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**The impacts of the COVID-19 pandemic on higher education students in
New Zealand**

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Abstract

The coronavirus pandemic and associated lockdowns have had broad impacts across societies globally. In particular, the move to online learning for students in higher education has been disruptive and challenging. We report on the New Zealand arm of an international survey of higher education students (n = 147), investigating students' experiences of online teaching and the impacts of lockdown. Using quantitative and qualitative data from the survey, we find that students coped reasonably well with the disruption to their studies, and were generally satisfied with how their lecturers and institutions responded to the unanticipated lockdowns. However, many students felt that their studies were negatively impacted, and in particular, vulnerable groups such as students with low financial resources, were most severely impacted. Moreover, students reported a range of negative emotions during lockdown that suggest mental health impacts may be a concern. Our results suggest that clear communication from authorities, reducing the uncertainty for students, and ensuring that vulnerable groups are appropriately supported, may be the best avenues to reduced negative impacts on students during future significant disruptions to study, whether pandemic-related or otherwise.

JEL Classification

I20; I31

Keywords

COVID-19

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1. Introduction

In December 2019, a new disease labelled COVID-19 was detected in Wuhan, China (Chen et al., 2020). By January 2020 the virus that causes COVID-19, SARS-CoV-2, had been confirmed and the virus was already spreading worldwide (Pullano et al., 2020). The first case of COVID-19 was reported in New Zealand on February 18 2020, and by 22 March, the number of confirmed cases had increased to 66. Facing the prospect of a rapid increase in the number of coronavirus infections, which was already being observed in many other countries, the New Zealand government introduced a four-tier alert level system on 21 March, and New Zealand moved to Alert Level 3 on 23 March, then Alert Level 4 at 11:59pm on 25 March.

Alert Levels 3 and 4 severely restricted the daily activities of people in New Zealand (see <https://covid19.govt.nz/assets/resources/tables/COVID-19-alert-levels-summary.pdf>). Under Alert Level 3, people were instructed to stay home other than for essential travel (for work, school if required, or recreation), physical distancing was required, gatherings were restricted to no more than ten people, and businesses could only operate if they could ensure they did so without close personal contact. Under Alert Level 4, all businesses and educational facilities were closed except for essential services (including supermarkets, pharmacies, and petrol stations). New Zealand returned to Alert Level 3 on 27 April 2020, and by 8 June all restrictions had been lifted, and the coronavirus had been effectively eliminated from the country. However, New Zealand's experience during April and May represents one of the strictest lockdowns worldwide (Baker et al., 2020).

Higher education institutions were particularly severely affected by the lockdowns, with the change in alert levels being announced only weeks after the start of the first semester teaching. Moreover, the Alert Level 3 restrictions were announced with only two days' notice, and several institutions responded by immediately cancelling in-person classes and replacing them with online classes. Moreover, assessment tasks that required in-person attendance on-campus, such as tests, examinations, and laboratory sessions, were unable to proceed and had to be replaced with online equivalent assessments. In most instances, individual lecturers were left to determine how to adjust their classes to best meet learning objectives. While some support and guidance was available from the university, the result was a mix of pedagogical approaches adapted at short notice to the online environment.

The rapid shift to online learning, along with the general upheaval to social and economic life, created significant disruptions for higher education students. Students faced uncertainty about how their studies would be impacted by the lockdown period, and most New Zealand universities responded by assuring students that their grades would not be adversely affected by the disruption (e.g. Owen, 2020; Wiltshire, 2020).

Understanding how these students were impacted by the pandemic and associated lockdowns, and how they perceived the period of online learning is important. While the coronavirus pandemic represents the first time in generations that university study has been

significantly disrupted nationwide, it has been argued that pandemic diseases will become more common in future (e.g. Jain et al., 2018). The coronavirus pandemic itself is not yet over, with occasional outbreaks leading to localized lockdowns, including in Auckland in August 2020. Moreover, disruptions to teaching and learning may occur at particular institutions due to natural disasters, such as the Christchurch earthquakes in 2010 and 2011 (Dohaney et al., 2020). Institutions and the government can potentially benefit by greater understanding of how students adapted to their enforced online learning period.

In this paper, we report on the New Zealand arm of an international study of the “Impact of the Covid-19 Pandemic on Life of Higher Education Students” (Aristovnik et al., 2020b). The global nature of the study means that we can compare students in New Zealand to their peers internationally, in terms of the immediate response to the pandemic and (where appropriate) lockdowns and online teaching and learning. The survey was in the field during a period in which New Zealand was in Level 3 lockdown, with no on-campus teaching and learning for university students. This was also the case for most of the international sample as well.

The international study has reported general findings elsewhere (see Aristovnik et al., 2020b), based on the full sample of over 30,000 students from 62 countries. Internationally, students were satisfied with the support of teaching staff during the pandemic, but felt that their workload had increased. They were concerned about their future professional career and studying issues, and were feeling bored, anxious, and frustrated. We return to more detailed results from this international later in the paper, with comparisons to the New Zealand sample.

Our study is not the first to report on the impacts of the coronavirus pandemic on higher education students in New Zealand. Akuhata-Huntington (2020) surveyed Māori tertiary students and received 351 eligible responses across all eight universities. This qualitative study analysed data using mixed methods based on Mason Durie’s model of Te Whare Tapa Wha. A range of issues were identified by the student respondents including ICT accessibility and availability, greater financial stress and difficulty exercising, a stronger sense of disconnection, sadness and isolation impacting mental health and wellbeing during lockdown. The research team felt that these impacts were not isolated incidents during lockdown, rather that systemic inequities faced by Māori students in New Zealand universities were exacerbated during lockdown. Relatedly, Akuhata-Huntington et al. (2020) outlined the experiences of a Māori doctoral student resident in Australia. Taking a personal narrative perspective to represent student voice, the PhD student presented an indigenous response to COVID-19. Drawing on her interactions with a team of doctoral students, she highlighted a range of issues being experienced by the students – consistent with Akuhata-Huntington’s (2020) findings. She emphasized the importance of her indigenous values of family, community and reliance on one another for care and her personal faith, as opposed to institutional structures, as being key to her coping with the consequences of COVID-19.

There is a growing international research literature on the impacts of the coronavirus pandemic on higher education students. Negative mental health impacts in particular have been noted (Cao et al., 2020; Elmer et al., 2020; Paredes et al., 2021; Perz et al., 2020; Sundarasan et al., 2020), as well as impacts on students' financial and food security (Elmer et al., 2020; Owens et al., 2020), learning (Owusu-Fordjour et al., 2020) and student performance more generally (Kamarianos et al., 2020; Gonzalez et al., 2020). In general, the literature concludes that building student resilience to adversity and challenges is important in the context of the pandemic (Bono et al., 2020; Liu et al., 2020; Ye et al., 2020), as has been shown in other contexts (Fogarty-Perry, 2019; Fogarty-Perry and Seiuli, 2018; Southwick and Charney, 2012). Our paper contributes to this important literature base by focusing on the experiences of New Zealand students, in comparison with a global sample.

