IT HAS POTENTIAL BUT…' –
EXPLORING UNIVERSITY STUDENTS' EXPERIENCES
AND PERCEPTIONS OF BREAKOUT ROOMS
DURING THE COVID-19 PANDEMIC

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Abstract

COVID-19 has created a dramatic and rapid transition to emergency remote teaching in higher education (HE) creating both new opportunities and challenges for lecturers and their students. As HE adapts to these new circumstances, there is a need for instructors to design and teach classes that support collaborative learning and increase opportunities for student interactivity. This article reports on an ongoing study exploring university students' experiences and perceptions of using breakout rooms (BRs), a technical feature of many synchronous online platforms, as part of their online classes. Using a mixed methods research approach, 127 students, who were registered on English language courses at a university in Cyprus during Spring 2021, participated in the study.

Findings indicate that students' experiences and perceptions of breakout rooms during this period were impacted in five key areas: (1) emotional/affective, (2) moral/ethical, (3) social, (4) pedagogical and (5) technological. These findings suggest that students' personal feelings, attitudes to online learning, sense of connectedness to their peers, expectations of the role and presence of the lecturer and issues relating to the technology, are all considered to be significant factors in their use of BRs. This study offers initial insights for educators who wish to use, modify and/or adapt synchronous online teaching to incorporate collaborative learning opportunities through breakout rooms.

Keywords: higher education; synchronous online teaching; breakout rooms; collaborative learning; student experiences; COVID-19

1. Introduction

With the declaration of a global pandemic by the WHO in March 2020, the transition to 'emergency remote teaching' (Hodges *et al*., 2020) led to many challenges for both teachers and students. While teachers were rapidly required to learn and use new digital tools, students

suddenly experienced having such digital tools 'used on them' (Larke, 2021). With backgrounds in TESOL education and research, the authors were curious to explore students' experiences of online learning in relation to Breakout Rooms (henceforth, BRs).

BRs are an integrated feature of synchronous online video conferencing platforms such as Cisco WebEx, Microsoft Teams, Blackboard Collaborate etc. that enable participants to break off into smaller group sessions. In an educational context, BRs function to recreate the physical classroom by creating a virtual social space that enables students to meet and work in groups on an assigned task for a specified period. In these spaces, teachers can set tasks, assign and monitor groups, provide support and allow learners to exercise autonomy within the scope of the task (Coomey & Stephenson, 2018). In this way, BRs create opportunities for learners to self-mediate learning and co-construct knowledge in a 'computer-mediated social constructivist environment' (Stojkovski, 2010).

However, in contrast to face-to-face groupwork, the interface of BRs does not enable instructors to have an overview of learner activity without entering a specific BR space. This means that the student experience of learning in BRs is largely unseen and unheard. In addition, the paucity of literature on the use of BRs during this period of emergency remote teaching means that not much is recorded about student learning in BRs.

Thus, this study sets out to explore university students' experiences and perceptions of learning behind the closed 'digital doors' of BRs. It is hoped that such a study will contribute to an understanding of learners' experiences and perceptions of BRs, thereby enabling educators to create motivating and relevant online learning spaces for their students.

2. Background

This study is theoretically positioned within a Community of Inquiry framework (CoI) (Garrison, Anderson & Archer, 1999). This framework proposes a model of online learning based on meaningful interaction that is located in teaching presence (the online interaction of the teacher in facilitating and supporting learning), social presence (the feeling of being with a 'real' person in a virtual reality) (Oh, Bailenson & Welch, 2018), and cognitive presence (the ability to construct meaning through communication (Aslan & Turgut, 2021). Drawing on sociocultural theories (Vygotsky, 1978), learning in a CoI is a social activity in which learners work together in small groups in order to construct new understandings and knowledge, thereby making students active participants in their own learning. By positioning this study within a CoI frame, the study aims to explore the extent to which learners are able to engage in collaborative and constructivist learning experiences.

In addition, this study also draws on the concept of BRs as 'semiotic social spaces' (Gee, 2005). Based on principles of video gaming, such spaces are defined as informal learning spaces that provide a socially safe context, in which learners can participate through different modes of communication (audio, video and/or text). Through this lens, BRs, as semiotic social spaces, can be seen to support and value distributed knowledge, i.e. group knowledge. In short, the knowledge produced as a group is more highly valued and rewarded than individual knowledge, which often typifies traditional classroom spaces. In practice, without the constant presence of the instructor, BRs have the potential to offer students a greater degree of autonomy in learning, participating and accessing resources. Thus, the nature of learning that occurs in the informal and invisible learning spaces of BRs forms the basis of this investigation.

Accordingly, the underlying assumption of this study is that by substituting and transposing traditional classroom and pedagogies into an online setting, the potential of BRs to support online learning remains limited. Moreover, while the theoretical potential of online collaborative learning spaces is recognized, lack of empirical data on students' experiences and perceptions of BRs, highlights the need for further research in this area.

3. Literature

The use of technology for online learning is well established and a review of the extant literature reflects what is known of the use of BRs from studies conducted pre-pandemic, as well as those conducted since 2020.

3.1. Pre-pandemic research

Pre-pandemic research typically focuses on the implementation of online pedagogical tools and practices that promote interaction and active student learning in higher education (e.g. see Gilmour & Compton, 2020; Law & Lambie, 2020). Such studies typically present educators' perspectives and findings suggest that while university teachers recognize the potential of such BRs, they also report feeling overworked, undertrained and overwhelmed as they attempt to manage these tools during online classes (Baehr, 2021; Fasso, 2013; MacDonald & Campbell, 2012).

