



Technologies and Learning Spaces for Collaborative Active Learning

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Technology itself may play a role in fostering a student's motivation to engage in the material, but it may also hinder it depending upon individual differences.

Nicol et al. (2017)

INTRODUCTION

It is important to take a look at especially theoretical arguments for the significance of hospitable learning spaces (HLS), and technology-enabled active learning classrooms in collaborative active learning (CAL) environments. For instance, Kolb and Kolb (2017) claim that HLS is student-centred and it empowers students to facilitate a partnership in the learning process, therefore, care must be taken to intentionally create the five dimensions of HLS for students: institutional, physical, cultural,

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social, and psychological (Kolb & Kolb, 2017). This is because according to Kolb's experiential learning theory (2015) students drive the learning process through synergistic connections with the learning environments. Additionally, according to Trinh et al. (2021) HLS can provide conditions for experiential learning to develop even in large classes (about 90 students) aided by the Appreciative Inquiry (AI) methodology. Likewise, Donkin and Kynn (2021) argue that learning space does matter when it involves small group, task-focused active learning in a technology-enabled active learning classroom that encourages group facilitation. This purpose-built collaborative environment can improve student explicit learning outcomes like assessment grades. Interestingly, it also helps to develop student implicit outcomes such as engagement, communication, and motivation (Donkin & Kynn, 2021). Furthermore, digital technologies and assets of social media use in educational contexts have the potential to promote students' work visibility, facilitate interaction and new forms of social learning as well as provide collaborative learning opportunities (Carvalho & Santos, 2022).

Consequently, according to Brooks (2012) the types of classrooms (traditional versus technology-enabled active learning) are causally linked to the observed differences in the lecturer behaviour. Whilst, the physical environments may have influence on student learning, the effect on facilitating or inhibiting lecturer teaching is more pronounced (van Merriënboer et al., 2017). To illustrate, lecturers in large traditional classes are more likely to focus on factual knowledge and less so on active learning approaches and they have low expectations of students' shared responsibility in learning (Benton & Pallett, 2013). To this end, students do not expect to be involved with active learning activities as the physical environment does not support it. Therefore, the effect on the lecturer behaviour and the student and lecturer expectations may eventually impact the social learning space in large traditional classes to such an extent that it may impede CAL approaches.

Focusing on the two elements of learning spaces and technologies, this chapter attempts to use pedagogy to integrate these elements into CAL strategies for both formal and informal environments. Therefore, any attempt to remove and/or add any elements into or from the CAL strategies would reflect on whether the revisions would bring positive contributions that go beyond the current practical approaches.

SYNERGY BETWEEN PEDAGOGY AND TECHNOLOGY

Educational technologies or, by and large, technologies are useful tools for lecturers who are equipped with pedagogical knowledge to deploy and implement the learning activities. To illustrate, as pre-class activities with bitesize videos are commonly used for students to view and interact before attending in-class workshops. However, students need more than videos because theoretically speaking, socio-constructivism purports that learning is a social phenomenon that requires discussing with, sharing with and teaching to others (Shieh, 2012). Therefore, it is crucial that lecturers set up a community of four to six students for them to interact and discuss the video content. This is because by interacting with their peers and lecturers and discussing ideas will generate a feeling of belonging to a community (Kwon et al., 2014) and eventually encourages students to be active in their learning (Hamalainen & Vahasantanen, 2011).

Next, in terms of the development of bitesize videos, design one video for each major concept presented in the lecture. Importantly, do not produce lecture-videos even if they are incorporated with interactive HTML5 Package (H5P), but try to stimulate students' thinking, provoke and excite them into wanting to know more. To achieve these results, relate the concepts to applications and real-life uses of the disciplines in the local situations (if possible). Additionally, lecturers can share with the students their personal experiences, research or project as well as problems related to the concepts and challenge them to find responses. Consequently, provide them reading materials with probing questions to satisfy their desire to seek information. By allowing students to express themselves easily and by creating a conducive learning environment, it is reasonable to assume that they can accept a shift in their role to work independently and to put effort towards group learning and taking responsibility for personal roles (Hamalainen & Hakkinen, 2010). To this end, the synergy between videos that stimulate thinking and discussion in a community may be more effective than videos that lecture students and not in sync with pedagogy. This is because meaningful learning can only be achieved through the synergy between innovative pedagogic infrastructure and a broad spectrum of pedagogic methods (Avidov-Ungar et al., 2018).

