



The Impact of COVID-19 on the Learning Experiences of Higher Education Students in the New Zealand Tertiary Institutions

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Abstract

Schools globally were forced to close operations during COVID-19 lockdowns. To keep academic activities alive most schools had to move classes to online learning platforms with no solid and adequate preparation. The objective of this study is to identify the impact of COVID-19 on tertiary students' learning situations, especially their experiences of learning online during COVID-19 lockdowns. The research also explored what assistance is needed by students to improve learning during COVID-19 lockdowns. The study collected data from 104 participants from tertiary institutions in New Zealand, and the data collected was analysed using descriptive statistics. The study has three sections. Section 1 found responses of Strongly Agree and Agree recorded between 52% and 66% of responses, indicating online learning during the COVID-19 pandemic had a positive impact on students' normal learning prior to moving learning online. Section 2 recorded 48% and 49% of Agreed and Strongly Agreed, that students had experienced positive online learning during the COVID-19 lockdown. Section 3 indicated that Agreed responses were recorded between 59.7% and 89.4% of responses on the need to assist students to improve learning online during the COVID-19 lockdown.

Subject Areas

Education Administration, Sociology

Keywords

COVID-19, Learning, Pandemic, Tertiary, Student, Experiences, Online Learning, New Zealand

1. Introduction

The COVID-19 pandemic started in Wuhan, China in December 2019 Huang *et al.*, [1]. Consequently, the World Health Organization (WHO) [2] confirmed COVID-19 to be a global pandemic and declared it highly contagious in March 2020. This declaration led to different governments adopting various policies, the most important among them being the social distance policy for the containment of COVID-19 in their countries. As a result, the education sector and its management opted for school closures and/or moving teaching and learning online where possible. However, this constituted a disruption to the traditional method of teaching and learning, especially for tertiary institutions using the face-to-face approach. Similarly, it was challenging for tertiary institutions which prior to COVID-19 had already adopted an online approach because more online resources were required due to the surge in the number of students enrolled online. Another challenge was acculturation to the use of online resources by teachers and students within a very short time. Some of these challenges and disruptions associated with education still persist.

According to UNESCO [3] and UNICEF [4], about 1.5 billion enrolled students experienced disruptions to their education programmes during COVID-19 lockdowns. This figure represented about 90% of the total global student population, although the COVID-19 pandemic was not the only situation that has disrupted students' education recently. According to Williamson *et al.* [5], civil unrest, war, famine, social unrest, and ecological disasters often result in disruption to education programs. However, to limit and reduce the disruption, trauma and psychological pressure experienced by teachers and students during the COVID-19 pandemic, schools were supported by governments, communities, and reputable organisations.

Managing learning and teaching as it used to be before the COVID-19 pandemic became problematic with different policies adopted by governments of each country to curb the pandemic. Some of these policies included lockdowns, closure of schools, border closures limiting enrolment of international students, restructuring, termination of teachers' appointments and closure of businesses. All these resulted in trauma and negative learning experiences from students' perspectives because these policies affected students, their families, and teachers.

This research was conceptualised after no academic articles on the impact of COVID-19 on the learning experiences of tertiary students in New Zealand could be found. This represents a gap in the literature and a gap in knowledge. Therefore, this study aims to identify the experiences and impacts of the COVID-19 pandemic on the learning of tertiary institution students during lockdowns and social distancing.

The benefits of the research are the identification of the impacts of COVID-19 on students' learning during the pandemic. This research provides an in-depth understanding of the implications of the COVID-19 pandemic on teacher-student relationships, how it impacted positively and negatively on tertiary

students' learning, the experiences of students of new teaching methods adopted to facilitate learning during the pandemic, and what needs to be done to enhance further teaching and learning quality. Research findings indicated that tertiary institutions must continuously support students by providing technological support for learning online. With this, students will remain positively engaged and experience effective learning from online classes.

Research objective

The objective of this study is to identify the impact of COVID-19 on the learning situations of tertiary students and their experiences.

Research questions

- A) What are the impacts of COVID-19 on tertiary students' learning?
- B) How do tertiary students perceive their online learning experience during COVID-19?
- C) What assistance is needed by tertiary students to improve learning during COVID-19?

2. Literature Review

COVID-19, otherwise referred to as Coronavirus Disease 2019, is an ongoing global pandemic associated with severe acute respiratory syndrome Petrov & Omisakin [6]. The source of the coronavirus was traced to Wuhan, China in December 2019 [1]. According to WHO [2], coronavirus is deadly, and the most effective way to curb the spread is social distancing [2]. However, Looi and Mahase [7] submitted that the deadliness of Coronavirus is becoming milder because of the increased immunity of the general population by concerned countries which reduces the rate of hospital admission and deaths. Coronavirus has affected almost all facets of the national and global economy such as the travel industry, hospitality, sport, international trade, finance, health, entertainment, and education. Despite the social distancing adopted initially to save lives, the global number of COVID-19-infected people kept on increasing. As of 07 August 2021, 202,353,777 people were infected by Coronavirus, 4,289,600 dead and 181,862,382 recovered Worldometer [8].

Because COVID-19 is deadly and highly infectious, most national governments while promoting social distancing as advised by WHO also adopted mandatory community lockdowns in areas where the virus was most pronounced and deadly. These policies affected every aspect of human life, and no sector was left untouched. Jena [9] argues that the COVID-19 pandemic has significantly upset every component of human life, especially teaching and students' learning processes. The next alternative taken by schools especially tertiary institutions to remedy the negative effects of the COVID-19 pandemic on traditional learning was to close schools and campuses or move learning and teaching online.

