned off**, making it harder to get to know remote students and keep track of their learning (4), and **difficulty facilitating discussions in an equitable way** (5) were the top five factors respondents cited for the lack of satisfactory interaction with students.

**Dissatisfaction with teaching effectiveness**

Participants reported that unsatisfactory interaction with students and associated factors gave them a feeling of **reduced teaching effectiveness**. They were not able to support weaker students, build constructive relationships or create a sense of community. In their view, the bimodal approach seemed to leave students disengaged.
Negative emotional impact
This sense of loss of control and effectiveness, plus the additional workload, had a negative emotional impact on participants, hence their poor classroom experience.

Increased workload
Participants also raised the issue of increased workload to prepare and run bimodal courses: part-time faculty mentioned the lack of pay for overtime work and full-time faculty raised the issue of lack of time for their research activities, a key component of moving up the academic ladder.

Faculty who support bimodal teaching
Participants who supported the bimodal approach had confidence in students' ability to solve problems and learn on their own. Instructors used strategies in their bimodal courses such as the flipped classroom, quizzes on recorded course content, clearly organized course material on the Virtual Campus, periodic learning targets for all students at specific times, and detailed planning and communication of learning activities such as clear guidelines for the division of online and face-to-face discussion groups. They also invited international speakers via Zoom in order to balance modes of knowledge transmission, between in-person and online students.
They also helped their Teaching Assistants support group discussions. Many spoke about how important the support of a Teaching Assistant was to the success of their course.
Class observations (Table 1)
In all class observations, having a suitable space and equipment played a major role in good classroom management.
Most online students had their cameras turned off, and sometimes the Teaching Assistant’s camera was turned off as well. In rooms with only one camera where a view of the entire class was not possible, some teachers were careful to stand in front of the camera, but others would forget. At times, the online students would only see an empty podium and a black screen.
The observers report that the role of most faculty was to convey information and, to a lesser extent, to act as guides or facilitators.
In most cases, faculty members were able to create a welcoming atmosphere for the students.
In most cases, faculty members initiated more interactions with students who were in class. Observers also noted that online students participated more in courses when the professor addressed them first, monitored the chat box from time to time, even with Teaching Assistant there, and/or addressed them by name.
Observers noted that online students communicated more with the professor by typing in the chat box than verbally.
Faculty members were observed to interact more with in-class students.

Similarities and differences between student and faculty perspectives (Table 2)
Comparison of the student and faculty study results shows that both were unanimous about the need to target specific courses for the bimodal format, the need for Teaching Assistants, and the flexibility benefits of bimodal courses.
However, there was less agreement between the two groups on issues of quality of learning, recording of courses, evaluation, well-being, equity, and sense of community.

Improvements needed
Participants would like:

• Targeted selection of courses for bimodal delivery (e.g., lectures, electives, second-year or third-year courses);
• Spaces that are better suited to bimodal courses;
• Better classroom technology;
• Clear guidelines on flexibility and online student conduct (e.g., attendance, cameras turned on, more participation);
• More help with bimodal pedagogical design and management.
Participant characteristics

The study involved 40 full-time faculty, 33 part-time faculty, and 19 faculty who were either postdoctoral fellows or paid support staff. Of participants, 43% were women and 57% were men. Of the 35% of participants who identified their gender, race and/or ethnicity, only one participant identified with racial and ethnic minority groups and one with gendered groups. The rest of the participants did not identify with any racial minority or gender group.

Figure 1. Demographic characteristics of participants

Figure 2. Participant distribution by faculty
About 74% of participants had taught one or two bimodal courses (45% reported one course, 29% had taught two courses, 13% had taught three courses, and 26% had taught more than three bimodal courses).

**Characteristics of courses with feedback**
Second-year courses were the most represented in the survey.

The type and year of study of the bimodal courses most frequently reported in the study were lecture–based courses (60%), followed by discussion–based courses (23%). The 14% of courses described as “other” were generally courses that participants said were “equal parts lecture and discussion course.”
Of participants, 61% had support from a Teaching Assistant.

**Reasons for teaching a bimodal course**

Out of 230 responses from 93 participants, the three most frequently given reasons why faculty agreed to teach a bimodal course were departmental request (73%), a desire to return to on-campus teaching (46%), and giving students the option to attend the course in-person and online (42%).

For the “other” response chosen by 16 participants, most said that they had no choice because the mode of course delivery was imposed on them.

Of respondents, 73% of faculty report that students were required to choose the course delivery type at registration; however, 66% of participants report that they decided to let students choose their mode of participation (in-person, hybrid, online) for each course.
Faculty comments on technology

In a series of Likert scale questions, teachers were asked about the reliability of technology in their classrooms.

According to half of participants, technology in the classroom did not work very well. Approximately 50% of faculty found the classroom technology hard to use (11% strongly agree, 21% somewhat agree, 18% neither agree nor disagree). Only 46% of participants thought that classroom technology was reliable (8% strongly agree and 38% somewhat agree).

Videoconferencing tools and functions were sometimes hard to use

Many participants (44%) reported that they had difficulty using the videoconferencing tools effectively. A slim majority of participants (56%) confirmed that they had no difficulty using the video-conferencing tools (e.g., Zoom, Teams) and functions (e.g., polls, breakout rooms) effectively.
Microphones did not always work

Only half of faculty reported that they could hear students properly online (19% strongly agreed, 34% somewhat agreed). Nearly 80% of participating faculty said they could hear in-person students properly (53% strongly agree and 26% somewhat agree). Masks (43%) and physical distancing (36%) were given as the main reasons for not hearing students well in face-to-face settings. In the “other” responses, participants noted problems with the microphones.