Consequently, in order to increase the effectiveness of students interacting in a community, lecturers have to teach them collaborative skills,

which incidentally are assumed even though they are not self-evident (Kirschner et al., 2006). Consequently, before students are comfortable to openly share and discuss in a group, they have to feel safe to make mistakes and less wary of being laughed at. Therefore, the first step in developing collaborative skills is to acquire mutual trust. According to Janssen et al. (2007), mutual trust allows information to be exchanged within the group members and to critique as well as to constructively react to feedback from one another. According to Nicol and Macfarlane (2006) to be constructive students have to be actively involved in constructing their own meaning from the feedback received and use it to improve their work. Additionally, to promote social interaction, getting to know one another and to build friendship, lecturers can introduce to students' popular social media like Facebook, YouTube, Instagram, Messenger, WhatsApp, WeChat, and Discord. In an online environment students may feel disconnected and distant from one another therefore, lecturers should make themselves approachable by visiting each Zoom Breakout Room in turn, to set a tone that helps them be more comfortable with asking questions and the possibility of being wrong. Initially, the sharing of thoughts is between lecturers and students, but over time a comfort zone and mutual trust are developed for students to openly discuss any ideas with their peers. Of note, mutual trust is vital for students to feel safe to admit their problems, thus maximising the chance their peers and lecturers can assist them through effective and constructive feedback. In a similar vein, mutual trust implies the shared perception that every member of a group protects the interests and rights of one another and performs tasks deemed significant to the group interest (Fransen et al., 2011).

Further, to facilitate peer interactions the second step in developing collaborative skills is to embrace socio-cognitive conflicts. It is believed that challenges and even conflicts are unavoidable in human interactions and thus the main collaborative activities such as negotiation of shared meanings, elaboration, mutual explaining, and reasoning may lead to socio-cognitive conflicts which are advocated as essential for the cognitive growth of individuals (Buchs et al., 2004). To serve the purpose of cognitive conflicts, students can work as a group in either a face-to-face environment or an online platform. In this regard, each member of a group shares his/her self-constructed meaning from the pre-class activity in Padlet, Google Jamboard or other collaborative devices. This is because the social constructivist theory states that learning is a social phenomenon

that requires sharing with and teaching to others (Powell & Kalina, 2009). Consequently, in the in-class workshop students are provided a new set of activities but somewhat related to the pre-class activity and they have to discuss and select five ideas from Padlet that they think are relevant to respond to the new activities. In this context, Padlet serves as a platform for students to share their pre-class responses and at the same time the pedagogical approach serves to facilitate student collaboration and co-construction of meaning when they interact with the in-class activities either in a face-to-face environment or an online platform like the Zoom Breakout Rooms. The cognitive conflict discussed earlier will function as a vehicle to enhance the construction and co-construction of meaning and the outcome is a mutually shared cognition, leading to higher group effectiveness (Van den Bossche et al., 2006).

In terms of increasing the effectiveness of CAL the third step in developing collaborative skills is social presence which can serve the purpose quite well. According to Fu et al. (2009, p. 553), social presence refers to “sense of awareness of an interaction partner”. Specifically, it implies how affectively members of a group are connected to one another, or how they present themselves and perceive others in the social interaction. There remains, however, how do lecturers promote social presence to build up student collaborative skills. In this regard, lecturers must develop learning activities that require group input to complete successfully, and are complex enough to make students realise that it is to their advantage to work together in achieving their common goals and joint rewards. In this manner, they will develop a sense of community that motivates them in collaboration with their peers (Smith & Flaherty, 2013) and increase their emotional engagement (e.g., fun, enjoyment, interest) with the learning activities (Kwon et al., 2014). Once the social cohesion is strong it will lead to high outcome interdependence and hence students are more inclined to search for solutions and compromises (Johnson & Johnson, 1989). Furthermore, besides students, social presence of lecturers is a necessary component to effective online instructions (Shea et al., 2006) because students need to feel connected to their lecturers and peers (Lewis & Abdul-Hamid, 2006) as well as to the content being studied. It is noteworthy that Moodle H5P Interactive Content is an effective collaborative platform to support social presence and to strengthen social cohesion. This is because in this platform, students are provided different sets of information depending on their responses to the questions asked. The students’ reactions to the information provided will lead them to

another situation that requires them to collaborate and decide how to move their learning forward. In addition to the collaborative H5P platform, discussion forum and web pages may help to develop students' social presence (Dixon, 2010). Therefore, the pedagogical design of the learning activities as described above is underscored by the interactive nature of the platform, discussion forum and web pages.