Additionally, studies focusing on learners' perspectives of BRs reflect a range of experiences and perceptions. On a positive note, some university students report that peer support in BRs helps them develop content knowledge, student identity, confidence and friendships. In a small scale-study in the UK, a diary method was used to record the student experience of online tutorials using Blackboard Collaborate (Chandler, 2016). Findings

reported that while students felt pressure to confirm their understanding in the main online session, they were more able to express their confusion in BRs. Moreover, while students recorded periods of boredom in the main online session, they also reported that BRs offer opportunities to re-engage with the lesson and each other (Chandler 2016). These findings align with other studies in which university students evaluate their experience of learning in BRs as equal to or exceeding that of face-to-face interaction (Foronda & Lippincott, 2014; Tonsmann, 2014).

However, other studies present diverging findings. For instance, a study at a US public university examined student satisfaction and student success in two sections of a Political Science class (Blackstone & Oldmixon, 2016). Specifically, the study compared a lecture-only class that met twice per week, with one that combined a physical lecture with an online tutorial using BRs. Comparing the lecture-only class with the combined lecture/BRs class, findings indicated that levels of student satisfaction in the former were higher than the combined lecture/BRs class. Moreover, students in the combined lecture/BRs section did not perform better than their lecture-only peers. Indeed, controlling for all other variables, students in the combined classes scored at least 2 grade points lower than their peers. The authors conclude that not only is there no evidence of the positive impact of BRs but that student satisfaction and success is positively related to students' physical attendance. Similarly, another study exploring students' reflective journals from an online graduate programme in online learning environments suggests that participation in BRs is perceived as one of the most challenging parts of their online courses (Yamagata-Lynch, 2014). Learner-to-learner interaction is a key feature of BRs and this study reported student frustration at time-wasting when deciding who would start the conversation, what roles students would take in completing the task and poor communication when not using the camera function etc. Similar findings were reported in a 2012 study (Martin, Parker & Deale, 2012) examining graduate students' interactions in an instructional technology programme in the US. Findings suggest that while students recognized the value of BRs in creating strong personalized interaction using webcams, they also reported disadvantages such as the dislike of working in small groups and audio delays in talking and/or talking at the same time.

On the whole, this pre-pandemic literature suggests that even when purposely integrated into the course design, the use of BRs in tertiary education is not without challenges for both instructors and for students.

3.2. The use of BRs during COVID-19

The recent increase in literature since early 2020 predominantly reflects emergency first wave remote teaching for teachers with little training and support of using online tools (Krajka, 2021). These studies focus on the use of BRs in subject-specific courses, student participation and teaching methodologies. To begin, the advantages of BRs in language courses are documented in several studies. Gruber and Bauer (2020) report on the use of BRs in a course teaching German as a Foreign Language to seven international university students. In groups of 2-3, students worked regularly in BRs to complete communicative-type language tasks and findings indicate that the use of BRs not only increased student-speaking time, but also led to greater social interaction and feelings of group cohesion. Moreover, students' anonymized written feedback shows that students considered BRs a 'safe-space' for language learning (Gruber & Bauer, 2020). The use of BRs is also examined in the teaching of other subject areas. For example, Li, Xu, He, He, Pribesh, Watson and Major (2021) report on the use of BRs to teach pair programming online to undergraduate students. The classes included assignments which students completed in pairs in BRs. Student feedback was partially positive highlighting the enjoyment of the task, the responsiveness of the instructor and interaction with their peers. However, students negatively evaluated the unreliable technology and the random selection of pairings for the tasks.

In relation to student participation in BRs, emerging literature challenges the assumption that the use of BRs in online classes inevitably facilitates collaborative behaviour between students who have never met before. Observations from a teacher education course in Hong Kong (Moorehouse, 2020) suggest that, in practice, lecturers reported that their online classes were more teacher-centered than face-to-face sessions, with less student participation, longer silences and shorter responses. Moreover, lack of participation was also carried over into BRs as students failed to turn on their cameras due to privacy concerns. Lack of participation in BRs was also observed during online classes in an introductory data science course at a US university. As a response, Saltz and Heckman (2020) developed a structured-pair methodology for students to use in BRs. Students were assigned roles as 'Driver' or 'Active observer', with each role accompanied by a detailed instructional script (e.g., *Drivers: State the problem in words*; *Active observers: Read what the driver is writing as he or she writes it, evaluate it for accuracy*). Roles were then rotated every 15 minutes. Findings indicate that when scripted structured-pair activities were used, students expressed greater degrees of satisfaction, productivity, motivation and connectedness to other students than in unstructured activities.

Overall, while lecturers often view BRs as an opportunity for community-building, learners may feel threatened by what they consider as 'forced interaction' (McGrath & Wolstencroft, 2021). Indeed, it is observed, anecdotally, that BRs create numerous challenges for students including social anxiety, technological difficulties, awkward interactions due to limited camera and microphone use, lack of participation in the assigned task and a sense that teachers are not really 'teaching' (Whear, 2020). Added to this is the mental health pressure of the pandemic with both teachers and students often reporting 'zoom burnout', i.e. the constant exposure to online meetings, inability to disconnect from work or studies and the general lack of motivation to participate (Martins, 2020).

These studies draw attention to how teachers use BRs in their teaching and also brings into question issues of teacher education. Krajka's (2021) study of grammar and vocabulary teaching in Polish primary and secondary schools during the first wave of remote instruction indicates that teachers' use of BRs during this period was an attempt to mirror group work as used in the physical classroom. Based on the SAMR model of online teaching (Puentedura, 2015), Krajka (2021) suggests this prevailing methodological approach to substitute the physical classroom, highlights the need for teacher education to prepare teachers for online teaching that transforms the online classroom.

Against this background of research literature, there appears a gap between social-constructivist ideals and potentiality of BRs for online learning and the varied experiences of students and teachers since the pandemic began. It is this space that this study sets out to explore.

4. Methodology

4.1. Context

The study was conducted at a private university in Cyprus between February and May 2021. The sample was selected through a call to participate in a research study sent to all students registered on any English language course that was offered by the Department of Languages during spring semester 2021.

