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Enhancing student learning experiences in digital learning spaces: pedagogy that works

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Academics at Central Queensland University, a multi-campus, regional university use the video conferencing technology called ISL - Interactive System-wide Learning to teach students across campuses. This paper reports on the way lecturers in the Bachelor of Education degree program made pedagogical changes to ensure that these ISL digital learning spaces are interactive and responsive; teaching spaces that enhance student learning experiences. Both students' and academics' perceptions and engaged experiences with the interactive ISL teaching and learning space are presented. A focus on the pedagogical approaches used by lecturers is explored. Participatory Action Research methods (Kemmis, McTaggart & Nixon, 2014) informed the use of surveys and focus groups. Data was gathered from participating lecturers and students prior to, and after the delivery of targeted first and second year Bachelor of Education units. The findings were analysed using a "three resources" framework (Nasir & Cooks, 2009); materials and activities, relationships and professional identity. The findings highlight the ways in which the use of a virtual teaching space can optimise student learning experiences in a range of discipline areas in the broader context of higher education.

Keywords: pedagogy, synchronous blended learning, digital learning spaces

Introduction

This paper reports on research that examined the ways a didactic ISL video streamed learning space is repurposed by lecturers at CQ University (CQU) in the Bachelor of Education program to embrace an interactive, relational approach to learning and teaching. The findings gathered in teaching Terms 1 and 2, 2018, across six first and second year units, identify the pedagogical and relational strategies that optimise students' learning and engagement. The paper also shows ways to enhance teaching academics' efficacy and effectiveness using a 'one class, one space, multi-campus' repurposed ISL approach. The paper foregrounds the challenge to find a "sweet spot"; the combination of the personal, interactive relational aspects of face-to-face teaching with the use of materials/activities that acknowledge and account for both student and lecturer identity.

Context

As a regional university with 26 campuses across Australia, CQU offers degrees through study in both on-campus and on-line distance modes. Many disciplines (e.g. engineering, aviation and business) conduct lectures using ISL; a synchronous digital video streamed teaching space where the lecture is beamed into classrooms on other CQU campuses. In the School of Education this mode of lecture delivery is not typically preferred due to the didactic teaching methods historically used, the issues related to the availability of ISL teaching spaces and limited staff expertise in using ISL. Instead, Bachelor of Education under-graduate students usually have only two options of accessing their classes; on campus or online distance.

In 2017, the authors as campus co-ordinators on two smaller CQU campuses identified three issues which resulted in this investigation. First, low enrolments on both campuses, second limited access to experienced sessional lecturing staff in Cairns, and third the Noosa campus involved a significant pool of experienced lecturers whose employment was under threat. The use of ISL provided a solution that could respond to these issues. The ISL delivery platform enabled teaching from one campus site to students face-to-face and simultaneously in real time, to students sitting in situ, at another campus, connected remotely. The aim was to create a 'one class, one space' feel within an alternative synchronous blended learning and teaching space to enhance student engagement with each other and with the lecturer in a way that replicated the face-to-face mode. A literature review was undertaken to identify the approaches that had been tried in other contexts, and to determine the likely nature of adaptations to learning and teaching experiences that might be warranted in our repurposed ISL space.

Literature guiding the project

The Learning and Teaching division at CQU has published a single information sheet for lecturers about teaching using the ISL platform (*Ten Top Tips*, CQUniversity, 2016). Although informative, it mainly focussed on technical advice to guide first time users of ISL system. Limited advice was available to guide the ways in which the ISL space could embrace interactive, inclusive teaching pedagogies that were purposefully designed to develop a community of learners (Lave & Wenger, 1991). Considerations about how lecturers could foster collaborative learning approaches that replicated the best-practice benefits of face-to-face teaching through point-in-time feedback, real-time peer/lecturer discussions and an enhanced sense of lecturer/student, student/student connectedness (Churchill et al., 2019) could be facilitated in the ISL space, were not articulated.