Finally, in mediating group effectiveness in the context of CAL, the group shared mental models become the fourth step in developing collaborative skills. According to Van den Bossche et al. (2011), shared mental models are conditional for setting group goals, deciding on group strategies, allocating subtasks to group members, adequate monitoring of group processes, and effective communication. To this end, the team-related and the task-related mental models are crucial for effective implementations of the collaborative task as a group (Van den Bossche et al., 2011). Specifically, the team-related mental models focus on the team functioning and the expected behaviours of both the team as a whole and the individual members in relation to one another. Additionally, the task-related mental models focus on the strategies needed to successfully carry out the task using the information gathered. In order to achieve effectiveness in collaboration, these mental models should be negotiated within the group and continuously updated during the collaboration process (Fransen et al., 2011). Pedagogically, lecturers arrange for students to communicate face-to-face and online as well as through Moodle. All the information students obtained and provided by the lecturers are stored and shared with the group members in Google Drive and they also use the Drive to exchange work-in-progress. Likewise, Wiki as a social media has the potential for collaborative learning as it supports inquiry-based learning and the co-construction of knowledge (Yukawa, 2006) as well as the internalisation and externalisation of knowledge from work with Wiki (Cress & Kimmerle, 2008). Importantly, students have to acquire workable shared mental models in order to enhance their positive interdependence and commitment towards the group. In this regard, students—lower performing students—need to understand that interdependence implies both accepting their peers' views and defending their own contributions where they accept challenges as feedback in order to promote participation in group work (Chang-Tik & Dhaliwal, 2022). Upon completion of the group tasks, they are uploaded to Moodle Workshop for intergroup peer feedback. Even though this device is designed for peer assessment, it can be adapted for feedback. Given all the insights as

discussed in this section, it is plausible to conclude that when technologies are in sync with pedagogies, student learning in the CAL environments both formal and informal would be fun, meaningful and interactive.

TECHNOLOGIES TO SUPPORT BOTH ASSESSMENT AND FEEDBACK FOR LEARNING

In the context of collaborative active learning (CAL), learning activities such as online reading materials and quizzes can provide lecturers with continuous learning evidence of their students. Consequently, they can use the evidence to decide which instructions, assessment and feedback to implement in order to achieve the students' learning outcomes. To this end, students have to engage with the learning activities, reflect and think about what to do. If so, the functionality and success of the pedagogical features of the learning activities depend on the students' willingness to engage with the materials in the manner intended as well as their personality and learning style (Li et al., 2014). In the context of a single modality learning style under the Community of Inquiry (CoI) framework, student blended learning experience and engagement are not be jeopardised (Chang-Tik, 2018).

In this section, the focus is on how to turn learning activities into assessment and feedback activities aided by technologies. Accepting that online reading materials are normally used as pre-class learning activities, which unfortunately, are not well received by students, the author suggests adding an assessment component to it to motivate students to act. To illustrate, based on an assigned reading students have to post at least one comment on any one issue from the reading to Moodle Forum. Henceforth, each student has to critique at least one post from their peers and defend their own view when challenged. After all, CAL activities involve negotiation of shared meaning, elaboration, mutual explaining and reasoning. In this regard, the normal practice of reading passively has become active interactions among peers where marks may be awarded (assessment activity). To this end, lecturers can select posts that need further elaborations and deliberations to discuss in face-to-face or online in-class workshops. To make it more interesting and challenging to the students, lecturers can play the devil advocate by adding new disputes to the selected posts. Consequently, allow some time for students to self-reflect before placing them in groups to share their views and ideas, to debate and discuss and to provide peer feedback in support of learning

(feedback activity). The time used in self-reflection as well as deep and active cognitive engagement will enable students to act upon peer feedback effectively (Yu & Lee, 2016). Importantly, the peer feedback can be either audio or video recorded so that students can revisit as many times as necessary (Morris & Chikwa, 2016) because they perceive digital recordings as detailed, personalised and usable (Ryan et al., 2019). Accepting an assessment and feedback for learning perspective, this simple exercise can be converted into a graded assignment where students as a group record (audio/video) their responses to their peer feedback and also their replies to the in-class workshop activities. Subsequently, they submit these digital files for grading and lecturers in turn, can provide feedback using video recordings that provide dual channels of information (i.e., voice and face) to enhance feedback experience (McCarthy, 2015).

