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IMPACT OF COVID-19 AND ONLINE LEARNING ON STUDENTS IN BC'S RURAL AND REMOTE COMMUNITIES

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BCCAT

TABLE OF CONTENTS

Executive Summary

Research typically finds that students from rural/remote communities differ from their counterparts in urban centres with respect to both their educational experiences and outcomes (e.g., Hango et al., 2021; Zarifa, Hango, & Pizarro Milian, 2018). With the rapid shift to online methods of instruction triggered by the pandemic, many have questioned whether rural/remote students were negatively and disproportionately affected given their more limited access to broadband internet in both Canada and abroad (e.g., Butler, 2021). As a result, in 2021 the British Columbia Council on Admissions and Transfer (BCCAT) commissioned Academica Group to perform an analysis of how the shift to online learning may have impacted rural/remote post-secondary students in the province.

Using administrative records provided by four participating public post-secondary institutions in Northern B.C. (Coast Mountain College, College of New Caledonia, Northern Lights College, and the University of Northern British Columbia), we examined rural-urban differences in two proxies of performance: term grade point average (GPA) and graduation/persistence rates. We used the student's current postal code, an imperfect but the only available proxy in the provided records, for identifying those residing within rural areas.

We observed that – on average – there were no large, systematic urban-rural differences in the GPAs of students either before or after the onset of the pandemic. Linear regression models that account for available student demographics and other potential confounders (e.g., program area, institution) allowed us to identify statistically significant rural-urban differences in GPA in the Fall of 2020. A variety of other unaccounted factors beyond the split into rural and urban may have influenced the results; thus, we caution the reader against drawing strong conclusions from this analysis.

We also conducted interviews exploring students' and faculty perceptions and experiences during the emergency remote teaching period that happened during the pandemic. The interviews were held at two of the four participating institutions in Northern B.C. The interview data allowed us to observe that students questioned the quality of emergency online education and saw a disconnect between grades and learning during the pandemic. This dynamic raises questions about the utility of using GPA as a proxy for learning via online learning during this period. In addition, we learned of software and hardware issues that served as impediments to effective participation in online learning, and which likely impacted rural students disproportionately.

Directions for future research include the replication of these analyses using provincial-level records capturing student performance, as the sample examined through this project is unlikely to be representative of the broader province. In addition, it would be useful to tap into larger-scale data sources – both qualitative and quantitative – capturing rural students experiences with online learning. The latter is likely to vary across geographical regions even if there is general parity in the measured performance of students.

Introduction

In response to the COVID-19 pandemic, British Columbia post-secondary students, like other students across Canada, moved to online learning. The move to emergency remote teaching may have widened the "digital divide" regarding access to technology to facilitate online learning for certain regions or demographics. In response to the potential widening of the "digital divide", the British Columbia Council on Admissions and Transfer (BCCAT) embarked on a project to explore the impact of the move to remote, online learning on students from rural and remote communities.

The specific objectives of the study include:

1) Conduct a multi-jurisdictional literature review on the "digital divide" in post-secondary education, focusing on North America, and particularly on the experiences of rural/remote learners and rural/remote Indigenous learners, specifically.

2) Utilize institutional data to assess the impact of the shift to online learning on student performance.

3) Capture the experiences of students and faculty regarding online learning and teaching in rural/remote communities during the pandemic.

4) Identify areas for future research related to online learning and teaching for rural and remote learners.

Through an analysis of administrative records, we evaluated rural-urban disparities in student performance and outcomes during the 2018-2021 period. Through the qualitative component of this study, we were able to obtain preliminary insight into the experiences of a small group of students and faculty members with online learning, including both the perceived benefits and difficulties of this mode of learning.

Method

To analyze rural-urban disparities we adopted a mixed methods research design. This included analyses of administrative records capturing student performance and interviews to probe student and faculty experiences with online learning during the pandemic. Four public post-secondary institutions in Northern B.C. participated in this study. Research Ethics Board approval was obtained from each institution.

ADMINISTRATIVE DATA ANALYSIS

The quantitative analyses presented in this report were performed with anonymized administrative student records provided to Academica Group by the four participating institutions - Coast Mountain College, College of New Caledonia, Northern Lights College, and the University of Northern British Columbia. In total, we received student-level records for 17,861 students enrolled at various points from Fall of 2018 to the Summer of 2021. The provided records were generally consistent in their structure, requiring standardization only for variables that differed in their structure across institutions, mainly field of study and credential type.

Contained within the administrative records were basic student demographics, including their year of birth, gender, citizenship status, and Indigenous self-identification. In addition, these records contained each student's current postal code. Using this field, we were able to identify those residing within a rural area as determined by their forward sortation area (FSA). Canada Post assigns a "0" to the second character of the FSA for those regions it deems rural, with other numbers representing non-rural areas. This led to the categorization of 11.5% to 17.7% of students as "rural" across each of the participating institutions (see Table 1 in the Appendix), with the remainder being identified as urban. In the pooled sample, 14.1% of students were identified as living in a rural FSA.

The provided administrative records also contained key academic details about each student, such as their program name, their course load (full vs. part time) and grade point average (GPA) during each term that they were enrolled during the period covered by the records. Further, the records contained information on whether a student had graduated during the period of observation.

These records allow us to explore two primary questions related to rural-urban differences in student performance pre- and post-pandemic:

1. Did the gap between rural and urban students' GPA grow during the pandemic?

2. Were there differences in the graduation rates of rural and urban students during the pandemic?

To analyze these questions with the described administrative records we use a mixture of techniques. First, we use descriptive statistics and differences in means tests to explore raw disparities in average

GPA and graduation rates. Second, for GPA, we explore the distribution of students' GPAs in terms before and during the pandemic to examine whether there were notable differences in how rural and urban students performed that were not perceivable through measures of central tendency (e.g., mean, medians). Third, we statistically model the differences in GPA and the likelihood of graduation for rural and urban students using a modeling strategy mirroring that used in Knoble, Flynn, Lee & Hilton (2007). Our statistical models control for potential confounders, like demographics, program area and institution enrolled in, and allow us to estimate net rural-urban differences in student performance[1].

LIMITATIONS

The described data and methods have important limitations. First, the four participating post-secondary institutions are located in the provincial north and are thus not likely representative of the broader B.C. PSE student population. Trends observed here could vary markedly from those in other institutions with varying student demographics. Second, the provided administrative records do not contain key information, which could influence student performance during the pandemic, including access to high-speed internet, the presence of dependents in the home, and proxies for the socio-economic background of students (e.g., parental education or income). These factors could partially mediate the impact of the pandemic on rural and urban students. Third, administrative records do not provide information on students' experiences during the pandemic. Even in a scenario where students have comparable GPAs – for example – there could exist disparities in the effort required to achieve said outcomes given students' variable circumstances. Fourth, many institutions introduced changes to grading polices and made grade accommodations during the pandemic; and these factors were not included into the analysis. Fifth, and perhaps most important, we use a coarse and imperfect rural/urban dichotomy to represent students' place of residence. There is meaningful diversity[2] within each of these categories that we are unable to measure, and which would shape students' experiences with online learning. It was impossible to draw conclusions about the impacts of the "digital divide", and the study focused on measures of student performance.

Given the limitations noted above, there is a need for both larger scale research and alternative methods to verify the findings produced through this exploratory statistical analysis. Nevertheless, our work provides valuable preliminary evidence that should inform future research and policy discussions in this space.

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[1] Controls in these models include: age and its squared term, gender, Indigenous status, citizenship status, credential enrolled in, enrollment status (FT/PT), program area and college/university enrolled in.
[2] For discussions of differentiation across rural regions, see Nelson et al. (2021) or Ratcliffe et al. (2016)

INTERVIEWS

Interviews were conducted to acquire complementary data that could help contextualize quantitative trends observed in the administrative data. Numbers are most useful in telling us what has happened, but they typically do not provide insight into why trends play out as they have.

Academica provided each participating post-secondary institution with selection criteria for identifying the target audience for the interviews, email templates for inviting students and faculty, and letters of information to include in the invitation to students and faculty. Student invitees must have been enrolled in a course that was moved online due to the pandemic during the period of March 2020 to August 2021 (excluding students enrolled in continuing education, contract training, and apprenticeship/trades), and faculty invitees must have taught a course that was moved online due to the pandemic during the period of March 2020 to August 2021 (excluding faculty teaching in continuing education, contract training, and apprenticeship/trades). Post-secondary institutions used the selection criteria to invite a random sample of students and faculty by email to participate in an in-depth individual interview. Invitees interested in participating were instructed to contact Academica by email.