The Blended Synchronous Learning Project (Bower, Delgarno, Kennedy, Lee & Kenney, 2015), funded by the Office for Learning and Teaching through the Australian Government, reported on a scoping study that explored the types of synchronous technologies used by Australian and New Zealand tertiary educators. The project investigated how rich-media technologies such as web conferencing, desktop video conferencing and virtual worlds could be used to effectively unite remote and face-to-face students in the same live classes. Though the project reported positive impacts, a review of the case studies found that none were conducted with the intent to specifically emulate the face-to-face experience with a focus on cross campus engagement and lecturer/student collaboration. Nonetheless, a cross-case analysis identified issues of interest for us. First, the findings noted that remote and face-to-face students valued several aspects of blended synchronous learning; namely, the flexibility, connectedness and sense of community, exposure to broader perspectives from other students

and an engagement in a wider range of activities (Bower et al., 2015, p. 4). Second, the findings indicated that lecturers recognised the potential benefits of blended synchronous learning but that “teaching in this way placed high demands on teachers in terms of cognitive load” (Bower, et al., 2015, p. 4). Technology reliability concerns were also identified by lecturers in the project as issues with which they had to contend when teaching in this mode.

The guiding principles in the Learning Spaces Framework (MCEETYA, 2007, p. 4) note that educators need to be mindful that their practices promote; flexibility, inclusivity, collaboration, creativity, student interaction and engagement. The framework highlights that lecturers should approach classes with an open mind about the space to allow for all participants to be responsive to issues and opportunities as they arose rather than setting out a rigid set of expectations and practices (p. 5). In addition, the guiding principles suggest that forming relationships is a necessary focus of the creation of any digital learning space, particularly in developing trust between participants to facilitate an inclusive collaborative, creative space. Our study purposefully targeted the range of pedagogical, relational strategies that lecturers could use to build a community of learners to improve the sense of connectedness between students and lecturers across the virtual and face-to-face learning and teaching space.

Nasir and Cooks’ (2009) research on learner identity conducted with students in the USA, contends that learner identity is constructed within a learning setting and that the notion of identity relates to three key elements which are posited within the learning setting. These elements include (1) the use of materials and activities, (2) the formation of relationships and (3) the construct of professional identity. They found that each of these elements can act as either a barrier or enabler to engagement thus influencing the way students and lecturers learned. These three elements provided a framework for data analysis and encapsulated our study aim to find the ‘sweet spot’ which is discussed in more detail in a later section.

Methodology

Our study was framed around a Participatory Action Research (PAR) (Kemmis, McTaggart & Nixon, 2014) approach; an approach that invited student and staff participants to actively engage in a research project that was both exploratory and responsive. The PAR framework facilitated all participants to take on the role of active researchers through the cycles of Plan, Activity and Evaluate/Reflect, as presented in Figure 1.

Staff and students worked together to design pedagogical strategies that enhanced participants’ engagement within the class. Lecturers were responsive in all stages of the cycles, but particularly at the planning and action stages. The students’ role centred around providing evaluative reflection point in time to give staff explicit feedback about their engagement in each cycle. Figure 1 shows that there were three levels on which the PAR cycles were enacted. At the Micro staff informally planned, enacted and reflected to respond to problems within individual teaching sessions, with students giving immediate feedback. At the Meso level, staff formally planned, enacted and reflected on teaching sessions and then spoke with students and other participating staff about those practices across the teaching term. The Macro level involved staff focus groups, where they reflected on and reviewed teaching practices used, identifying and discussing the strengths and challenges of practices used as well as the impacts on student engagement. Collective feedback was used to plan for teaching iterations in future teaching terms. Students were not as engaged in evaluation in the Macro level of the process other than to provide survey responses which served as a catalyst for the staff reflection. The

PAR cycles were useful in providing students with a level of responsibility in and for their learning, complementary to that of each individual lecturer's input. This is an aspect of implementation that aligns with PAR through which participants have a voice. The three-resource model (Nasir & Cooks, 2009) was the framework through which formal data was analysed.