The remainder of the paper is organized as follows. In the next section, we outline the data collection and analysis methods, both quantitative and qualitative. We then present the results of the quantitative analysis, followed by the qualitative analysis. Finally, we discuss the results in comparison with the global sample, and conclude the paper with some implications for government and higher education institutions.

2. Methods

As part of the international "Impact of the Covid-19 Pandemic on Life of Higher Education Students" project, a survey of New Zealand higher education students was undertaken. Respondents were recruited by an invitation to participate distributed by their university. Although all eight New Zealand universities were invited to participate, only two (Victoria University of Wellington and the University of Waikato) agreed to do so. The online questionnaire was in English, and was common to all international cohorts of the study (see Aristovnik et al., 2020a for details). The survey included questions on demographic characteristics of the participants, academic life, studying from home, social life, emotional life, and life circumstances. Most questions were focused on the period of the pandemic at the time of the survey, while some questions asked retrospectively about the time before the pandemic (see Aristovnik et al., 2020a for details). A final open-ended qualitative question asked for respondents' "general views/words... of reflection on COVID-19". The New Zealand arm of the study received ethics approval from the Waikato Management School Human Research Ethics Committee.

The survey was open from 5 May until 7 June 2020. New Zealand was in Level 3 lockdown during that entire period, with no on-campus teaching or learning occurring. In total, 171 New Zealand respondents commenced the survey, and 147 respondents completed enough of the questionnaire (being the demographic section plus at least six questions from the academic life section) to be included in the final sample for analysis. Overall, more than 31,000 respondents worldwide completed the survey, with 200 or more responses from each of 36

countries (Aristovnik et al., 2020b). New Zealand was the only country from the Oceania region to participate in the project.

Table 1: Sociodemographic summary statistics

Variable	New Zealand sample		Global sample
	Number	Percentage	Percentage
Age			
Under 20	46	31.3%	26.9%
20-24	62	42.2%	54.9%
25-30	16	10.9%	9.8%
Over 30	23	15.7%	8.4%
Gender			
Male	37	25.2%	34.4%
Female	105	71.4%	65.6%
Gender Diverse	3	2.0%	Not reported
Prefer not to say	2	1.4%	Not reported
Citizenship			
Domestic	130	88.4%	94.1%
International	17	11.6%	5.9%
Student Status			
Full-time	130	88.4%	88.1%
Part-time	17	11.6%	11.9%
Level of Study			
Bachelors	111	75.5%	80.5%
Masters	28	19.1%	14.8%
Doctoral	8	5.4%	4.7%
Field of Study			
Arts and humanities	16	11.0%	10.2%
Social sciences	103	70.6%	37.0%
Applied sciences	16	11.0%	31.1%
Natural and life sciences	11	7.5%	21.7%
Scholarship			
Yes	34	28.6%	29.2%
No	85	71.4%	70.8%
High Ability to Pay for Studies			
Yes	63	52.5%	52.6%
No	57	47.5%	47.4%
Cancelled Face-to-Face Classes			
Yes	122	83.0%	86.7%
No	7	4.8%	13.3%
Not Applicable	18	12.2%	Not reported
Moved Home			
Yes	31	26.1%	Not reported
No	88	73.9%	Not reported

Lost Job^a			
Yes	17	21.5%	61.7%
No	62	78.5%	38.3%
Institution			
Victoria University of Wellington	51	34.7%	N/A
University of Waikato	91	61.9%	N/A
Other	5	3.4%	N/A

N.B. ^a The denominator for students who lost their job is only students who reported having a job before the pandemic.

Given the relatively small sample size of 147 available for analysis, the quantitative analysis involved three steps. First, each outcome variable was tabulated, then statistical differences by each socio-demographic characteristics were tested in a univariate analysis. Each socio-demographic correlate achieving $p < 0.1$ was then entered into a final multivariate regression model. Adjustments were not made for multiple hypothesis testing, so results in terms of statistical significance were treated with some caution where p-values were close to threshold for conventional statistical significance. Outcome variables that were measured as satisfaction (on a five-point Likert scale from very dissatisfied to very satisfied) were treated as continuous variables for analysis. Outcome variables that were measured in terms of agreement (on a five-point Likert scale from strongly disagree to strongly agree) were converted into binary variables with responses of agree and strongly agree coded as one, and zero otherwise. Linear probability regression models were preferred over logistic regression models for these variables, due to the ease of interpretation of the results. Due to small numbers of gender diverse students, and students who were unwilling to give their gender analysis by gender was conducted by comparing female students with all others. In all analyses, the base category for degree level was bachelor's degree, and the base category for field of study was arts and humanities. In analyses involving lost jobs, the sample is limited to respondents who reported having a job prior to the pandemic.

Drawing on Braun and Clark's (2006) framework, the open-ended question responses were thematically analysed. Responses were first clustered into 15 key word topics, with some responses re-coded under several topics due to the multi-faceted nature of the answers. The responses were then re-coded in an iterative process, resulting in some topics having more than 12 responses, while others had just one. The responses in dominant topics were then re-read to identify patterns and similarities within and across the answers. These topics were classified into the broader themes based on patterns of commonality determined by key words that evoked the value of collectivity and demonstrated emotive responses to the lockdown. From this process, three overarching themes were generated: Collectivity, Emotions and Higher Education. The first two themes were complex and include a number of sub-themes. For the third theme, answers were clustered based on the way in which the responses commented with specificity on higher education in light of their lockdown experiences.

3. Results

3.1 Quantitative analysis

As noted in Table 1, 83 percent of respondents reported that their face-to-face classes had been cancelled. Other respondents presumably had no face-to-face classes because of the structure of their degree (such as being in a research-only degree), or interpreted the transfer of classes to an online environment as not constituting ‘cancellation’ of classes. Respondents who answered that classes had been cancelled were asked a series of questions about changes in the teaching and learning environment (or academic life). The overall responses are summarised in Table 2, which also identifies the statistically significant socio-demographic correlates in each case. Panel A of Table 2 summarises the levels of satisfaction with various formats for lectures and tutorials. In terms of lectures, respondents were most satisfied with online video recordings (mean 3.80 on the 5-point satisfaction scale), followed by real-time videoconferencing (3.58). These were also reported as the dominant forms of lectures during lockdown, with 67.8 percent of respondents reporting recorded videos and 23.1 percent reporting videoconferencing as the dominant replacement for lectures. Students who had lost their job had significantly higher satisfaction with recorded video lectures, while students with higher ability to pay had significantly higher satisfaction with lecture presentations that were sent directly to students. For tutorials, overall preferences were reversed, with respondents most satisfied with real-time videoconferencing (3.69), followed by recorded video tutorials (3.57). Video-conferencing was the dominant replacement for face-to-face tutorials, reported by 66.7 percent of respondents, followed by recorded video (17.1 percent). Students who had high ability to pay for their studies had significantly greater satisfaction with video-conferenced tutorials, students aged 25-30 (but not older students) had significantly greater satisfaction with tutorial presentations sent directly to students, and all fields of study had significantly higher satisfaction with written tutorial forums and chats than students in arts and humanities.