Academica conducted the interviews by telephone; one interview with a faculty member was conducted via Microsoft Teams at the interviewee's request. A total of nine interviews were conducted, including five interviews with students and four interviews with faculty members. Interviews were conducted between April 14 and July 13, 2022, and lasted up to 50 minutes. Verbal consent for participation was obtained at the start of each interview. Interviews were audio-recorded, with permission from the interviewee, and transcribed. Audio-recordings for the verbal consent process and interview were captured as separate recording files and were stored separately to exclude any identifying information from the interview responses. All data was securely stored on Canadian data servers.

LIMITATIONS

This project aimed to interview fifteen students and ten faculty members who participated in online learning or teaching due to the COVID-19 pandemic, however there was low interest in interview participation among students and faculty members from the participating post-secondary institutions. Three of the participating institutions invited a random sample of students and faculty members to participate in an interview, however students and faculty from only two institutions participated in an interview. Given the low levels of participation, we have likely captured only limited variation in the experiences of both groups with online learning. Further data gathering and analysis would be useful in better mapping these experiences.

Literature Review

The pandemic brought on by COVID-19 resulted in a massive and sudden shift to online learning, with over 2 million Canadian post-secondary students moving to online learning in March 2020 (Schrumm, 2020). This move was unprecedented in both speed and scale. And while it was necessary to prevent the spread of the virus, it also quickly became apparent that what was designed as a measure to benefit/protect was leaving some learners behind due to the digital divide. The digital divide refers to the gap between individuals regarding their access to information and communication technologies (OECD, 2001), and reflects deeper socio-economic, geographic, gender, and racial inequalities.

In post-secondary education, the digital divide has created inequities related to learners' access and success long before the pandemic, but the massive shift to online learning has caused the divide to widen. In the U.S., close to 20% of college students reported inadequate computer hardware or internet connection that inhibited participation in online learning when classes were moved online (Jaggars et al, 2021). Inadequate technology was more common among lower-income students than higher-income students; Black and Hispanic students relative to White students; and students living in a rural area compared to those living in a suburban or an urban area (Jaggars et al, 2021). In Canada, an Ontario study found that 20% of post-secondary students experienced technology-related challenges during the pandemic-induced online learning, including slow internet connection, computer challenges, and challenges learning new systems (Markov et al., 2021).

DIGITAL DIVIDE: RURAL AND REMOTE LEARNERS

For rural and remote learners, online delivery of post-secondary education has the potential to reduce or remove geographic barriers to traditional on-campus learning, allowing students to remain in their home communities (ABLE Research Consultants, 2020; Brennan et al., 2021; Veletsianos et al., 2021). However, learners in rural and remote areas are also more likely to experience the digital divide with regards to online learning due to factors including a lack of access to affordable and high-speed internet, lack of access to personal digital devices, and lack of access to local technology resources and support (Hambly, Worden, & Gillam, 2021; Lai & Widmar, 2021; Parkes et al., 2020).

According to Innovation, Science and Economic Development Canada (ISED), Canada is facing a "national connectivity gap" (ISED Canada, 2019, p. 4). In 2019, 87% of Canadian households had access to 50/10 Mbps service, compared to only 46% of rural households (CRTC, 2020). In B.C., 94% of all households have access to 50/10 Mbps service but only **63% of rural B.C.** communities and 68% of Indigenous communities have access to 50/10 Mbps service (CRTC, 2020). Internet with 50/10 Mbps speed is generally considered as necessary to fully utilize the opportunities offered by the modern

internet, however this speed has recently been cited as being too slow for cloud-based software applications and online learning resources (ISED Canada, 2019).

A strong internet connection is required for full participation in online learning, however students living in rural, remote, and northern areas in Canada, including Indigenous students in rural areas, often have poor access to affordable, reliable, and high-speed internet (Auger & Baker, 2021; Brennan et al., 2021; Canada's Public Policy Forum, 2014; CRTC, 2020; ISED Canada, 2019; McMahon et al., 2011; Robinson et al., 2020; Schrumm, 2020). For example, in the Yukon, broadband speeds can support basic online applications, such as email, social networking sites, and banking, but not high data applications such as distance education and training, eHealth, and research (Canada's Public Policy Forum, 2014).

During the COVID-19 pandemic, poor internet connection, wi-fi and online learning system interruptions, computer challenges, and challenges learning new systems were identified by Ontario post-secondary students as contributing to learning challenges including being logged out during a test, assignment submission errors, communication lags, audio issues during discussions and presentations, lack of engagement, missing important content, distractions, and feelings of stress and frustration (Markov et al., 2021). These challenges were noted as a particular issue for students in rural and remote areas who may have poor internet connection (Markov et al., 2021). Some students also indicated that internet speed and technology-related challenges impacted their testing and resulted in consequences such as missing an examination or being unable to complete all test questions (Markov et al., 2021). The high cost for reliable and high-speed internet furthers the digital divide for rural and remote learners. CRTC reports that the cost of broadband internet with 50/10 Mbps speed is higher in rural areas compared to urban areas (CRTC, 2020).

Throughout 2020, Academica Group conducted COVID-19 related enrolment research that included the perspectives of almost 27,000 PSE or PSE-bound students from across Canada through two studies: The Domestic Prospective Students Study (DPSS) and the Current Students Study (CSS).[3] Custom analysis of the data for this BCCAT study found that rural prospective students were significantly more likely than other prospective students to report being concerned that their internet connection was not fast or reliable enough (37% of rural students compared to 24% of other students). Additionally, while prospective students did not differ in their ownership of a device to use for online learning only 66% of rural prospective students said they had a reliable, high-speed internet connection compared to 83% of prospective students living in urban and suburban areas. Among current post-secondary students, the results were similar with only 66% of rural students indicating that they have a reliable, high-speed Internet connection compared to 80% of urban and suburban students.

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[3] For additional information about these studies, see
https://www.academica.ca/sites/default/files/DPSS%20Public%20Release%20Final_1.pdf and
https://forum.academica.ca/forum/current-students-covid19.

Students located in rural and remote areas may also lack access to a personal digital device which is required for online learning (Schrumm, 2020). Senior administrators and faculty at post-secondary institutions in Canada have identified lack of access to technology and wi-fi as concerns related to equity in digital learning, both for students located in northern, rural communities and in urban centres (Johnson, 2020). Lack of local technical support and lack of or insufficient computer skills have been noted as additional barriers to remote education for rural First Nation students in Canada (Simon et al., 2014).

Similar to Canada as a whole, students in rural and remote post-secondary students participating in online learning in British Columbia (BC), specifically, may experience poor access to high-speed internet and barriers to accessing technology hardware and software, which can negatively impact motivation and participation in learning (ABLE Research Consultants, 2020; Hayden, 2020). Lack of computer skills and the need to travel long distances to access learning resources, such as libraries, have also been identified as online learning barriers (ABLE Research Consultants, 2020).

DIGITAL INFRASTRUCTRE INVESTMENTS

In 2019, ISED put forth Canada's Connectivity Strategy which commits to providing every Canadian with universal 50/10 Mbps service by 2030 (ISED Canada, 2019). The Canadian government is investing $1.7 billion in broadband infrastructure and $2 billion in the Rural and Northern Stream of the Investing in Canada Infrastructure Program (ISED Canada, 2019).

In January 2021, BC initiated Contact North BC, a collaboration between Coast Mountain College and Indigenous communities located in northwestern BC (Government of British Columbia, 2021). Contact North BC aims to expand post-secondary access for students living in rural and remote areas, including Indigenous students by providing access to face-to-face supports, online supports, and reliable technology and internet through community-based learning centres located close to their home communities (Government of British Columbia, 2021). The initiative supports students located in the traditional territories of the Haida, Nisga'a, Gitxsan, Wet'suwet'en, Tsimshian, Haisla, and Tashltan Nations, as well as School District 92 (Nass), School District 54 (Bulkley Valley), and the Métis Nation in Terrace (Government of British Columbia, 2021). Since Contact North BC launched, students in rural and remote areas have enrolled in 400 post-secondary courses in BC, and the initiative aims to have 2000 registrants by March 2022 (Government of British Columbia, 2021).

Research Findings

ADMINISTRATIVE DATA ANALYSIS: STUDENT PERFORMANCE

This analysis focuses on rural/urban student performance differences, as the administrative data did not have any information that would link performance directly to the digital divide. Another caveat in this analysis is an imperfect proxy – students' place of residence – for categorizing rural/urban dichotomy. The limitations preclude the generalization of the results; however, this exploratory analysis offers valuable preliminary evidence for future research.

GRADE POINT AVERAGE

Our quantitative analysis showed only small differences in the average GPA of rural/urban students, both before and after the onset of the pandemic. In only two semesters – Fall 2018 and Winter 2019 - we see that rural students had a statistically significant GPA advantage, and the difference was small: 0.21 in Fall 2018; and 0.18 in Winter 2019 (Table 2 in Appendix 1). Overall, these descriptive statistics did not signal any large, systematic urban advantage in academic performance, noted in the literature.