4.2. Research design

Using an explanatory sequential mixed methods design (Cresswell & Clarke, 2017), the current study was carried out in two stages involving an online survey (see Appendix) followed by semi-structured interviews. The survey questions focused on participants' self-reported

experiences and perceptions of working in BRs during their online classes. The follow-up interviews were intended to elicit further insights into BRs including participants' general experiences and perceptions of BRs, collaboration with other students, the use of cameras, the role of the lecturer and suggestions for future use of BRs.

4.2.1. Online survey

In total, 127 participants responded to the online survey; however, 19 responses were excluded from the data sample as participants stated that they had never used or were unsure whether they had used BRs in their online classes. As a result, the final sample included 108 participants, of whom 35 (32.4%) were men, 69 (63.9%) were women, 3 (2.8%) participants declared as non-binary and 1 (0.9%) participant did not wish to state their gender. The mean age of participants was 21.81 years with ages ranging from 17-56 years (Table 1). Most of the respondents (87%) were undergraduates and a minority (4.6%) were postgraduates. The remaining respondents (8.3%) stated they were studying for a certificate or diploma. Within the sample, 51 students (47.2%) were in the first year of their studies, 33 (30.6%) were in the second year, 12 (11.1%) were in the third year and 11 (10.2%) in the fourth year. In order to preserve anonymity and confidentiality, the online survey was distributed to students via their instructors and not directly through the researchers. Participation was voluntary and no personal identifiable information (email addresses, names, IP addresses) was collected.

Table 1. The age of study participants

	N	Minimum	Maximum	Mean	Median	St. Deviation
Men	35	18	56	23.69	21	7.9
Women	69	17	41	20.97	20	3.9
Non-binary	3	19	21	20	20	1
Overall	108	17	56	21.81	20	5.6

4.2.2. Interview data

In order to gain deeper insights into students' experiences and perceptions of using BRs, semi-structured interviews were conducted with a purposive sample of five full-time undergraduate students (2 females and 3 males) who had completed the survey. Interviewees' ages ranged between 19 and 25 years with the mean age being 20.6 years and all had completed English language courses equivalent to C1 level language proficiency. At the time of the interviews, interviewees had completed between 1 and 2 years of their studies in their respective programmes (Table 2)

Table 2. Background of interview participants

	Age	Gender	Studies	Year of study
Iliana	19	Female	Marketing	1st
Ivan	19	Male	Psychology	1st
David	25	Male	Psychology	2nd
Georgia	19	Female	English	2nd
Alexei	20	Male	Computer Science	1st

Before taking part in the interviews, interviewees gave informed consent expressing their willingness to participate. All the interviews were conducted in English via WebEx meetings online conferencing software and recorded for later transcription. Interviews were between 15 and 24 minutes in length with the average being 18 minutes. Interview data were managed with qualitative data management and analysis software, Quirkos, and analyzed using thematic analysis (Clarke & Braun, 2018). After several repeated readings of full orthographic and verbatim transcriptions, broad categories started to emerge. Transcripts were then coded into initial themes, which were then reviewed and refined and collated into a hierarchical map. Using quotes from the data, the researchers attempted to preserve students' voices and represent them as accurately as possible. In the presentation of findings, pseudonyms are used to preserve anonymity.

4.3. Findings

Themes emerging from the datasets highlight five key dimensions of participants' experiences and perceptions (Table 3). These dimensions are defined by their common characteristics as perceived by participants. As such, they can be seen to be dynamic, interrelated and subjectively perceived between individuals and within the individual experience. In other words, not only are BRs experienced and perceived differently by individual participants, but individual participants also express a range of experiences and perceptions that prevent generalization. However, for the purposes of this discussion, these dimensions are treated discretely in order to highlight their distinct features.

Table 3. Participants' reported experiences and beliefs of BRs

Dimensions	Definitions	Subthemes
Emotional/ Affective	Attitudes, feelings, beliefs & preferences	- Overall perceptions - Emotional (un)ease
Moral/Ethical	Fair & equal treatment	- Between students

		- Right to privacy
Social	Group cohesion, social interaction & engagement	- Connectedness - Communication - Group norms - Engagement/ motivation
Pedagogical	The role of the lecturer	- Teaching presence - Supporting learning - Organisation of groups - Task types
Technological	The role and function of technology	- Use of cameras - Functionality of interface - Connectivity

