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Sustainable Strategies for Teaching and Learning Online

Dianne Forbes [1,*], Dilani Gedera [2], Maggie Hartnett [3], Ashwini Datt [4] and Cheryl Brown [5]

[1] Te Kura Toi Tangata School of Education, University of Waikato, Hamilton 3240, New Zealand
[2] Faculty of Business Economics and Law (FoBEL), Auckland University of Technology, Auckland 1010, New Zealand; dilani.gedera@aut.ac.nz
[3] Centre for Education Transformation, Massey University, Palmerston North 4442, New Zealand; m.hartnett@massey.ac.nz
[4] Faculty of Medical and Health Sciences, The University of Auckland, Auckland 1142, New Zealand; a.datt@auckland.ac.nz
[5] School of Educational Studies and Leadership, University of Canterbury, Christchurch 4800, New Zealand; cheryl.brown@canterbury.ac.nz
* Correspondence: dianne.forbes@waikato.ac.nz

Abstract: Investigating students' lived experiences of online learning can inform us on how best to teach them. In this paper, we harness the insights gained from pandemic teaching and learning to inform sustainable approaches. Theorized in relation to Ben-Eliyahu's sustainable learning in education (SLE), this article offers insight into what tertiary teachers can do to support students with sustainable strategies, as well as how students can develop long-term learning strategies. We draw upon the research on the perspectives and experiences of New Zealand university students studying online in 2020 to inform SLE in online teaching and learning in the long term. The researchers collaborated with student associations to undertake a survey exploring the students' experiences of online learning. There were 952 valid survey responses from all 8 New Zealand universities, complemented by 20 individual interviews and 9 focus groups involving 43 student participants, both on and offshore. Our findings indicate that students regard support, communication, and engagement as key areas where they experienced challenges or helpful practices, and where there are sustainable directions for future teaching and learning. We propose support that institutions can provide to both students and staff for sustainable strategies.

Keywords: online learning; sustainable learning in education (SLE); student support; communication; engagement; strategies

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1. Introduction

When educational institutions were forced into what was termed "emergency remote teaching" because of the pandemic, few were able to draw on past experiences of pivoting online in response to natural or political disasters. An overwhelming workload and the feeling of needing to reinvent the wheel were reported commonly amongst educators across all sectors. As we look to a future where socio-political, technological, and natural disruptions are becoming increasingly common, how do we learn from our past experiences? Others have reflected on pandemic teaching and learning experiences to propose priorities for our post-pandemic futures of education [1]. However, this paper harnesses the insights gained from student experiences of pandemic teaching and learning to inform sustainable approaches to teaching and learning online.

A sensible starting point for conceptualizing sustainable teaching and learning strategies is SDG 4, to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" [2]. The emphasis on inclusion, equity, quality, and lifelong elements will form the basis for our reasoning in this paper.

Like sustainable development, sustainable learning means being able to continuously learn, and to create more equitable and sustainable means of doing so [3–5]. Graham and

Longchamps [6] characterized sustainable learning as long-lasting, continuous, participative, purposeful, renewable, and habitual.

Learning and teaching strategies are sustainable if they "enable learners to effectively renew, rebuild, reuse, inquire, be open-minded, and cope with challenging and complicated circumstances that require learning and relearning" [7] (p. 1). Sustainable strategies are those that enable durability across different contexts, situations, and domains [7], and enable resilience and continuity across challenging circumstances [3,5,8].

Ben-Eliyahu [7] (p. 1) argues that sustainable strategies, or what she refers to as "sustainable learning in education," involves four key components, which are as follows:

(1) renewing and relearning; (2) independent and collaborative learning; (3) active learning; and (4) transferability.

Renewing and relearning entails lifelong learning, being able to reflect on progress, to set goals, and to adapt to change in an agile and flexible way [3,4,6–9].

Independent and collaborative learning is a way of creating conditions for continuous and renewable energy. In order to sustain learning, it is vital to be able to work both alone and with others in a community; therefore, the ability to seek support is a crucial skill [4,10]. The power of social learning, with the relational aspects of learning, persists whether online or in person [7,11]. Help seeking sustains learning during challenging circumstances, which is key to guided autonomy and durability [6,10]. The flipside of seeking help is teaching others, which is also a way to acquire durable skills [6,11]. Interpersonal and relational aspects of learning remain essential, with presence, trust, and empathy highlighted by Jagannathan [8].

Active learning is fundamentally about creating solutions to ensure the sustainability of resources. Active learning is, by definition, not passive, a unidirectional transmission, or teacher-centric [6,8]. Ben-Eliyahu [7] emphasizes active learning with a future orientation, requiring forward thinking, planning ahead, goal setting, and evaluating and readjusting as needed [3,4,6,7]. Active learning is participatory and engaging, and often collaborative and interactive [6,8], aligned with a constructivist paradigm.

Engagement is a vital component of sustainable learning, as it influences the learners' perseverance with learning. Motivation and stimulation are powerful forces, as Graham and Longchamps [6] attest. Motivation influences how individuals think, feel, and act while learning, and is fundamental to success and achievement. It affects the learners' choices, effort expended, and persistence in the face of challenges. In exploring the conditions needed to improve student engagement in online learning, Lee, Song, and Hong [12] identified the following six key factors: psychological motivation, peer collaboration, cognitive problem solving, interactions with instructors, community support, and active, self-directed learning.