A visual analysis of the distribution for winter GPAs showed that there were both more low and high performing rural students than urban students. This was true both prior and during the pandemic, evidencing that there was no change in the overall structure of student GPAs during the pandemic (Figure 1 in Appendix 1).

Overall, the weight of the evidence produced through our statistical models suggests that there is no statistically significant difference in the GPAs of rural and urban students, either before or after the pandemic (Tables 3-5 in Appendix 1). The only exception was the Fall 2020 semester, where we detected a moderate but statistically significant rural deficit in GPA (Table 3 in Appendix 1). It is unclear why this was the case for this specific term, but this deficit might have been caused by the disruption of the first Fall term of the pandemic.[4]

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[4] We reached similar conclusions via a differences-in-differences analysis of rural-urban pre/post pandemic.

GRADUATION AND PERSISTENCE

To explore differences in graduation, we began by looking at graduation rates for students first appearing in the administrative records in the Fall semesters of 2018, 2019, and 2020.[5] The rate dropped for all groups given that those entering in later years had had far less time to complete their programs (Table 1). Despite this, each cohort had rural students graduating at lower rates than their urban counterparts. The rural-urban gap (15.8 percentage points) was largest for those that first appeared in the administrative records in the Fall of 2019.

### Table 1. Total Graduation Rates by Region/Cohort

Cohort	Rural	N	Urban	N
Fall 2018	47.6%	769	55.0%	5,846
Fall 2019	22.3%	373	38.0%	2,200
Fall 2020	18.6%	290	22.6%	1,814

Further insight into rural-urban disparities in student outcomes can be derived from examining the group of students who did not graduate during our observation window. We compared the percentages of rural and urban students in the Fall of 2018 cohort who graduated within our observation window (until 2021) alongside those who did not graduate but i) remained enrolled in the Fall of 2019, and ii) those that failed to re-enroll in the Fall of 2019. In this pre-pandemic cohort, a higher percent of urban students returned to school in the Fall of 2019 than did rural students (19.7% urban vs. 18.2% rural). Meanwhile, 25% of non-graduating urban students that were first observed in the Fall of 2018 failed to enroll in the Fall of 2019. The rate for non-graduating rural counterparts (34.2%) was roughly 9 percentage points higher (Figure 1).

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[5] To determine if a student first appeared in the records, we looked at their first reported GPA term. Thus, for example, if a student had a GPA reported in the Fall of 2019 (and no GPA reported for the Fall of 2018), they were categorized as being in the Fall of 2019 cohort. Our cohorts are thus not traditional "entry" cohorts of first time students. They simply reflect the first time we observe the student within the window covered by administrative records.

Figure 1. Student Outcomes, 2018 Cohort
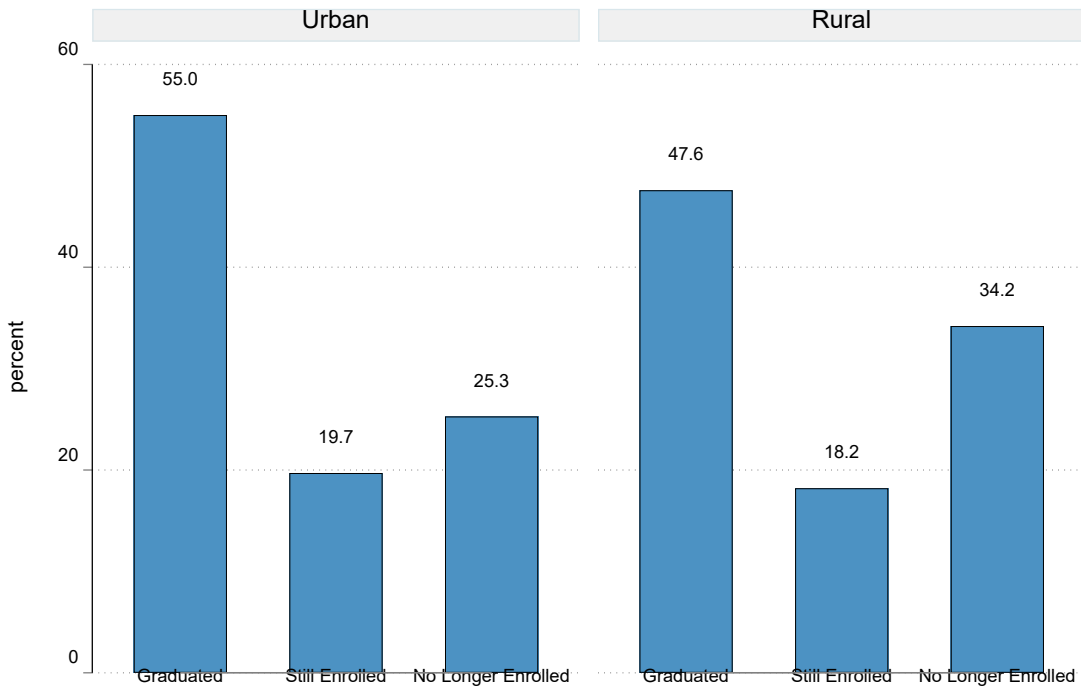
By focusing on those that were first enrolled in the Fall of 2019 and for which there was no record of enrollment since the Fall of 2018 (Figure 2), we had an opportunity to analyze outcomes for those that were more likely to be i) first year students, and ii) potentially impacted by the pandemic. For this group we see a similar share of non-graduating urban (29.8%) and rural (30.0%) students remaining enrolled by the Fall of 2020. A more sizable difference is observed in the percentage of urban (32.1%) and rural (47.7%) students that failed to re-enroll in the Fall of 2020 (without having graduated).

Figure 2. Student Outcomes, 2019 Cohort
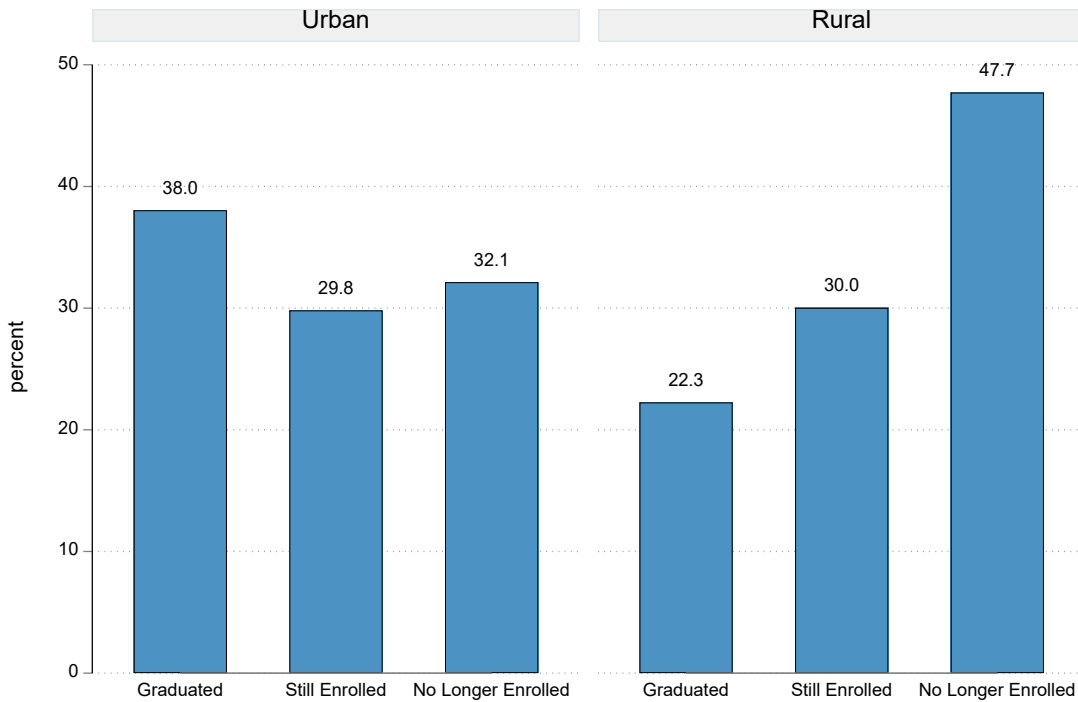
To further probe rural-urban deficits in graduation, we statistically model graduation separately for the Fall of 2018 and Fall of 2019 cohorts using logistic regression (Tables 6-7 in Appendix 1).[6] We began with a model that only includes our rural/urban variable as a predictor, and saw a statistically significant and negative coefficient for the Rural dummy. This meant that rural students were less likely to graduate (p<.001). However, the progressive addition of demographics and program information variables into the models rendered the Rural coefficient not significant. This indicated that variables other than rural-urban category (e.g., credential category, program length, and accumulated credits) could mediate the relationship between residing in a rural area and the chances of graduation.