4.3.1. Emotional/ affective dimensions of BRs

The first dimension of participants' experiences and perceptions of BRs relates to their emotions and affect, i.e. their general attitudes, feelings and beliefs. Firstly, while reflecting on their attitudes and feelings regarding the use of BRs, participants reported both positive and negative aspects of this specific mode of study. Most participants were ambivalent in their enthusiasm for BRs (Figure 1). While a minority (18.5%) of participants agreed with the statement that 'working in BRs bores me', most participants (81.5%) were equally divided between those who had no opinion or disagreed with the statement. Likewise, while 43.5% of participants agreed 'working in BRs motivates me to learn', 32.3% had no opinion and 24.1% disagreed with the statement. Similarly, 50% of participants agreed with the statement that 'time spent in BRs is well spent', while 25% had no opinion and 25% disagreed that it was an effective use of their learning time. This ambivalence was also reflected in interview data comments. One participant, Ivan, perceived BRs positively: 'I definitely think it has potential, umm I can definitely see, for example for a few times first using breakout rooms, I thought it was quite productive. It was quite nice, actually talking to one another'. Similarly, another participant, Georgia, felt that two of her online classes suffered due to the absence of BRs: 'I have five courses this year and two of them did not use them at all because they were like lectures, really long lectures, which were very boring and if they had breakout rooms they would be more interesting'. Despite recognizing the potential of BRs, other participants referred to their challenges. Iliana commented 'so the breakout room could be a really good thing, a successful, umm…principle, but I just feel like it is not used properly'. While David observed 'so while there was potential of creating new ways of communicating there was still low participation'. Similarly, Alexei felt that there were additional challenges for first year students: 'to be honest, it was quite difficult, and I think I know what was the problem, since it was our first year and I didn't know my friends and I didn't know my classmates'.
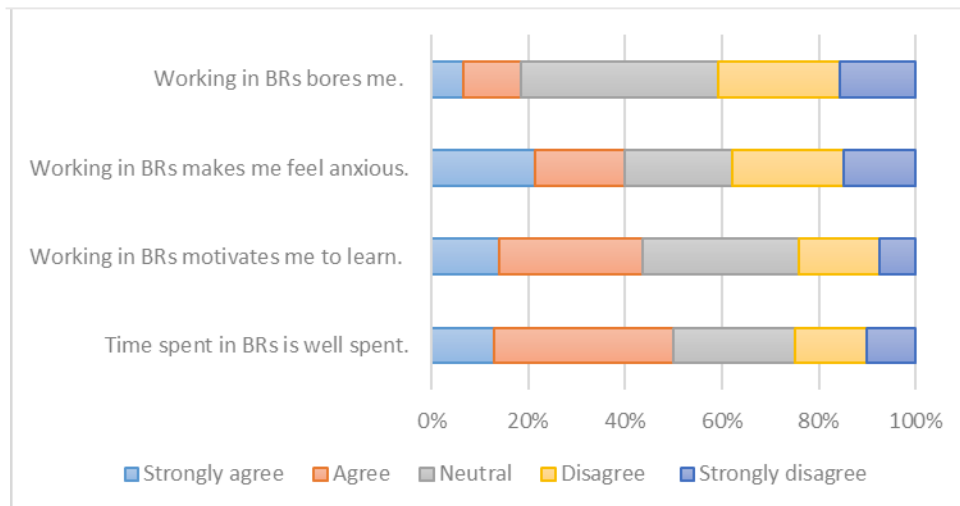
Figure 1. Emotional/affective dimensions of BRs

Another facet of this dimension is the social unease expressed by participants in using BRs. Several participants repeatedly referenced anxiety in relation to the use of BRs. On a general level, David observed that 'people do have social anxiety manifested through the camera… in our age right now with the pandemic' while on a more personal level, Georgia stated: 'I was a bit weirded out when there were more people because I would get uncomfortable'. Iliana tried to expand on her feelings of anxiety commenting: 'I was part of that group that felt awkward and anxious opening the camera, if nobody else was opening it because I felt weird. Like, I was one of the only students opening it … it's a weird feeling to have it open, if no other students have it open. Even if one student has it open and no one else has it open, then it's just really weird. I can't really explain it''.

4.3.2. Moral/ ethical dimensions

The second dimension relates to participants' moral and ethical perspective of BRs, i.e. what participants perceive to be fair and equal treatment. Firstly, participants expressed concern about the negative interactions that occur within BRs including negative judgement by peers. For instance, Georgia commented: 'I felt I was being judged sometimes about my questions because like the teachers weren't there so sometimes they [other students] will make fun of me and my opinions that I would say out loud'. Another concern expressed by participants relates to the inequitable distribution of work within BRs. An anonymous participant in the online survey commented: 'because the professor tries to check every group, when she/he is not present a very big percent of the students do not work at all, they let just one or two people to do the work and then they share the credit'. Secondly, participants expressed concerns about

BRs violating their private space and, as such, their right to privacy. As Iliana noted: 'they [students] don't want people to see their private space or maybe they're in bed' and similarly, Georgia commented: 'I could be doing a lesson in the kitchen and I wouldn't want my classmates looking at my family or there might be a lot of things that I might be ashamed of and not want to open the camera or my mic, for example, my mum might be in the background screaming at me…there's a lot of things'.

4.3.3. Social dimensions

The third dimension relates to the social dimensions of BRs including participants' sense of group cohesion, social interaction and engagement. Firstly, there is evidence to suggest that BRs foster a sense of connectedness and belonging to a community. For example, just over half (58.3%) of all participants stated that working in BRs made them feel part of a community; likewise, 59.3% of participants viewed relationships between students as a critical factor to the success of BRs. A similar number (56.5%) of participants agreed that BRs allowed them to get to know their classmates and almost half the participants (47.3%) felt they received support from their peers during BRs sessions. These findings are echoed in the interview data (Figure 2). David commented: 'Yes, I got the opportunity to know someone from the breakout rooms, we actually worked on different projects together, we were constant in our breakout rooms for the whole semester', Similarly, Alexei noted: 'I have only one friend from my course and I realized on the first day his name is written in [Alexei's language] and I was like, ok, he's my mate then'.

Secondly, in relation to modes of communication, findings indicate that most participants (43.5%) preferred to communicate using both audio and text, while another 38.9% of participants preferred to communicate solely though speaking. Interview data suggest that despite flexible modes of communication, the extent of communication may have been limited. Ivan noted: 'we would break out into these breakout rooms and nobody would say anything, nobody would write anything, we would wait our ten or fifteen minutes and then go back to class and nothing much would get done'.
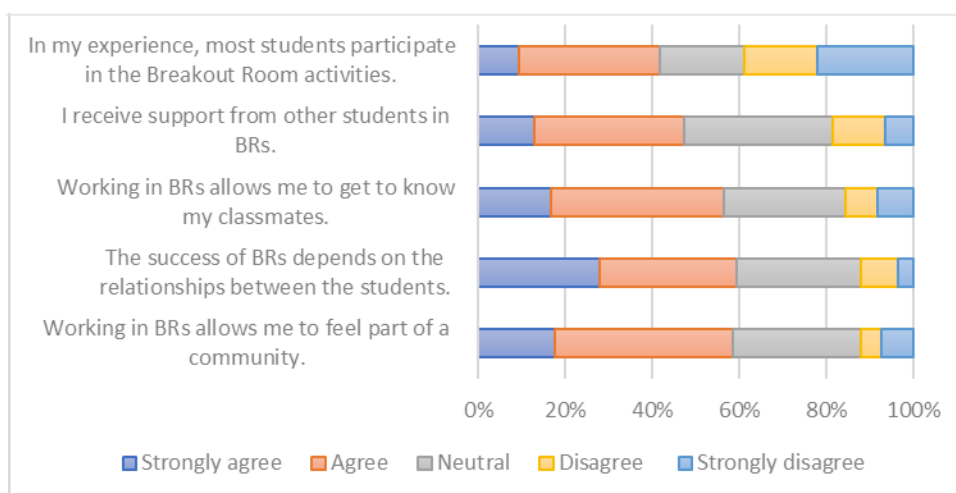
Figure 2. Social dimensions of working in BRs