Finally, transferability suggests that what is learned in one context can be applied more widely across and throughout life, bringing us back to lifelong (and life-wide) learning, or, in Jagannathan's [8] terms, "life-led, continuous learning" (p. 9), enduring capabilities, and "transversal skills" (p. 25). Transferable capabilities and skills include mindsets that prioritize growth [13], a proactive approach to personal development, and a range of soft, business, and technological skills.

Sustainable strategies enable the continuity of learning in changing and challenging circumstances. Some examples are provided by Graham and Longchamps [6] (p. 8), who suggest the following:

> "... learning to teach others, learning by doing, building group discussion or using different types of audiovisual or technological pedagogical tools in modern education as essential components in any enhanced knowledge acquisition processes."

Jagannathan [8] similarly highlights the importance of a shift from passive to participatory and reflective approaches, problem solving in real-world contexts, and teamwork and collaboration via flexible formats.

Importantly, sustainable strategies will involve several parties, including the learner, the teacher, and the institution [14]. The indicators of sustainable learning behaviors include

peer interaction, while teachers are evaluated according to their reliability, assurance, empathy, and responsiveness [14]. Graham and Longchamps [6] argue that learners must be at the center of planning and decision making so that they are consulted and invited to influence the pedagogy.

Graham and Longchamps [6] (p. 10) emphasize the following:

> "... it is of paramount importance to include a variety of learning experiences and situations to truly engage the student in interacting with the teaching materials and concepts acquired through collaborative interaction and participation. This is why sustainable active learning depends on an inclusive, varied, flexible, innovative, and enriching relational pedagogical approach."

As we work to determine sustainable strategies, there are two key points of reference: 1. Which evidence-based strategies have worked in the past and endured to the present (with likely future-oriented potential)? and 2. What students need—what "students themselves see as particularly helpful and/or useful" [15].

Prior to the pandemic, in relation to online learning, students have indicated that they value such affordances as organization, flexibility, ease of collaboration, and the ability to review, replay, and revise digitally recorded learning materials, as well as the opportunity to engage visually and to search more widely for supplementary materials to corroborate or clarify what had been learnt while at university [15]. Even so, the authors of this pre-pandemic study bemoaned the "lack of more active, participatory or creative uses of technology within our survey data" [15] (p. 1577), concluding that there are more empowering, and, therefore, more sustainable ways of engaging students in online learning.

Since COVID-19, it has been recognized that there is a special place for blended and online learning going forward. Wong [9] (p. 1899) regards blended learning as "the best way to use technology for sustainability in higher education," as the most sustainable solution is not to rely on a single mode of learning, but rather to blend technologies, paradigms, and in-person and workplace learning [8,9]. As Argawal writes in the foreword to Jagannathan [8], the pandemic experience has raised awareness of the affordances of flexible learning and has accelerated blended learning as a means of ensuring global access to education. Blended learning offers "the benefits of flexibility of time and pace, interactivity and engagement" [8] (p. 28).

Our project focused on how students at universities in New Zealand experienced online learning during the pandemic. This perspective fills a gap in the literature noted by Mishra, Sahoo, and Pandey [16] that research during the pandemic was focused on online pedagogies and technology, with less of a focus on the students' perspectives. The key findings show the diversity of students' experiences and learning approaches. Our research, like Ruegg [17], confirmed that, at times, learning online during this tumultuous period was a lonely and frustrating experience, while, at other times, it was experienced as flexible and liberating. Inequity in terms of access and digital fluency were also concerns, and stress was a common factor. This was disproportionality experienced by the indigenous students [18]. The students expressed a need for social connection to support their learning [11,19]. Relational connections were highlighted as a means of promoting equity and inclusion in online learning, as teachers worked to show caring and consideration for students and generated a sense of belonging through shared learning experiences and responsive pedagogies [11]. This confirms what others have noted about the critical need to consider wellbeing as part of students' learning experiences [19].

Delving more deeply into the pattern of diverse experiences, we determined that students tended to fall into two clusters, reporting either enhanced or diminished attitudes and agency [10]. Like others [20], we have noted that the dominant student experience was one of less motivation, reduced focus, and lower confidence and control over learning. We also noted a small group of students who reported enhanced attitudes toward learning during the pandemic, as well as greater control, focus, motivation, and confidence [3]. The students in the diminished-attitudes group were more likely to experience a lack of routine, stress, anxiety, and distraction, while being unsure where to receive help. Not knowing

where or how to receive help also contributed to the students' lack of wellbeing [21]. The students in the enhanced-attitudes group were more likely to report enjoyment of learning online and an appreciation of more concentrated study time. Students in both groups found it useful when the teachers provided video recordings, regular updates, clear communication, and extended times for assignments [10]. This coincides with what others have noted, in that students benefit from enhanced structure [17], good communication, empathetic relationships [22], and peer learning, which can provide motivation, active learning opportunities and support [23], flexibility, and adaptability, which enable an inclusive learning environment [1].

The students for whom practical learning was a key component of their studies reported that this was often postponed during the pandemic, creating a gap in their learning experience. There was a tendency to revert to the transmission of content via lectures and reading, relegating the students to passive roles. Sustainable alternatives to these patterns occurred when the students actively constructed knowledge by engaging in collaborative activities with their peers, problem solving and sharing ideas and resources. Interactive opportunities, which enabled feedback from the teachers and peers, enabled the students to build online and hybrid competencies relevant to their future professions [24] by generating digital content and by blending online and offline practices.