Whether or not assessment of learning—tests and examinations, the primary purpose of which is to provide feedback that involves dialogue to enable students to explore, clarify and internalise the comments provided. By providing students opportunities to have shared and individual interpretations of the constructivist feedback developed through dialogue among peers and between lecturers and students, will lead to co-construction of knowledge (Price et al., 2011). In this regard, lecturers can use screencasts to give feedback to students where they can view text-based explanations while simultaneously hearing lecturers explaining and providing detailed examples of how to address issues (Soden, 2016). The benefit of this method is students can revisit and reuse the screencasts at their point of need, particularly, during the writing of their assignments (Moscrop & Beaumont, 2017). It is noteworthy that many universities are pushing ahead with online teaching and learning not because of COVID-19 but more so due to the course suitability of being developed into an online delivery mode and also there is a growing acceptance of this mode of teaching by the students and lecturers. If so, to facilitate discourse using assessment and feedback, besides screencasts, lecturers can use an audio over PowerPoint iSpring suite to scaffold the assessment requirements to students in a very structured way. Further, in line with the assessment for learning practices, students are placed in small groups or Zoom Breakout Rooms to collaborate and to peer instruct. According to Arico and Lancaster (2018), aligning self-assessment to peer instruction may benefit students in ‘reflective observation’ and appraising their level of knowledge and skills before engaging in group discussion. Furthermore, peer instruction is a scalable, effective and convenient solution to

large group teaching in lecture theatre environments (Arico & Lancaster, 2018).

For students who are too shy to talk they can use Wiki or Chat to provide peer feedback. During the small group interactions, either face-to-face or online, students are required to negotiate and reason what the assessment requirements entail and how they can collectively work to achieve the learning outcomes through the requirements provided. In the event they encounter any difficulties or problems, they can seek assistance from the lecturers. To support student learning, assistance will take the form of socio-constructivist feedback for students to further elaborate and argue among themselves. It is important that the tasks are designed to improve students' beliefs in their own academic abilities, that is, to have mastery-focused activities supported by constructive feedback (Tanner, 2013). In what follows, given the plethora of technology available, lecturers have to acquire both technological and pedagogic knowledge so that they can pick the right technology to enrich student learning experience (Avidov-Ungar et al., 2018) and also be wary of the promises of potentiality that surround the technology. In this context, Dawson and Henderson (2017) conclude that technology interventions need to be guided by clear goals, need improvements in assessment and feedback designs, and need to address organisational matters.

The literature concurs that assessment for learning is part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance ongoing learning (Klenowski, 2009, p. 264). If so, then it is theoretically plausible to embed in the assessment processes co-assessment of students' oral presentations, where each student self-assesses his/her own presentation before agreeing on a final grade with the lecturers after critical discussion (Deeley, 2014). Through co-assessment initiative, students are afforded the opportunity to form a staff-student partnership which may result in students becoming more active and self-regulated learners (Deeley & Brown, 2014). Furthermore, in this partnership students are expected to respond and reflect upon information together with the lecturers and their peers to enhance their learning. In this manner, it fits within the framework of Vygotsky (1978) in which the experts and students are required to work together to reach a shared meaning. In order to assist them in self-assessment, Echo360 or Panopto is used to record the oral presentations. According to Murphy and Barry (2016) the recordings are helpful for students' self-assessment and

conducive for co-assessment with the lecturers. Therefore, the tendency to work together in a staff-student partnership, a relatively simple assessment process of oral presentations may result in students adopting deep approaches to learning (Higher Education Academy, 2014). This suggests that the use of the partnership for student learning could contribute to enriching the feedback process too. Specifically, in terms of learning, lecturers can use Camtasia, a software for audio-video screen casting to provide socio-constructivist feedback on students' written group-based assignments. Consequently, they are given some time to collectively act on the feedback and resubmit their work indicating how they use the feedback for improvements. Accepting feedback from the assessment for learning perspective, Hyland (2000) highlights the need to turn each item of the assessed work into an instrument to feed forward on student learning. It is noteworthy that students believe that feedback from Camtasia is of better quality, easier to understand and more personal (Hyde, 2013).