Thirdly, in relation to group norms, evidence suggests that most participants (67.6%) were aware of and conformed to one specific group behaviour within BRs, i.e. the non-use of cameras. Only a minority of participants (6.5%) said that they regularly used their cameras in BRs. Iliana echoed this finding stating: 'personally I don't feel comfortable opening the camera if other students don't open the camera, it's a group thing'.

Finally, within this social dimension, participants' level of engagement within BRs is also highlighted. Findings suggest that while most participants generally felt motivated to engage with the tasks set for them in BRs, they felt that their classmates were not as motivated. Most participants (77.8%) stated they typically participated in BR activities; however, a significant number of participants (38.9%) felt that their peers typically did not participate (Figure 2). On a positive note, Georgia credited BRs with helping her re-engage with the lesson: 'they should do them more often because they are very fun and they are more interactive because I could wake up in the morning and still be tired and if the teacher says, 'hey, breakout rooms' then I would be like, ok, alright then, I am also going to talk a bit with my classmate, we are going to chat a bit'. For other participants, engagement in BRs started well but over time, it started to decline. Ivan stated: 'and actually, we interacted and collaborated to complete the task so it was really good but then after a little bit it seemed to die down, nobody was engaging with the task as much'. Some participants were more pessimistic citing the impact of the pandemic on education and their levels of motivation. Iliana summed it up thus: 'with COVID we are really unmotivated, we have been sitting at home for a whole year in front of a screen, it's exhausting mentally and physically for students and, at some point, we all just sit here and think 'I don't want to do this anymore'.

4.3.4. Pedagogical dimensions

The fourth dimension refers to participants' perceptions of the role of the instructor in setting up and supporting learning. In this theme, four subthemes emerge: teaching presence, supporting learning, organisation of groups and task types.

Firstly, in relation to teaching presence, as discussed in relation to the CoI framework (Garrison, Anderson & Archer, 1999), the online presence of the teacher is considered important for learning. This presence is seen through the presence of the teacher in BRs. Two-thirds of participants (66.6%) agreed that 'the quality of the BR experience depends on the individual lecturer' (Figure 3). Indeed, the regular presence of the lecturer to monitor work and support learners in BRs is reflected in participants' comments. Iliana stated: 'but I feel like it's not a bad thing when a lecturer comes in once in a while to check on us and say 'Hey, is everybody here?' 'How's the assignment going?' Is everything ok?' 'Does anybody have any technical issues? So it's a good thing that the lecturer comes into the breakout room because it helps us monitor, it helps us stay on track and stay focused'. Teaching presence might involve the virtual presence of the teacher joining the specific BR, but it may also be related to learners' being accountable for group work conducted in BRs. David highlighted the consequences of students' lack of external motivation: 'then we understood that no one was checking us so as time went on we had less and less participation'.

Secondly, in relation to supporting learning, 66.7% of participants felt BRs promoted increased opportunities for interaction between peers during online classes. Similarly, 64.8% of participants agreed that BRs allowed them to exchange ideas freely with their peers and almost half of participants (49%) agreed that BRs helped them understand the lesson better (Figure 3). While some participants perceived BRs as more effective in supporting learning than lecture-only classes, others felt the benefits were limited to socializing. As Alexei observed: 'to be honest I would not say there was anything beneficial from using breakout rooms, maybe just to talk about life … if you are chatting with your friends, what happened yesterday, what happened a month ago, but not for learning'.
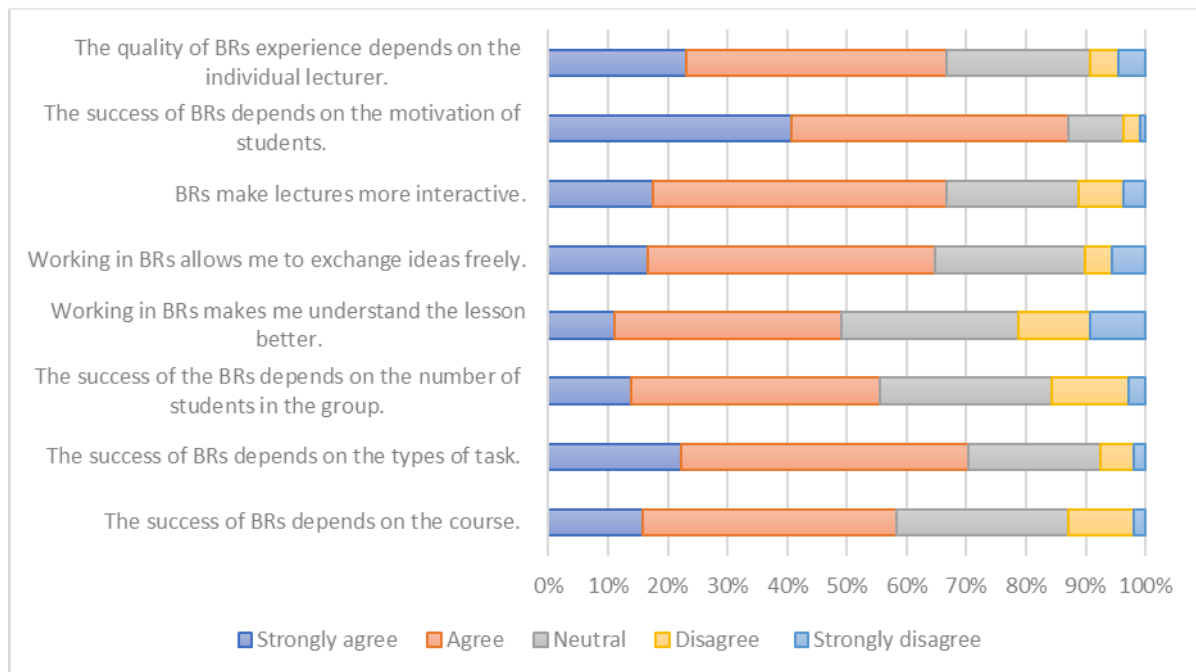
Figure 3. Pedagogical dimensions of working in BRs