Table 2: Satisfaction with online teaching and learning approaches

Outcome	Mean (SD)	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
<i>In place of face-to-face lectures, satisfaction with:</i>			
Real time (videoconferencing) lectures	3.58 (1.02)	Age >30 (0.90 ^{***}); Full-time (-0.58 [*]); Domestic (0.61 [*]); Masters (-0.55 ^{**});	-
Recorded video lectures	3.80 (1.04)	High ability to pay (0.40 [*]); Lost job (0.64 ^{***})	Lost job (0.66 ^{***})
Recorded audio lectures	3.13 (1.22)	-	-
Lecture presentations sent to students	3.25 (1.22)	Age 20-24 (-0.58 ^{**}); Masters (0.54 [*]); Social sciences (0.88 [*]); High ability to pay (0.84 ^{**});	High ability to pay (0.74 ^{**})

Written forums, chat, etc.	3.31 (1.14)	Moved home (-0.89**) Full-time (-0.57*)	-
<i>In place of face-to-face tutorials, satisfaction with:</i>			
Real time (videoconferencing) tutorials	3.69 (1.13)	Social sciences (0.78*); Scholarship (0.44**); High ability to pay (0.49**)	High ability to pay (0.49**)
Recorded video tutorials	3.57 (1.01)	-	-
Recorded audio tutorials	3.12 (1.02)	-	-
Tutorial presentations sent to students	3.04 (1.05)	Age 25-30 (-0.95***); Full-time (-0.85**)	Age 25-30 (-0.95***)
Written forums, chat, etc.	3.32 (1.19)	Social sciences (1.14***); Applied sciences (1.45***); Natural sciences (1.13**)	Social sciences (1.14***); Applied sciences (1.45***); Natural sciences (1.13**)

N.B. ^a Only statistically significant (at $p < 0.1$) correlates are shown; ^b Only statistically significant (at $p < 0.05$) correlates are shown; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Students' levels of satisfaction with teaching and administrative support are summarised in Table 3. Students were more satisfied with lectures (3.76) than either supervision and mentorships (3.47) or tutorials, seminars and practical classes (3.37). Students who had lost their job had significantly greater satisfaction with lectures, female students had significantly lower satisfaction with tutorials than male or other students, and full-time students had significantly lower satisfaction with supervision than part-time students. Students' levels of satisfaction with support services was highest for teaching staff (3.96), tutors (3.74), and IT or technical support (3.74), and lowest for international offices (3.05) and finance and accounting (3.08). Students who had lost their job were significantly less satisfied with their institution's international office, and full-time students were significantly less satisfied with public relations than part-time students. For student counselling services, domestic students were significantly more satisfied than international students, while students who had moved home were significantly less satisfied than those who had not moved.

Table 3: Satisfaction with teaching and administrative support

Outcome	Mean (SD)	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
<i>Satisfaction with:</i>			
Lectures	3.76 (1.06)	Female (-0.48*); Social sciences (0.67*); Applied sciences (1.12***); Natural sciences (1.17**); Lost job (0.51**)	Applied sciences (0.96**); Natural sciences (1.10***); Lost job (0.55**) ^c

Tutorials, seminars, and practical classes	3.37 (1.17)	Female (-0.75***); Social sciences (1.22***); Applied sciences (0.97**); High ability to pay (0.52**)	Female (-0.64**); Social sciences (0.89***)
Supervisions and mentorships	3.47 (1.14)	Full-time (-0.78**); Social sciences (1.63***); Applied sciences (2.20***); Natural sciences (1.25**); High ability to pay (0.63*)	Full-time (-0.71**); Social sciences (1.11***); Applied sciences (1.83***)
<i>Satisfaction with:</i>			
Teaching staff	3.96 (0.91)	-	-
Technical supports and IT services	3.74 (1.00)	Age >30 (0.58*); Full-time (-0.53**)	-
Student affairs office	3.55 (1.08)	Masters (0.67**); Social sciences (0.95*); Applied sciences (1.13*); Natural sciences (1.33*)	-
Finance and accounting	3.08 (1.18)	Age >30 (1.08*); Social sciences (1.11*); Moved home (-0.99**)	-
International office	3.05 (1.28)	Age >30 (2.13***); Lost job (2.57***)	Lost job (2.67**)
Library	3.67 (1.09)	High ability to pay (0.48*)	-
Public relations (websites and social media)	3.65 (1.15)	Full-time (-0.82***)	Full-time (-0.82***)
Tutors	3.74 (0.97)	Applied sciences (0.80*); Natural sciences (0.97**); High ability to pay (0.39*); Moved home (-0.51**)	-
Student counselling services	3.31 (1.11)	Domestic (1.44***); Full-time (-1.03***); Moved home (-0.83*)	Domestic (1.02**); Moved home (-0.89**)

N.B. ^a Only statistically significant (at $p < 0.1$) correlates are shown; ^b Only statistically significant (at $p < 0.05$) correlates are shown; ^c When lost job was included as a covariate, no other correlate was statistically significant at $p < 0.05$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Respondents' agreement with statements about their academic work and the academic environment during the pandemic are summarised in Table 4. A majority of respondents agreed or strongly agreed with statements about their lecturers' activities during the pandemic. The lowest level of agreement (61.5 percent) was with lecturers being open to students' suggestions.

Arts and humanities students agreed least that lecturers had responded to their questions in a timely manner. Many students (74.5 percent) agreed that it was more difficult to focus on their studies, although this was statistically significantly lower among students with high ability to pay for their studies. A majority (53.5 percent) agreed that their performance as a student had worsened, while 22.8 percent agreed that their performance had improved. Students with high ability to pay were both statistically significantly more likely to say their performance had improved, and less likely to say it had worsened. Students also were obviously concerned about their ability to master the classwork and skills, but again this was less of a concern for students with high ability to pay. Workload was also an issue – 59.8 percent of students noted that their study workload was larger or significantly larger, while just 10.3 percent noted that it was smaller or significantly smaller. There were no robust socio-demographic correlates with workload, suggesting that all students experienced similar increases (or decreases) in workload during the pandemic.