In the comments section, participants raised the issues of classroom size, lack of volume control, poor ability to capture classroom conversations for online students using the room’s microphones, and the quality of the online students’ internet connection, which made it difficult for students to converse with each other or with in-class students and faculty.

Figure 9. Microphones

In the Fall session, in-person students could speak to each other and me easily, but these conversations were captured poorly by the room mic, making it very hard for the two remote students to join in. Things were further complicated because the connections for the remote students were of very different quality, meaning they could not interact with each other, and only one-by-one with the in-person students. This created a very unequal footing for a graduate seminar space.

Large classroom and I wear hearing aids, so it was difficult.

Cameras did not capture everything

Only 9% of participants reported being able to see their online students well (4.4% strongly agree and 4.4% somewhat agree). Conversely, 91% of faculty reported that they could see the in-class students well.
More than half of participants (56%) said their lecture slides were clearly visible on screen, but only 30% said that the cameras were able to capture their notes on a non-digital blackboard/whiteboard (10% strongly agreed and 20% somewhat agreed).

Faculty had difficulty using their own equipment in the classroom

Only 30% of participants say they were able to use their own equipment easily to facilitate classroom activities.
Faculty comments on their techno-pedagogical experience with bimodal courses

In a series of Likert scale statements, faculty were asked to rank the ease of classroom management and activity coordination in their bimodal course. Overall, participants report a rather negative techno-pedagogical experience.

**Faculty found it challenging to plan and manage bimodal classroom activities**
More than half of participants (57%) found it difficult to plan the course.

Of participants, 62% report that they found it difficult to manage in-person and online teaching tasks simultaneously.

For activities requiring participation, 75% of respondents found it difficult to facilitate discussions, small group work and working in pairs (51% strongly agree and 24% somewhat agree).

**Figure 13. Faculty techno-pedagogical experience**

**Figure 14. Faculty techno-pedagogical experience (2)**
Three-quarters of participants also found it hard to manage class activities such as polls, questions and answers (46% strongly agree and 29% somewhat agree).

**Faculty found it hard to interact with students**
Approximately 65% of faculty found it very difficult to interact with students taking online courses (35% strongly disagree and 30% somewhat disagree with ease of contact), while 80% found it easy to connect with students attending class in person.
Only 38% of faculty thought it was easy for students to communicate with them (16.5% completely agree and 21% somewhat agree).

**Overall faculty satisfaction with bimodal course delivery**
Respondents had a rather negative view of bimodal courses. They were asked if they had a good experience in the bimodal course and if they would teach another bimodal course if it were offered.

Of the respondents, only 36% had a good experience in a bimodal course (8% strongly agree and 28% somewhat agree), 13% neither agree nor disagree, 16% somewhat disagree and 35% strongly disagree.

Dissatisfaction was higher among full-time faculty than among part-time faculty.
Teach another bimodal course?
When asked “If you had a choice, would you teach another bimodal course?” only 10% said “yes, absolutely,” 16% said “yes, with some improvements,” 35% said “probably not,” 32% said “absolutely not,” and 8% said “I don't know.”

![Figure 17. Overall satisfaction (2)](image)

About the 51% of faculty who did not have a good experience in their bimodal course
The faculty members who responded “strongly disagree” (35%) or “somewhat disagree” (16%) to the question “Overall, I had a good teaching experience in this bimodal course,” were asked to explain the reasons for their response.

The challenge of interaction
Comments were focused mainly on the challenges faculty faced when interacting with online students.
Although respondents confirmed that they were able to teach their usual course content, they reported losing control over class interactions due to the number and complexity of spaces they needed to manage. They did not experience the same quality of interaction and dialogue as they did with their in-class students. They were not able to monitor their online students’ learning curve in a personalized and effective way. The visual and body-language cues they would normally use to adjust their teaching strategies were lacking in their bimodal courses.

Many respondents reported that what detracted from having a connection and direct dialogue with students were the following: online students having their cameras turned off, student silence, questions submitted by chat box which were handled by the Teaching Assistant, who was tasked as a conversation facilitator to filter questions and pass on only a few. These issues created a sense of loss of control over the classroom and a diminished sense of community.

Out of 44 written responses, random student attendance, whether in class or online (1), cameras turned off and thus difficulty getting to know remote students (2) unsuitable physical space (3), difficulty facilitating discussions equitably (4), and technology issues (5)
were the top five reasons why participants did not have satisfactory interactions with their students. Instructors stated explicitly that these problems affected their support for weaker students, their ability to build constructive relationships, and the sense of belonging to a community.

Interaction challenges were most pronounced in discussion-based courses.

![Graph showing interaction challenges in bimodal courses](image)

**Figure 18. Interaction challenges in bimodal courses**

Difficulty managing the class and unsatisfactory interaction with students created a sense of loss of teaching effectiveness and a negative emotional impact for participants, hence the poor classroom experience.
Low class attendance and gradual decline in online participation

Sixteen professors (33%) reported a gradual decrease in the number of students in class over the course of the semester and low participation of online students in synchronous sessions. They felt that the availability of course recordings and the human tendency toward laziness and inertia were among the main reasons for this behaviour. Low student attendance resulted in faculty feeling demoralized and unmotivated.

"Another problem is that while I started the term with 2/3 of the students registered for in class and 1/3 for online, only between 3 and 8

Cameras turned off and lack of participation in discussions

In several comments (20%), participants complained about online students' behaviour, such as not turning on their cameras, not speaking up and not participating enough in discussions, which disrupted the traditional professor-student interaction in class. Participants reported that these behaviours reinforced their feelings of frustration and dissatisfaction with their teaching practice, and called their professional identity into question.

« Les étudiants en ligne ne se comportent pas comme les étudiants en classe. Ils n’ouvrent pas la caméra (malgré de nombreuses demandes de
students show up in person (out of 25 students registered for in class). Because I record my classes, no more than 15-20 attend classes virtually, which is about half the class. Those valiant few who attend in class seem to enjoy it! But the inertia of online has meant that too few are bothering to come to class, even when they are registered to do so."