Overall, our studies have determined that students at New Zealand universities experienced a range of challenges, varying in type and extent. The key challenges were associated with new technologies, a lack of interaction and connections, disruption to routines and study spaces, and competing commitments, due to multiple roles and responsibilities. In order to address these challenges, it is important to ensure sustainable teaching and learning strategies to cater for diverse student needs.

2. Materials and Methods

This study investigated New Zealand university students' perspectives and lived experiences of online learning during COVID-19. The research questions asked the following: How did students experience online learning during the pandemic? And what can be learned from student experiences to inform sustainable strategies for online learning and teaching? Ethical approval was obtained from three of the five universities at which the authors work, the University of Waikato (FEDU 036/20), AUT (20/171), and Massey University (4 000 023 000). The approvals were subsequently lodged with, and ratified by, the ethics committees at Auckland and Canterbury universities. Students from all eight New Zealand universities participated in this study, including domestic and international students enrolled in undergraduate and postgraduate programs across multiple disciplines.

Our study adopted a mixed-method design in order to gain an in-depth understanding of the research problem by "comparing different perspectives drawn from quantitative and qualitative data" [25] (p. 216).

This study had two data collection phases, spanning approximately five months. In the first data collection phase, we invited students from all eight universities to share their online learning experiences during COVID-19 via an online questionnaire (Qualtrics). Student associations in each university agreed to share and promote the questionnaire to student members via social media channels. Each member of our research team also shared the questionnaire widely with students. We received 952 valid responses to the questionnaire.

The first part of the questionnaire comprised demographic questions, including age, gender, program of study, device accessibility, and domestic or international status. The second part of the questionnaire asked the students about the benefits and challenges of online learning, helpful teaching approaches, study routines, practical learning experiences, and preferred future learning and teaching practices. After cleaning the questionnaire data for invalid responses, frequency counts and percentages were generated. The open-ended survey responses were analyzed, with qualitative data stemming from the subsequent phase of data collection, as follows.

In the second qualitative data collection phase, 43 students volunteered to participate in semi-structured interviews and focus groups via Zoom. The interviews and focus groups focused on the students' online learning experiences, probing the benefits, challenges, and impacts of learning during the pandemic (Appendix A). Transcripts of interviews and focus groups were imported into NVivo, together with the open-ended data from the questionnaire. All data were anonymized to safeguard confidentiality of the participants and institutions.

The qualitative data analysis process included reading through the data and looking for patterns to determine themes and sub-themes. This process was led by two researchers and then checked by the other research team members. Throughout the analysis process, the themes and sub-themes were discussed, refined, merged, or discarded based on their significance. Selected interview extracts and quotations from the open-ended questionnaire data are used to illustrate key points in the Section 3 of this paper.

3. Results

The participants in the wider study were enrolled in various programs at diploma, degree, and postgraduate levels, covering multiple disciplines. The participants were from a range of ethnic backgrounds and various age groups.

Comparisons with national tertiary participation data [26] show that the overall respondent groups were broadly representative of the wider New Zealand student population in terms of the percentage of domestic versus international students and students that were 24 years of age and under. Female participants were over-represented in the survey (76%), compared to the broader student population (61%), and participants who identified as Māori (the indigenous people of New Zealand) were underrepresented (5% versus 11%). A summary of the participant demographics is shown in Table 1 and Figures 1 and 2 below.

An inductive analysis of the survey, interview, and focus group data generated three clusters of key messages from the students in relation to their needs and experiences when studying online during the pandemic. The students emphasized the importance of support, communication, and engagement as key areas where they experienced either helpful practices or challenges. Using the lens of Ben-Eliyahu's components of sustainable learning in education, we report on students' needs and experiences using illustrative quotes drawn from the qualitative data (survey and interviews).

Table 1. Demographics of questionnaire participants compared with New Zealand university student demographics (population data from Education Counts (2022)).

Variable	Categories	Study (n)	Study (%)	Population (%)
Type of student	Domestic	839	89	86
	International	105	11	14
Ethnicity	New Zealand European	528	56	58
	Asian	195	20	18
	Pacific Peoples	72	8	8
	Māori	51	5	11
	Other	102	11	5
Gender	Female	722	76	61
	Male	205	22	39
	Gender diverse	10	1	-
	Prefer not to say	9	1	-
Age	Under 20 years	280	30	17
	20–24	304	32	47
	25–39	234	25	25
	40 years and above	125	13	11

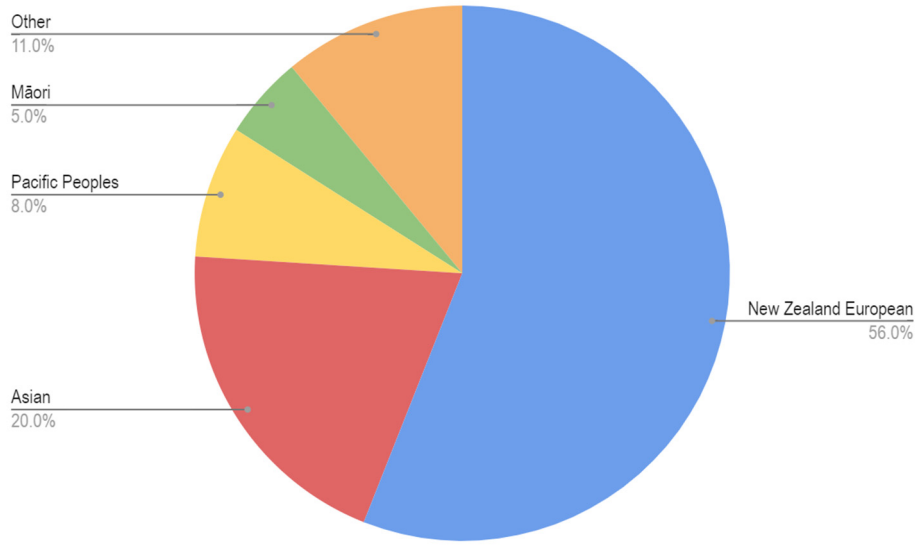

Figure 1. Ethnicity breakdown of participants.