Table 4: Academic work and the academic environment

Statement: My lecturers...	% Agree or Strongly Agree	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
... have provided course assignments (e.g. readings, homework, quizzes) on a regular basis.	84.9	Female (-0.12*)	-
... have provided feedback on my performance on given assignments.	63.5	-	-
... have responded to my questions in a timely manner.	78.2	Age 20-24 (-0.19*); Female (-0.17**); Social sciences (0.45***); Applied sciences (0.55***); Natural sciences (0.51**); Scholarship (0.17**)	Social sciences (0.36**); Applied sciences (0.46**); Natural sciences (0.51***); Scholarship (0.18**)
... have been open to students' suggestions and adjustments of online classes.	61.5	-	-
... have informed me on what exams will look like in this new situation.	77.7	High ability to pay (0.16*)	-
Statement: It is more difficult for me to focus during online teaching in comparison to on-site teaching.	74.5	Age 25-30 (-0.39**); High ability to pay (-0.22***)	Age 25-30 (-0.44***); High ability to pay (-0.24***)
My performance as a student has improved since on-site classes were cancelled.	22.8	Age >30 (-0.22**); Female (-0.21**); Natural sciences (0.41**); High ability to pay (0.29***)	High ability to pay (0.28***)

My performance as a student has worsened since on-site classes were cancelled.	53.5	Age 25-30 (-0.40 ^{***}); High ability to pay (-0.18 [*]); Moved home (0.19 [*])	Age 25-30 (-0.46 ^{***}); High ability to pay (-0.21 ^{**})
I have adapted well to the new teaching and learning experience.	47.6	Age 25-30 (-0.29 [*])	-
I can master the skills taught in class this year even on-site classes were cancelled.	44.6	Age 25-30 (0.35 ^{**}); Age >30 (0.27 [*]); Full-time (-0.25 [*]); High ability to pay (0.29 ^{***})	Age 25-30 (0.43 ^{***}); High ability to pay (0.32 ^{***})
I can figure out how to do the most difficult classwork since on-site classes were cancelled.	34.0	Age 25-30 (0.51 ^{***}); Age >30 (0.46 ^{***}); Full-time (-0.28 [*]); Masters (0.26 [*]); High ability to pay (0.19 ^{**}); Lost job (0.28 [*])	Age 25-30 (0.56 ^{***}); Age >30 (0.43 ^{**}); High ability to pay (0.23 ^{**}) ^c
Workload (larger or significantly larger = 1)	59.8	Age 25-30 (-0.39 ^{***})	-

N.B. ^a Only statistically significant (at $p < 0.1$) correlates are shown; ^b Only statistically significant (at $p < 0.05$) correlates are shown; ^c When lost job was included as a covariate, age >30 was no longer statistically significant at $p < 0.05$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 5 summarises respondents' access to resources and infrastructure necessary for studying from home, and their confidence with activities associated with online learning. Respondents have high levels of access to most resources and infrastructure, except only 53.5 percent reported often or always having access to a quiet place to study. Importantly, only 70.0 percent reported having access to a good internet connection. In both cases, students who had moved home since the pandemic started were less likely to have access. Respondents reported a high level of confidence with online learning activities, with the exception of applying advanced settings to software and programs (44.0 percent).

Table 5: Studying from home

Often or always have access to:	%	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
A quiet place to study	53.5	Age 20-24 (-0.22 [*]); Female (-0.27 ^{**}); Applied sciences (0.55 ^{***}); Moved home (-0.24 ^{**}); Masters (0.20 ^{**});	Moved home (-0.25 ^{**})
A desk	72.0	Applied sciences (0.36 ^{**});	Scholarship (0.19 ^{**})
A computer	96.0	Scholarship (0.17 [*]); Domestic (-0.04 ^{**}); Scholarship (0.06 ^{**})	Scholarship (0.06 ^{**})

Required software and programs	86.1	Full-time (-0.16 ^{***}); Social sciences (0.27 [*]); Lost job (- 0.28 ^{**})	Full-time (-0.14 ^{***}) ^c
A printer	44.6	Domestic (0.37 ^{***}) Female (-0.10 [*]); Domestic (-0.12 ^{***});	Domestic (0.37 ^{***})
Headphones and microphone	89.1	Applied sciences (0.27 ^{**})	Domestic (-0.09 ^{**})
Webcam	91.1	Age 20-24 (-0.11 [*]); Full-time (-0.10 ^{***})	-
Office supplies (e.g. notebooks, pens, etc.)	92.1	-	-
A good internet connection	70.0	Age 25-30 (0.22 [*]); Domestic (-0.21 [*]); Social sciences (0.44 ^{***}); Applied sciences (0.64 ^{***}); Natural sciences (0.60 ^{***}); Moved home (-0.35 ^{***}) Age >30 (0.21 [*]); Social sciences (0.46 ^{***}); Applied sciences (0.64 ^{***}); Natural sciences (0.48 ^{**})	Social sciences (0.40 ^{***}); Applied sciences (0.59 ^{***}); Natural sciences (0.52 ^{***}); Moved home (-0.30 ^{***}) Social sciences (0.44 ^{***}); Applied sciences (0.65 ^{***}); Natural sciences (0.49 ^{**})
Course study materials (e.g. course readings)	70.3		
Statement: I am confident in...	% Agree or Strongly Agree	Univariate (coefficient)^a	Multivariate (coefficient)^b
...browsing online information	92.1	Age 25-30 (-0.16 ^{**}); Age >30 (-0.16 ^{**}); Full-time (-0.09 ^{***}); Masters (0.10 ^{***})	Age 25-30 (-0.15 ^{**})
...sharing digital content.	86.1	Age 25-30 (- 0.19 ^{***}); Masters (0.17 ^{***}); Natural sciences (0.27 ^{**})	Masters (0.18 ^{**})
...online teaching platforms (e.g. Moodle, Blackboard, etc.)	90.1	Female (-0.09 [*])	-
...using online collaboration platforms (Zoom, MS Teams, Skype, etc.).	86.1	Age 25-30 (-0.13 ^{**}); Natural sciences (0.27 ^{**}) Female (-0.04 [*]); Full-time (-0.03 [*]); Masters (0.04 [*]); Social sciences (- 0.04 [*])	-
...using online communication platforms (e-mail, messaging, etc.)	97.0		-
...using software and programs required for my studies.	76.2	Age 25-30 (0.28 ^{***}); High ability to pay (0.16 [*]); Moved home (-0.27 ^{**})	Age 25-30 (0.31 ^{***}); Moved home (- 0.22 ^{**})