“La bimodalité donne aussi l’impression aux étudiants que la présence est facultative.”

**Technological problems**

About 20% of the comments were focused on technology-related issues that disrupted teaching and learning continuity.

“The technology simply didn’t work […] The mic I was given simply didn’t work, I was told to pass it around to students in the room so they could speak to students online, and if I tried to use the podium, the system simply crashed. It would have been a complete disaster if the students and I hadn’t jerry-rigged a solution using my own tech.”

“Les caméras en classe réduisent le prof à la taille d’un Schtroumpf et les étudiants en ligne ne voient pas ce qui est écrit au tableau, etc”

[...] But when I’m teaching in bimodal classroom, the camera is actually fairly far away from me, and especially because I might move around, you know, during the class. [...]

**Unsuitable spaces**

Some participants raised the issue of certain classrooms being unsuitable for the bimodal approach.

“Room was appalling. Room in church. Very high ceiling. The only way students online could speak to me was in ceiling about 30 feet up. I could not hear what they were saying quite often. There was no microphone available in the classroom for the students in-class to speak. The only way they could speak was to walk over to them across large space and hold up to them the microphone for the teacher’s microphone. The computer was in a far corner of the classroom, so I couldn’t see what the chat was unless I turned my back on class and tried to see what chat said.

La façon dont mon podium était positionné dans la salle podium était problématique. Il était vraiment dans le coin de la salle. Je ne voyais pas mes étudiants en ligne qui étaient derrière moi sur l’écran. Un peu catastrophique, je dois le dire.

I was in CRX C0101 of my favorite rooms and a room that I requested to be in. Now the university is well aware of the fact that this is a basement room. I should have come as no surprise to them that in a basement the Wi-Fi is never strong.
Concerns about inferior quality of student learning

Several faculty members spoke of their concerns about the inferior quality of learning for online students, especially those who were struggling and needed more motivation and support. The quality of questions asked by students declined. Instead of focusing on content, students frequently asked the instructor to repeat themselves.

Unsuitable format for discussion-based courses

Several faculty members (18%) commented that the bimodal format was not suited to discussion-based courses. Room size and the technological problems compounded the complexity of the instructor’s task of coordinating discussions.

Lack of teaching effectiveness and satisfaction with work

Due to difficulties managing the class, they reported a lack of teaching effectiveness and satisfaction with their work.

Online students' internet connection and the learning experience

The quality of the students' online network connection did not always facilitate interaction with the in-class instructor and students.

"In a small, graduate seminar of four students, the bimodal format baked in a structural inequality that was hard to overcome. The fact that two remote students had very different connections (one mostly but not perfectly stable on WIFI in Quebec, the other much more intermittent over data in central Africa meant ..."
[...] I felt I was not able to achieve my best work when trying to consider both groups of students in the bimodal format. I always felt disconnected from students attending virtually. In a fully online class, it is easier to make the connection.

**Other reasons for an unsatisfactory experience in bimodal courses**

- **Instructors found that learning assessment for the two groups was inequitable.**

  En outre, dans le cas des examens, j’estime qu’il y a un bris d’équité entre les étudiants en classe [surveillés par le prof et l’assistant] et ceux en ligne [qui peuvent tricher comme ils le veulent]. Ce n’est pas acceptable.

- **They felt demoralized due to low student participation.**

  But I think the problem of giving students the choice whether to attend in person or online means that people’s laziest tendencies take over, and they do what is easiest (attend from home). The result is a demoralized professor and students who are getting a pale shadow of a good course. I can’t wait until we are all back in class, physically together.

- **They felt stressed by the lack of students’ ethical regard for freedom of expression.**

  [...] Des pressions sont faites pour que l’on enregistre nos cours, ce qui est extrêmement dangereux pour le corps professoral (extraits des cours mis sur les médias sociaux, cours placés entièrement sur YouTube par les étudiants, etc.

- **Their workload increased.**

  And students who are registered for in-person often randomly choose to attend online since they have the option, even though technically this is not allowed, which makes fostering collaboration even with the in-person students more difficult. I guess this might work fine for a large lecture-based course, but it basically makes the kind of teaching I do incredibly difficult, twice as time-consuming, and half as effective. Never again.
• They felt they were losing their autonomy and freedom with this mode of teaching.

Cette façon de faire impose aussi indirectement une pédagogie centrée sur les PowerPoint, les partages d’écran etc. et invalide une approche plus traditionnelle de l’enseignement...

• They see bimodal education as a temporary solution under exceptional circumstances.

I agreed to teach bimodal courses as an emergency measure that seemed to offer at least a little bit more human interaction than fully online courses. Both do nothing but encourage student disengagement, sometimes to the extreme. There is not enough room here to go into detail on all I have experienced, but I can report that neither bimodal nor online courses are anything more than a poor emergency substitute for a real classroom when you are trying to get students to read, write, and think about literature and culture.

• They raised questions about the University’s management model.

Is the University of Ottawa willing to pay double salary for each course (please note that the technical staff hired in faculties of civil law and social sciences were precarious & non-unionized – is that the model of employment for a university?)?
Faculty who want to see improvements before teaching another bimodal course

Faculty who were willing to teach another bimodal course but only with improvements were asked to share what improvements they would like to see.

**Faculty want better technology in the classroom**

Better classroom technology (microphones, computer screens and cameras) was the number one request.

**Faculty want formal guidelines for online student conduct**

Participants felt that creating a student code of conduct to better define the values and expectations for these courses, such as more online student participation and having cameras turned on, in addition to more support from the University, would all improve the bimodal course experience.