The severe implications of COVID-19 for people and the economy were unexpected by the education sector, especially the schools, teachers, and learners.

However, it was agreed by the highest institutions and their management that the best alternative for them at that time was to go online for continuous teacher-student engagement for learning and teaching. It was understandable that in some schools, the students and teachers were not novices to online-related learning and teaching, but the application of online teaching was limited prior to the COVID-19 pandemic. According to Hjelsvold *et al.* [10], unavailable resources and lack of adequate practice in delivering online teaching and coping with the limited time constituted barriers to online learning. However, Hjelsvold *et al.* [10] found that both learners and teachers adapted to change fast. The authors concluded that students started to have positive experiences of online learning within the first week of online teaching. This was due to feedback provided by the teacher, group activities created for learners online, the provision of online tutorials and the provision of formative and summative assessment instructions. This study is of the view that the positive experiences gained from online learning by students do not guarantee the expected engagement, or that online is more effective than face-to-face for students' learning. Using a test score, Nyer [11] ran a comparative analysis by examining the best and most effective way to deliver courses, including moving classes online during the COVID-19 pandemic lockdown. The analysis examined students' learning outcomes after the delivery of lectures to students via three lecture modes: face-to-face; online instructions on a video recording to deliver a classroom lecture; and virtual instruction using documents entrenched with charts, graphs and tables. Analysis indicated that virtual instruction methods recorded low levels of engagement compared with the traditional face-to-face lecture mode. However, lectures delivered via face-to-face and online lectures delivered via entrenched documents found students taking higher quality notes compared with the online video delivery lecture method. On the contrary, El Said [12] found no substantial variance in students' achievement in courses taught face-to-face compared with delivery of the same course online because of COVID-19.

According to Bozkurt *et al.* [13], teachers and learners were pressured during the COVID-19 pandemic, leading to some institutions reducing curriculum content to meet online teaching needs, reducing pass marks and focusing more on formative assessments. Formative assessments are done online through synchronous and asynchronous methods. Synchronous methods are when teachers and learners work together through specific online mode platforms such as Microsoft Teams and Zoom. These platforms often provide opportunities for virtual and audio communication between teachers and students during learning sessions. This enables teachers, learners, and groups of learners to learn on their own and receive immediate feedback where necessary. However, asynchronous methods provide opportunities for learners to learn at their own pace. This does not provide an opportunity for real-time interaction between teacher, learner, and other participants, and therefore, teacher, learner and other participants do not teach and learn at the same time Craig [14]. Although the asynchronous

method provides some limited virtual opportunities for teachers and learners to ask questions, tasks and activities can be organised through emails, messages, and application platforms to provide effective communication between teachers and learners and facilitate effective learning and teaching.

The essential lessons for teachers, students, parents, and educational institutions to manage the occurrence of any type of pandemic in the future are ensuring digital literacy for stakeholders and building capability skills for analysing and evaluating the authenticity of related information. Accordingly, Depoux *et al.* [15] argue that misinformation and lack of ability to authenticate information is more contagious than Coronavirus. To prepare for and guard against the possible occurrence of another pandemic in the future from an education sector perspective, Koehler and Mishra [16] suggested that educators become familiar with and trained in online pedagogies. Despite this suggestion, online learning and teaching methods cannot be a replication of face-to-face learning and teaching methods Depoux *et al.*, [15]. The authors concluded that ensuring digital literacy for stakeholders would require redesigning curricula to accommodate technological knowledge as well as academic and content knowledge. Above all, adequate and necessary professional development must be provided for teachers to overcome their deficiencies. This research opines that despite the belief that students enjoy online learning because of its flexibility, many of them still find online learning challenging. Muthuprasad *et al.* [17] suggested that for online learning to be effective and ensure the expected learning outcome is achieved, students must be supported to engage and be focused during online classes. The authors also argue that the teacher must frequently provide supportive interactions and answer queries from students during online classes. From an institutional support perspective, Ullah *et al.* [18] suggested that for students to be successful in online learning, institutions must support them with financial assistance, technical assistance, and mentoring.

This study developed a model that includes the COVID-19 pandemic and its effects on 1) students' learning plans for face-to-face learning when their learning was moved online; 2) students' online learning perception; and 3) learning assistance needed by students during their online learning. The impacts of the pandemic on students' learning during the lockdown period were examined from these three constructs depicted in **Figure 1**.

3. Methodology

This study adopted a quantitative methodology using a survey questionnaire to collect data from participants, and descriptive statistics for analysis through the SPSS software package for data interactive and statistical analysis. This method was adopted to ensure the research is independent of the researcher, making the whole process objective Struwig [19].

The 104 participants of this study were drawn from tertiary institutions in Auckland. The study applied a convenience sampling method to recruit participants who were available and qualified to participate in the study Saunders

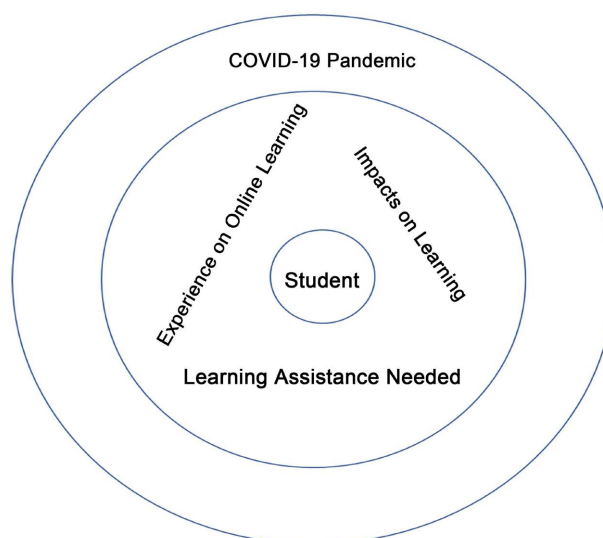


Figure 1. Conceptual framework of the impact of the COVID-19 pandemic on students' learning.

et al., [20]. To qualify as a participant, a student must be attending a university, polytechnic or tertiary college. The study invited participants through email and networked for possible participants through students and teachers from tertiary institutions.