...applying advanced settings to some software and programs.	44.0	Age 25-30 (0.29*); Age >30 (0.33**); Female (-0.21*); Social sciences (0.37***); Applied sciences (0.64***); High ability to pay (0.25**); Moved home (-0.35***)	Social sciences (0.23**); Applied sciences (0.45***); Moved home (-0.24**)
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N.B. ^a Only statistically significant (at $p < 0.1$) correlates are shown; ^b Only statistically significant (at $p < 0.05$) correlates are shown; ^c When lost job was included as a covariate, full-time study was no longer statistically significant at $p < 0.05$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6 summarises the emotional experiences of respondents while studying during the pandemic. Respondents reported low levels of positive emotions including often or always feeling joyful (15.7 percent), proud (20.0 percent), or hopeful (25.6 percent). They reported high levels of negative emotions including often or always feeling frustrated (66.1 percent), anxious (64.5 percent) or bored (46.3 percent). Female respondents were statistically significantly more likely to report feeling frustrated or anxious, and significantly less likely to report feeling proud. Full-time students were statistically significantly more likely to report feeling hopeless than part-time students. Older students (aged over 30) were statistically significantly less likely to report feeling anxious, hopeless, or bored.

Table 6: Emotions experienced while studying during the pandemic

Often or always feel:	%	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
Joyful	15.7	Female (-0.18**); Doctoral (-0.18***); High ability to pay (0.13**)	Doctoral (-0.18***);
Hopeful	25.6	Female (-0.18*); Social sciences (0.26***); High ability to pay (0.16**)	-
Proud	20.0	Female (-0.22**); Doctoral (-0.22***); High ability to pay (0.15**)	Female (-0.20**); Doctoral (-0.23***)
Frustrated	66.1	Female (0.33***)	Female (0.33***)
Angry	22.3	Age >30 (-0.18**); Moved home (0.17*)	-
Anxious	64.5	Age >30 (-0.50***); Female (0.30***); Doctoral (-0.30*); Social sciences (-0.28***); Applied sciences (-0.27*);	Age >30 (-0.48***); Female (0.25**)

Ashamed	12.4	High ability to pay (-0.17*)	-
Relieved	17.4	Social sciences (0.19***); Applied sciences (0.20*); Age>30 (-0.32***); Full-time (0.31***); High ability to pay (-0.14*); Moved home (-0.35***); Age>30 (-0.37***); Moved home (0.24**)	Social sciences (0.19***)
Hopeless	27.3	High ability to pay (-0.14*); Moved home (-0.35***); Age>30 (-0.37***); Moved home (0.24**)	Age>30 (-0.28***); Full-time (0.15***)
Bored	46.3	Moved home (0.24**)	Age>30 (-0.33**)

N.B. ^a Only statistically significant (at $p<0.1$) correlates are shown; ^b Only statistically significant (at $p<0.05$) correlates are shown; * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

The main sources of respondents' worries are summarised in Table 7. Studying issues were the most common worry that students reported experiencing most or all of the time (44.2 percent), followed by personal finances (29.2 percent), future professional career (29.2 percent), and personal mental health (29.1 percent). Arts and humanities students were statistically significantly more likely to report worries about their personal mental health. Doctoral students were less likely to report worries about studying issues or future education, presumably because they have neared the end of their education, and well as less likely to report worries about travelling abroad. Students with high ability to pay for their studies were significantly less likely to report worries about their personal finances, while full-time students were more likely to report worries about their family and relationships. Finally, students who had moved home were significantly more likely to report worries with their future education and travelling abroad.

Table 7: Personal worries during the pandemic

Worries most or all of the time:	%	Socio-demographic correlates	
		Univariate (coefficient) ^a	Multivariate (coefficient) ^b
Personal physical health	21.6	Age 20-24 (-0.22**); Age 25-30 (-0.23*); Natural sciences (-0.40***); Moved home (0.18*); Age>30 (-0.21**); Full-time (0.19**); Social sciences (-0.41***); Applied sciences (-0.40**); Natural sciences (-0.67***); High ability to pay (-0.18**); Moved home (0.22**)	Age 20-24 (-0.27***); Natural sciences (-0.42***) ^c
Personal mental health	29.2	Social sciences (-0.41***); Applied sciences (-0.40**); Natural sciences (-0.67***); High ability to pay (-0.18**); Moved home (0.22**)	Social sciences (-0.32**); Applied sciences (-0.35**); Natural sciences (-0.60***)

Studying issues	44.2	Age>30 (-0.27**); Full-time (0.29***); Masters (-0.27**); Doctoral (-0.53***); High ability to pay (-0.19**)	Doctoral (-0.50***)
Future education	25.0	Age>30 (-0.21*); Doctoral (-0.28***); Social sciences (- 0.35**); High ability to pay (-0.19**); Moved home (0.21**)	Doctoral (-0.22**); Moved home (0.23**)
Personal finances	29.2	Full-time (0.19**); Social sciences (- 0.31**); High ability to pay (-0.28***); Moved home (0.17*)	High ability to pay (-0.22***)
Family and relationship	20.8	Full-time (0.17**); Social sciences (- 0.31**); Lost job (0.25*)	Full-time (0.14**); Social sciences (- 0.29**) ^d
Professional career in the future	29.2	Scholarship (- 0.15*); High ability to pay (-0.14*); Moved home (0.21**)	-
COVID-19 or similar pandemic crisis in the future	12.6	Social sciences (0.19***); Applied sciences (0.20*); Doctoral (-0.13***); Social sciences (- 0.26*); Natural sciences (-0.36***);	Social sciences (0.19***)
Leisure activities	11.7	High ability to pay (-0.13**); Moved home (-0.35***)	Doctoral (-0.10***); Natural sciences (- 0.32**)
Travelling abroad	20.8	Age 25-30 (- 0.20***); Doctoral (- 0.12***); Moved home (0.15*)	Age 25-30 (-0.19**); Doctoral (-0.19**); Moved home (0.18**)

N.B. ^a Only statistically significant (at $p<0.1$) correlates are shown; ^b Only statistically significant (at $p<0.05$) correlates are shown; ^c When all fields of study were included as covariates, social sciences and applied sciences became statistically significant and negative at $p<0.05$; ^d When lost job was included as a covariate, both full-time study and social sciences were no longer statistically significant at $p<0.05$; * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Finally, students reported an overall moderate degree of satisfaction with their university (59.7 percent reporting being satisfied or very satisfied), more than banks (40.2 percent), but less than hospitals (82.1 percent) or the government (90.7 percent). Of the socio-demographic correlates, only scholarship students reported a statistically significantly higher level of satisfaction with their university (coefficient=0.19, $p=0.05$).