---

**Le matériel technologique doit être amélioré.**

Need technology to “marry” chalkboard and slide screen.

Obligation pour les étudiants d’avoir leur caméra ouverte, sauf exception justifiées

**Plus d’aide. Trouver la façon que les personnes en présence n’aient pas à se connecter en zoom pour voir et entendre les étudiants à distance.**

We absolutely need more support. I need more space to explain.

**Accès à un ensemble chariot, caméra, trépied, ordinateur afin de circuler prendre en visioconférence ce qui se passe. Les contributions audios demeurent difficiles. Celles et ceux en présentiel doivent avoir accès à un micro pour se faire entendre et il y a échos et perturbations avec la proximité.**
Qualitative analysis

To supplement the survey results, participating faculty were invited, at their convenience, to a semi-structured interview lasting 30 to 60 minutes. Questions sent to faculty prior to the interview covered topics such as course design, teaching strategies, sense of community, assessment, technology, successes, challenges, best practices and recommendations.

Thirty faculty members took part in the interviews, of which 18 were full-time faculty and 12 were part-time. Of those who took part, 12 professors were affiliated with the Faculty of Arts, nine with the Faculty of Social Sciences, three with the Faculty of Science, two with the Faculty of Law, two with the Faculty of Education, one with the Faculty of Engineering and one with the Faculty of Medicine.

Six (6) faculty members, consisting of five (5) full-time and one (1) part-time professor, had a good experience in their bimodal courses and support this format, compared to 24 who did not. Disciplines in favour of the bimodal format include law, chemistry, engineering, international development, and second language instruction.

While faculty members in the engineering, science and law faculties vary somewhat in their perception of and experience with bimodal courses, faculty in the arts, social sciences and education are almost unanimously reserved about this teaching format.

As an example, all faculty in English, Philosophy, History and Communication (Faculty of Arts) felt that the nature of their subject and learning objectives are not compatible with the bimodal format. Most participants in the Faculty of Social Sciences, albeit with less reservation than those in the Faculty of Arts, found the experience to be challenging. However, they appreciated the Teaching Assistants' help in navigating classroom technology.

Themes that emerged from the interviews

While faculty who took part in the interviews briefly touched on the topic of the design of their bimodal course (1), the majority of the discussions, much like the comments in the survey, centred on their classroom experiences, teaching practices, successes and challenges (2).

The themes that emerged from the preliminary analysis of instructor interviews are therefore consistent with the themes that emerged from the survey, but are more nuanced (see Table 1).

Quality and equity of learning were major topics of discussion (a). The suitability of course type for the bimodal format was also the focus of several comments, particularly from humanities faculty whose courses are discussion-based (b). Mediums such as the space and technology in the classroom came up several times in discussion of their classroom experience and interaction with students (c). Workload was noted by part-time faculty in particular (d). Throughout the interviews, faculty members also shared their emotional responses to the experience (e).
To a lesser extent, they shared their views on the **accessibility of bimodal courses to a wider population**, including Francophones, both in Canada and internationally (f), learning assessment practices and grading (g), post-class activities such as office hours (h), teaching evaluation (i), and the University's research expectations, which were incompatible with professors' onerous pedagogical tasks in a bimodal course (j). Finally, they shared their recommendations for the future of teaching and learning at the University of Ottawa (k). The following figure summarizes the most important themes that emerged from the qualitative analysis of the interviews.

<table>
<thead>
<tr>
<th>Context</th>
<th>Before class</th>
<th>In class</th>
<th>After class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support policies</td>
<td>Instructor training</td>
<td>Course type</td>
<td>Space</td>
</tr>
<tr>
<td>Pedagogical commitment</td>
<td>Course design</td>
<td>Teaching strategy</td>
<td>Recording</td>
</tr>
<tr>
<td>Flexibility policies</td>
<td></td>
<td>Equity and quality of learning</td>
<td>Emotional impact</td>
</tr>
<tr>
<td>Equity of access</td>
<td></td>
<td>Course management</td>
<td>Workload</td>
</tr>
<tr>
<td>Teaching Assistants</td>
<td></td>
<td>Engagement</td>
<td>Camera</td>
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<tr>
<td></td>
<td></td>
<td>Interaction</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Participation</td>
<td>Sense of community</td>
</tr>
</tbody>
</table>
Course design

Most faculty, whether or not in favour of the bimodal format, made only **minor changes to their course design** due to time constraints. Several professors used flipped classroom pedagogy (pre-recorded lectures posted on the Virtual Campus, followed by meetings with students in synchronous classes for discussions or group work). Some divided their course content into smaller sections and made use of interactive educational technologies (Wooclap, Zoom breakout rooms, Groups on Teams) to create engagement and participation activities or virtual office hours. Some faculty, especially those who supported the bimodal format, recorded their courses. Conversely, most participants reported making more changes to exam design.

*Au niveau du contenu, je n’ai presque rien changé. J’ai coupé certaines sections que je trouvais moins utiles pour alléger un peu la matière. J’ai travaillé sur ces sections coupées à l’écran, les transformer en fiche signalétique pour les mettre sur le campus virtuel. J’ai monté des chronologies en histoire. […] Tout le matériel supplémentaire que j’ai monté à part pour téléverser sur le campus virtuel, pour que les étudiants puissent les télécharger […].*

*J’ai choisi la pédagogie inversée, c’est-à-dire que j’avais tout le matériel. En asynchrone, bon, j’ai fait des podcasts, j’ai fait des entrevues, ce genre de choses, avec du matériel que j’avais, et ensuite, je rencontrais les étudiants en groupes de discussion chaque semaine.*

*[…] So, you know producing pre-recorded lectures in a bimodal context or flipped classroom approach context that was a little bit easier because I would just make the video once and then I would rebrand it for the Uni course*

Some faculty reported that their workload increased from having to make these changes. One of the concerns raised by part-time faculty was not being paid for the overtime hours they spent making these adjustments.