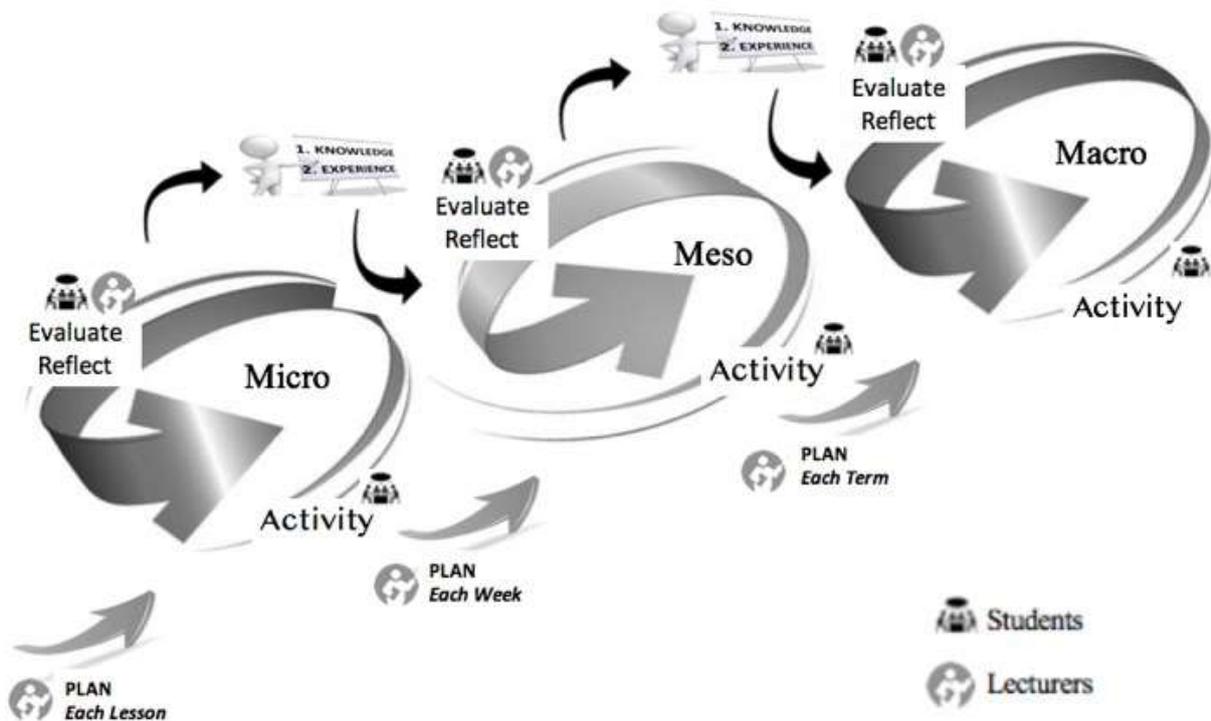


Figure 1: PAR cycles: the role of lecturers and students

Ethics approval for the project was sought and confirmed from CQUniversity (Approval number: 0000021348). Additional written approval for the project was provided by CQUniversity's Provost for Learning and Teaching services. Formalised data collection instruments were used at key junctures at the end of each teaching term. Participating students (Term 1, n=28; Term 2, n=29) were invited to complete surveys which posed open-ended questions that required commentary style responses as well as Likert scale rated statements. The survey data provided descriptive statistics only. Completion of the surveys was voluntary and nearly all students completed them (Term 1 n=26, Term 2 n=27). Student participants were predominantly female, aged 19 – 35, and were in their first or second year of tertiary study. At the end of each term, participating lecturers (Term 1, n=3; Term 2, n=3; two of whom were the authors of this paper) voluntarily participated in audio-recorded focus groups. Data was collected about the pedagogies that enhanced learning and teaching in our ISL space, as well as about the ways in which the pedagogies acted as enablers and/or barriers to inclusive participation and engagement in that space.