The weight of the evidence produced through this exploratory analysis of rural-urban disparities in graduation suggests that while rural students graduate at lower rates than urban counterparts, this difference is attributable to observable differences between these groups. Importantly, demographic and program/institution controls do much to diminish the rural-urban graduation gap.

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[6] Though we only present results from logistic regressions, we produced similar estimates of rural-urban disparities in graduation via probit and linear probability models.

INTERVIEWS

To better understand how the transition to online learning shaped student experiences and outcomes during the pandemic, we conducted interviews with 5 students and 4 faculty members. Through these interviews we learned of various dynamics that could influence the trends observed in the administrative data.

GRADES AND ONLINE LEARNING

First, certain students expressed that they believed their professors were more lenient and accommodating during the initial transition to online learning than they normally were:

> *The teachers were usually more lenient because they understood that it was a different mode of learning. So, we had open book quizzes. If you were unable to make a deadline because you got sick or life was just too stressful, for the most part, they were really understanding about it.* – Student

In this new environment, some suggested that their grades did not suffer, but their general motivation and the quality of their work suffered:

- *...I had a pretty reduced course load. That helped me a fair bit compared to some other people I knew who were doing four or five courses a semester. They were really struggling. But for me, I found my actual grades stayed about the same, but my motivation and quality of work I think dipped a little bit.* – Student

It was intriguing to witness students decouple learning with grades, as one would normally expect the two to be closely related. However, through our interviews we became aware that some students saw these as distinct concepts. Moreover, we learned that – within the online learning environment – some saw themselves as achieving high grades despite not having to engage in the same "struggle" to study and memorize their course material:

- *Because it was open book for most of the tests and quizzes, you weren't really pressured to memorize anything. So, as long you knew the material, you could just breeze through the quizzes and get like or nineties or eighties. It wasn't a struggle. You didn't really have to study and then you would just forget all that info.* – Student

This general sentiment was more modestly echoed by one faculty member who plainly stated: *"I am not convinced that learning outcomes were met during the pivot."* In light of these trends – of greater leniency and a perceived disconnect between grades and learning – it is possible that metrics like GPA may not be the optimal method to evaluate rural-urban disparities resulting from the pandemic.

BARRIERS TO LEARNING

Through our interviews we also learned that about some of the barriers to effective participation in online learning. Some students admitted that their home internet connection did not offer the necessary bandwidth for all users to simultaneously engage in online learning:

- *Sometimes it got a little bit congested. So, as I mentioned, I had a roommate at the time who was working fully remote from home. And so, there was sometimes where if he was on a Zoom call and I was trying to do a lecture, and maybe the people living upstairs were also using it, it would jam or freeze.* – Student

Students also recalled that their instructors at times struggled with internet connectivity issues. For example, one recalled that:

- *… I remember one of my teachers, where she was living at home didn't get cell reception and the school was shut down, so she had to do her… classes from Boston Pizza…*– Student

Hardware issues were also reported as a factor limiting participation in online learning. Several students shared stories of having to share their laptops with roommates or friends at points during the pandemic:

- *I did however have to share [my laptop] with my other roommate who is a nursing student as well last year, just because her laptop broke. And then she couldn't afford to buy a new one… we had the exact same classes anyway, so we both just did it from my laptop.* – Student

Smaller hardware malfunctions also limited full participation in online learning:

- *I don't have a webcam… it stopped working in my laptop basically when I bought it, and then I tried to get it fixed, but it would've taken too long. And then I needed the laptop for school because it was going online.* – Student

As such, despite the general parity we observed among urban/rural students' academic performance, one could reasonably expect that these sorts of connectivity/hardware issues could disproportionately affect the quality rural students' learning. As one faculty member highlighted:

- *Those in more remote areas than others were often those who had to disengage their video cameras, because their internet connection was simply too weak to maintain it… So that was pretty significant in terms of their ability to successfully complete assignments or exams or courses.* – Faculty

Similarly, faculty noted that those students living in remote areas at time struggled to quickly access hardware or course materials:

- *If they needed to get a book that I recommended for some of them, it would take three days and for some, it would take four or five weeks to get to them... they're not close to a major store where they can pick up things that might be needed in the classes, even just the microphone, headset or whatever is more challenging for them because they can't go down to the local Best Buy or whatever. So, they're relying almost entirely on online shopping to get their stuff. And their internet connections often were not reliable enough.* – Faculty

Beyond technical barriers, some students opined that the quality of online education they received was linked to its format, with synchronous learning providing quality more comparable to traditional in-person learning:

- *I think asynchronous was significantly worse, quite truthfully. I think synchronous was in comparison to in-class. I'm not necessarily certain on the reason for that. It may have to do with effort. The profs that were doing synchronous were putting in a lot of effort to make sure that all the students were keeping up with things and understanding what was going on, and able to be more responsive.* – Student

Online learning was also perceived to be of lesser quality than in-person course delivery given that it offered limited opportunity to engage with the instructor and peers:

- *[The quality] wasn't what it usually would be with the in person, for sure. I found it was hard to solidify concepts because you were in an online platform and asking questions was super hard to do... everyone's trying to ask a question and then you're speaking over each other on the mic.* – Student

In addition, students missed the ability to interact with faculty via regular face-to-face interactions, either during office hours or after class:

- *I found it was frustrating not to have ordinary office hours... I found it frustrating to have to put my thoughts typed into an email if I had a question, especially because if you have questions about certain things, you're actually never just asking one question...* – Student

Similar sentiments were expressed with respects to peer-to-peer interactions:

- *The big difference [between in-person and online learning] was being able to go and meet classmates and form study groups. Because it's pretty well known that if you can get different perspectives on [an idea], you can really develop that idea more and understand it better. And I feel like in the online environment, there wasn't as much sharing of ideas, which really limited the perspective of the knowledge in some sense.* – Student

One faculty member echoed the disadvantages of not being co-present with students in the classroom, particularly with respects to fostering an engaging classroom environment.

- *I think one of the challenges with online, especially when you have larger groups is the engagement piece... you're teaching and everyone has their camera off... sometimes students have just logged on and maybe they're doing other things, they're multitasking. And I think we can all be guilty of that a bit with the zoom thing... I always feel like sometimes you have to be a bit of the game show host of bringing the energy and the excitement, and that can be exhausting... we also really tried to manage the chat box... So just trying to use the technology to its fullest potential.* – Faculty

A second factor which was cited as hindering the effectiveness of online learning was the lack of separation between home and school life. As one student explained:

- *If you're doing this at home, online, you need to be so incredibly self-disciplined. I cannot be thinking, 'Okay, wait, did I turn a slow cooker on? Or did I not?' 'Oh, wait, that laundry probably is done. I should probably put in the dryer.'* – Student

Faculty also saw this as an impediment to student success.

- *In class, if you get those students who, I say, 'The sky is blue' and then five minutes later, a student will say, 'Well, what colour is the sky?' And so often I will say, 'Well, five minutes ago, I answered that question' ... I see it more often happening in online... they might be going making a coffee or a tea or run out to somewhere or whatever. And that's why they missed what I said. And that often comes back on me. Like, that's my fault that they didn't hear me.* – Faculty

BENEFITS OF ONLINE LEARNING

Despite the drawbacks mentioned above, students and faculty members believed that online learning offered rural/remote students an array of potential benefits. One perceived benefit was that it allowed these students the opportunity to *"learn anywhere at any time"* (Faculty), while also being able to save on living costs:

- *I've been putting off doing my math requirement for several years, and so since it was online that summer, I was actually able to do it while living at home as well, whereas normally it would've required me staying [near campus]... I had never done any summer courses before, mainly just because my usual pattern was to go home and cut down the cost-of-living expenses.* – Student

- *It was also cheaper. The cost-of-living went down because you didn't have to have a car. You didn't have to be there for class. You didn't have to pay for parking.* – Student

A second benefit, primarily associated with asynchronous online learning, was that it offered greater flexibility to schedule learning around existing work schedule and responsibilities:

- *The asynchronous worked well, just because it gave you the flexibility with your school schedule... I could pick up work during the day and then just watch the pre-recorded lectures at night.* – Student

- *The fact that it was asynchronous or that they recorded the lectures that were synchronous, it was super flexible. At one point I was working like 35 hours a week while doing four classes... I could just catch up on the evenings and in the morning.* – Student

Some students found little difference between watching a lecture in-person or online:

- *I didn't find that much difference between watching a lecture or sitting in on one. And actually sometimes it's kind of handy because you [can] watch the recording more than once or pause, rewind, speed up.* – Student

Conclusion

Our analyses provide preliminary insight into how the transition to online learning triggered by Covid-19 could have impacted the performance of post-secondary students in British Columbia. First, through our analysis of administrative data we were able to estimate rural-urban differences in student performance. We observed little evidence that rural students systematically underperform in the classroom, as measured through their grade point average (GPA). The presented models detected statistically significant rural-urban differences in GPA in the Fall of 2020 term only. Similarly, modeling rural-urban disparities in graduation rates for students that first appear in our records in the Fall of 2018 and 2019 does not reveal significant differences net of available controls. Based on these limited set of analyses, we see no evidence of systematic rural-urban differences in student performance either before or after the pandemic. Subsequently, through our small set of interviews we learned that grades and learning became loosely coupled during the pandemic. From the interviews we learned about how students in rural/remote regions could have been affected by internet connectivity and hardware issues.