**Advantages of bimodal courses**

**Flexibility**

Flexibility, in terms of both accessibility and accommodation, was seen as the strength of the bimodal format, whether faculty supported bimodal courses or not. They noted that the format allows students to attend courses online if they are sick and cannot make it to class. The bimodal format is more "responsive to the diverse needs of students" and creates "a diverse learning community." If the course is recorded, non-native speakers of the language of instruction are able to watch the recording again to absorb the content better.

*Dans le contexte actuel, c’est de pouvoir rejoindre ceux et celles qui auraient, dans ce contexte, abandonné un cours s’ils n’avaient pas pu venir.*

*The strength is accessibility. I mean there’s very good reasons why students may not be able to make it to class at a certain time.*

*Je trouve que pour les étudiants en immersion, le fait que le cours soit enregistré, c’est un avantage pour eux. Donc c’est vraiment un avantage puisqu’ils peuvent réécouter plusieurs fois quand ils n’ont pas bien saisi le français.*
Flexibility applies as much to the students as to the instructors themselves when unforeseen circumstances arise.

La semaine dernière, j'ai eu un problème et je n'ai pas pu donner l'un de mes cours car c'était impossible. J'ai dû aller à l'hôpital. J'étais aux urgences, donc j'ai envoyé un courriel à mes étudiants et annulé le cours du lendemain. Jeudi, la semaine dernière, j'ai pu enregistrer mon cours et le placer sur BrightSpaces, et il a pu y avoir une livraison normale de la semaine. J'ai donc pu donner le contenu de ma semaine.

However, much like in the survey comments, flexibility of attending in class and, to a lesser extent, flexibility of camera use, were reported as significant challenges.

Internationalizing the program
Other participants pointed out the opportunities to bring a diversity of voices and perspectives from around the world into their courses through videoconferencing.

Now with having this online component, I bring in four guest speakers from four different countries and students then work on projects towards helping these organizations [...] So it brings this real world into the classroom, the community like an international community organization into the classroom, which has been so fantastic. It creates, it addresses all these things around. internationalizing our curriculum, giving diversity of voices being in different experiences. So having the opportunity to change it, to zoom has really been very positive experience for us to globalize our classroom.

Some faculty further noted that the ability to invite online speakers via Zoom is a way to be a little more inclusive of online students and restore some balance versus in-class students.

I'm teaching in person, but I've brought lot of guest speakers who are all online. And so that I think that it creates a balance. It makes those who are online feel like they're more on an equal footing because the speakers are also online.

How did faculty who support the bimodal format respond to the challenge of interaction?

Analysis of comments by faculty members who support the bimodal approach shows that they trust students' ability to solve problems and learn independently. They feel that the flexibility of bimodal courses is an asset in teaching/learning and is more effective than an asynchronous online course because the professor can give the students more guidance.

Is that a success? Well, I think it can be because there's some other students, I know that they prefer to be online, but other ones can't focus online so with this approach I can really see that we can play to everyone strengths or almost everyone strengths, you know, like OK, I need it to be disciplined. Therefore, I need to go into the classroom. I need to do this, this, and this.
All the lectures are recorded ... but I preferred more of like an asynchronous synchronous kind of combination of the two, so. I'll push in that direction because I've noticed that some people want to learn on their own, but they still need a guide direction of what do I need to get done this week.

These participants considered student flexibility and autonomy in the design of their bimodal courses, and they created conditions that made independent learning possible.

**The flipped classroom**

Some faculty adopted the flipped classroom approach. For example, in one course where flipped learning was utilized, part of the course was recorded so that students could review the content on their own, and part of the course was conducted in class so that they could discuss and apply what they learned from the recordings during group exercises with the professor and Teaching Assistant.

When I was teaching online, I’d already made like videos and activities that they can do on their own time. So, flipping to Bimodal. In class time, in person student work together and online students work together.

I think I’ll push in that direction because I've noticed that some people want to learn on their own, but they still need a guide direction. like, what do I need to get done this week? And they won’t know it if I don’t give it to them. So that’s something I’m still missing for just like my normal courses.

So, what I typically do and you'll see on Monday, is I have a problem for them to work on in class. The people in class will work together around the circle circular tables and then I will make breakout rooms for those that are not in class, and they work together, and the TA actually does this kind of jump into the rooms and manages their rooms for me. And they handle that and then at the end the classic come back, and I go through the problem, and it’s all recorded.

**Quizzes on recorded content**

The instructor also created quizzes on each recorded segment.

I have put the quizzes and so forth on that time, but it’s not like an actual lecture, so it makes sure I don’t double up.

Not for the tutorial, but for the lectures, I usually have like a WooClap poll of Socratic questions to connect to the students and ask them questions and get some feedback. Then, obviously doing my tutorials as breakout rooms and connecting with them that way.

**Videos**

Another instructor used videos he had already made for discussion groups.

J'utilise des vidéos que j'ai créés et ensuite, ça devient des groupes de discussion. C'est des vidéos que j'ai moi-même produites il y a deux ou trois années. Donc que ce soit un environnement en personne, en ligne ou bimodal, je me sers de ces vidéos-là, on les écoute ensemble et ensuite je fais des petits groupes. Dans l'environnement en ligne, j'utilise la fonction le Breakout rooms, là pour faire des petits groupes.
Multimodal access to content
One instructor, in addition to creating short videos on the content, posted slides online.

Separation of online and in-person focus groups
Two faculty members separated the in-person and online focus groups.