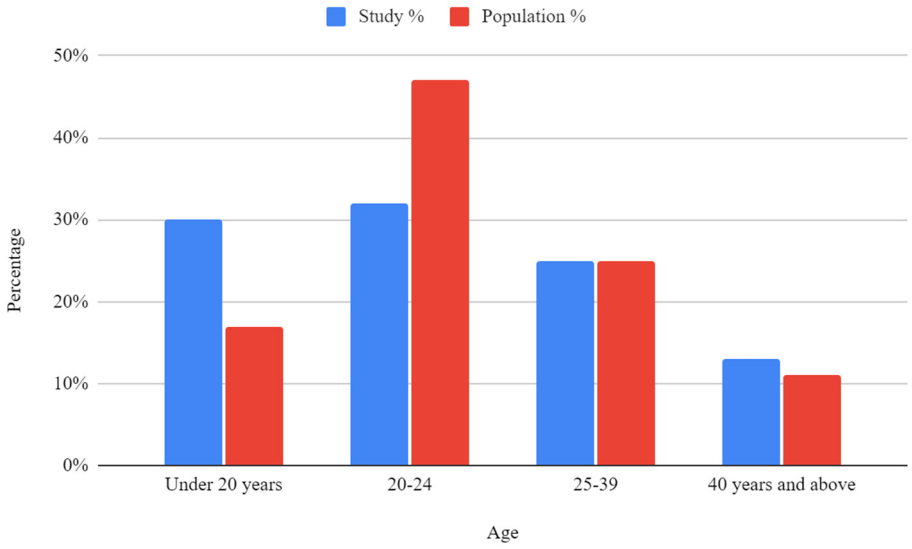

Figure 2. Age distribution of participants.

3.1. Renewing and Relearning

This component draws on the students' ability to assess their learning and knowledge. It emphasizes self-reflection and self-assessment and aligns with "meta processes which encompasses the knowledge and knowhow related to cognitive, behavioral and affective learning strategies" [7] (p. 4). The importance of renewing one's resources could also be seen to relate to individual wellbeing.

The students described flipped learning approaches—whereby a range of online resources were shared before meetings or lectures online—as a particular strategy that enabled them to prepare and then engage interactively. For example:

> "... we could engage with workshops in an interactive way, could read more/be more informed before listening to lecture." (survey, ID18)

While some of the students reported a lack of engagement with recorded video lectures, others found video demonstrations very helpful and engaging, as well as convenient and occasionally even entertaining. The asynchronicity of video was considered an advantage, allowing the students to work at their own pace and to pause, repeat, or speed up the recordings. Flexibility was a frequently mentioned benefit, enabling the students to engage at the times that suited them best. For example:

> "So just watching the videos, having discussions online and the fact that we could actually watch the videos over and over. So that actually helped me." (FG9 P1)

> "For me, some of the problems in teaching behaviour are that they speak so fast and not clear the words. I am happy about the video recordings because I can change the speed of my lecturers to $\times 0.75$. However, some of the words even I hear 5 times, but I could not hear them properly. And it would be great if we have CC under the recorded video. Anyway, I am happy because I can listen to my lecture many times." (survey, ID318)

In addition to captions, some students mentioned that transcripts of videos, course notes, and copies of slides helped their learning. The students also appreciated having "various presentations of equivalent material in different modes—visual, audio, images, reading materials" (survey, ID534). These pedagogical approaches, whilst necessitated by the rapid adoption of online learning during the pandemic, provided tools for the students to evaluate their learning.

Personal wellbeing emerged as a core issue for the students, who conveyed a need for more support of various kinds. This included pastoral care, counselling, "support for stress and anxiety" (survey, ID651), referral to health and disability services, help with motivation, and IT support, including timely access to tools and resources. Evidently, students had mixed experiences with these support services. For example:

> "A strong focus on well-being and a realistic approach to how students were coping with the lockdown was really good. Acknowledgement that we have been in a really unusual situation and not just continuing on like nothing had changed was really appreciated." (survey, ID628)

There was a sense that support was deeply ingrained in the culture of some universities, where caring for people was a key value, and there was a sense of being part of a family or a team. However, some staff were perceived as being less approachable, or even unresponsive or uncaring. Delays in communication (e.g., inefficient approaches to email) contributed to this perception and interrupted the learning progress. For example:

> "A lot of times the lecturers could take quite a while to respond to emails. And I'm sure that's because they had quite a few people dealing with the same stuff, but also, if you have, you know, the stupid questions that you just come up with and you don't want to email the lecturer with the stupid question. You kind of want to be able to ask a friend. And that was a lot harder during lockdown." (INT P9)

> "I have appreciated the reassurance from my lecturers and the quick communication from them." (survey, ID416)

The students appreciated an interpersonal approach to communication, beyond delivering information, lectures, and instructions. For example:

> "I have appreciated the staff that put in lots of effort to keep students updated, even with things not study involved, e.g., one teacher emailed us every few days with things she had been doing, positive affirmations, isolation ideas and it was just comforting to know about this as meant she cared a lot more. Compared to some staff we heard nothing of." (survey, ID431)

> "More room for personal touch and interaction, a lot of time especially lockdown was just delivering students lectures, new dates, and things to work on, but I don't think they understood how overwhelming that was given the circumstances" (survey, ID431).