COLLABORATIVE LEARNING SPACES

According to van Merriënboer et al. (2017) the quality of education may suffer when pedagogies and physical learning spaces are not aligned. Similarly, in the context of constructive alignment, Biggs and Tang (2011) argued that to increase the quality of learning, teaching must be designed to promote students' deep approach to learning which is more likely to enhance deep understanding (Entwistle, 2018; Trigwell, 2012). Accepting a socio-constructivist perspective for the collaborative active learning (CAL) approach, quality of education may imply strong collaboration activities like mutual explanation, elaborative questioning, analytic reasoning and collaborative knowledge construction occurring both in the face-to-face situations and in the virtual environments. In relation to that, Keppell and Riddle (2012) highlight the significance of having adaptable and flexible learning spaces to accommodate collaborative and individual learning. Interestingly, students have a much higher expectation of the flexible social spaces to support the collaborative nature of the learning activities outside the classroom (Todhunter, 2015). Indeed, today's student learning is "leaving the classroom" (Roberts & Weaver, 2006, p. 97) and "digital devices can turn almost any space outside the classroom into an informal learning space" (Johnson & Lomas, 2005, p. 16). In this context, informal learning spaces are able to offer lecturers

and students supplementary platforms to enhance face-to-face and virtual participation outside the classroom. Accordingly, it would be beneficial to provide a descriptive definition of informal learning spaces, which would lead to a more informed understanding. From the university library perspective, informal learning spaces are defined as non-discipline specific spaces for self-directed learning activities within and outside the library spaces (Harrop & Turpin, 2013). Additionally, they are hybrid spaces for students to socialise with friends and to study alone and they are also known as the Third Space (Oldenburg, 1998).

It is important to note here that with the pervasiveness of Wifi and mobile devices, informal learning spaces can create a blended learning experience that models distributed learning (Keppell & Riddle, 2012). Specifically, distributed learning embraces lifelong and life-wide learning, that is, learning does not just occur in the university but also at work, home and within the community. The tools for collaboration have changed dramatically, for instance social media and Web 2.0 like Blogs and Wikis play a crucial role in student learning and socialization (Cress & Kimmerle, 2008). Furthermore, according to Woods and Bliss (2016), asynchronous online discussions are common collaborative tools used for social interaction, discussion of assessable work and group projects. Given all the insights above, it is reasonable to assume that the process of learning through social interaction is of utmost importance. This assumption suggests that, for the learning process to be successful, students have to equip themselves with self-regulated learning skills in order to manage and evaluate their learning and to provide self-feedback and judgement of the learning process. In addition, e-portfolio is a useful tool to support the development of learning skills, particularly lifelong learning skills, as it enables students to reflect on their learning and professional development (learning at work and within the community) and to construct presentations of the artefacts stored in the e-portfolio in order to share and collaborate with others (Heinrich & Bozhko, 2012). Besides lifelong learning, Keppell and Riddle (2012) state that e-portfolio together with Web 2.0 tools provide connected environments for interactive learning (student with content), networked learning (students with peers and lecturers) and peer learning where two-way feedback and dialogue happen between peers and lecturers. It is evident that learning is essentially about the interaction of three interconnected elements within the community, that is, learning tasks, technologies and learning spaces. Furthermore, the roles played by students and lecturers pertaining to the

CAL approach will describe how each element should be realised in the learning environment.

The use of e-portfolio systems such as Mahara (<http://mahara.org/>) and Pebblepad (<http://www.pebblepad.co.uk/>) for educational purposes and the integration of the system with Moodle LMS and Web 2.0 has allowed students to create an environment akin to a Personal Learning Environment (PLE). According to Attwell (2007), PLE that integrates formal and informal learning spaces supports lifelong and life-wide learning because it is based on the idea that learning occurs under different situations and contexts. It is evident that PLE is a tool that serves no specific purpose for some, and an intentional functional means for others. To illustrate, self-regulated students use the tool to support personal learning through manipulation, synthesis, and analysis of information as well as group-based learning by manipulating PLE as a communication tool to support interaction between people on the Internet (Wilson et al., 2007). On the other hand, the not so self-directed students may find it a challenge to create meaning from the large depositories of information and to organise and share the content. The reason being this group of students may be lacking in constructivism which is crucial to self-directed learning (Zimmerman, 1989). Nevertheless, evidence suggests that CAL can promote self-directed and general learning skills (Warburton & Volet, 2012) and thus may assist students in the PLE intentional functional means.