Puis je me disais : c'est plus facile de garder les gens en personne, en personne, les gens en ligne, en ligne, plutôt que d'essayer de les mélanger. Parce que la réalité, c'est que les gens qui sont en personne n'étaient pas dans Breakout rooms. Alors c'est ça, je l'ai fait de cette façon-là. Ça fonctionne très bien. On peut se faire des petites salles assez facilement dans Zoom pour les étudiants en ligne. Là, je leur donnais dix/quinze minutes pour en parler en groupe et ensuite, on en prenait un en commun. C'était parfait. Ça a été fluide dans le sens que ce que je fais en personne a été transposé à ce que je faisais en bimodal et 100 % en ligne.

Je ne regroupe pas les gens en virtuel et en présentiel ensemble, ceux qui sont en virtuel travaillent ensemble ce temps. Ils sont en salle de travail ensemble.

Target setting
In designing classroom activities, one instructor set learning objective targets at regular intervals during the session. Three or four times during the session, the entire class had to demonstrate that they were at the same point in the learning objectives. These targets were assessed by means of online quizzes and assignments for all students.

And you know, sometimes it takes months to get that certain doctor appointment and like, you don't really want to miss it or reschedule it. And so, there's that flexibility to do that but you know, you can't wait to the end of semester to catch up on everything. So, in this class, I typically have three kinds of quizzes since it's a nice cost to do that. And those are like the goal posts, right like you can do whatever you want before, but once you hit here, everyone should be at that same spot. So everyone gotha catch up.

Clearly organized online course content
Another strategy was the very careful organization of course content on Virtual Campus or similar websites, so that students had access to all materials (such as examples, previous exams). However, it was noted that faculty who took this approach had years of experience teaching the course.
Part-time faculty who took pains to organize their courses raised the issue of the University not paying for overtime.

Clear and explicit instructions
Two participants report giving students clear instructions on the course learning objectives, including procedures with headings. Having instructions for both in-person and online students facilitated dialogue between the instructor and students during the bimodal course.
I think that's the key for them. Smooth and clear, I guess right? Like they need to know what the expectations are and if you're online or in person, you know how it's going to go. But I did the tutorials, you know, I did it the first time I said how did people find that there's a couple hiccups, but I figured out how to fix that anyway, for the next time. And I think they know. They're used to it. They know what to expect.

Ce que j'ai fait, c'est un cours comme je le disais où il y a beaucoup de discussions, donc il y a toujours des sections où je présente toujours un plan, un plan où ils se retrouvent avec les intitulés. Donc je débute toujours par « réfléchissons », là ils savent qu'ils vont devoir discuter en petits groupes. Ensuite, il y a un peu de théorie, c'est mon enseignement. Il y a ensuite « à vous de jouer ». Alors ils savent que c'est à eux d'intégrer les concepts. Donc je pense que le fait d'avoir un plan où chacun sait où on va et lorsque c'est le temps de réfléchir en groupe ou en petit groupe, ça se passe très bien en bimodal, ça se passe très bien en virtuel.

Interaction and technology
Faculty comfort level with technology also played an important role in creating satisfying dialogue and interactions with students. All faculty who support bimodal courses said they were comfortable with the technology. Most had their own computers in class and were connected to Zoom to monitor the chat box. They were resilient when faced with equipment limitations, such as making sure they stood in front of the podium so that online students could see them. When they moved around the room, they used their own device so that the online students could still see them. The Faculty of Law uses OWL technology, a type of 360-degree, Wi-Fi enabled microphone-camera that automatically zooms in on the person speaking:

I also like to move around the classroom, but I've tried to stay a bit more. Still, if I want to walk around the room, I might bring the laptop with me and just so.

Instructors resorted to patience and humour while trying to solve technology problems. Some went straight to their own devices to reconnect with students online. They commented that keeping the technology simple was the important thing. Others turned technology challenges into a time for reflection and learning with students. To maintain course momentum when changing screens or equipment, some would give students a task, such as reflecting on a question or watching a video.

Doing teaching bimodal requires patience. So, for example, I don't just put up a video in class, I have to stop sharing my screen. I have to share a new screen and I just remind them that we all have to be patient and things don't happen as rapidly.

Professor–student relationship
In terms of the professor–student relationship, most instructors chose to monitor the Zoom chat box on their own computer, with or without the intervention or collaboration of a Teaching Assistant. Even if they didn't answer all the questions in the chat box, they kept an eye on it so they could read some of the questions and answers out loud from time to time. They addressed by name the online students who asked or answered a question in the chat box, and they acknowledged those who gave correct answers.
But I have to admit, I catch myself: Let me check with the students online. Are you still there? Are you still awake? Do you have any questions? Let me check the chat. So, it's just about being mindful, mindfulness about ... you know, I haven't checked the chat for a while. Let me see what you're saying on the chat, quickly scanning that.

When they asked questions, they gave priority to the online students.

I have to be very deliberate when I'm teaching so that if I ask a question, I say, "Let's hear first from the students online, let's hear from two people online" and then "OK, well, let's hear from a couple in the classroom". And so I have to go back and forth. [...] I think I do it well. And I've students have told me that I've done it very balanced. And the people online feel as involved.

They were also more resilient about cameras that were turned off, which did not bother them.

**Teaching Assistants**

The support of a well-trained and engaged Teaching Assistant, acting in tandem with the professor, played an important role in bimodal class success. Two faculty members who support the bimodal format noted the indispensable role that the Teaching Assistant played in their courses. The Teaching Assistants not only managed classroom technology to allow the professor to focus on content, but also handled technology problems, grouped together similar questions from students, and provided guidance to students.
Figure 20. Successful practices in bimodal courses
**Course observation**

In parallel with the survey and interviews, we asked participants if we could observe their classes using an observation tool we developed. The validity of the observation tool was tested in three bimodal classes during the fall of 2021. Two people observed 14 courses in class and online simultaneously.