The term questionnaire has been consistently used in the conduct of research as a form or format for collecting data information from participants. Questionnaire is expected to be designed based on certain expected principles. However, from the questionnaire design principle's perspective, this study ensures its designed survey questionnaire's content, wording and format facilitate the collection of reliable, valid, and relevant data information from the respondent. Therefore, to ensure that this study attained the stated requirements. All questionnaire items were made directly related to the objectives and uses of the survey. This study ensure that the collection of information was designed to minimize the response burden by making the number of questions items sizable. Participants' inclusion criteria were provided as well as classification variables such as gender and age. This was to help possible respondents to know if they were qualified to participate in the survey. The study provided questionnaire items so that responses could be provided easily and with sufficient reliability.

A Likert scale survey instrument with five options (Strongly Disagree to Strongly Agree) was designed and used to collect data from participants. A questionnaire with 23 survey questions was drawn up and divided into three sections: the impact of the COVID-19 pandemic on students' traditional normal learning plans during the pandemic; students' experiences of learning online; and assistance needed by the learners to enhance online learning.

Data analysis was done using descriptive analysis. The data collection process was started after obtaining Otago Polytechnic's research ethics committee approval (Application Number AIC60).

4. Results and Analysis

Descriptive analysis was adopted to calculate the mean scores and standard deviation, frequency distribution tables and cross tabulations as well as graphs and charts to determine the research findings.

4.1. Participants

A total of 104 tertiary institution students took part in the survey questionnaire for the study. The participants' age distribution was 54 participants aged between 20 - 29 years representing 51.92% of the total population; 40 participants aged between 30 - 39 years representing 38.46% of the total participants, 10 participants aged between 40 - 49 years representing 9.61% of the total respondents. No participants aged 50 years and above took part in the survey. **Table 1** represents the tabulated demographic analysis indicating that 54 participants were female, representing 51.92% of the total respondents and 50 were male, representing 48.07% of the total respondents.

4.2. Analysis and Findings of the Impact of COVID-19 on the Learning Experiences of Tertiary Students

The research adopted descriptive statistics to analyse data collected from 104 participants through a Likert scale of Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5. It also adopted the use of Mean and Standard Deviation (SD) to analyse the data collected. For the sake of analysis this study created upper and lower limits to ascertain and interpret the mean outcome for the Likert scale used: Strongly Disagree, 1.81 to 2.6 = Disagree, from 2.61 to 3.40 = Neutral, from 3.41 to 4.20 = Agree, from 4.21 to 5 = Strongly Agree.

The ranking order on the impact of COVID-19 on students' normal learning is presented in **Table 2** (n = 104). Questions 1, 3, 5 and 7 recorded a higher mean of 3.56 (SD = 0.879), 3.38 (SD = 0.896), 3.38 with (SD = 1.017) and 3.57 (SD = 1.05) respectively. The interpretation here suggests that respondents mostly agreed or strongly agreed that online classes impacted positively on their learning. However, the remaining questions 2, 4, and 6 recorded means of between 2.83 to 3.05 (SD = 1.025 to 1.21). This result indicated that participants mostly chose to strongly disagree or disagree or remain neutral in their responses to the survey questionnaire.

Given the above analysis, this study suggests that online learning introduced and adapted during the pandemic impacted positively on students' traditional learning methods. Online learning also impacted positively on other learning-related plans and activities. The analysis also indicated that students strongly agreed that they needed more time to attend to learning needs during online classes and more time to plan during online classes. This led the researcher to believe that students strongly agreed and agreed that they had challenges in continuing with normal learning during online classes. However, the analysis also

Table 1. Gender distribution of the sample.

Gender	Frequency	Percentage (%)
Male	54	51.9
Female	50	48.1
Total	104	100
Age (Years)		
20 - 29	54	51.92
30 - 39	40	38.46
40 - 49	10	9.61
Total	104	100

Table 2. Impact of online classes during COVID-19 on students' traditional normal learning plans.

QN	Do you agree with the statement below?	Mean	SD
Q1	Online learning impacted traditional learning plans positively	3.56	0.879
Q2	Online learning impacted traditional learning plans negatively	2.84	1.025
Q3	Online learning impacted positively on other learning-related plans and activities	3.38	0.896
Q4	Online learning impacted negatively on other learning-related plans and activities	2.83	1.047
Q5	Attending to other learning needs requires more time planning during online class	3.38	1.017
Q6	Online classes affected other schedules planned	3.05	1.21
Q7	Continuity with normal learning plans was challenging during online	3.57	1.05

Note. QN = Question Number, SD = Standard Deviation.

suggested that a substantial number of participants strongly disagreed with or were neutral about the negative impacts of online learning on other learning-related plans and activities; and how online classes affected other schedules planned. Nevertheless, the result from these three questions demonstrates the positive impact of online classes during the COVID-19 pandemic on students' traditional normal learning plans and patterns. This is because the three questions were asked from a negative perspective. For instance, the study asked, "Online learning impacted traditional learning plans negatively" and students mostly strongly disagreed, disagreed or were neutral.