Findings

A sample of qualitative student feedback comments, collated through the open-ended survey questions, is presented in the following sections to evidence the ways in which students described the repurposed ISL experience. The feedback snapshots highlight both enablers and

barriers to student engagement and study success. The quantitative data is also presented in order to note beginning understandings about the ways in which students perceived the repurposed ISL experience.

Cycle 1: Term 1, 2018, Student perceptions

The data showed that 22 of the 26 students agreed that the ISL classes allowed them to effectively participate in their unit of study, 17 of the 26 noticed a difference in the way they engaged with their lecturer in the ISL space, and 22 students of the 26 participants agreed that they had adjusted to the ISL space. Nineteen students agreed that they were comfortable working in the ISL space. Under half of the students (n=11) agreed that they found it hard to ask questions and clarify information in the ISL class, whilst only six students reported that the ISL space did not support a suitable range of hands on activities.

Table 1 Quantitative survey data Term 1 and 2, 2018

Quantitative Questions 1-6	Response									
	Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
The ISL classes allow me to effectively participate in my unit of study	1	0	3	4	0	5	13	11	9	7
I notice a difference between the way I engage with my lecturer in the ISL classroom than in the non ISL classroom.	1	1	5	1	3	4	10	13	7	8
I find it hard to ask questions and clarify information in the ISL classroom.	5	5	8	6	2	6	9	6	2	4
I am comfortable within the ISL classroom.	0	2	3	5	3	7	12	9	7	4
I have adjusted to the demands of the ISL classroom as the term has progressed.	0	2	2	3	2	5	12	10	10	6
The ISL classroom does not support a suitable range of hands on activities.	7	5	6	4	5	7	4	5	4	6

While the quantitative data indicated that most students appeared positive about the ISL space, student commentary from the open-ended question responses showed that they had generally experienced a sense of initial discomfort in the first phase of the study. This was borne from the different learning environment and from the different nature of the interaction between lecturer and students. Student commentary highlighted the shortcomings and awkwardness of the technical ‘hard-ware’ components of the space that detracted from the student learning experience rather than lecturers’ use of activities, materials and relationship building strategies. For example, students made comments about the clarity of the screen, microphone usage, the disconnect between screens. Student A for example commented that,

“It’s a bit awkward. We don’t like the way the ISL cuts off quickly at the end of the session and I do find it a bit hard to ask questions and get information clarified. It felt like you couldn’t talk for the fear of talking over the top of someone”.

Significantly, student commentary identified that, “the teacher plays an important role on whether it’s successful or not” (Student E). Relational connections between the lecturer and students, face-to-face and across the digital space, were highlighted positively in the data. With regards to specific strategies used by lecturers, students commented that they liked it when lecturers used their name intentionally through questioning to draw them into the discussion. For example, Student C commented that, “the lecturers really want us to share ideas and they encourage questions and give us explanations. There are a lot of inclusive practices that the lecturers use and I like that. They try to use our names where possible”. They also commented that relational connections were evidenced through the teaching pedagogies used by individual lecturers and identified that for some lecturers, this was a teaching strength. Only one student participant identified lecturer interaction as a barrier to engaging in the ISL space. The student (Student D) commented that,

“...the lecturer appeared to forget that the other campus existed. She taught mainly to the students sitting in front of her on campus and she did not consistently refer to us or engage with the other campuses at the other end of the computer screen.”.

Overall, the students indicated that whilst they had a strong and consistent preference for face-to-face learning experiences, they preferred the repurposed ISL approach over the online, distance mode.

Cycle 1: Term 1, 2018, Lecturer perceptions

Lecturers’ comments regarding their experiences in Term 1, 2018 showed that they too experienced discomfort within the ISL learning and teaching space. In the focus group discussion, lecturing staff offered mixed views about adjusting to the demands of the ISL space. Lecturer A described the way in which she, “...struggled to apply best practice teaching pedagogy within the ISL setting”. She offered further that she, “...felt somewhat undervalued for the work compared to the level and recognition of skills that were required.” The other two lecturers acknowledged the difficulties, but they talked about their respective approaches that were proactive towards problem solving the challenges.