The observation matrix dealt with the characteristics of the room and its equipment, the flow of the course, the professor's management of the bimodal environment, the students' behaviours, and the successes and challenges related to them.

Of observed courses, four were taught by faculty who supported the bimodal format and 10 were taught by faculty who did not. We observed equal numbers of courses taught in French (seven courses) and English (seven courses) in various disciplines. All courses were undergraduate level, and most were lecture-based courses given most often by the professor.

Two professors invited us to observe more than one course to compare the effects of the space on their bimodal teaching.
Table 1. Bimodal course observations

<table>
<thead>
<tr>
<th>Space</th>
<th>In all observations, the physical space of the classroom and proper equipment played an important role in good classroom management. For example, in a course held in an active learning room in CRX Hall or another in HGN Hall that was also a new space, the interaction between the instructor and students on the one hand, and between the students themselves on the other, was more flexible and successful. In contrast, the bimodal experience in older rooms, located in the Morisset Hall, was not very satisfactory. Several technological issues arose and, on one occasion, a tech support call went unanswered. Regarding courses taught by professors not in support of the bimodal format, online observations showed that facilities in some classrooms were inadequate and online students’ experience of what was happening in the class was not the same.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td><strong>For all courses, there were more online than in-class students.</strong> Attendance was very low in one course, with only three students present in the classroom.</td>
</tr>
<tr>
<td>Cameras</td>
<td>Aside from a course by a professor who supports the bimodal approach, online students’ cameras were turned off in most courses, as was the Teaching Assistant’s camera at times. <strong>In no classes did faculty ask</strong> students to turn on their cameras.</td>
</tr>
<tr>
<td>Recordings</td>
<td><strong>All courses given by faculty who support bimodal teaching</strong> were recorded.</td>
</tr>
<tr>
<td>Teaching Assistants</td>
<td>In most classrooms, Teaching Assistants supported professors by managing the online experience, either with chat boxes and breakout rooms or starting up the equipment. In one class without an assistant, the professor struggled to manage the technical problem and spent much of the class time trying to resolve it. In courses with faculty who support bimodal teaching, the Teaching Assistant worked well with the instructor and performed their duties effectively. However, at times, a Teaching Assistant would be inactive and observed not responding to questions in the chat box.</td>
</tr>
<tr>
<td>Faculty practices and participation</td>
<td>Observations also show that online student participation was higher in courses where the professor addressed those students first, monitored the chat box from time to time despite the presence of the Teaching Assistant, and/or addressed students by name. In rooms with only one camera where a class-wide view was not possible, some teachers were careful to stay in front of the camera, but others would forget. At times during class, online students saw only an empty podium and black screens.</td>
</tr>
<tr>
<td>Interactions with students</td>
<td>Observers noted that online students communicated more with the professor through chat messages than verbally. Greater interaction with the professor was observed among in-class students.</td>
</tr>
</tbody>
</table>
**Space and technology**

**Observer comments on a course at the CRX Hall**

Session is lecture based but there is very good elicitation of discussions by the instructor. Students actively engage in discussions. Chat is monitored constantly so written comments/questions do not go unnoticed. Cameras offer double views of the instructor, wide shot and close-up. Screen-share is used to share a ppt presentation. Session is recorded to be accessed later on BS.

**Space and technology**

**Observer comments on a course at the MRT Hall**

The classroom is equipped with a single camera on the professor. In-class students are not visible to on-line students. The camera is high on the ceiling. The professor is mainly not in frame, but when he is, we only see his head.

The professor is animated but cannot directly address online students as the only display is at the front of the class behind the instructor.

**Teaching Assistants**

One online TA moved between the breakout rooms to support students as they worked on the problem given to them at the beginning of the class. One in-class TA who also helps online handled the time (i.e., letting students know how long they had to work on the problem and reminder before the end of the breakout rooms)

**Teaching Assistants**

The TA’s are not active in the chat session and do not intervene.

Students online are essentially inactive. Occasional interventions in the chat were not replied to by professor or the TA.

TA responded to questions in the chat. Although I did not observe more than a handful of interactions

**Teaching practices**

Heavily lecture based but instructor asks for participation from online and in-person attendees equally. I think that the instructor’s approach to stop and ask whether students had any questions as well as answering both in-person and online students’ questions was effective. Online students did not feel left out and like their questions cannot be answered because they are online. Thus, not being in-person did not seem to serve as a barrier in this regard as the instructor actively answered questions as they arose. There was someone who also answered a few questions in the chat, who may have been a TA. This also seemed to be effective in case the instructor does not see the question on time or a few questions come up at once.

**Interactions between students**

Online students did not engage with each other in the chat box nor on break out rooms. It is possible that the attendance of an online observer may have played a part, but this cannot be verified.
Similarities (S) and differences (D) between student and instructor perspectives on their bimodal course experience

Comparison of student and faculty survey results shows that students were generally satisfied with their bimodal experience and asked the University to keep this format. In contrast, most faculty members reported a poor experience in their bimodal courses and asked the University to discontinue the format or make improvements.
Table 2. Intersection of student and faculty perceptions of their bimodal experience