Overall, according to King (2016) collaborative active learning (CAL) has contributed to the blurring of boundaries between physical and virtual spaces as well as social and learning spaces. Specifically, student personal virtual spaces such as Facebook, YouTube, Flickr and Twitter are used to socialise with friends inside and outside the class, and they are also used for communication with peers and others over the Internet in search of information to complement learning in the classroom. Likewise, when students are physically present in the classrooms or laboratory, they are also virtually active in the Internet searching for information to corroborate their own learning and group discussion. In a study by Chang-Tik and Song (2022) students tend to share answers in WhatsApp more so than other information, therefore, lecturers should encourage them to share learning processes in order to increase their ability to co-construct knowledge and to co-regulate learning. This is because according to the social cognitive theory, learning occurs within the

social community through observation and emulation of others (Schunk, 1996). Furthermore, to enhance learning in the virtual social spaces, lecturers should be educated and trained on strategies in which they can adapt to existing learning spaces to support their learning and teaching methods purposefully, rather than treating the strategies as isolated activities. Casanova (2014, cited from Carvalho, 2021) concurs that the shift in the educational paradigm requires a change in the lecturers' mentalities and continuous training.

Focusing on student learning, particularly, on the four central learning components (Vermunt & Donche, 2017) such as cognitive processing strategies, regulation strategies, conceptions of learning, and learning orientations, a learning pattern framework is developed to coordinate these components. In this respect, Lonka et al. (2004) identify four recurring learning patterns: undirected, reproduction-directed, meaning-directed and application-directed learning patterns. Consequently, Yu et al. (2021) in their study on learning patterns and learning spaces provide evidence indicating that students adopting application-directed learning patterns prefer flexible learning spaces. In addition, reproduction-directed students tend to favour traditional classroom settings and the meaning-directed students place less emphasis on the importance of learning spaces. Following these findings, it may be to the best interest of student learning to have a combination of traditional classrooms and new learning spaces (Park & Choi, 2014).

Furthermore, using high-technology active learning classrooms as a collaborative learning space does not necessarily create an environment that is conducive to engaging in this self-paced, responsible learning (Nicol et al., 2018). To achieve effective results in educational processes that include high-technology active learning classroom, interaction among lecturers, students and content should be structured effectively (Garrison & Cleveland-Innes, 2005) and a structured mechanism should be implemented (Hung & Yuen, 2010). Therefore, there is a need to ensure that students are not disengaged with high-technology and get distracted by communicating with peers on irrelevant topics (White et al., 2014). Also, the need to be wary that open and innovative learning spaces may help the more-capable students learn well but not so for the less-capable students (Yu et al., 2021). Since technology and learning spaces are already—and will continue to be—used by students, lecturers should adopt a pedagogy-driven approach to integrating technology in the learning spaces. There should also be changes to the

curriculum as well as lecturers' experience, training and attitudes towards technology before benefits would be incurred by students in deeper learning through small group collaboration. According to Copridge et al. (2021), for lecturers to have a change in the pedagogical perspectives when teaching in either the normal or active learning classrooms, they should be provided professional development opportunities.

Learning spaces or, by and large, learning technologies that students are engaged with in their learning appear to stand closer to the social cognitive theory which is the ability of students to learn within a social environment through observation and emulation of others (Schunk, 1996). Accepting a collaborative active learning (CAL) perspective, it is reasonable to assume that there is a need to incorporate co-construction of knowledge and co-regulation of learning skills among students pointing at three pertinent CAL features: self-reflection, social interaction and socio-cognitive conflicts (Chang-Tik, Chapter 1 this volume). Similarly, equating learning spaces with learning technologies, Ellis (2016) suggests that certain personality types and learning styles may favour high-technology learning environments. In other words, when there are high levels of collaboration and social engagement, Nicol et al. (2018) cautions that technological renovations to the classrooms may not overcome the performance losses due to interpersonal processes as spelled out in the three CAL features.

HOSPITABLE LEARNING SPACES AND ACTIVE LEARNING CLASSROOMS

Consequently, it is important to gain insights into some dimensions of learning spaces to grasp a full conceptual understanding of how they affect CAL from the student and lecturer perspectives. According to Kolb and Kolb (2017) these dimensions are intentionally managed to create hospitable learning spaces (HLS) for students. They are:

- Institutional space—institutional policies, goals and traditions play a crucial role in shaping student learning and in enhancing lecturer teaching. Institutions should help to create a learning environment that encourages critical thinking, higher-order learning and enhances the use of digital futures as well as the use of open access learning opportunities to such an extent that it can become the central

component for CAL. If so, according to Patton (2010) institution should broadly define learning outcomes as developmental outcomes to provide flexibility to lecturers to use different teaching techniques, help attenuate the workload, and reduce monotony. Consequently, according to Apkarian et al. (2021), institutions where student evaluation of teaching is important, lecturers will place less emphasis on active learning. Given all the insights above, it is reasonable to state that lecturers need “a tremendous amount of institutional support” (Mabrito & Medley, 2008, p. 16) and a flexible ‘whole-of-institution’ approach (Taylor, 2001).