3.2 Qualitative analysis

Of the 147 valid responses, 80 respondents supplied a response to the open-ended question “general views/words... of reflection on COVID-19”. Of those, 71.3 percent were female, 87.5 percent were full-time students, 75 percent were bachelor’s degree students, 71.3 percent were social science students, and their average age was 25.5 years.

As outlined earlier, three themes (Collectivity, Emotions, and Higher Education) were identified, and these included several sub-themes: Collectivity (Reflective; General; Gratitude; Criticism); Emotions (Depression and stress; General fears; Fear of the unknown; Fears for health; Fear regarding the future/career/finances; Balanced response; Positive response; General stress; Work/life/study balance); and Higher Education (Negative views; Balanced views). The responses were clustered under each relevant sub-theme, with some responses applying to a range of themes. For example, the following quote fits with Collectivity (Reflective and Gratitude), Emotions (Stress and Balanced) and Higher Education (Negative):

I think it has been significantly challenging for all involved. It may seem like life for students did not change that much but online learning has its own challenges. These include trying to stay motivated and connect with other students for compulsory group assignments. The majority of group members are fine but there is definitely a lack of communication and assessment input from certain group members. I feel we as a nation and Government have dealt well with the situation by understanding the importance of lockdown and having clear guidelines to follow. (Female, Bachelors Degree, Social Sciences, age 40).

The multi-faceted nature of this response indicates that students responded to the open-ended question in a variety of ways, misinterpreting or even ignoring the request for general reflective ideas about the pandemic. Some combined insights on the personal impact of the lockdown with their more general views. However, many students chose to respond to the question from a more subjective perspective, honing in on their individual response to the crises. Some provided single word responses, evoking specific emotions that they were presumably feeling or had felt, while others provided only slightly more details regarding their personal struggles):

Depressing. (Female, Bachelors Degree, Applied Sciences, age 19)

Not into it. (Gender diverse, Bachelors Degree, Natural Sciences, age 24)

Stressful, life changing. (Female, Bachelors Degree, Social Sciences, age 21)

Highly stressful and demotivating. (Female, Bachelors Degree, Natural and life sciences, age 20)

Stressful and lonely. (Female, Masters, Social Sciences, age 22)

Scary and worrying. (Male, Masters, Social Sciences, age 45)

Disaster. (Male, Masters, Social Sciences, age 35)

The strongest thematic aspect was the number of comments that expressed different types of emotional responses to COVID 19 or the lockdown, such as those above. A great deal of the comments focused on negative responses to the pandemic, such as:

This pandemic really affected my studies this year. It has been a bit stressful adjusting to the changes but I know we are social distancing for a good reason. (Female, Bachelors Degree, Social Sciences, age 18)

Fear was a common emotion, including fear of the unknown, or fears for the future. For example:

Alien, stressful, unreal threat. (Female, Bachelors Degree, Social Sciences, age 25)

It's all been quite unknown. (Female, Bachelors Degree, Social Sciences, age 18)

Has been incredibly stressful financially and also in terms of future life prospects regarding work, study and travel in particular. (Female, Bachelors Degree, Social Sciences, age 20)

Given the high response rate to the open-ended question from women, challenges resulting from having to balance study with other 'shifts' (Sarkisian, & Gerstel, 2012) were also a common refrain, such as:

COVID-19 has been difficult to adjust to and will take a while longer to adjust to. A lot of other things have impacted my ability to truly focus on my studies during this time too. (Female, Bachelors Degree, Social Sciences, age 20)

It has been very challenging trying to manage working from home, study, children and homeschooling. My children couldn't leave the house and I couldn't even take refuge in my room to work. My toddler would camp outside the door crying. The first 3 weeks of lockdown were horrible. I cried every day and felt like a terrible parent, student and employee. Now that we are at level 2, I am happy to see people out and about smiling and working. It was an uplifting experience finally leaving the house after 5 weeks and seeing so many smiling also mixed bag. (Female, Masters, Social Science, age 34)

As the second comment above illustrates, there were also comments that expressed hope, or were overwhelmingly positive. In terms of the latter:

Enjoyed the time with family and working from home. Introverts dream! (Female, Bachelors Degree, Applied Science, age 36)

Moreover, there were also responses that sought to balance the negative comments, indicating a desire for resilience. For example:

It's been shit, but I'm lucky to be in the country that am in. (Prefer not to say, Bachelor's Degree, Arts and Humanities, age 22)

Significantly though, the majority of responses mirrored wider discussions in the media, such as signalling out the good fortune of New Zealand due to the government and/or the leadership of Jacinda Ardern as key factors in ensuring the safety of the nation. For example:

The government, institutions, and citizens of my country have responded very well, but I can't speak for other countries. (Male, Bachelors Degree, Applied Sciences, age 27)
The lockdown has been an eye opening experience and has shaken my lifestyle greatly, but we will all get through it. I'm glad the government set out these measures to ensure that the virus did not spread more rapidly throughout NZ. (Female, Bachelors Degree Social Sciences, age 23)

In contrast, three responses mirrored negative discussions in the media; two positioned the government's response as being over the top and one endorsed the view that COVID is the product of conspiracy theories. For example:

Millions more will suffer from unemployment, debt, loss of homes, loss of their businesses than would have died from this hyped up flu. Graduates will be suffering for the next 10 years because of governmental decisions for a flu that kills less people than cancer and other medical conditions based on worse case modelling. It is an absolute disgrace and my heart breaks for everyone that is going to be effected for the next 10 years... General view an absolute hoax. (Female, Bachelors Degree, Applied Sciences, age 23)

The consistency of these messages with those discussed in wider media and online serve to illustrate uniformity in New Zealanders' thinking during lockdown, but this was a somewhat surprising finding given the role of University education in promoting critical thinking.

Finally, some of the comments focused on respondents' personal experiences of higher education during the lockdown period. These comments were relatively negative in orientation, such as:

I am a Mother of 3 and my husband also is studying. There was very little consideration and help given from the University and the Government for people in our situation and it was disappointing. These last couple of months have been so hard emotionally and mentally. My University said all the right things but there was very little follow through or action. (Female, Bachelors Degree, Social Sciences, age 29)
I think it has been significantly challenging for all involved. It may seem like life for students did not change that much but online learning has its own challenges. These

include trying to stay motivated and connect with other students for compulsory group assignments. The majority of group members are fine but there is definitely a lack of communication and assessment input from certain group members. I feel we as a nation and Government have dealt well with the situation by understanding the importance of lockdown and having clear guidelines to follow. (Female, Bachelors Degree, Social Sciences, age 40)

Overall, the qualitative comments reinforce the challenges identified in the quantitative analysis, particularly the strong emotional response of respondents. There is also much in common with the extant literature in terms of identifying the lockdown as a difficult and fearful experience. For example, respondents acknowledged that their support networks (families and friends) were key to coping with the challenges posed by the lockdown and the shift to online learning, resonating with the views in Akuhata-Huntington (2020).