Thirdly, in relation to the organisation and use of BRs, most participants stated that their lecturers gave instructions on how to use the BR function. Most participants (84.3%) claimed that on average they used BRs once or twice per week. Many participants (66.7%) also claimed that the average BRs session lasted between 10 to 30 minutes while almost a third of participants (30.6%) said they lasted less than 10 minutes and only a minority (2.8%) said they lasted more than 30 minutes.

Fourthly, more than half of all participant (55.6%) considered group size to be a significant factor in the effectiveness of BRs (Figure 3) and the majority of participants (93.5%) indicated that their last BR session comprised two to five members. Asked about their preferences for group size, Ivan stated: 'so we were in groups of either 4 or 5 students in a breakout room which I think is a perfect amount, you know umm… I would say the perfect range is about 3 to 5 students'. However, a preference for pair work was also expressed. In addition, most participants (78.8%) stated that groups were randomly assigned by the lecturer. Whilst Iliana agreed with this method: 'I feel like organizing them randomly is the best choice to do because you work with different people each time and you get to experience different aspects', others felt that self-selection was preferable. Georgia stated: 'they should let us choose with who to be with because I could be with someone who doesn't like me or someone who has a completely opposite personality with me … but they should let the students choose.'

Finally, most participants (70.3%) expressed the belief that the type of task determined the success of the BR activity. Based on experience, participants reported that the most commonly-used activities were (1) discussing a question or a topic (86 responses), (2) answering questions (67 responses) and (3) generating and sharing ideas (61 responses), with watching a video (3 responses) being the least-used activity (Figure 4). Over half the participants (58.3%) also believed that 'the success of BR depends on the course' which may be interpreted to mean that certain courses were more suited to BRs than others were. This is supported by interview data that indicates that participants believed that BRs were more useful when used with specific, problem-solving tasks in practical and communicative type classes (e.g. Computer Science and English) rather than abstract and more theoretical classes. Alexei illustrates this with the following comment: 'Yes, there were some differences because in Programming there was a specific task that we had to finish – for example, write a small programme and you know how coding works, right? So yes, it's kind of different for different subjects in my other classes, I had Maths classes and I don't think using breakout rooms for Maths would be a smart idea'. Ivan also echoed this sentiment, commenting: 'I think in English it was definitely something that worked very well ..., I mean when we did engage it worked wonderfully because we'd have a few sentences that we would have to correct or find mistakes in or stuff like that'.
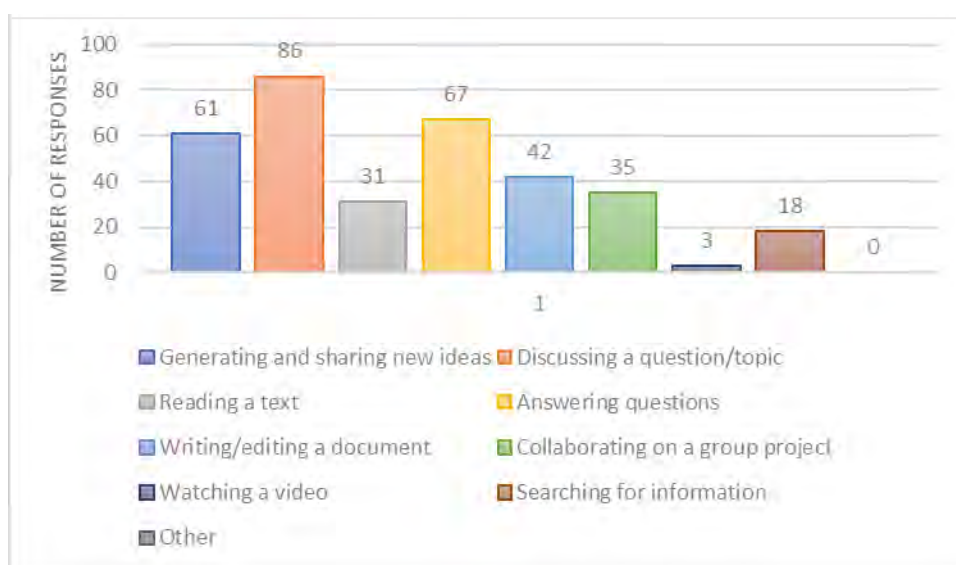

Figure 4. What types of activities have you worked on in Breakout Rooms?