- Physical space—classroom setup, lighting, tables and chairs that makeup the formal physical learning space need to be adaptable and flexible to motivate student learning and provide lecturers with diverse teaching approaches (Keppell & Riddle, 2012). Nevertheless, according to Arvaja (2007) students are surrounded by a variety of resources that are utilized in CAL, therefore, the focus should be to integrate physical and virtual (Web 2.0), personal and collective as well as formal and informal learning spaces. Importantly, the physical space should reflect the pedagogy of the variety and evolving nature of activities to be undertaken (Jamieson et al., 2000). This is because physical space does have an effect on promoting active learning and engaging students (Donkin & Kynn, 2021). In this regard, physical space should be open and can accommodate a range of lecturer—and student-led activities at any one time (van Merriënboer et al., 2017).
- Cultural space—the norms, values, language and history used in the learning interactions and learning activities may affect student participation and engagement. This is because student engagement in education has behavioural and psychological components that are assimilated into the academic culture (Kahu, 2013). Specifically, according to Wright et al. (2019), lecturers may find it productive to establish norms in high lecturer-to-student contact learning spaces like CAL that involve students’ new roles, experiencing key differences in learning and also for lecturers to negotiate role expectations with students. Moreover, this negotiation should include many Asian cultures that support collectivist goals (Miyahara et al., 1998) which may be detrimental to CAL, particularly in the computer-supported version (Zhong, 2010). Still though, some lecturers may be concerned with violating departmental norms and some cited

the “publish or perish” culture where universities value research productivity over teaching effectiveness (Michael, 2007).

- Social space—focuses on the lecturer-student relationships and among the peers and others in the learning communities that support learning, and it encourages students to think more deeply about a subject in the pursuit of their interests. As discussed in Chapter 1 (Chang-Tik, this volume), social interactions and social anxieties combine all elements of CAL in such a way that serves learning, and students as well as lecturers should employ more effort to elicit and interpret the evidence of learning. If so, there is a need for the institutional, physical and cultural spaces to complement and enrich the social space in order to facilitate discourse and to bring about a more insightful debate and argument. In this context, social presence is crucial in the development of a sense of community to motivate and facilitate peer collaboration in CAL (Smith & Flaherty, 2013). In a similar vein, Solomon et al. (2010) claimed that group work creates opportunities for social comparison, social learning and social cognition. As a result of this comparison, students make gains in achievement, motivation and self-efficacy (Hernandez et al., 2013).
- Psychological space—individual psychological characteristics that include learning style, personality traits, values and learning skills. It pertains to a space where students receive psychological safety while participating actively in CAL. According to Edmondson and Lei (2014, p. 24), psychological safety “describes the perceptions of the consequences of taking interpersonal risks in a particular context”. Very similarly, when there is a high level of psychological safety, cohesion and interdependence, it will strengthen students’ belief that it is worthwhile to engage in group activities which is key to learning (Van den Bossche et al., 2006). In what follows, Kolb and Kolb (2017) suggest lecturers treat students with unconditional positive regard, that is, by tailoring the learning process to accommodate student’s individual needs and developments, and showing warm and caring acceptance when interacting with them. In this regard, students may perceive feelings of acceptance and respect from the lecturers in the psychological space. In a similar vein, through peer interaction students may generate contact leading to feelings of acceptance and connectedness to their peers (Sidelinger & Booth-Butterfield, 2010) which is crucial in facilitating conversations.

Viewed from this lens, the negative teaching and learning experiences in CAL classes may be the consequences of the failure to create and maintain an HLS. In this respect, Kolb and Kolb (2017) argue that without this space even the most engaging and well-designed CAL approaches may fail. From a methodological perspective, Appreciative Inquiry (AI), which is founded on the principles of social constructionism and positivity (Cooperrider et al., 2008), uses four-phase scaffold to stimulate CAL in large classes in the context of HLS. Consequently, with hospitable learning spaces and an effective AI approach lecturers should be able to implement CAL in a normal classroom with a class size of at least 100 students. If so, is there a need for an active learning classroom?