| Targeting the right courses | Students and faculty report that the bimodal format works better in lecture-based courses than in discussion-based courses. (S)  
Most humanities and social sciences faculty whose courses are based on interaction, reflection, and in-depth, spontaneous discussion of content feel that the current bimodal format is unsuited to their learning objectives. (D)  
Faculty whose courses deal with sensitive topics, such as sexuality, feel that their course cannot be taught in a bimodal format. (D) |
| Space | According to both groups, the size of the physical space and its suitability for the type of course (lecture or discussion), play a crucial role in improving the experience. (S) |
| Technology | Both faculty and students are unanimous that improved classroom technology infrastructure and CTI-TLSS support will enhance the teaching/learning experience in bimodal courses. (S)  
Students appreciated the use of educational technologies such as Wooclap, chat boxes and breakout rooms to increase their participation. |
| Distribution of tasks | Both groups were unanimous that having an assigned technology facilitator (having a Teaching Assistant available to faculty) will enhance the teaching/learning experience of bimodal courses. (S) |
| Flexibility | For almost all students, "flexibility" and "well-being" are major strengths of bimodal teaching and learning.  
Conversely, in the qualitative analysis of faculty interviews, those who do not support bimodal teaching report that the flexibility given to students to attend online or in class and to turn off their cameras is detrimental to faculty motivation, the quality of teaching and maintaining productive interaction with their students. (D) |
| Learning | While the majority of students in the study reported learning the material successfully, faculty are doubtful of the quality of learning for low- and mid-level students. (D)  
Faculty perceived deterioration in the quality of questions asked in class and in interactions between faculty and students. Grade inflation during the pandemic also made it difficult for them to rely on exam results. They noted that online students participated less in course activities. |
| Recording | While all students greatly appreciated the recorded lectures, faculty expressed concern about the following: excerpts of their lectures posted on social media, poor student attendance, and unsatisfactory learning of certain concepts. (D) |
| Evaluation | Students and most faculty appreciated technology's impact on exams, which were more focused on higher cognitive skills. (S)  
On the other hand, some faculty were concerned about equity and increased plagiarism, and some students reported a heavier workload and a quantitative increase in testing throughout the semester. (D) |
| Well-being | Students who were able to choose the modality they wanted (online, in-person, or hybrid format) appreciated the impact of the bimodal format on their well-being.  
The same is true for faculty who support the bimodal approach, because they see flexibility as an aid to optimal learning. (S) |
In contrast, faculty who did not support the bimodal format experienced more stress and dissatisfaction with their teaching effectiveness in bimodal courses.

**Equity**

For students and professors who support bimodal courses, accessibility, accommodation, access to university programs for more French-speaking students, and internationalization are elements that support equity in post-secondary teaching and learning. (S)

All students and faculty who had problems with classroom technology cite this as a challenge for equity of learning. (S)

An interesting point of intersection is worth noting. On the one hand, some student felt that treatment was inequitable in that professors tended to ignore online students. On the other hand, faculty who do not support bimodal teaching complained about student disengagement online: cameras turned off, low participation and spotty attendance, which faculty found discouraging.

**Sense of community**

At the class level: Students, especially Francophone students, and faculty who support bimodal teaching, greatly valued technology features such as chat boxes and breakout rooms, which they saw as important elements in creating a sense of community. (S)

In contrast, faculty not supportive of bimodal teaching reported that these features further complicated the management of the distributed space, increased the sense of loss of control, and detracted from the quality of interaction with students.

Faculty also noted that the Teaching Assistant acting as an intermediary diminishes the traditional professor and student relationship. However, this was not something students noted when they received satisfactory answers from the Teaching Assistant. (D)

**Sense of community at the university level**

All faculty as well as the majority of English-speaking students asked the University to consider the importance of building a sense of community and campus culture among students. (S)
Faculty suggestions for improving the bimodal course experience

Table 3 summarizes faculty recommendations.

Table 3. Faculty suggestions for improving the bimodal experience

<table>
<thead>
<tr>
<th>Administrative considerations</th>
<th>Practical considerations</th>
<th>Pedagogical considerations</th>
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| Professors recommend: Faculties and departments make a more targeted selection of courses for the bimodal format based on:  
  - Subject matter  
  - Whether the course is required or an elective  
  - The type of course (lecture, discussion, etc.) | Professors recommend: Improved computer equipment and digital technology in classrooms  
Better immediate technological support when issues arise in the classroom | Professors recommend:  
Training on course design based on “active learning” and “interaction in multimodal spaces” |
| A review of classroom size for bimodal courses based on:  
  - Numbers of people in class and online  
  - Flexibility options for the course | The provision of spaces on campus for students who want to log in to their online courses | Training for instructors, Teaching Assistants and students on how to use the computer equipment |
| Consideration of the technological capabilities of the space according to type of course (lecture, discussion, etc.) and number of people. | Assigning Teaching Assistants or technology support (equipment start-up) and discussion support (discussion groups, chat rooms, etc.) to reduce professors’ workload | Having start-up guides and written operating instructions available at the podiums specific to the features of the podium in that classroom |
| Having clear guidelines that are communicated to the community on certain classroom behaviours such as:  
  - Attendance  
  - Cameras, recordings  
  - Participation | | Training on “designing activities to promote interaction in a divided and complex space” |
| | | Training on “managing classroom interactions” |
Conclusion

Bimodal course delivery in the 2021-2022 academic year was a new experience for faculty and students and for administration and support services at the University of Ottawa. The purpose of this study and the two reports was to deepen our understanding of the impact of bimodal courses on the teaching and learning experience of faculty and students, and to identify strategies to improve pedagogical practices, select digital tools, and determine training and techno-pedagogical needs and resources for faculty and students.

While the results of the study showed that students mostly approve of the bimodal format, but with improvements, two-thirds of the faculty in the study rejected it as a model for higher education. Equipment and structural factors, such as suitability of the physical classroom space, installation of multimedia equipment, the choice of technology, the format of the courses, on the one hand, and human factors, such as managing a complex space of dialogue and interaction, dividing up tasks, and certain student behaviours, on the other, resulted in an unsatisfactory experience for the majority of faculty.

Due to its relative novelty, it is difficult to measure the true impact of the bimodal format at this time. However, to narrow the gap between student and faculty perceptions, it is important that issues raised by the community be taken into account in the future to adapt the bimodal format so that the teaching and learning experience will continue to improve.