Despite these conclusions, it is important to emphasize once again the limitations of the work carried out in this exploratory study. First, it is not possible to connect the results of the institutional data and interview analysis to the impact of the digital divide discussed in the literature review. Moreover, the low response to our interview recruitment hinders the generalizability of our observations through such data. Continued efforts to gather qualitative data on the experiences of rural and urban students would be useful in better understanding their varied experiences with online learning during the pandemic. These data are particularly important given the general parity that we observed with respect to GPA and graduation rates. It is plausible that, though eventually achieving similar results, rural students were exposed to disproportionate hardship during the transition to online learning. At the same time, a larger scale analyses of administrative records across the province could produce more conclusive results as it pertains to rural-urban student disparities in performance. The four institutions that participated in this study – along with the students that attend them – could differ in important ways from the broader post-secondary system in British Columbia. As such, it is possible that our estimates of rural-urban differences in student performance would vary had our sample included additional institutions. Further, the timespan covered by our records – ending in the Summer of 2021 – does not allow for a more comprehensive comparison of student outcomes, including both student attrition and graduation rates.

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Acknowledgements

Appendix 1. Administrative Data Analysis

Table 1. Overall Rural/Urban Distribution by Participating Institution (Percent)

	Institution 1	Institution 2	Institution 3	Institution 4	Total
Urban	84.4%	82.3%	88.5%	84.7%	85.9%
Rural	15.6%	17.7%	11.5%	15.3%	14.1%
Total	100%	100%	100%	100%	100%

Table 2. Grade Point Average by Student Region and Term

	Urban		Rural		Difference (urban - rural)		
	N	Mean	N	Mean	diff.	t	p
Fall 2018	5846	2.85	769	3.06	-0.21	-4.88	0.00
Fall 2019	6143	3.05	828	3.14	-0.09	-2.28	0.02
Fall 2020	5859	3.10	765	3.11	-0.01	-0.26	0.79
Winter 2019	5810	2.89	704	3.07	-0.18	-4.17	0.00
Winter 2020	5940	3.15	680	3.19	-0.05	-1.14	0.25
Winter 2021	5582	3.11	774	3.20	-0.09	-2.09	0.04
Summer 2019	2223	2.92	271	3.05	-0.13	-1.63	0.10
Summer 2020	2430	3.16	266	3.20	-0.04	-0.54	0.59
Summer 2021	2364	3.15	299	3.15	0.00	-0.03	0.98

Note: t and p values are produced through a two-sample t-test.

Figure 1. GPA Distributions across Terms (2019-2021)
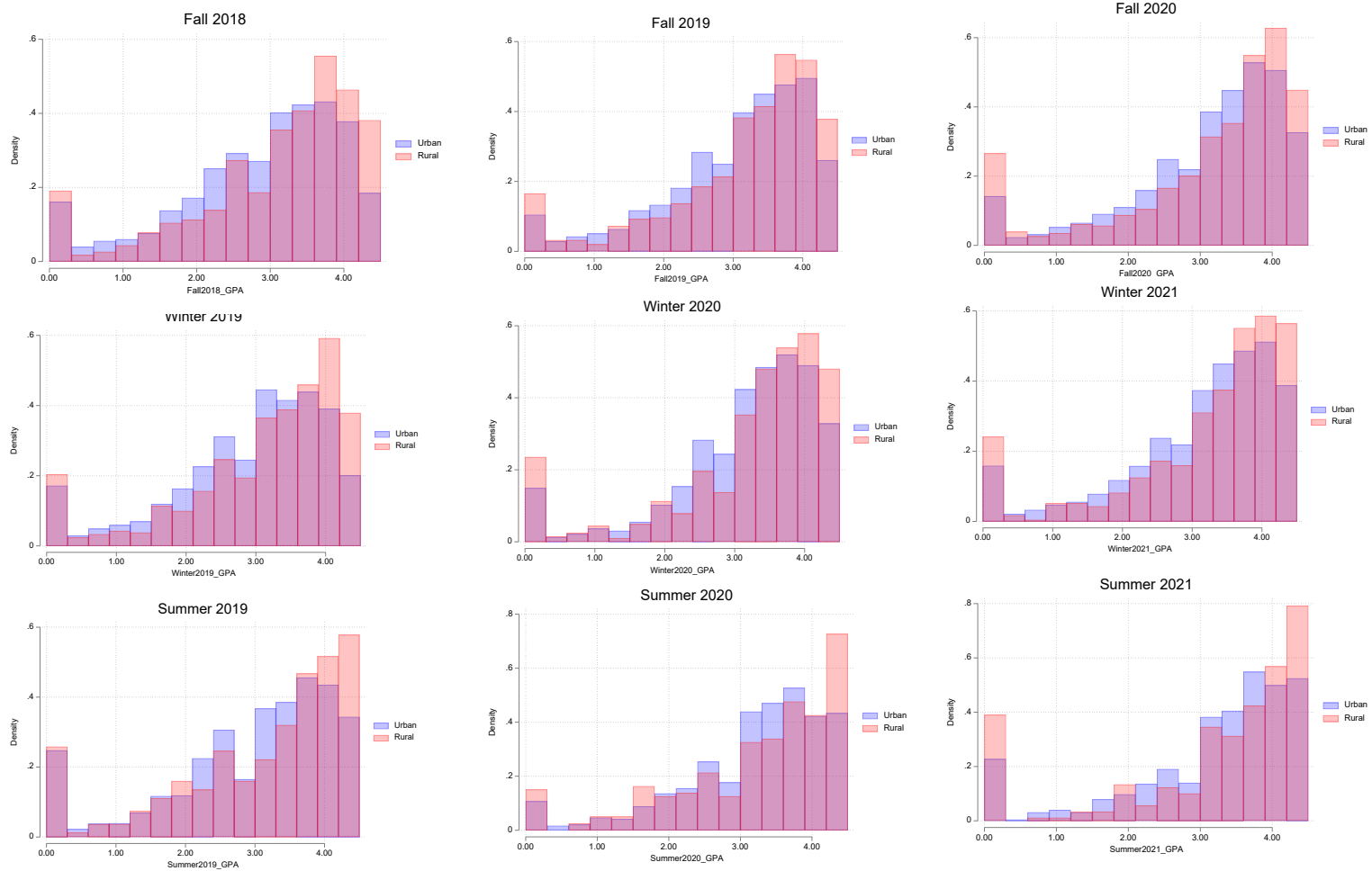
To estimate rural-urban GPA differences net of available controls, we fit a series of ordinary least squares regression (OLS) models (Table 3-5, Appendix 1). To address the negative skew of the GPA distribution (and the resulting residuals) we run our models using a quadratic transformation of GPA. This renders the interpretation of our models less straight forward. However, it allows our residuals to resemble a normal distribution more closely.

Controls in these models include: age and its squared term, gender, Indigenous status, citizenship status, credential enrolled in, enrollment status (FT/PT), program area and college/university enrolled in.

To ensure the robustness of our findings, models in Tables 3-5 (Appendix 1) were also re-fitted using the raw GPA variable. The same general rural-urban patterns were observed through this alternative set of models. Estimated coefficients had the same sign and significance levels, with the only difference being in their size given the different scale of the untransformed GPA variable.

In addition, given the skewed distribution of our dependent variable, we re-fitted each of the presented GPA models using quantile regression – which focuses on the conditional *median* as opposed to the conditional *mean*. The reported findings also proved generally robust to this alternative approach.