The percentage distribution of participants' responses to survey questions on the impact of online classes during the COVID-19 pandemic on students' traditional normal learning plans (n = 104) is illustrated in **Figure 2** as created from

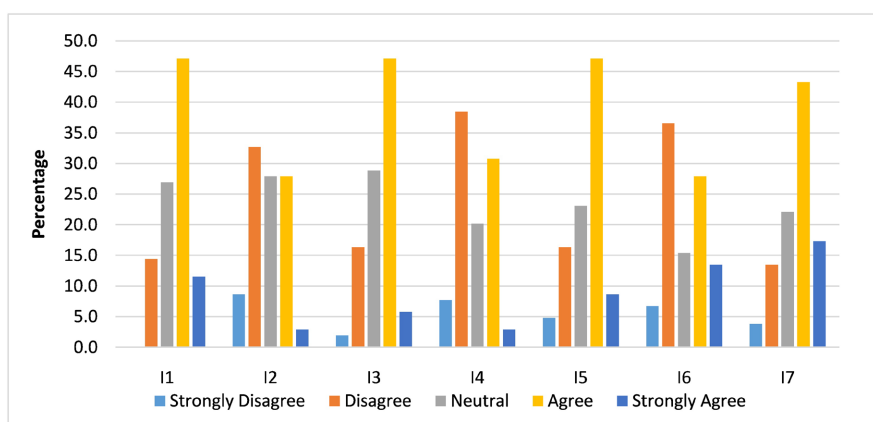


Figure 2. Percentage distributions of participants' responses to survey questions on impact of online classes during COVID-19 on students' traditional normal learning plans".

Table 3. The intention was to determine what impact switching to learning and teaching online has had on students' traditional learning plans as used prior to online classes during the COVID-19 pandemic relative to percentages of participants' responses to survey questions (**Table 3**). **Figure 2** indicates 47% agreed and 11% strongly agreed that online learning impacted positively on their traditional learning plans while 14% and 26.9% chose to disagree or remain neutral. Similarly, in response to Q3, 47.1% agreed and 5.8% strongly agreed that online learning impacted positively on other learning-related plans and activities, representing about 52.9% of the total responses. The remaining 47% was spread among participants' responses of strongly disagree, disagree and neutral. Similar positive responses were obtained from participants' responses to whether attending to other learning needs requires more time planning during online classes. More than 55% of the total responses were either agree or strongly agree. Survey Q7 also recorded positive responses to the question of whether continuing with normal learning plans was challenging during online classes to which 43.3% of participants agreed with the question while 17.3% of participants strongly agreed. The analysis indicated that between 52% and 60% of all participants agreed or strongly agreed with each of these four statements. From this analysis, it is suggested that switching classes to online learning during the COVID-19 pandemic impacted positively on students' traditional normal learning plans. Similarly, Hjelsvold *et al.* [10] concluded that students adapted to change fast during online classes, leading them to realise the positive experience of online learning within a short time of their attending online classes.

Figure 2 also indicated that just 30.8% of participants agreed or strongly agreed with the statement "online learning impacted traditional learning plans negatively". Contrary to this, 41.4% of total responses were shared between strongly disagree and disagree, while 27.9% chose to be neutral. Similarly, barely 33.7% of responses represented participants that agreed and strongly agreed with Q4 "Online learning impacted negatively on other learning related plans and activities". On the other hand, 7.7% and 38.5% respectively represented responses

Table 3. Percentage of participants' responses to survey questions on "impact of online classes during COVID-19 on students' traditional normal learning plans".

QN	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Q1	0.0	14.4	26.9	47.1	11.5
Q2	8.7	32.7	27.9	27.9	2.9
Q3	1.9	16.3	28.8	47.1	5.8
Q4	7.7	38.5	20.2	30.8	2.9
Q5	4.8	16.3	23.1	47.1	8.7
Q6	6.7	36.5	15.4	27.9	13.5
Q7	3.8	13.5	22.1	43.3	17.3

Note. QN = Question Number.

for strongly disagree and disagree. Additionally, 20.2% of participants chose to be neutral. Analysis of the percentage distribution of participants' responses to survey Q6 (online classes affected other schedules planned) shown in **Figure 2** illustrated that 6.7% and 36.5% respectively were responses from participants who strongly disagreed and disagreed, while 15.4% represented neutral responses. This analysis showed negativity in terms of participants' responses to the three statements. However, their interpretations relative to the expectation of the study are positive. This is because the researcher asked participants negative questions and participants strongly disagreed, disagreed or were neutral, indicating that moving classes online during the COVID-19 pandemic impacted positively on students' traditional normal learning plans. Similarly, Oye *et al.* [21] argue that moving classes online during the COVID-19 pandemic motivated positive learning for students.

Table 4 shows students' experiences of learning online during the COVID-19 pandemic (n = 104). Three questions (Q3, Q6 and Q9) asked whether online learning made use of other learning materials and documents easier and faster than face-to-face; whether online learning is comfortable for students; whether online learning is practical and whether training courses online are challenging to students. **Table 2** recorded a higher mean of 3.44, 3.51 and 3.93 with SD of 0.901, 1.043 and 0.851 respectively. The interpretation of this is that participants' responses to these three questions fall within the higher mean distributions of Agree and Strongly Agree. Similarly, questions 1, 2, and 7 also recorded high means of 3.15 (SD = 1.104), 3.25 (SD = 1.104) and 3.31 (SD = 1.043). The interpretation of participants' responses to these questions indicated a good number of agreed and strongly agreed responses although they may not be totally positive.