Some of the universities assigned each student a support person. This contact helped the students to sustain their connection to the university and reassure them that they and their wellbeing mattered. The opportunity to "catch up" and "chat" was valued.

The pandemic experience has foregrounded student wellbeing in ways that we had perhaps not considered before. SLE needs to actively consider how we replenish our own

resources. This also suggests that, when the affective dimension of learning is taken care of, it creates favorable conditions for cognitive and behavioral learning strategies.

3.2. Independent and Collaborative Learning

This component focuses on both learning on one's own and learning with others. To learn independently (whatever the mode) involves the ability to seek social support and scaffolding. Help-seeking behavior is a critical aspect of SLE. Similarly, communities of knowledge are also an essential part of SLE, including collaborative learning, peer learning [23], and team- or group-based activities and interactions.

The pandemic foregrounded contradictions between the individual and the collaborative.

The students reported a lack of in-person support, manifested as feeling that they were left to their own devices (literally), and found obtaining help more difficult than usual. There was a sense that they were expected to work independently, and that there were fewer opportunities for one-to-one support to ask questions and obtain feedback in a timely manner. For example:

> "Nobody really helped much because like the lecturers just organizing the lectures and recording and all of that they didn't really help in person. They're kind of like, just do it." (INT P2)

> "... just studying on my own was the biggest challenge and not having feedback from the lecturer." (INT P18)

> "I think during COVID-19 reaching out for online support was great. I was able to connect with the lecturers and the online help support." (survey, ID819)

Some of the students appreciated regular contact from various areas in the university, including the student associations. Library support included posting books to students when the resources were not available online. Students who were experienced online learners reported satisfaction with the support that was already in place. For example:

> "... there was a lot of support from the University like phone calls and emails from different staff members, and Students Association, which I really appreciated." (INT P15)

Peer support was also sought by the students, as was support within their families. Effective peer support was possible for some of the students through collaborative online sessions (e.g., in breakout rooms within Zoom and via asynchronous online discussion forums). For example:

> "Using a platform called [Blackboard] collaborate to deliver interactive labs was really helpful for discussion and engagement with course material and other students and have a sense of collectiveness (as opposed to feeling very isolated studying by oneself)." (survey, ID311)

> "... a lot of help from uni with my lecturers, my tutors, like a lot of peers, were helping each other. In our online collaboration sessions, we have breakout rooms that you can go, just chat with other peers as well, like any questions or someone might know the answer to something else." (FG9 P1)

While some peer support occurred within courses, there were also student-initiated informal support networks. For example:

> "Our class was fortunate in that some students organized informal online video chats outside of class time which helped me feel connected to classmates." (survey, ID399)

The students expressed a need for support to come to them proactively, as their own ability to reach out was variable. Some of the students were unaware of the support that was available to them. For example:

> "I'm too shy to ask for help given that I supposedly have more time and more rest, but online learning has been less convenient and much less productive for me." (survey, ID368)

The students reported diminished engagement as peers disappeared, and attendance was sporadic. There were also reports of students who did turn up to class but were insufficiently prepared for group tasks and peer-to-peer learning. This had a demotivating effect, and hindered opportunities for interactive formative feedback and an exchange of views to challenge thinking. There was a lack of participation, interaction, and collaboration, with an emphasis on solitary reading and writing or viewing recorded lectures. The emphasis on reading particularly affected the students with English as a second language and students with learning disabilities. As with previous themes, Zoom was often not considered to be an adequate replacement for face-to-face interaction but was considered to be superior to video recordings alone without any interaction. A lack of practical work also negatively impacted student engagement. For example:

> "Having no practical aspect to help consolidate and understand the theory, I feel the depth of my learning and retention was negatively impacted. Also, worrying how/when we will catch up on all the practical aspects that we have missed out on." (survey, ID311)

Some of the students reported a positive experience when the tutorials were interactive, teachers were creative, and peers and teachers alike were engaged. Combining recorded lectures with Zoom tutorials was met with approval. Dialogue in forums within the LMS was an engaging experience for some of the students, who appreciated having time to think about their responses. For example:

> "Students were way more engaged. I found at least I know a lot who were called away by kids and stuff like that, so they weren't able to give as much time as normal, but there's a whole other group who were really engaged. And so, we had public conversations and it all sharp tutorials and that as well." (INT P6)

> "The [Blackboard] collaborate sessions were also fantastic, really well done and facilitated more meaningful conversations. ... the teaching staff were more engaged and creative with their teaching which was of benefit." (survey, ID199)

3.3. Active Learning with a Future Orientation

Active participation in one's learning involves learners being able to self-evaluate, monitor their own progress, and plan ahead. The ability to take on board feedback and feedforward, i.e., taking initiative to maintain and adjust their own learning, contributes to SLE, which can transfer beyond the classroom.

The pandemic clearly disrupted the students' established and familiar patterns of learning.