Summarised commentary from all lecturers indicated that the effective and successful management of technological issues was a critical influence on the efficacy of the learning and teaching experience. Lecturers noted that minor technology issues caused frustration. Lecturer B noted as well that his students said things like, “...you’ve disappeared again. Lecturer B, I don’t think we can see what you’re talking about? Should we be looking at a blank screen?” The lecturers described the difficulties in managing the teaching tools such as the whiteboard, the document camera, the multiple screens, the power-point, the manipulatives as well as the positioning of the students themselves, outlining how this was continuously negotiated and problem-solved through collaboration with students to find a mutually satisfactory resolution.

The three staff acknowledged that there was a difference in the way they engaged with their students in the space; different from the ways they engaged usually in their regular face-to-face and/or on-line teaching spaces. Collectively the lecturers suggested that, “interactions were quite open and polite. Students were responsive, but there was something lacking. After much thought, I would label this as the ‘warmth of a personal touch’” (Lecturer B).

Cycle 2: Term 2, 2018, Student perceptions

Table 1 shows similar trends in the quantitative data collected in the second cycle, however there was a change in focus in the qualitative commentary sourced from the student surveys. Student commentary qualified Term 1 perceptions about the ISL space, noting specifically lecturers' improved use of the technology: "The equipment sometimes still does not work. But it is definitely better than last term" (Student F). With the technological issues from Term 1 resolved, the findings in the second cycle focussed more on the interactions and relationships between lecturers/students and students/students. The students acknowledged that our repurposed ISL approach afforded the benefits of having a wider range of lecturers and lecturing expertise as well as access to a wider range of opinions and ideas from other students. Student H noted, "as well we get access to a wider range of lecturers that we otherwise wouldn't". Student A noted that, "we have been encouraged to share ideas and consider viewpoints outside of the limits of the physical space, which is great".

Cycle 2: Term 2, 2018, Lecturer perceptions

Lecturer views were strongly linked to their varying levels of teaching comfort experienced. Lecturer C who had taught using ISL in Term 1, 2018 commented,

"I had already worked out how to do hands-on activities using a digital platform and had used google docs a lot. I worked hard to learn [student] names and learn voices as well. I emailed students throughout the week, answering questions that they were unwilling to ask in class. My focus was on building relationships."

Lecturer C noted that she, "worked hard to use humour, to use students' names and to give explicit instructions about the progress of the lesson. I sometimes felt resistance from the group about them giving feedback to others across campus".

Lecturer E who lectured in the repurposed ISL space for the first time in Term 2, highlighted practical strategies that worked in the digital space from the outset. She said, "I got to know the students' names quickly. I also found just simply putting every instruction that I needed for students to follow on the PowerPoint, so that when they were doing a task, they kept referring back to the screen not to me."

On the other hand, Staff member D, also new to the ISL lecturing mode, commented,

"I feel really discomforted by this ISL teaching. I am discomforted by a disconnect with my usual teaching methods and the needs of the ISL space. Other colleagues helped me...but I couldn't change the PowerPoint slides, the clicker doesn't work from that position, I really tried to get the groups talking but I didn't manage to create that. My teaching style relies heavily on developing close relationships with students."

Her final comments indicate that she was never able to resolve the feeling of loss she experienced as she, "felt like I'd lost my immediacy and I wanted it back".

Discussion

The aim of our repurposed ISL study was to examine the way lecturers could provide robust, authentic learning and teaching experiences for students that replicated the face-to-face mode. It became clear that the challenge for participating lecturers was to find the “sweet spot”. That is, the space where personal, interactive relational aspects of face-to-face teaching combined with the use of materials/activities that acknowledged and accounted for both student and teacher identity. A researcher construct of the “sweet spot” is presented in Figure 2. The construct is an adaptation of the three resource model (Nasir & Cook, 2009). Each of the three key elements is considered in the following discussion.