Table 3. OLS Regression of Fall GPA

	Fall 2018		Fall 2019		Fall 2020	
	b	SE(b)	b	SE(b)	b	SE(b)
Urban	0.00	(.)	0.00	(.)	0.00	(.)
Rural	0.27	(0.21)	-0.30	(0.19)	-0.62**	(0.22)
Age	0.41***	(0.05)	0.53***	(0.05)	0.40***	(0.05)
Age^2	-0.00***	(0.00)	-0.01***	(0.00)	-0.00***	(0.00)
Female	0.00	(.)	0.00	(.)	0.00	(.)
Male	-0.91***	(0.14)	-1.13***	(0.12)	-1.33***	(0.14)
Other	0.62	(0.99)	-0.46	(1.54)	0.75	(1.55)
Non-Indigenous	0.00	(.)	0.00	(.)	0.00	(.)
Indigenous	-2.03***	(0.22)	-1.84***	(0.22)	-1.60***	(0.25)
Domestic	0.00	(.)	0.00	(.)	0.00	(.)
Other	-4.20***	(0.20)	-3.61***	(0.19)	-3.30***	(0.20)
Certificate	0.04	(0.36)	0.11	(0.34)	0.72*	(0.35)
Diploma	0.69*	(0.30)	0.29	(0.29)	0.85**	(0.29)
Associate's Degree	-1.72***	(0.39)	-2.14***	(0.37)	-1.15**	(0.36)
Bachelors Degree	0.00	(.)	0.00	(.)	0.00	(.)
Post-Degree Cred.	2.46***	(0.32)	3.00***	(0.32)	3.25***	(0.34)
Missing	-2.44***	(0.42)	-2.45***	(0.39)	-0.63	(0.40)
Full-Time	0.00	(.)	0.00	(.)	0.00	(.)
Part-Time	-0.91***	(0.20)	-1.02***	(0.20)	-0.68***	(0.20)
Nursing	0.00	(.)	0.00	(.)	0.00	(.)
Business	-1.93***	(0.24)	-1.63***	(0.23)	-2.82***	(0.25)
Social Science	-2.29***	(0.26)	-1.81***	(0.24)	-2.94***	(0.26)
Humanities	-1.70***	(0.29)	-1.52***	(0.27)	-2.50***	(0.29)
Science	-1.16***	(0.22)	-0.73***	(0.21)	-1.17***	(0.22)
Other	0.19	(0.26)	0.53*	(0.24)	-0.75**	(0.29)
Institution 1	0.00	(.)	0.00	(.)	0.00	(.)
Institution 2	0.72*	(0.36)	-0.41	(0.34)	1.39***	(0.36)
Institution 3	0.70**	(0.26)	-0.25	(0.26)	0.15	(0.25)
Institution 4	-0.66*	(0.30)	-0.75*	(0.30)	-0.27	(0.30)
Constant	4.29***	(0.83)	4.15***	(0.81)	6.98***	(0.76)
Observations	6344		6691		6350	
R^2	0.221		0.247		0.205	

Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. OLS Regression of Winter GPA

	Winter 2019		Winter 2020		Winter 2021	
	b	SE(b)	b	SE(b)	b	SE(b)
Urban	0.00	(.)	0.00	(.)	0.00	(.)
Rural	0.16	(0.22)	-0.32	(0.22)	-0.15	(0.21)
Age	0.41***	(0.05)	0.34***	(0.05)	0.38***	(0.05)
Age^2	-0.00***	(0.00)	-0.00***	(0.00)	-0.00***	(0.00)
Female	0.00	(.)	0.00	(.)	0.00	(.)
Male	-1.14***	(0.14)	-1.16***	(0.13)	-1.27***	(0.15)
Other	-1.25	(2.08)	-1.69	(2.10)	-1.52	(1.16)
Non-Indigenous	0.00	(.)	0.00	(.)	0.00	(.)
Indigenous	-2.04***	(0.23)	-1.71***	(0.24)	-1.74***	(0.25)
Domestic	0.00	(.)	0.00	(.)	0.00	(.)
Other	-3.98***	(0.20)	-3.49***	(0.19)	-3.40***	(0.21)
Certificate	1.61***	(0.36)	0.78	(0.40)	2.52***	(0.36)
Diploma	1.73***	(0.31)	0.41	(0.36)	1.88***	(0.31)
Associate's Degree	-1.13**	(0.40)	-1.63***	(0.41)	0.08	(0.39)
Bachelors Degree	0.00	(.)	0.00	(.)	0.00	(.)
Post-Degree Cred.	3.26***	(0.35)	2.12***	(0.44)	3.04***	(0.38)
Missing	-1.28**	(0.44)	-0.86	(0.44)	-0.50	(0.42)
Full-Time	0.00	(.)	0.00	(.)	0.00	(.)
Part-Time	-1.26***	(0.20)	-1.92***	(0.20)	-1.68***	(0.19)
Nursing	0.00	(.)	0.00	(.)	0.00	(.)
Business	-1.58***	(0.26)	-0.92**	(0.30)	-2.81***	(0.27)
Social Science	-2.18***	(0.27)	-1.74***	(0.31)	-3.04***	(0.28)
Humanities	-1.53***	(0.30)	-1.06***	(0.32)	-2.82***	(0.31)
Science	-0.70**	(0.24)	-0.07	(0.26)	-1.61***	(0.23)
Other	-0.69*	(0.30)	-0.04	(0.34)	-1.51***	(0.32)
Institution 1	0.00	(.)	0.00	(.)	0.00	(.)
Institution 2	-0.16	(0.39)	0.89*	(0.39)	0.56	(0.40)
Institution 3	-0.16	(0.27)	0.28	(0.31)	-0.55*	(0.27)
Institution 4	-0.91**	(0.32)	0.62	(0.37)	-0.58	(0.33)
Constant	4.63***	(0.92)	7.15***	(0.88)	7.54***	(0.76)
Observations	6292		6364		6030	
R^2	0.195		0.175		0.195	

Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. OLS Regression of Summer GPA

	Summer 2019		Summer 2020		Summer 2021	
	b	SE(b)	b	SE(b)	b	SE(b)
Urban	0.00	(.)	0.00	(.)	0.00	(.)
Rural	0.07	(0.37)	-0.57	(0.35)	-0.72	(0.38)
Age	-0.02	(0.08)	0.10	(0.07)	0.18*	(0.07)
Age^2	0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Female	0.00	(.)	0.00	(.)	0.00	(.)
Male	-1.17***	(0.24)	-0.99***	(0.21)	-1.12***	(0.26)
Other	6.04***	(0.61)	-2.06	(1.46)	-1.10	(1.99)
Non-Indigenous	0.00	(.)	0.00	(.)	0.00	(.)
Indigenous	-1.68***	(0.47)	-1.62***	(0.44)	-1.83***	(0.47)
Domestic	0.00	(.)	0.00	(.)	0.00	(.)
Other	-3.50***	(0.35)	-3.61***	(0.34)	-2.65***	(0.36)
Certificate	-3.16***	(0.78)	-0.07	(0.66)	0.98	(0.60)
Diploma	-2.67***	(0.74)	0.48	(0.59)	0.06	(0.54)
Associate's Degree	-4.17***	(0.83)	-0.81	(0.67)	-1.76**	(0.67)
Bachelors Degree	0.00	(.)	0.00	(.)	0.00	(.)
Post-Degree Cred.	0.58	(0.79)	1.84**	(0.66)	1.51*	(0.63)
Missing	-4.96***	(0.77)	-2.02**	(0.65)	-1.02	(0.63)
Full-Time	0.00	(.)	0.00	(.)	0.00	(.)
Part-Time	-0.39	(0.25)	0.10	(0.21)	0.26	(0.25)
Nursing	0.00	(.)	0.00	(.)	0.00	(.)
Business	1.55**	(0.55)	-1.62***	(0.39)	-0.94*	(0.48)
Social Science	3.88***	(0.54)	-1.55***	(0.43)	0.20	(0.52)
Humanities	2.07**	(0.67)	-1.05*	(0.46)	-0.01	(0.56)
Science	3.53***	(0.55)	-0.30	(0.38)	1.78***	(0.46)
Other	5.34***	(0.55)	1.19**	(0.41)	0.66	(0.53)
Institution 1	0.00	(.)	0.00	(.)	0.00	(.)
Institution 2	3.51***	(0.83)	-0.34	(0.64)	3.53***	(0.62)
Institution 3	2.98***	(0.70)	0.65	(0.52)	3.45***	(0.46)
Institution 4	2.66***	(0.75)	-0.61	(0.60)	2.39***	(0.56)
Constant	9.21***	(1.45)	11.49***	(1.19)	6.89***	(1.21)
Observations	2429		2640		2560	
R^2	0.235		0.222		0.167	

Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In Model 1 within Table 6 (Appendix 1), we see a statistically significant and negative rural coefficient. This mirrors what we previously saw through descriptive statistics in Table 1 (main text). This coefficient grows in Model 2 after we control for the students' GPA in the Fall of 2018. Once we control for student demographics (age, gender, citizenship, Indigenous status), the rural coefficient shrinks dramatically and is rendered insignificant. The rural coefficient shrinks further once we account for their program area and the institution students attended (both of which are strongly correlated with graduation).