4. Discussion

New Zealand has been lucky in terms of the low impact of the coronavirus pandemic to date. At the time our survey was undertaken, there had been few cases or deaths, although New Zealand spent several weeks in ‘Level 4’ lockdown. Other countries included in the global sample were not so lucky. The biggest impact on students both in New Zealand and globally has been the cancellation of face-to-face classes, with in most cases a variety of online options (either synchronous or asynchronous) replacing them.

New Zealand students on the whole were quite satisfied with the change in the nature of teaching and learning to the online environment, and were more satisfied than students from other world regions (Aristovnik et al., 2020b). However, not all alternative teaching approaches were rated equally, and New Zealand students reported highest satisfaction with recorded video lectures, and real time (videoconferenced) tutorials. In contrast, in the global sample real-time teaching received the highest satisfaction rating for both lectures and tutorials (although in general, satisfaction was lower with all alternative teaching practices in the global sample compared with the New Zealand sample).

Student preferences and satisfaction may depend on the modes they have been exposed to. In the New Zealand sample, video recording was the dominant mode for replacing lectures, reported by 67.8 percent of respondents, compared with just 11.6 percent globally. Asynchronous recorded lectures offer flexibility for students to study at a time and pace that suits their needs and aspirations. However, that comes with a trade-off of the loss of in-class interaction. The improved opportunities for interaction with lecturers and other students in a smaller synchronous group setting like a tutorial may explain students’ higher satisfaction with synchronous video in that setting.

New Zealand students also showed a higher level of satisfaction with teaching and administrative support than the global sample, but ranked the various support services similarly to the ranking in the global sample. Lectures received the highest satisfaction scores and tutorials the lowest, and were most satisfied with teaching staff and least satisfied with finance and accounting, and the international office. These differences may simply reflect that New Zealand was less affected by the pandemic than other countries. Nevertheless, the impact on student finances due to lockdowns and reduced financial security for those whose part-time jobs were furloughed (e.g. hospitality workers), and the uncertainty around international travel and student visa holders, may have contributed to lower student satisfaction with those areas of the universities. Student counselling services also received a relatively low satisfaction rating, which might be problematic given the potential mental health impacts of the pandemic and associated lockdown (Cao et al., 2020; Elmer et al., 2020; Paredes et al., 2021; Perz et al., 2020; Sundarasan et al., 2020).

Respondents generally agreed that lecturers are directing academic work appropriately. However, only 61.5 percent agreed that lecturers had been open to students' suggestions in relation to online classes. The transition to teaching online was abrupt, with little time for lecturers to engage in the typical preparation; nor was there sufficient time to engage in a high degree of consultation with students over the necessary changes to course delivery and assessment. Nevertheless, New Zealand performed substantially better across these dimensions than other countries in the global sample (Aristovnik et al., 2020b).

Students clearly faced a number of difficulties with the transition to online learning, with many agreeing that it is more difficult to concentrate, and that their performance as a student had worsened. This was true of the global sample as well as the New Zealand sample. Moreover, over half of New Zealand students (59.8 percent) believed that their academic workload was larger or significantly larger than before. This was substantially higher than the 42.6 percent in the global sample, which may be cause for concern. A higher academic workload increases pressure on students, which may be particularly damaging in a period of substantial upheaval and uncertainty. This may also explain the large number of answers to the open-ended question that focused on negative emotional responses.

Respondents generally had access to the resources necessary to study from home, and expressed confidence in using the digital tools necessary for online study. The main exception was having a quiet place to study, which was reported by just 53.5 percent of respondents. When combined with higher workload, the lack of a quiet study space creates anxiety and exacerbates any workload pressures and learning challenges that students are facing. A good internet connection is an essential prerequisite for online study, but this was reported by just 70 percent of respondents. However, this was higher than the global sample, where only 59.9 percent of students had access to a good internet connection often or always. This result is similar to that found by Akuhata-Huntington (2020), where nearly a quarter of Māori students reported lacking a good internet connection.

Respondents demonstrated a higher propensity to experience negative emotions during the pandemic, including frustration and anxiety, as well as boredom. New Zealand students were substantially more frustrated than students from other countries (66.1 percent vs. 39.1 percent), and more anxious (64.5 percent vs. 39.8 percent). They were also less hopeful (25.6 percent vs. 39.4 percent) and less joyful (15.7 percent vs. 29.7 percent). While we cannot know from our data how the emotional experience of students compares with the time before the pandemic, these results are nevertheless concerning, and are similar to those reported in the Life Under Lockdown survey of the general population (Prickett et al., 2020). That survey found that young people (aged under 25 years) were more likely than older people to report experiencing negative emotions such as anger, depression, sadness, stress, and worry during lockdown, and less likely to report enjoyment or happiness.

The high levels of anxiety and frustration reported by our respondents will not have been conducive to quality learning experiences or to a quality home life. The fact that New Zealand students were experiencing more negative, and less positive, emotions than students in other countries in spite of the lower health impacts of the pandemic in New Zealand is particularly worrying. It is possible that the approach of ‘go hard and go early’ adopted by New Zealand (Jamieson, 2020) took a particularly heavy emotional toll on students, whose studies were suddenly and unexpectedly impacted in ways that caused emotional stresses. In such circumstances, resilience becomes particularly important (Fogarty-Perry and Seiuli, 2018). It is clear from the responses to the open-ended question that students who were able to access strong support networks from family and friends were better able to cope with the impacts of the lockdown.

Understandably given the substantial changes in course delivery, respondents were most worried about studying issues (44.2 percent). This proportion was similar to the global sample (46.6 percent). Other areas of worry were also similar to the global sample, although New Zealand respondents were less worried than students globally about their professional career in the future (29.2 percent vs. 42.6 percent). A substantial minority of New Zealand respondents were worried about their personal mental health (29.2 percent), which is reflected in the open-ended responses and accords with the other findings discussed above.

Overall, a number of student socio-demographic groups faced negative consequences of the coronavirus pandemic, in relation to their study or emotional life. In many cases there were challenges across several of the domains we investigated.

Younger students (those aged under 25 years) were more likely to report difficulty with focus during online teaching, and less likely to report confidence with mastering the skills taught in their classes, and in figuring out how to do the most difficult classwork. Younger students (aged 30 years and under) were more likely than older students to report feeling

anxious, hopeless or bored since the start of the pandemic. Younger students may have found the transition to online learning more challenging due to the need to be more self-directed and the loss of a sense of community with other students. The uncertain environment may have increased their anxiety, and there was weak evidence that younger students were more worried about studying issues and future education than older students.