To answer this question, let's start with the definition of active learning classrooms (ALCs), which according to Baepler and Walker (2014), ALCs are student-centred learning spaces that facilitate collaboration, promote interaction and engagement as well as minimise barriers between lecturers and students. To illustrate, a typical classroom layout can be transformed into different settings to accommodate various in-class learning activities, and supported by sufficient power outlets and wireless networks. It can hold between 50 and 60 students in a single session. In the context of the physical space of HLS, it is theoretically plausible to expect any positive impacts of ALCs to align with the pedagogy applied to the nature of the learning activities (Jamieson et al., 2000). If so, the strong relationships between the five spaces of HLS may indicate that besides the physical and technological aspects of ALCs, the other variables like social, cultural, institutional and psychological aspects of teaching and learning also play a significant role, independently of ALCs. Using ALCs as a means of teaching would not necessarily lead to a positive result in the learning process because not all lecturers will use the classroom as intended as they need training in order to use the rooms effectively (Knaub et al., 2016). Likewise, according to Avidov-Ungar et al. (2018), lecturers who are low in pedagogic and technological knowledge may find ALCs a barrier for teaching. Indeed, today's ALCs are generally high-technology and unfortunately these classrooms do not always create an environment conducive for self-paced responsible learning. This is because it takes numerous years for the curriculum to change and also for lecturers to build up a certain level of experience before any benefits would be incurred (Rogers et al., 2015).

Consequently, to achieve effective results in educational processes that include ALCs, interaction among all the five spaces of HLS should

be structured effectively and a structured mechanism should be implemented. Therefore, an applicable framework should be executed for the integration of physical and virtual (Web 2.0), personal and collective as well as formal and informal learning spaces (Arvaja, 2007). The theoretical background employed is based on the Community of Inquiry (CoI) framework, which aims to develop effective online and offline learning communities to support learning (Akyol et al., 2009). According to the framework, learning is about the interaction of the three interconnected and dynamic presences (social, cognitive and teaching) within the community (Garrison & Cleveland-Innes, 2005) realised in the hospitable learning spaces. Upon successful execution of the applicable framework, it is reasonable to expect some positive effects of ALCs in enhancing engagement and encouraging interaction (Baepler & Walker, 2014) and to reinforce collaborative teaching and learning methods that enable students to construct knowledge by themselves (Avidov-Ungar et al., 2018).

CONCLUSION

Before universities jump on the bandwagon to convert classrooms into active learning classrooms (ALCs), it may be plausible for the management to align the universities policies and goals with the pedagogical shift to blended and/or fully online learning. Additionally, the management needs to consider the synergy between technologies with pedagogies in both formal and informal CAL environments in order to bring about fun, meaningful and interactive learning. Therefore, to bridge a gap from a perspective of lecturers and students having to be physically present in campuses against them working and learning from home, universities may have to reconsider the purpose of learning spaces and technologies. On one hand, when there are high levels of face-to-face contact required in teaching and learning, it is not easy to conclude that students can achieve self-learning on their own without the physical presence of lecturers. This point becomes important when combined with van Merriënboer et al. (2017) finding that pedagogies and physical learning spaces need to be aligned. It is also important to check for practical significance of ALCs in relation to the five spaces of HLS, if a decision is made to set up such classrooms. On the other hand, to make the transition from face-to-face delivery to either blended or fully online, a richer understanding of informal learning spaces is required. In this respect, distributed learning

spaces recognise that learning has increasingly occurred at work, home and within a community (Keppell & Riddle, 2012). Importantly, the availability of Wifi and mobile devices give students a blended learning experience outside the classrooms that models distributed learning. In other words, learning does not just occur in the formal university setting but also at work as in work integrated learning, in the community as in community-based learning and the Personal Learning Environment (PLE) as in distributed learning.

It is noteworthy that a substantial shift in the instructional delivery and learning spaces within the CAL environments may lead to the lecturers and students to be more inclined to view assessment and feedback as effective tools for deep approach to learning. According to Asikainen et al. (2013), assessment has a strong influence on students' learning and may either encourage or discourage deep approaches to learning. Therefore, when students are better informed about the learning outcomes that are manifested in well-designed activities and assessment methods aided by appropriate technologies, they are more likely to embrace assessment and feedback for learning and possibly form a staff-student partnership to bring assessment to a new level of learning. On the contrary, if assessment guides students towards memorisation instead of knowledge construction (Asikainen et al., 2013) and the learning environment is too challenging, then students are likely to adopt unreflective approaches to learning. In this regard, it is crucial that lecturers must constructively align the learning outcomes to assessment and teaching-learning activities in HLS environments to enhance deep meaning-oriented learning.

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