To improve the interpretability of these regression results, we derive and plot the unadjusted (Model 1) and fully adjusted (Model 4) predicted probabilities that urban and rural students will graduate (Figure 2). We once again see that prior to adjustments, urban students graduate at a higher rate (.55) than rural (.47) counterparts. These estimates mirror the descriptive statistics presented in Table 5 (Appendix 1) for the 2018 Cohort. But, once we adjust for covariates, we see the estimate for rural students pulls much closer to the urban estimate, and that the confidence intervals for the two overlap considerably.

Table 6. Logistic Regression of Graduation

	Model 1		Model 2		Model 3		Model 4	
Urban	0.00	(.)	0.00	(.)	0.00	(.)	0.00	(.)
Rural	-0.30***	(0.08)	-0.40***	(0.08)	-0.12	(0.09)	-0.03	(0.09)
Fall 2018 GPA			0.40***	(0.02)	0.62***	(0.03)	0.71***	(0.03)
Age					0.24***	(0.03)	0.32***	(0.03)
Age^2					-0.00***	(0.00)	-0.00***	(0.00)
Female					0.00	(.)	0.00	(.)
Male					0.08	(0.06)	-0.20**	(0.07)
Other					0.61	(0.87)	1.35	(0.88)
Non-Indigenous					0.00	(.)	0.00	(.)
Indigenous					-0.09	(0.09)	-0.24*	(0.10)
Domestic					0.00	(.)	0.00	(.)
Other					1.85***	(0.08)	1.67***	(0.10)
Full-Time							0.00	(.)
Part-Time							-1.36***	(0.10)
Nursing							0.00	(.)
Business							1.49***	(0.12)
Social Science							1.33***	(0.12)
Humanities							0.48***	(0.13)
Science							0.71***	(0.11)
Other							0.24*	(0.11)
Institution 1							0.00	(.)
Institution 2							-0.20	(0.12)
Institution 3							-0.58***	(0.08)
Institution 4							-0.15	(0.11)
Constant	0.20***	(0.03)	-0.94***	(0.07)	-6.14***	(0.45)	-8.21***	(0.53)
Observations	6610		6610		6610		6610	
Pseudo R^2	0.002		0.035		0.133		0.215	

Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 2, Predicted Probability of Graduating, 2018 Cohort
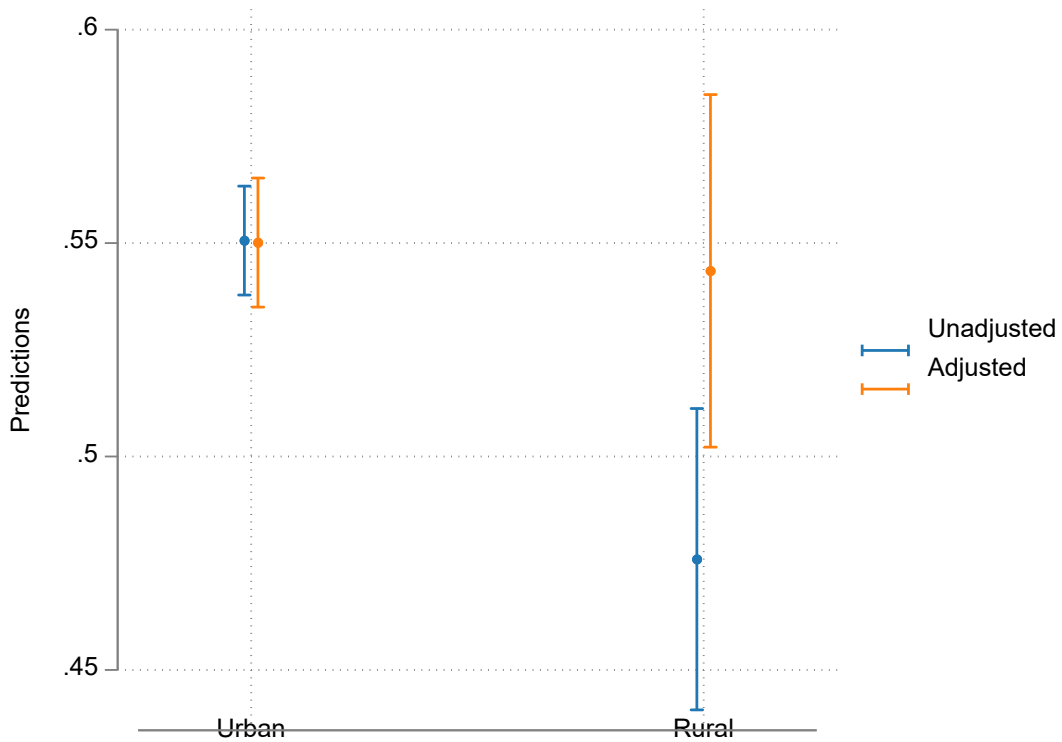
A similar story can be observed through Table 7 (Appendix 1), which focuses on those students who first appear in our records in the Fall of 2019. Again, we initially estimate a negative and statistically significant rural coefficient in Model 1. This coefficient shrinks dramatically once we introduce demographic controls (Model 3) and is rendered insignificant once we control for program/institution (Model 4).

Table 7. Logistic Regression of Graduation

	Model 1		Model 2		Model 3		Model 4	
Urban	0.00	(.)	0.00	(.)	0.00	(.)	0.00	(.)
Rural	-0.76***	(0.13)	-0.78***	(0.13)	-0.40**	(0.15)	-0.19	(0.16)
Fall 2019 GPA			0.57***	(0.04)	0.83***	(0.06)	0.98***	(0.07)
Age					0.25***	(0.05)	0.32***	(0.05)
Age^2					-0.00***	(0.00)	-0.00***	(0.00)
Female					0.00	(.)	0.00	(.)
Male					-0.16	(0.11)	-0.24	(0.12)
Other					-0.76	(1.07)	-0.46	(1.11)
Non-Indigenous					0.00	(.)	0.00	(.)
Indigenous					0.54***	(0.15)	0.28	(0.16)
Domestic					0.00	(.)	0.00	(.)
Other					2.33***	(0.13)	1.81***	(0.15)
Full-Time							0.00	(.)
Part-Time							-2.36***	(0.20)
Nursing							0.00	(.)
Business							0.83***	(0.19)
Social Science							0.18	(0.22)
Humanities							-0.33	(0.23)
Science							-0.14	(0.17)
Other							-0.66***	(0.19)
Institution 1							0.00	(.)
Institution 2							1.11***	(0.20)
Institution 3							0.65***	(0.13)
Institution 4							0.67**	(0.23)
Constant	-0.49***	(0.04)	-2.26***	(0.14)	-7.85***	(0.74)	-9.79***	(0.78)
Observations	2573		2573		2573		2572	
Pseudo R^2	0.011		0.066		0.204		0.308	

Robust standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Again, a similar pattern plays out in the predicted probability plots (Figure 3, Appendix 1), with adjusted estimates for urban and rural students (.28 vs. .23) being far more comparable than unadjusted estimates (.38 vs. .22).

Figure 3. Predicted Probability of Graduating, 2019 Cohort
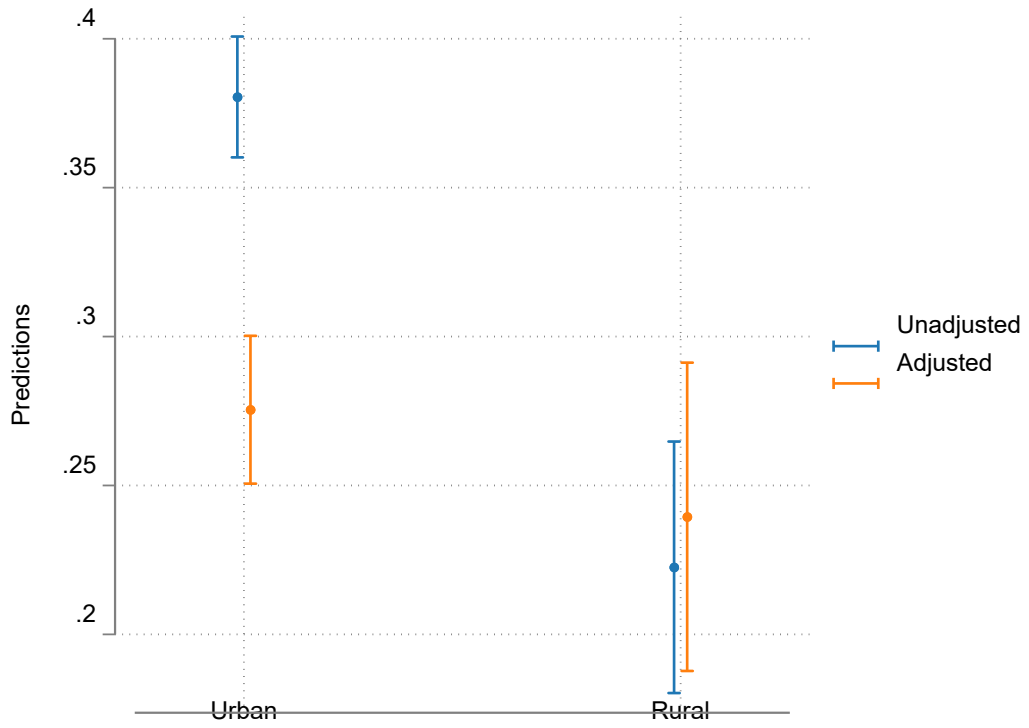
Appendix 2. Interview Instruments

Faculty Interview Invitation

Hello [firstname],

The University of Northern British Columbia is currently participating in a research project funded by the BC Council on Admissions and Transfer (BCCAT) and conducted by Academica Group. The goal of this research is to better understand how access to technology and learning resources have affected students in rural and remote communities during COVID-19 related online delivery – we hope this information will help to improve the experience of rural and remote learners across BC.