The students had a range of thoughts on effective communication and less effective (or lack of) communication, as well as ideas for sustaining and improving communication going forward. They had to find different ways to assess their learning and receive the feedback they needed. For example:

> "Even interacting with your lecturer, or sometimes the doubts that haven't been able to clear out in the lockdown due to the lack of communication. It's much easier to do it when I'm in person." (FG4 P2)

> "Lecturers who were understanding and good at communicating with us were a Godsend, it made it a lot easier to understand our tasks. The communication did not go unappreciated." (survey, ID245)

Clarity and consistency of communication were particularly important, and the students were unsettled when they perceived a lack of organization, coordination, and ready assistance. For example:

> "Clear reassuring communication is a must. The lecturer being easily accessible also important." (survey, ID58)

Some of the students considered the irregularity and awkwardness of Zoom meetings to be an inadequate means of feedback, whereas others welcomed "times for unstructured Zoom chats where students can ask questions" (survey, ID650). A key message was the importance of flexibility when providing times for Zoom meetings, for example: "Zoom meetings at the same time don't always work for everyone" (survey, ID729). Bridging both regularity and flexibility via a range of options seemed to be met with approval. For example, asynchronous forums were appreciated, provided the lecturers were regularly and reliably present.

Some of the students could draw on familiar active learning approaches, for example: "I ordered a lot of books, which was a really cool service that the university provided. I think, maybe four or five books and they posted them to us, which was really cool. There was a couple of assignments that didn't have anything online that I could read. So, getting the book posted out was really helpful" (FG7 P1).

However, others found the dominance on textual resources overwhelming, for example: "Due to a lot of the online content being reading and not interaction, my biggest challenge was my learning disability. Not having enough resources to support learning through online readings" (survey, ID355).

> "Certainly, I think they were very generous with extensions. The library didn't want your books back until lockdown was over, I think every, every possible help assistance was, was offered." (FG8 P1)

Being reminded to ask questions was helpful for the students, particularly those at an early stage of their studies. The students valued knowing where to receive help and being aware of the available resources. The students appreciated the university trying to reach out to them, or the services built into university processes. For example:

> "Regular support and check in by lecturers and . . . Scholarships Office." (survey, ID206)

> ". . . making sure that everyone was aware of what resources were available would have been really helpful." (survey, ID708)

While some of the students preferred to ask questions verbally rather than in writing, some considered there to be inadequate time for asking questions during the live sessions and were reticent about taking up too much time. Some of the students preferred "Times for unstructured zoom chats where students can ask questions" (survey, ID650). Other students found Zoom, with or without breakout sessions, to be awkward and stilted.

While a lack of communication was an issue for some students, others were overwhelmed by the volume of communication. For example: "Clear communications, 20+ emails a day is a no go" (survey, ID566).

> "I felt like I was bombarded with emails, Moodle notifications, Panopto recordings to watch, and while I didn't mind the workload, it was hard to follow what needed to be done." (survey, ID885)

One student suggested that "better communication" could entail "personal calls/emails/texts with lecturers and ongoing assessment check-ins where we can paste our assessments to gather feedback, so we get better guidance." (survey, ID234)

Communication between students was a challenge for some, who sought "better means for students to communicate with each other—helping students get answers outside of staff schedules." (survey, ID752)

New opportunities emerged for students to evaluate and adjust their learning. One student explained how they would pause the online recordings to seek clarification of a point before continuing. By either emailing the lecturer or searching wider online resources (via Google), the student was able to engage deeply. While this could certainly occur on

campus, the student valued the relaxation of time restrictions when video recordings were involved and welcomed the opportunity to structure their own day. For example:

> "I think I had to really learn to be resilient, because of all of the changes all of the time.... It was kind of hard to gauge what was expected, what the changes were, the communication, you know. I felt like I had to send a lot more emails to say, "Hey!" Like, "Are we going to class now?" Or "Are we going to be doing Zoom?" You know, so I had to be a lot more like, inquisitive with, you know, things and how things were going to be." (FG7 P1)

> "I didn't have to run around after accessibility services waiting for them to help me with my special conditions because they were already built in. Because of the way lockdown worked, I didn't have to ask. I could just immediately email a lecturer saying, hey, can I have an extra 15 min because I need those as part of my conditions. Yes, you're done. It was easier. The processes spit up so much faster because it was way more direct and that sort of support, we can call those kinds of support amazing." (FG8 P2)

When the students reported satisfaction with the support they received, this often took the form of flexible approaches to assessment, where lecturers were more accommodating than usual of special considerations, and extended deadlines.

3.4. Transferability

For SLE, students need the ability to apply familiar strategies, processes, and skills in different contexts. These critical transferable skills include planning, regulating emotion, controlling attention, and engaging in social behaviors [7] (p. 6).

Whilst the pandemic was an unprecedented circumstance, the students demonstrated the ability to draw on their own resources. For example: "I think it is important to consider that online learning was new for most of us, and generally speaking, the lecturers did an amazing job to teach during a global pandemic. They appreciated the fact that it would be difficult initially for us to adapt to the situation and provided us with support and extensions where necessary" (survey, ID765).