4.3.5. Technological dimensions

The fifth dimension refers to participants' perceptions of the role and function of technology in BRs. Evidence suggests that in general, most participants (73.1%) did not experience any

technical difficulties while using BRs. However, the one outstanding technological aspect related to the number of participants (67.6%) who never switched on their cameras due to group norms (see 4.3), lack of necessity or obligation. Ivan explains: 'In most of our courses, I don't turn my camera on and nobody else does and nobody needs to and some of the teachers don't or they turn the camera off during the lecture… I haven't had any course that actually required me to put my camera on and I think that transfers and carries to the breakout room.' Next, in relation to the functionality of BRs, participants added that there were occasional difficulties in accessing course materials and other resources while using BRs. As Ivan explained: 'I remember that on several occasions because we had to access material that is on a course page or elsewhere, so I would often, or other members of the class would send the link in the breakout rooms because there is somebody who does not know where to find it and access it'. Finally, for those who did experience technical difficulties in BRs, these were related to connectivity issues. Participants referred to difficulties in connecting to BRs, which they attributed to their own devices. Georgia stated: 'Well aside from breakout rooms kicking me out of the lessons, they were pretty good… it was probably my laptop, it was my fault, it requires a good laptop, I guess.' Iliana also referred to the use of specific devices explaining: 'There are always technical issues when it comes to using breakout rooms…some students have a hard time connecting. I know a student who couldn't really connect well because they didn't have a computer, they only had a phone and connecting to breakout rooms from a phone can be really complicated.'

5. Discussion

This study, set out to explore students' experiences and perceptions of BRs during their synchronous online classes and initial findings are discussed below.

- Emotions and affect shape students' experiences and perceptions of BRs

Firstly, in relation to their emotion, feelings, attitudes and beliefs, participants expressed a degree of ambivalence towards BRs. While acknowledging the potential for interacting with peers, engaging in the lesson and the positive impact on their learning, participants also expressed feelings of boredom, lack of motivation and social anxiety. These findings are also reflected in recent literature with the suggestion that BRs do not 'magically create engagement and higher levels of learning' (Saltz & Heckman, 2020: 230) and indeed, the general lack of structure in BRs can lead to feelings of 'awkwardness', anxiety and boredom (McGrath & Wolstencroft, 2021; Whear, 2020).

- Students' moral and ethical judgements shape their experiences and perceptions of BRs

Findings from both the survey and the interview data reflect students' concerns with issues of fair and equal treatment in BRs, especially when the lecturer was not present. These concerns ranged from a sense of having their views judged negatively by peers to the unequal distribution of work for the group task. Indeed, this latter point aligns with other studies that indicate that while some students like the interactivity of BRs, other students dislike all forms of group work (Martin, Parker & Deale, 2012). Moreover, findings suggest that while participants felt that there was a chance for lecturers to observe the fair distribution of group work in a physical classroom, this was not possible behind the 'closed' virtual doors of BRs. Another related area concerned participants' right to privacy and not wishing to share personal space with unknown group members. Concerns for privacy with the non-use of cameras has also been noted in other studies during the COVID-19 period (Moorehouse, 2020). Additionally, the limited paralinguistic communication which results from the non-use of cameras in BRs has also been observed as a major barrier to effective interaction (Peachey, 2017).

- Social connectedness between students in BRs matters

Findings indicate that BRs have the potential to create a sense of connectedness between students with more than half of all participants stating that they met friends or got to know their classmates in BRs. Students' sense of learning in and through the presence of others offers a perspective of the BRs as a CoI (Garrison, Anderson & Archer, 1999). However, in terms of communication between students, findings suggest that while they could use different modes of communication in BRs (audio, video and text), there was a preference for audio and chat and that communication did not extend much beyond the task. While accessibility to different modes of communication is an important feature in any semiotic social space (Gee, 2005), the literature also suggests that effective interactions in BRs emerge from specific and structured tasks (Saltz & Heckman, 2020). Moreover, communication between students was also impeded by the presence of group norms. Apart from wanting to protect their privacy, participants also stated they did not use their cameras because no one else did. On a positive note, findings also highlight the opportunities BRs offered for re-engagement with learning. Other studies also show that when students record periods of boredom in the main online session, participation in BRs allow them to re-engage with the lesson and each other (Chandler, 2016). However, these findings also reveal for some students there is a general lack of motivation to participate in online teaching during this COVID-19 period. Indeed, the mental health pressures associated with constant exposure to online meetings ('zoom burnout') and the inability to disconnect from work and studying are also documented in recent literature (Martins, 2020).

- Pedagogical strategies and approaches shape students' experience and perceptions of BRs

Findings indicate that for most participants, BRs were a typical feature of online classes and their expectations mostly aligned with their experiences of using BRs, involving small groups of two to five students for periods of 10 to 30 minutes. While many participants expressed the preference for selecting their own group rather than being randomly assigned to groups by their lecturers, this rarely occurred. The impact of group formation in BRs on student satisfaction and learning is just now beginning to be explored (Bamidele, 2021; Wang & Tokiwa, 2021). Students also expressed their belief that BRs worked better for some courses, such as English and Computer Science than for other subjects and the value of using BRs for teaching languages and computers is also emerging in the literature (Gruber & Bauer, 2020; Li *et al.*, 2021). Findings also indicated a preference for practical activities with specific instructions and the literature also reflects learners' preference for scripted structured-pair activities (Saltz & Heckman, 2020). Finally, findings also indicate that students felt the regular presence of the teacher was important as a way to monitor participation, explain the task and offer support; however, the nature and degree of teaching presence in BRs is not investigated in this study and should be further explored.

Similar to previous studies (Chandler, 2016), this study suggests that BRs offered some participants the opportunity to develop their content-knowledge and student identity through peer-to-peer interaction. However, findings also suggest that some participants were ambivalent about the potential for BRs to support their learning, help them understand the lesson better and make the lesson more interactive and it might be that the principles and practices that promote interaction and active student learning in BRs (Gilmour & Compton, 2020; Law & Lambie, 2021) are not well-understood by their lecturers. Indeed, lack of skill and tutor confidence have been identified as major barriers to the effective use of BRs (Chandler, 2016).

- Technological access shapes students' experience and perceptions of BRs

Finally, findings indicate that most participants did not experience technical difficulties. This might be because this was the second semester of online learning and students had gained sufficient experience in the previous months. However, the few issues that were experienced related to students' own devices, their own unstable internet connections and the functionality of the interface (e.g. not having reminders of the task, difficulties navigating, sharing and importing sources). Again, the literature also reflects these challenges and barriers to engagement (Martin, Parker & Deale, 2012).