Questions 4, 5 and 8 had the following mean and SD: 2.99 (SD = 1.093); 3.04 (SD = 1.033); and 3.13 (SD = 1.086). This means that responses from participants to this question fall within the lowest mean distribution of all questions.

Table 4. Students' experiences of learning online during COVID-19.

QN	Do you agree with the statement below?	Mean	SD
Q1	Online learning is fun like	3.15	1.104
Q2	Online learning is easier	3.25	1.104
Q3	Online learning made use of other learning materials and documents easier and faster	3.44	0.901
Q4	Online learning is difficult	2.99	1.093
Q5	Online learning is confusing	3.04	1.033
Q6	Learning online is comfortable	3.51	1.043
Q7	Communication with the teacher during online teaching is challenging	3.31	1.043
Q8	Understanding the teacher is challenging during on-line learning.	3.13	1.086
Q9	Practical and training courses online are challenging	3.93	0.851

Note. QN = Question Number, SD = Standard Deviation.

This indicates that participants disagreed, strongly disagreed or were neutral on the statements in the survey questions. This can be justified because negative questions were asked from participants and they either disagreed with the questions or remained neutral, leading to lower responses of agree and disagree.

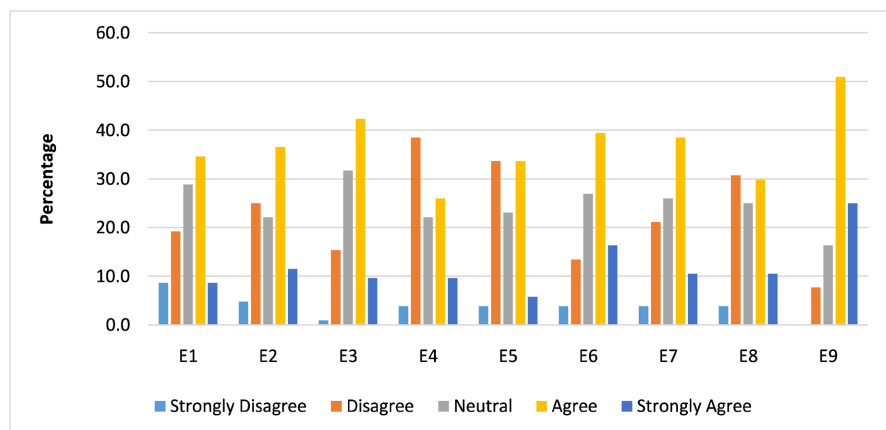
From the above analysis it is concluded that most of the participants believed that online learning during the COVID-19 pandemic enabled them to use other learning materials and documents with ease, making learning online easier and comfortable for them. The analysis also indicated that online classes created for students during the COVID-19 pandemic were comfortable and non-confusing, and it was easy to communicate and understand teachers' teaching both practical and theoretical. However, other questions that elicited higher responses of disagree, strongly disagree and neutral from participants could be said to be appropriate because of the negativity of the questions put to them.

Table 5 shows the percentage of participants' responses to survey questions on students' experiences of learning online during the COVID-19 pandemic. From this table, **Figure 3** was created representing the percentage distribution of participants' responses (n = 104). This was done to determine the percentage of participants' responses to nine survey questions on how students perceived their learning online during the COVID-19 pandemic. From **Figure 3** participants' responses to the survey question "Online learning made use of other learning materials and documents easier and faster". 42.3% of the total responses indicated agreed and 9.6% strongly agreed. This represented 51.9% of the total responses. Similarly, Q6 asked if online learning was comfortable for students, **Figure 3** indicated that responses to agreed and strongly agreed were 39.4% and 16.3% respectively. This represented 55.7% of the total responses to this survey question. From this analysis, it is argued that given the necessary infrastructure

Table 5. Percentage of participants' responses to survey questions on "students' experiences of learning online during COVID-19".

QN	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Q1	8.7	19.2	28.8	34.6	8.7
Q2	4.8	25.0	22.1	36.5	11.5
Q3	1.0	15.4	31.7	42.3	9.6
Q4	3.8	38.5	22.1	26.0	9.6
Q5	3.8	33.7	23.1	33.7	5.8
Q6	3.8	13.5	26.9	39.4	16.3
Q7	3.8	21.2	26.0	38.5	10.6
Q8	3.8	30.8	25.0	29.8	10.6
Q9	0.0	7.7	16.3	51.0	25.0

Note. QN = Question Number.

**Figure 3.** Percentage distributions of participants' responses to survey questions on "students' experiences learning online during COVID-19".

needed, online learning will facilitate the use of other learning documents and material through online real-time searches for needed learning material and documents, making teaching and learning easy for both the learners and teachers. According to Naveed *et al.* [22], the provision of needed infrastructure to support students during online classes will make online learning platforms user-friendly for students. Similarly, in **Figure 3**, Q9 investigated participants' views on whether undertaking practical and training courses online is challenging, and responses indicated that 51% and 25% of participants agreed and strongly agreed respectively. This summed up to 75% of the total responses to Q9. Therefore, it can be concluded that while the use of online teaching can facilitate an effective and efficient learning and teaching relationship, this may not be negotiable, and especially during the COVID-19 pandemic, it could not be over-emphasised that applying it to some practical courses might be challenging

as indicated by participants' responses. Accordingly, Muthuprasad *et al.* [17] submitted that certain courses require practical skills based on practice. Conducting online classes for such courses will be a difficult task.