We are inviting you, as a faculty member, to share your experiences learning online during the COVID-19 pandemic.

Your participation would involve one telephone interview that will take 30-45 minutes.

By completing the interview, you acknowledge that you have consented to participate in this study and have given permission for the data you provide to be used in the study. Participation is voluntary; you can stop participating at any time, and you can skip any question you don't want to answer. No significant harms, risks or discomforts are anticipated from participating in this study.

Your anonymity will be respected. Information that discloses your identity will not be released without your consent. Interviews are being conducted by Academica Group on behalf of BCCAT. Your interview responses will not be shared with your university. Your information will be encrypted and stored securely in Canada. Following completion of the study, the interviews and transcripts will be securely destroyed.

It is anticipated that the results of the study may be published on the BCCAT website.

To schedule your interview, please respond using the following link: Yes, I would like to participate.
If you would like more information, please contact:
Katie Herlick, Academica Group: katie@academicagroup.com
OR
Anna Tikina, BCCAT: atikina@bccat.ca

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the UNBC Office of Research at 250-960-6735 or by e-mail at reb@unbc.ca.

We appreciate your time. Thank you in advance for contributing to this project.

Faculty Interview Guide

Two to three interviews with faculty who taught online during the COVID-19 pandemic will be completed at each participating institution.

Introduction

Thank you for taking the time to participate in an interview. Please note that if there are any questions that you cannot or prefer not to answer, we can skip to the next question. Before we begin, would it be okay if I record our conversation for notetaking purposes?

Can you tell me a little bit about yourself, including the program you teach in and how long you have been teaching in postsecondary?

Experience Prior to COVID-19

1. Prior to the COVID-19 pandemic, were you primarily teaching online or in-person?

2. **[If primarily in-person]** Had you ever taught an online course before the move to online learning in March 2020?

    a. If yes, approximately how many online courses had you taught prior to March 2020?

Experience During COVID-19

3. Thinking back to those first few months when your courses were moved online due to the pandemic, can you tell me about this experience?

    a. What format were most of your courses in? (e.g., synchronous, asynchronous, lecture, group work, etc.)

    b. Were there any courses or elements of your courses that were not able to be transferred online? (e.g., experiential learning, labs)

    c. Were you provided any professional development or support? If yes, please describe.

    d. Did you experience any challenges related to teaching online?

Thinking now about your students' experiences of online learning from March 2020 to August 2021…

4. Did any of your students experience any challenges or barriers to online learning?
    a. If yes, can you describe those challenges/barriers?
    b. Was the student able to overcome them?

5. The focus of this study is on students living in rural and remote areas. Were you aware of which students were located in rural and remote areas?

6. Were you aware of any challenges faced by your students in rural and remote areas?
   a. If yes, please describe the challenges.

7. Were any accommodations made to account for the challenges faced by rural and remote students? (e.g., learning resources in multiple formats, range of ways to connect with/provide support to learners, flexible assignment submission)
   a. If yes, please describe.

8. Were there aspects of online learning that worked particularly well for rural and remote learners? If yes, please describe.

9. How could students living in rural and remote communities be better supported in relation to online learning? (e.g., by faculty, by institutions, by government)

Conclusion

10. That brings us to the end of my questions. Do you have any additional feedback that you would like to share?

11. Thank you for taking the time to speak with me today. We greatly appreciate your insights!

Student Interview Invitation

Hello [firstname],

The University of Northern British Columbia is currently participating in a research project funded by the BC Council on Admissions and Transfer (BCCAT) and conducted by Academica Group. The goal of this research is to better understand how access to technology and learning resources have affected students in rural and remote communities during COVID-19 related online delivery – we hope this information will help to improve the experience of rural and remote learners across BC.

We are inviting you, as a student living in a rural or remote area of BC, to share your experiences learning online during the COVID-19 pandemic.

Your participation would involve one telephone interview that will take 30-45 minutes. In appreciation for your time, you will receive $50 for completing the interview.

By completing the interview, you acknowledge that you have consented to participate in this study and have given permission for the data you provide to be used in the study. Participation is voluntary; you can stop participating at any time, and you can skip any question you don't want to answer. No significant harms, risks or discomforts are anticipated from participating in this study.

Your anonymity will be respected. Information that discloses your identity will not be released without your consent. Interviews are being conducted by Academica Group on behalf of BCCAT. Your interview responses will not be shared with your university, and will not affect your evaluation or grades in any way. Your information will be encrypted and stored securely in Canada. Following completion of the study, the interviews and transcripts will be securely destroyed.

It is anticipated that the results of the study may be published on the BCCAT website.

To schedule your interview, please respond using the following link: Yes, I would like to participate.

If you would like more information, please contact:

Katie Herlick, Academica Group: katie@academicagroup.com
OR
Anna Tikina, BCCAT: atikina@bccat.ca

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the UNBC Office of Research at 250-960-6735 or by e-mail at reb@unbc.ca.

We appreciate your time. Thank you in advance for contributing to this project.

Student Interview Guide

Five student interviews with rural and remote students who learned online during the COVID-19 pandemic will be completed at each participating institution.

Introduction

Thank you for taking the time to participate in an interview. Please note that if there are any questions that you cannot or prefer not to answer, we can skip to the next question. Before we begin, would it be okay if I record our conversation for notetaking purposes?

1. Can you tell me a little bit about yourself, including the program you are taking and the year of study you are in?

Experience Prior to COVID-19

2. Prior to the move to online learning in March 2020, had you ever taken an online course before?

    a. If yes, approximately how many online courses had you taken prior to March 2020?

Experience During COVID-19

3. Thinking back to when your courses first moved online due to the pandemic, can you tell me about this experience?

    a. What type of device were you using to participate in your courses? (e.g., laptop, desktop, smart phone)

    b. Where were you doing most of your course work? (e.g., at home, at another location to access internet)

    c. What format were most of your courses in? (e.g., synchronous, asynchronous, lecture, group work, etc.)

    d. Were there any courses or elements of your program that were not able to be transferred online? (e.g., work-integrated learning, labs)

4. Thinking now about the entire period of online learning from March 2020 to August 2021, were you able to complete all of the courses you planned or hoped to take?

5. How did you feel about your academic performance in your online courses?

6. How was the quality of the education you received online?

7. Did you access any advising or learning technology support services during the period of online learning?

    a. If yes:

        i. Were you satisfied with the services you received? Why or why not?

        ii. Did you experience any challenges accessing these services at your institution? If yes, please describe the challenges you faced.

8. Were there aspects of online learning that worked well for you? If yes, please explain.

9. Did you encounter any challenges when learning online?

    a. If yes, what challenges did you experience? (e.g., internet speed, access to ICT support; access to computer servicing and repair; multiple individuals in household sharing the internet; multiple individuals in household sharing devices; isolation)

10. How do you think that students living in rural and remote communities could be better supported in relation to online learning?

General

I just have a few final questions for you, **[Ask each if not addressed already in the conversation**]

11. Do you know what your internet speed is? If not, how would you generally characterize the speed (slow, fast, reliable, unreliable)?

12. Do you have a device for online learning? If yes, do you share this device with anyone else in your household?

13. Do you have a webcam and microphone for your computer/device?

14. How many people live in your household? (Probe: Kids? Adults?)

15. Do you have a place to work uninterrupted on your online courses?

Conclusion

That brings us to the end of my questions. Do you have any additional feedback that you would like to share?

Thank you for taking the time to speak with me today. We greatly appreciate your insights!