> "Most lecturers were fully understanding of the situation and allowed more time and flexibility for assignments given we couldn't ask questions face to face or get a reply as quickly as normal. The effort they made to help us learn as best we could was fantastic." (survey, ID473)

Many of the students appreciated the efforts that the teaching staff went to and were cognizant of the challenges and pressures for the staff. They acknowledged the commitment, hard work, passion, and positive attitudes of the teachers; therefore, transferability in learning clearly relates to transferability in teaching. For example:

> "I really enjoyed the way that the teaching staff absolutely stepped up to the challenge." (FG9 P2)

The students mentioned the need for understanding, empathy, compassion, and kindness when referring to the lecturers' attitudes toward the students' circumstances and "recognition of external life pressures beyond University" (survey, ID651). For example, students juggling full-time employment with family commitments experienced significant stress, as did those students living with health and disability challenges. For example:

> "Lecturers were more personal in their approach. Previously, I had found a lecturer very cold and ableist about my disability. During online, they were much more approachable and were even curious to learn more about how it affected me. It was much more helpful." (survey, ID345)

Rather than assumptions, the students appreciated "open discussion/acknowledgement about the challenges of this time" (survey, ID650), as well as listening, for example: "when lecturers listened about our worries and gave us access to all resources—e.g., recordings

and PowerPoints—and realised that some people had to help out more with family." (survey, ID628)

It is noteworthy that some students commented on the perceived engagement of the lecturers too. For example:

> "I was studying online prior to lockdown but I noticed engagement from lecturers improved when everyone went online. The time to resolve technological or resource issues improved. Course issues like poor coordination or quality were taken more seriously than they were when they were only affecting students who opted for online learning." (survey, ID528)

Interestingly, there was a divide between the students who found it easier to focus when learning online and those who found it easier to focus when attending lectures on campus. For example:

> "I think it's inferior. So, I think it's, it's fine for some things, but in terms of replacing lectures, yeah, I don't, I think face to face is preferable because it allows more interaction." (FG8 P2)

> "I fully believe that lectures are much harder to concentrate/learn in than learning online. I have no time restrictions learning online in terms of lectures. No getting up at 6 in the morning to only arrive at university at 8. I could wake up at 8 am and do my lecture at 9 am, therefore, being a lot more concentrated, awake, and focused." (survey, ID122)

> "I feel like universities only cater for those students who do not like online study due to them being the majority, so I have to suffer from their choices. Online study is not hard at all, in fact it's easier than any other option. No hours wasted travelling, ability to research topics whilst studying them to further your knowledge and stay up to date on your learning (sometimes even ahead), with all the extra time comes the ability to have more free time in your days." (survey, ID122)

A key suggestion from the students was that there should be a choice in relation to blended or hybrid learning, so that those who prefer to attend and engage on campus could do so, while students can also opt for online learning for components of their courses or at times when they are unable to attend on campus. For example:

> "Lectures and tutorials recorded and able to be viewed at any time. Having content online meant that you could choose if you wanted to engage via online learning or in person, or if you miss a class for whatever reason, you are still able to catch up and aren't relying on classmates to fill you in." (survey, ID37)

> "Ability for students with disability or health issues to be able to access recorded lectures online, even if these are not video recorded, simply a voice recording would be more helpful than trying to navigate the teacher's slides alone. I was diagnosed with a couple of underlying health conditions while in lockdown, and now find it difficult to physically attend class some days, but if I don't make it in then my learning suffers as all the online resources are no longer available for my classes this semester." (survey, ID238)

Fundamentally, alongside the issue of choice sits the importance of quality learning design and pedagogy. For example:

> "Well-designed online learning is great and can be phenomenally effective. If respondents are saying that they prefer on-campus lectures to online lectures, is it possible that the online lectures are simply boring? Poor design and delivery are likely to be a large part of respondents' difficulty engaging with online learning." (survey, ID70)

4. Discussion

As our findings suggest, the student participants in our study indicated a need for multiple avenues and means of support, communication, and engagement. For sustainable learning in education and ensuring inclusion and equity, a diverse range of strategies is necessary.

4.1. Sustainable Support Strategies

In relation to renewing and relearning, help seeking is a key strategy for students to master their ability to sustain learning when challenges arise [4,6,10]. It is imperative that teachers make it very clear where and how the students can receive help with any aspect of their studies, and that there are regular proactive reminders and encouragement to seek help. In keeping with the need for multiple means of enabling help seeking, some students want one-to-one support to ask questions and obtain feedback, whereas others are satisfied with support being provided asynchronously via Q&A forums or emails. It follows that support can be provided via multiple means, ensuring adequate opportunities for regular Zoom drop-ins at a range of times, individual appointments, group message boards, individual tutorial dialogue spaces in the LMS, and/or emails. While teachers are instrumental in providing a great deal of support for their students, institutional support also comes from a range of other sources, such as librarians, learning support staff, IT support, accessibility services, counsellors, and student associations [11]. Ensuring that students are aware of all of the avenues of support that are available to them is essential and is not something that can be carried out once and for all, but rather requires sustained efforts to publicize the available support via a range of communication channels.

As the students in our study have suggested, it is essential that support is timely and proactive. Reliable presence and responsiveness are appreciated by students [11]. While teachers cannot be online 24/7, it is reasonable to expect timely responses, particularly when the teacher openly stipulates what the timeframe for responding will be; for example, agreeing to respond to an email within 24 h during weekdays, visiting the LMS daily on working days, and holding regular office hours, as well as advising the students of absences. In order to sustain this level of support, the teachers in turn require institutional support with their workload, and a team-teaching approach enabling the division of the workload would need to be adequately resourced. Ideally, teachers would have sufficient time for regular check-ins with their students on an individual or small-group basis. There is a role for learning analytics here, as the automated monitoring of students' online learning activity can identify which students may need support at various times. Some of the support could also be automated, e.g., reaching out to students with scheduled text messages to invite them to book appointments with support services.