Figure 3 also indicated Q1, Q2 and Q7 reflected sizeable percentages of agreed and strongly agreed responses. For instance, while Q1 (if online learning is fun-like) recorded 34.6% agreed and 8.7% strongly agreed, representing a total of 43.3%, neutral responses were 28.8%, and the remaining 27.9% were spread between disagree and strongly disagree responses. From **Figure 3**, the percentage distribution of Q2 (if online learning is easier) was like Q1. Agreed responses were recorded 36.5% and strongly agreed recorded 11.5%, summing up to 48%, while neutral responses were recorded 22.1%, and strongly disagreed and disagreed realised a total of 29.8%. Q1 and Q2 elicited 43.3% and 48%, respectively for strongly agreed and agreed, so it is concluded that after students had attended online classes several times, they became easier, and classes became fun-like learning activities for students.

On Q7 participants were asked if communication with the teacher during online teaching was challenging. According to **Figure 3**, responses from participants indicated that 38.5% agreed and 10.6% strongly agreed, totalling 49.1%, while 26% were neutral. 3.8% strongly disagreed and 21.2% disagreed. From this analysis it could be concluded that a substantial percentage (49.1%) of respondents agreed that there were challenges in communicating with the teacher during online classes. This might be because of the challenges commonly associated with new users of some learning management systems for higher education such as Blackboard, Moodle, Canvas by In structure and D2L Bright space. It could also be internet capability issues depending on the student's location.

Q4 asked participants to respond to the statement that online learning is difficult. Participants' responses indicated that 38.5% disagreed while 3.8% strongly disagreed, totalling 42.3% of responses. Neutral responses totalled 22.1% while 35.6% of respondents either agreed or strongly agreed. **Figure 3** shows students' responses to the statement that "online learning is confusing" (Q5). Responses indicated that 33.7% of responses disagreed with this statement and 3.8% strongly disagreed, totalling 37.5% while 23.1% of responses were neutral and 39.5% either agreed or strongly agreed. Findings from percentage distribution analysis on Q4 and Q5 as presented above indicated that most participants disagreed that online learning was confusing. Based on these percentages it can be argued that participants did not find learning online difficult or confusing. However, more than 20% of the responses were neutral. This could be interpreted to show that these participants were neither confused nor comfortable with online classes. **Figure 3** also presents the percentage distribution on the statement in Q8 that understanding the teacher is challenging during online classes. **Figure 3** indicates that 30.8% and 3.8% of respondents respectively either disagreed or strongly disagreed that understanding the teacher was challenging, while 25% of respondents were neutral, and 40.4% of respondents either agreed or strongly agreed with the statement. It is concluded therefore that

a substantial number of participants did have problems understanding their teacher during online classes. This could be because they were not fully engaging during online classes, the sudden change from face-to-face learning to online teaching was difficult, or that students' states of mind and/or health during online classes e.g., with stress and trauma associated with lockdown affected their learning. The content of online teaching sessions may not have been accessible, and students may require more structure and support.

The descriptive statistic in **Table 6** represents the order of rank on the assistance needed by learners to enhance online learning during the COVID-19 pandemic ($n = 104$). All the seven questions recorded a higher mean of between 3.5 to 4.05 ($SD = 0.546$ to 0.914). This was because most participants agreed and strongly agreed with the seven statements set out in **Table 6**. Given the above analysis, it is argued that in relation to online learning, adequate assistance must be given to students in order to enhance their learning experience. However, the findings suggest that during an emergency situation such as the COVID-19 pandemic or any future epidemic that may warrant moving learning and teaching from face-to-face to online platforms, the following assistance must be provided: provide more information on how best to learn through online platforms; continuous tutorials on how to succeed in online classes; online learning platforms must be stocked with digital learning material needed for effective learning; best practice on learning online should be provided; creation of an online resources hub to link information on how students can utilise resources effectively and efficiently for learning; provide technological support for learning online; and provide tutorials on the best way to use online learning templates. This assistance will be most useful for first timers on online learning.

Figure 4 created from **Table 7** represents the percentage distribution of participants' responses to survey questions on assistance needed by the learner to enhance online learning during COVID-19 ($n = 104$). The objective of creating **Figure 4** was to determine the percentage of participants' responses to seven questions in the research survey, questions on what assistance students needed to enhance their learning online during the COVID-19 pandemic. In **Figure 4**, in response to the survey question asking if students "needed more information on how best to learn through online teaching", 56.7% of participants agreed and 9.6% strongly agreed, representing agreement and strong agreement from 66.3% of the total respondents while 11.5% represented the total responses of strong disagreement and disagreement, and 22.1% of participants chose to be neutral. Similarly, Q3 to Q7 asked participants whether: 3) online learning platforms should be stocked with digital learning material; 4) best practice in learning online should be provided; 5) an online resources hub with links to information on how to utilise the resources effectively and efficiently should be provided; 6) technological support for online learning should be provided; and 7) tutorials on the best way to use the online learning templates should be provided. The responses as presented in **Figure 4** demonstrated that 71.2% of respondents agreed or strongly agreed to Q3; 79.8% of respondents agreed or strongly agreed to Q4;

Table 6. Assistance needed by the learner to enhance online learning during COVID-19.