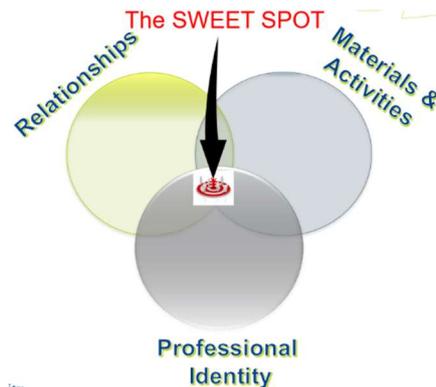


Figure 2: ‘Sweet Spot’: relationships, materials/activities, professional identity

Materials and activities

The findings from the first cycle of data collection identified a willingness of lecturers and students to engage in the ISL teaching space, but there was a clear frustration with the actual technological aspects and hardware elements of the ISL functionality. All lecturers across the two terms noted similar challenges in terms of the way in which they adapted their teaching strategies to respond to the hardware and physical room constraints. In response to the findings from Cycle 1, at the end of Term 1, 2018, key recommendations for the ways the technical aspects could be managed successfully were identified by staff and students. The recommendations, implemented in Term 2, 2018, included:

- design a set up and trouble-shooting guide to instruct the use of camera and microphones;
- manage time to be mindful of the automatic cut off before the wrap up, specifically watch for the 5 min warning;
- use interactive word docs (Googledocs) to facilitate cross campus groupwork;
- limit white board use or if using white board write in four inch font using jumbo black pens;
- exchange continuous feedback from one campus to the other about camera location and positioning of lecturer to stay in frame; and
- use the most suitable lecture spaces to host the ISL teaching platform.

It is clear from the lecturer and student feedback at the end of Term 2, 2018 that the specific use of these explicit teaching strategies had a positive impact on the teaching/learning experience, and that student perceptions had shifted beyond the technical barriers to the benefits of accessing a wider source of opinions and expertise. There was acknowledgement that practical, engaging interactional activities like Googledocs could be utilised effectively.

These results support and confirm the experiences recorded in many of the case studies in the Blended Synchronous Learning Project (Bower et.al., 2015). In that project and in this study, it was evidenced that as lecturers and students worked together to identify problems and find solutions to those problems, they became confident to extend upon and explore the options available within the space. Positive shifts in lecturer and student perceptions about our repurposed ISL space resulted from frequent and regular collaborations that lead to quick resolutions.

Relationships

A student recommendation made in Term 1 2018 was that lecturers needed to engage with all students on all campuses through purposeful inclusion. Unlike the 2015 Blended Synchronous Learning project (Bower et al., 2015) where the focus was on the range and variety of technologies that could be used to deliver content, the pedagogical focus for our study shifted to developing relationships highlighted in Nasir and Cook's (2009) work. Once the technical issues were addressed, only then could the lecturers' prime focus turn to developing relationships. These efforts then targeted developing strong connections and trust between lecturers and their students, and between students themselves. Students recognised the efforts that lecturers were making to adopt a 'one class, one space' approach in Term 2. Comments from students noted that, "teachers are really intentional about all students participating and it certainly diminishes the 'anti-social' feeling of an on-line lecture" (Student G).

This was acknowledged by the lecturers themselves, three of whom suggested that they felt that they had made significant in-roads into their connections with the students on both campuses. Interestingly it was the two lecturers who claimed the highest level of discomfort in the teaching space that reported that they did not feel as though they had made gains in their relationships with students. The three lecturers that were comfortable with the relationships that they had developed with students, facilitated experimentation with innovative ideas for their teaching. Their interactions with students focussed on strategies and approaches that created opportunities for students to work together and to learn from each other. This appeared to only be possible once the lecturer felt that they had a sufficiently strong bond with the whole class, as one class.