6. Conclusion

To conclude, this study set out to investigate university students' experiences and perceptions of BRs as part of their synchronous online courses during the COVID-19 crisis. Findings indicate that to varying degrees, students' experiences and perceptions of breakout rooms during this period were impacted in five key areas: (1) emotional/affective, (2) moral/ethical, (3) social, (4) pedagogical and (5) technological. These findings suggest that students' personal feelings and attitudes towards online learning and the use of BRs, their sense of connectedness to their peers, their expectations of BRs in relation to the impact on their learning and the role and presence of the lecturer, and issues relating to technology, were all considered to be significant factors in how students experienced and perceived their online learning.

From this ongoing study, several areas for future investigation are highlighted. The first area is the need to develop a multidimensional model of online learning and teaching that extends beyond a narrow model based on the pedagogical, content and procedural knowledge and skills. Such a model has its roots in humanistic learning theories (Johnson, 2014) and highlights the importance of the affective, moral and social dimensions of the student experience in online learning. In relation to this multidimensional model is the new awareness that teaching in crises requires a refocusing of professional knowledge to support student identity, emotional wellbeing and resilience. In addition, this study highlights teachers' use and learners' responses to the use of breakout rooms, a feature of video conference platforms, designed primarily for professional rather than educational contexts. It is hoped that the continuing development of this technology along with professional training and academic research will enable teachers to develop and share best practices.

In considering these initial findings, the limitations of the study should also be acknowledged. This is an exploratory study based on purposive sampling and, as such, these findings are not necessarily representative of the whole university population; nor may these findings be generalizable outside this specific context. However, in this ongoing study, preliminary findings highlight the barriers and challenges, as well as the opportunities of BRs for learning. It also invites teachers using BRs to consider the strategies and approaches they employ (e.g. group size and formation, frequency, duration, subject-specific classes, task choice, role of cameras, strategies for motivation etc.) and their impact on student learning. It is also important that teacher educators consider the role of such tools in online learning not solely as a substitute for the physical classroom, but as a way to redefine it. We hope that this study offers initial insights for educators in higher education who wish to use, modify and/or

adapt synchronous online teaching to incorporate collaborative learning tools such as breakout rooms.

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Appendix: Online survey

1. What gender do you identify as?
   o   Woman
   o   Man
   o   Non-binary
   o   Prefer not to say

2. How old are you?

3. What level of education are you currently studying?
   o   Certificate, Diploma
   o   Bachelor's
   o   Master's
   o   Other

4. What is your registration status?
   o   Full-time
   o   Part-time

5. What is your current year of studies?
   o   Year 1
   o   Year 2
   o   Year 3
   o   Year 4
   o   Other

6. This semester, how many of your courses are fully online?
   o   0 courses
   o   1 course
   o   2 courses
   o   3 courses
   o   4 courses
   o   5 courses

7. Have you used Breakout Rooms in any of your online classes?

- o   Yes
- o   No
- o   Not sure

8. Did your lecturer explain how to use Breakout Rooms?
- o   Yes
- o   No
- o   Not sure

9. In a typical week, how often do you use Breakout Rooms as part of your online classes?
- o   Never
- o   1-2 times per week
- o   3-4 times per week
- o   5 or more times per week

10. Do you ever have a chance to choose your group members for the Breakout Room?
- o   Yes
- o   No
- o   Sometimes

11. In your last experience of Breakout Rooms, approximately how many students were in your group?
- o   2 - 5
- o   6 - 10
- o   More than 10

12. What types of activities have you worked on in Breakout Rooms? (please tick any that apply)
- o   Generating and sharing new ideas
- o   Discussing a question/ topic
- o   Reading a text
- o   Answering questions
- o   Writing/ editing a document
- o   Collaborating on a group project
- o   Watching a video
- o   Searching for information
- o   Other

13. Do you typically turn on your camera in the Breakout Room?
- o   Yes
- o   No
- o   Sometimes

14. If you answered 'No' for question 13, briefly explain why not.

15. Have you ever experienced technical difficulties in the Breakout Rooms?
- o   Yes
- o   No

16. If you answered 'Yes' for question 16, briefly describe the technical difficulties

17. Approximately, how long do you typically spend in the Breakout Room session?
- o   Less than 10 minutes
- o   10 minutes to 30 minutes
- o   More than 30 minutes

18. Typically, do you participate in the activities in Breakout Rooms?
- o   Yes
- o   No
- o   Sometimes

19. What is your preferred method of communication with other students in the Breakout Room?

- o   Speaking
- o   via Chat (writing)
- o   Both

20. Describe any other challenges you have experienced in Breakout Rooms

21. Rate your level of agreement with the statements below.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Working in Breakout Rooms allows me to exchange ideas freely.					
Working in Breakout Rooms allows me to get to know my classmates.					
Working in Breakout Rooms makes me feel part of a student community.					
I receive support from other students in Breakout Rooms.					
Working in Breakout Rooms motivates me to learn.					
Working in Breakout Rooms makes me feel anxious.					
Working in Breakout Rooms bores me.					
Working in Breakout Rooms helps me understand the lesson better.					
The quality of the Breakout Room experience depends on the individual lecturer.					
Breakout Rooms make lectures more interactive.					
In my experience, most students participate in the Breakout Room activities.					
The success of the Breakout Rooms depends on the motivation of students.					
The success of the Breakout Rooms depends on the type of task.					
The success of the Breakout Rooms depends on the course.					
The success of the Breakout Rooms depends on the relationships between the students.					
The success of the Breakout Rooms depends on the number of students in the group.					
In my experience, time spent in Breakout Rooms is well spent.					

22. Please add any additional comments that will help lecturers improve the use of Breakout Rooms during online classes.