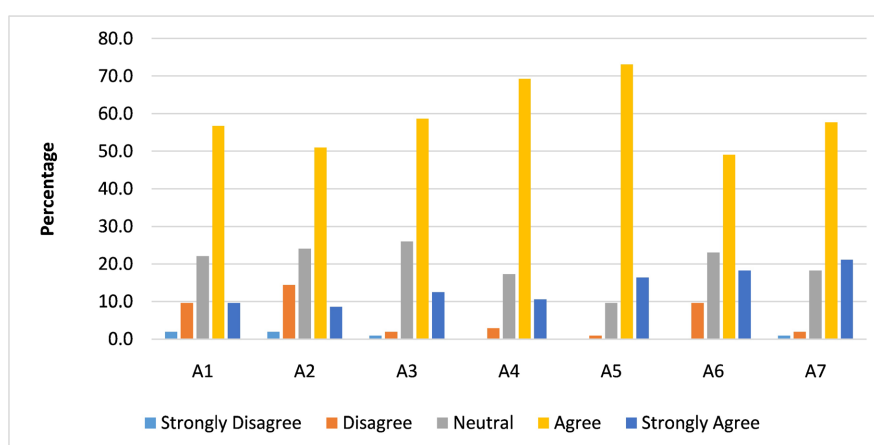
QN	Do you agree with the statements below?	Mean	SD
Q1	Need more information on how best to learn through online platforms	3.63	0.861
Q2	Need continuous tutorials on how to succeed in online classes	3.5	0.914
Q3	Online learning platforms should be stocked with digital learning material needed for learning	3.8	0.716
Q4	Best practice on learning online should be provided	3.88	0.618
Q5	Need online resources hub with link to information on how to utilise the resources effectively and efficiently for learning	4.05	0.546
Q6	Need technological support for learning online	3.76	0.865
Q7	Tutorials on the best way to use the online learning template provided	3.96	0.749

Note. QN = Question Number.

Table 7. Percentage of participants' responses to survey questions on "assistance needed by the learner to enhance online learning during COVID-19".

QN	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Q1	1.9	9.6	22.1	56.7	9.6
Q2	1.9	14.4	24.0	51.0	8.7
Q3	1.0	1.9	26.0	58.7	12.5
Q4	0.0	2.9	17.3	69.2	10.6
Q5	0.0	1.0	9.6	73.1	16.3
Q6	0.0	9.6	23.1	49.0	18.3
Q7	1.0	1.9	18.3	57.7	21.2

Note. QN = Question Number.

**Figure 4.** Percentage distributions of participants' responses to survey questions on "assistance needed by the learner to enhance online learning during COVID-19".

89.4% of respondents agreed or strongly agreed to Q5; 67.3% of respondents agreed or strongly agreed to Q6; and 78.9% of respondents agreed or strongly agreed to Q7. Further analysis on Q3 to Q7 on percentage analysis of participants' responses of disagree indicated 3.46% on average while participants' responses to strongly disagree indicated an average of 1%. Similarly, the percentage analysis on participants' neutral responses was 18.86%. However, 59.7% agreed or strongly agreed with Q2. This was the lowest summed percentage of agreed and strongly agreed responses from the figure. Despite this, it is still altogether a good response. As well as positive responses, 24% of respondents remained neutral, 1.9% strongly disagreed and 14.4% disagreed. From the above analysis, it is concluded that the emergence of moving the learning and teaching relationship from face-to-face to online generated by the COVID-19 pandemic requires that appropriate assistance be provided to learners. The change to online learning was managed by most higher institutions without adequate preparation for learners and teachers.

5. Discussion

This study focused on examining the impacts of COVID-19 on learning and teaching for tertiary students' institutions and their experiences. A survey instrument with 33 questions was created. The 23 questions were divided into three sets of objectives. Each had a different theme. Set 1 examined the impact of the COVID-19 pandemic on students' normal learning plans prior to online learning; Set 2 examined how students perceived their experience learning online during COVID-19; and Set 3 examined what assistance would be needed by students learning online. Survey questions were created for each of these sets of themes. Set 1 has 7 questions, set 2 has 9 questions, and set 3 has 7 questions.

Findings from seven questions from the set 1 survey (impact of COVID-19 on students' learning) indicated that questions 1, 3, 5 and 7 showed the sums of responses of agreed and strongly agreed were: 58.6%, 52.9%, 55.8%, and 60.6%. The highest recorded percentage among these four questions responding to neutral responses was 28.8% (Q3), 27.9% (Q2), 26.9% (Q1). The lowest responses were recorded on strongly disagree and disagree on questions 1, 3, 5 and 7 with 0.0%, 14.4%; 1.9%, 16.3%; 4.8%; 16.3%; 3.8%, and 13.5%. From this analysis, it is argued that online classes during COVID-19 had a positive impact on students' normal learning plans prior to the adoption of online learning (objective 1 met). According to Oye *et al.* [21], online classes during the COVID-19 pandemic based on face-to-face learning content enhanced positive learning for students. Similarly, Naveed *et al.* [22] argued that online learning constitutes a positive learning development for students because of its flexibility and the lower cost of learning from home.

The outcome of the analysis of the nine questions from Section 2 (how students perceived their experience learning online during COVID-19) indicated that questions 3, 6 and 9 recorded the sum of responses of both agree and strongly agree in the following order: 51.9% online learning enables usage of

other learning materials and documents to be faster and easier; 55.7%; learning online is comfortable; 75% learning in practical and training courses online is challenging (objective 2 met). The findings in this context are like those of Baczek [23] who submitted that online learning makes students more pragmatic to learning and provides opportunities for students to access and use online materials.