The recommendations, implemented in Term 2, 2018, included the following:

- explicit strategies that developed quick, ready familiarity with student names for both the face-to-face and virtual campuses particularly for questioning;
- engage in informal conversations with all students prior to the start of the lecture;
- use explicit discussion protocols that required participation from all; and
- use of frequent 'checks-for-learning' between chunks of directed teaching and discussion.

Identity

This study showed that all participants felt a level of discomfort when the ISL space was first introduced. However, it was mainly the lecturers who raised and described this aspect, connecting it to their identity. Hedberg (2011) discussed how the introduction of technology into a teaching space can be a disruption and can create anxiety for staff. He described that "the pedagogy of discomfort occurs where teachers are challenged to address their concerns and to embrace a more flexible sense of the self" (p.2). For two of the lecturers, the discomfort associated with the challenges impacted on their professional identity. They said things like, "I let the students down" and "I could have done more, I usually teach much better than this. I

usually have really strong connections with my students.”. It appears that a shift in their professional identity compromised the way they viewed their relationships with the students. Interestingly, this perceived non-relationship was not identified in the data gathered from students. Furthermore, when the two lecturers were presented with anecdotal and survey evidence of students’ satisfaction with their teaching, the lecturers still could not reconcile this with their own perception of their professional identity. In short, they could not accept that the students perceived their teaching in the ISL space to be positive and effective. It was as if a barrier had been created through their own negative perceptions and they were not able to get past it.

In contrast, the three lecturers who put aside their discomfort with the challenges and adopted a problem-solving approach to the ISL complexities, heightened their professional identities. They problem-solved through a ‘can do’ attitude that rippled through into positive lecturer/student relationships. This was evident in the way that they collegially discussed a wide range of lecturing strategies; the ways in which they tried to draw on pedagogies that reflected the face-to-face experience and simultaneously formed relationships with students. Most interestingly, these three lecturers recognised that the students had a responsibility to engage in the space as adult learners and they were willing to share the responsibility for learning equally.

The very recent work of Flavell et al. (2019) conducted with university lecturers, explains this difference by connecting lecturers’ response to the adoption of introduced technology with their level of personal resilience. The findings from their research showed that lecturers had to be assisted to find solutions to their discomfort by addressing their emotional response through critical reflection. In our study, lecturers’ regular discussions and observations about practice, which were made in socially informal settings, did add to the personal reflections with which lecturers were engaging. In hindsight though, a more formalised approach to reflection on practice, for practice, might have made for more positive impact for all participating lecturers. In our study this element of the guided, shared critical reflection only occurred at the end of the study rather than throughout.

The recommendations from findings, implemented in Term 2, 2018, included the following:

- establish, use and attend to protocols that target both respectful individual and collective professional behaviours;
- build trust and accountability through quality feedback and feed-forward to students;
- encourage risk-taking, problem-solving and questioning from, and to students and lecturers;
- develop the sense of ‘one class, one space’ through inclusive practices such as the use of terms such as ‘we’, ‘us’, ‘our’; and
- mentor participating staff through formal and informal discussions.

Conclusions

The study has shown that it is feasible to create a “one class, one space feel” in an ISL space, across campuses. The study identified specific pedagogical approaches and strategies that can be used by lecturers to maximise the efficacy of the experience for themselves and for their students. However, it is clear that the changing nature of academic identities must be acknowledged and nurtured to ensure that all participants feel comfortable in the learning and teaching space. The critical process of mentoring lecturers and students to facilitate self-reflection that challenges and develops their resilience for change must be acknowledged. All

participants in this new space need assistance to adapt to and learn new ways of being in the space. It must be acknowledged that our study is small as it is limited to one university, in one discipline with few participants. However, the dissemination of our findings has sparked interest from other universities as others seek to explore how they can provide online learning and teaching spaces that enhance student engagement and relational connections and lecturers needs for developing resilience in their professional identity. This project continued to run successfully in 2019 and is ongoing as we intend to include additional campuses and lecturers next year.

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