Wellbeing is central to SLE. Fundamentally, there is a need for kindness and an ethic of care when providing support to students, which should be sustained far beyond any pandemic or crisis [8,11]. If the teachers are mindful of the diverse needs and circumstances of their students, assumptions can be replaced with relational pedagogy, where the teachers get to know the students and their individual needs [7,11]. Again, this comes with implications for teacher workload and the need for institutional support for teachers, as well as students. Supporting wellbeing is a shared responsibility that should be addressed at an institutional level as well [22].

Flexible approaches to assessments are a key means of providing support to students, including flexibility around deadlines, as promoted by Hills and Peacock [27]. The students appreciated being offered an extension without having to request or provide reasons for obtaining one. Setting both a deadline and a proactive extension, where work is accepted without penalty within a set timeframe, generates a flexible structure, encouraging self-regulation and a more equitable and inclusive environment for diverse learners.

As previously mentioned, not all of the support needs to be provided by the teachers alone. Communities of learning complement independent learning, and there is a wider role for the institution. While encouraging students to access internal support from the various

services of the university, there is also a place for promoting use of external support services provided by government and community agencies, which in turn educates the students about the support they can access (and promote to others) long after their graduation from university, in keeping with lifelong learning.

Peer support is an important avenue that can be sustained via formal and informal approaches. Interaction and collaboration with peers as part of learning activities is a valuable opportunity for support. Both within and beyond coursework, opportunities for social and informal conversation are also a means of support. Institutions can encourage the students to establish support networks in the form of study groups and communities using social media and similar networking tools [11].

4.2. Sustainable Communication Strategies

While the themes of support and communication naturally intersect—with support being dependent on communication and the need for a supportive tone when communicating—our findings highlight the importance of clarity, consistency, and a well-coordinated approach, again premised upon multiple avenues of communication to reach students with diverse circumstances. Other key characteristics of effective communication include timeliness, reciprocity (listening to students), avoiding overload, and enabling communication between students [11].

The students recommended an interpersonal approach to communication, with individualized check-ins, incorporating the use of multiple formats, like phone and text messages, alongside email, Zoom, and LMS forums. Ensuring learning activities are active and interactive, with opportunities for students to lead, is an important way to build sustained communication in reciprocal and empowering ways. This also points towards the value of online peer learning, which, as Tang, Lau, and Chau [23] have noted, can both support and deepen learning and increase the students' sense of belonginess.

4.3. Sustainable Engagement Strategies

Engagement is sustained via active and interactive approaches to learning and teaching, venturing beyond readings and the viewing of lectures [6,8]. Retaining practical activities, with opportunities to apply learning to authentic problems, is a sustainable approach. Creative tasks, workshops, and a variety of flexible modes of learning are all good design practices. Providing choice for students to work either independently or collaboratively can be an approach to mitigate the stresses of group projects with disengaged peers.

Choice is a key component for sustaining equitable and inclusive learning, and the students clearly conveyed a wish to be able to choose both whether and when to study online or in person for various aspects of their learning. Hybrid and blended learning are means of providing choice and variety to meet the needs of diverse students [8,9].

5. Conclusions

A vital part of designing sustainable learning in education is the need to consult with students as partners in the educational process. Our study has precisely achieved this via multiple methods of exploring students' lived experiences of teaching and learning online during the pandemic. We asked the students what was (and was not) helpful for their online learning, and they responded with rich insight into their learning experiences, challenges, and positive teaching practices, as well as providing suggestions for future strategies. The students indicated that key areas of need comprised support, communication, and engagement.

Inspired by the students' experiences and suggestions, we propose multiple means of support, communication, and engagement as sustainable strategies for teaching and learning online.

5.1. Sustainable Teaching Strategies

- Regularly remind the students to seek help, ensuring that they are clearly informed about the multiple avenues of help available.
- Proactively reach out to the students to check in and offer help.
- Provide multiple means of seeking support—flexible, synchronous, asynchronous, verbal and written, individual and small group—both in class and outside of class time.
- Be present and responsive.
- Get to know the students, listen to them, and be kind.
- Build choice into the learning and assessment and enable self-pacing, including flexibly structured deadlines.
- Communicate clearly and prioritize organization.
- Encourage the students to work together, while also providing the choice to work independently.
- Devise active and creative learning opportunities, including practical learning.
- Prioritize flexibility and accessibility.
- Enable hybrid and blended approaches.

5.2. Sustainable Learning Strategies

- Cultivate a habit of help seeking when needed.
- Support your peers.
- Provide constructive feedback to the teachers and support staff to inform quality and inclusive teaching and learning.

5.3. Sustainable Institutional and Inter/National Strategies

- Ensure adequate resourcing to mitigate workload issues for the teaching and support staff.
- Enable hybrid approaches to teaching and learning, with quality infrastructure.
- Support and resource continuing professional learning and development.

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Appendix A

Interview questions

1. Let us start by hearing a bit about what lockdown was like for you?
2. Thinking about your study in particular, what was the impact of lockdown for you?
3. What were the biggest challenges for your study/learning during level 4? And level 3? And level 2?
4. What benefits or upsides were there to study/learning during the pandemic?
5. Who/What helped or supported you during this time? What further support would you have preferred?
6. In terms of online learning specifically, how did study at this time differ from your regular experiences? (Could you describe your average "day in the life of a lockdown student"?)
7. What are your thoughts about online learning now?
8. What are you most looking forward to/excited about in terms of studying in level 1?

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