The remaining six questions in this section resulted in 40% and below for the sum of both agree and strongly agree in the following order: 43% (Q1), 48% (Q2), 35.6% (Q4), 39.5% (Q5), 49.1% (Q7), 40.6% (Q8). The average percentage of all neutral responses to the whole nine questions was 24.6% with questions 3 and 1 having the highest neutral percentages of 31.7% and 28.8%. However, questions 4, 5 and 8 resulted in responses of disagree as follows: 38.5%, 33.7% and 30.8%. Two questions resulted in strongly disagree responses of 8.7% and 4.8% and the remainder resulted in responses between 1.0% and 3.8%. Analysis of section 3 of the study indicated that all seven questions recorded the sum of agreed and strongly agreed responses of between 59.7% and 89.4%. This is interpreted as despite the positive experience realised by students learning online, these students are still in need of various academic assistance to enhance their effective learning online (objective 3 met).

As in this finding, Huang *et al.* [24] suggested that realising effective learning from engaging in students' online classes in an emergency such as the COVID-19 pandemic lockdowns requires schools to assist students to familiarise themselves with tools that will help them understand the use of online learning technology such as provision of reliable and interactive electronic resources and provision of interactive methods like discovery-based learning. According to Alsoud and Harasis [25], moving to learning online unexpectedly by students during COVID-19 and attending online classes for the first time require support for students in their attempts to apply the use of technology in the learning and teaching process.

The primary objective of this research was to fill a gap in the literature concerning the impact of the COVID-19 pandemic on the learning and teaching situations of tertiary institutions' students, students' experiences learning online during COVID-19 and the assistance needed by students to improve learning during the pandemic from a New Zealand perspective. This study opined that this research is necessary to determine what needs to be done to maintain the positive perception of international students' on New Zealand postgraduate education during Covid-19 Omisakin & Kularatne, [26]. This study has achieved its goals by administering survey questions on tertiary institutions' students, processing and analysing the data collected and presenting findings. This research found that online classes impacted positively on students' learning plans prior to moving classes online, and most students had positive experiences learning online. However, an important finding in the study was the need to provide support for students engaging in online classes. Therefore, tertiary institutions must provide support in the following areas among others: tutorials to

succeed in online classes; technological support for learning online and a stock of online learning platforms with digital learning material needed for effective online learning. From the analysis above, this study has answered its three research questions. Therefore, this study has reduced the gap in the literature and contributed to knowledge relative to students' online learning during the COVID-19 pandemic lockdown from a New Zealand perspective.

6. Conclusion

This study examined the impact of the COVID-19 pandemic on the learning situations of tertiary institutions' students and their experiences. The research contributes to the literature relating to the impacts of COVID-19 on students' normal learning plans because of moving learning online, student experiences of online learning, and assistance needed to improve students' online learning.

The research results from the seven survey questions in Section 1 revealed that four of the questions elicited average summative responses of 56.9% on both strongly agree and agree. This suggests that most participants had a positive experience from engaging in online learning relative to their traditional learning plans before online classes commenced. However, the remaining three questions had an average summative response of 35.3%. It can be said that this group of participants did not realize the full positive impact of online learning during the COVID-19 pandemic on their traditional learning plans. Section 2 of this study had nine survey questions. Questions 3, 6 and 9 had average summative responses on agreement and strong agreement of 51.9%, 55.7% and 75%. These findings indicated that students had positive experiences learning online during COVID-19 lockdown. Four questions had average summative results of 43.3%, 48%, 49.1%, and 40.4% responses on strongly agreed and agreed while the remaining two questions had responses of 35.6% and 39.5% as their average summative responses on strongly agreed and agreed. The reason why there were low percentage responses to agreed and strongly agreed was that questions responded to by participants were drawn from negative perspectives. For instance, one of the statements asked was "Online learning is difficult". Therefore, lower percentage responses on agreed and strongly agreed could be interpreted as suggesting online learning during the COVID-19 pandemic was not difficult for students. This is also justified by the average response of participants remaining neutral as 24%, disagree as 23% and strongly disagreeing as 3.7%. This finding is like Howaida and Manahill (2023) [27] that found E-learning improved the quality of students' learning during COVID-19 and suggested teachers should adopt E-learning in their teaching process. Section 3 of the study had seven questions asking students what assistance was needed for them to attain effective learning online. Question number seven recorded that an average summative of 73% was in responses to strongly agreed and agreed. Therefore, based on their responses to the survey questions, it is concluded that students needed assistance while engaging in online learning to enhance effective learning.

7. Limitations

The main limitation of the study is that data was collected from tertiary institutions' students from the Auckland region of New Zealand only. This limited the research population to Auckland. However, collecting data from Auckland region of New Zealand only is justified by Education New Zealand (2016)'s [28] argument that Auckland is the most populated region with the highest number of colleges, polytechnics, and universities in New Zealand. Although the sample size of this study population is 104 participants. This is justifiable based on the argument of Altunışık *et al.*, (2004) [29] that sample size between 30 and 500 at 5% confidence level is generally sufficient for many researchers. However, generalising the research findings may be difficult comparatively with countries with bigger populations and higher institutions than New Zealand. Therefore, the research recommends future research include students from across the wider New Zealand region's tertiary education sector. This could make such research findings more generalised.

Conflicts of Interest

The authors declare no conflicts of interest.

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