Female students generally reported similar experiences and levels of satisfaction as did male students, which differs from the international sample where male students were found to be more greatly impacted by the pandemic (Aristovnik et al., 2020b). However, female students reported higher levels of negative emotions and lower levels of positive emotions than male students. For instance, female students were 33 percentage points more likely to report frustration, 25 percentage points more likely to report anxiety, and 20 percentage points less likely to report feeling proud. We are unable to determine whether these differences arose because of the pandemic, or whether female students in our sample tended to more negative emotions generally. Nevertheless, negative emotions are likely to have a negative impact on students' studying and their life more generally.

There were few instances where international and domestic students differed in our sample. International students had significantly lower satisfaction with student counselling services than domestic students, which may indicate that those services are not particularly well suited to catering to the needs of international students. Full-time students reported being less satisfied with supervisions and mentorships than part-time students. That may be because full-time students face greater time pressures associated with their studies, and a disruption to the normal mentoring and supervision process could create significant uncertainty and anxiety for those students. Full-time students were also less satisfied with their university's public relations (websites and social media). Again, that may be because of the uncertainty associated with change, and reflect on the quality of university communications for these students. Full-time students were also significantly more likely than part-time students to report feeling hopeless (by 15 percentage points) since the outbreak of the pandemic, and expressed more worries about their family and relationships. In contrast, in the international sample it was part-time students who were more strongly affected by the pandemic (Aristovnik et al., 2020b).

Students with a high ability to pay for their studies showed a higher degree of resilience in the face of the challenges the pandemic and lockdowns posed, highlighting that students with lower access to financial resources faced particularly difficult circumstances. This was similar to the findings in the international study (Aristovnik et al., 2020b). Students with low ability to pay also tended to have lower satisfaction with online teaching and learning approaches. This may suggest that the financial pressures they faced impacted on how they perceived their studies, or inhibited them from using the online environment effectively to support their learning. Students with low ability to pay also reported higher levels of difficulty with focusing during online teaching, and were significantly more likely to report that their performance as a student had worsened (and less likely to report that their performance had

improved). They were also less likely to report confidence with mastering the skills taught in their classes, and in figuring out how to do the most difficult classwork. These students also expressed greater worries about their personal finances. Collectively, these results suggest that students with low financial resources are at greatest risk of being negatively impacted by a disruption to their studies, such as those caused by the pandemic and associated lockdowns. Surprisingly though, students who had lost their job did not appear to suffer from the same hardships as those with low ability to pay for their studies. This is somewhat contrary to the findings of Fletcher et al. (2021), who reported that in the Life Under Lockdown survey, households where the respondent was aged under 25 experienced greater economic impacts of the lockdown. However, this difference may reflect the ability of some students to access financial support structures in their wider familial networks, that may not necessarily be available to non-students.

Students who had moved home had lower satisfaction with student counselling services than other students. That may be because they found it more difficult to access those services from their new location, or more likely (because these services had to be offered online), they found the services were not meeting their specific needs. Those students were also significantly less likely to have a quiet place to study, or access to a good internet connection. Many of these students would have moved to their family home from a dormitory or shared living arrangement. In their new location, they lack access to some of the resources necessary to ensure a quality learning experience. They also reported lower confidence in using software and programs required for their studies. Combined with the lack of a good internet connection, this creates a serious challenge for these students, who may not be able to easily access necessary IT support during a lockdown, due to their poorer internet connections. They also expressed greater worries about their future education than students who had not moved.

Students in the arts and humanities fields of study tended to report lower levels of satisfaction with the online learning environment. They were significantly less likely than students in other fields to have access to a good internet connection, and reported lower access to required study materials such as course readings. This may be a particular concern, because arts and humanities courses may require higher engagement with readings than other courses. They also reported greater worries about their personal mental health than students in other fields of study, which may reflect the greater pressures they are under without access to study materials and facing a challenging digital environment without access to a suitable internet connection.

Our study has a number of limitations. First and foremost, the data come from an international study, where questions were developed by an international team with no input from most countries. That means that some questions that would be of interest, such as particular changes in assessment styles, were not asked. Moreover, we are unable to disaggregate the results by ethnicity, because ethnicity was not asked in the survey. Nevertheless, the international nature of the survey is also a strength, providing detailed and

comparable data across many countries (Aristovnik et al., 2020a). Second, because the data come from a single cross-sectional survey, we are unable to definitively say whether the statistical relationships are causal, or merely correlation. This is compounded by some sections of the survey, such as the questions about emotion, where there is no baseline for how often students felt different emotions before the pandemic. Longitudinal data would overcome these limitations to some extent, but not entirely, as it would have required the foresight to field a survey of students before the impacts of the pandemic were becoming established and lockdowns ensued. Third, the sample size for New Zealand of 147 respondents is relatively small, and due to item non-response, the sample size for some analyses is even smaller. This limits the statistical power to detect small relationships between the outcome variables and socio-demographic characteristics of the sample. Finally, the qualitative analysis was limited to data collected on a single, open-ended question at the end of the survey. Very few ($n = 80$) students provided any response to the open-ended question, which was at the very end of the survey. Moreover, the question itself simply asked for general views or reflections on COVID-19, and did not specifically ask about students' experiences. A more thoughtfully worded question would have attracted more useful responses. In spite of this, we were able to extract some important themes from these data that supported the quantitative analysis from the rest of the survey.

Overall, it is clear that most students had the tools and resilience to cope with the impacts and changes that the coronavirus pandemic and associated lockdowns imposed on them. However, many students felt that their studies were negatively impacted, and in particular, vulnerable groups such as students with low financial resources, were most severely impacted. A pandemic is fortunately not a common occurrence. However, the current pandemic is not yet over, and with new and potentially more infectious variants of the coronavirus now spreading worldwide (e.g. Wise, 2020), future lockdowns remain a persistent possibility. Higher education institutions and the government should take note of these results.

Students require more certainty about the impact of the lockdowns on their studies, including what it means for classes and assessment. This information should be quickly and clearly disseminated to students at the time a lockdown is initiated. Students should also be advised in advance of what a future lockdown may mean for their studies, and how the institution will deal with the situation. Students need access to appropriate counselling services, and these must be scaled up during periods of lockdown, to ensure that students' anxieties and worries can be appropriately addressed. This is particularly important for students who are facing changes in the home or work lives in addition to study, and for younger students, who may be in their first sustained period away from their family and associated support networks. Finally, appropriate financial support must be available to help vulnerable students to deal with the economic consequences of the lockdown period, and to ensure that they can afford access to the tools and resources that they need to maintain their studies.

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