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Students engage with and benefit from active learning when this is appropriately embedded in curriculum design

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Abstract

The present investigation sought to evaluate the influence of active and blended learning approaches to teaching on student engagement, learning gains, confidence, and sense of belonging in their psychology course. Two-hundred and eighty-four undergraduate and taught postgraduate psychology students took part in an online survey examining their perspectives, experiences, and barriers to engagement with teaching and learning approaches in their course. The survey included a range of closed- and open-ended questions. Findings from our qualitative content analysis of the open responses provide evidence that students experience some benefit from active learning, as opposed to more traditional didactic methods often seen in large cohort courses. Benefits are qualified, however, by the extent of active learning and how it is presented. Our work, therefore, points towards some considerations on how active learning can be embedded within a technology-enhanced curriculum to support student engagement and learning experience.

Keywords

active learning, blended learning, curriculum design

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Introduction

The design of the learning environment can play an important role in the student learning experience and includes elements such as teaching and learning practice, teaching and learning spaces, and the role of technology in supporting learning inside and outside the classroom (Radcliffe et al., 2008). Within the context of teaching practice, mode of delivery has shifted from the more traditional didactic paradigm, where the focus is primarily on content delivery by the lecturer, to more active approaches where students actively engage with and construct knowledge (Bonwell & Eison, 1991). Recently, universities have also seen a move towards more blended approaches to teaching and learning (Maguire et al., 2020). Blended learning has been defined as "teaching and learning that combines in-person delivery and delivery in a digital environment" (Office for Students, 2022, p. 2) and "a combination of face-to-face learning and dynamic digital activities and content" (Beetham & MacNeill, 2023, p. 12). According to Jisc, a "well-developed offering programme of blended learning can enhance the student learning experience, potentially improve student outcomes, widen participation, improve accessibility and inclusion" (Jisc, 2020). Students have shown a preference for a flexible pedagogy including a combination of online resources and physical learning spaces that support interactivity between learners and this can have positive effects on students' learning experience (Valtonen et al., 2021). Blended learning environments can, however, pose some challenges for community building among learners and staff (Jisc, 2020).

Given this shift in how we design teaching and learning practices in higher education, we need to consider what the impact of such approaches may be for the learning experience, from the students' perspective. This study seeks to collect evidence on the impact of active and blended learning approaches on student learning, engagement, and sense of belonging, and what potential barriers or challenges might students face with engaging with their learning. Gaining an understanding of students' perceptions and experiences can help to develop interventions in the design of inclusive teaching and learning practices and to support student engagement (Cooper et al., 2017; Graham et al., 2023).

Developing inclusive teaching practices: Active learning and blended learning

To engage and support the learning experience and expectations of our diverse student cohorts, strategies have been documented in the literature with the aim of developing an inclusive learning environment for all. Inclusive teaching practices are student-centred and support the success of our diverse student population by providing equal opportunities through a variety of approaches for access, engagement, and participation in their learning (Johnson, 2019). These include teaching strategies inside and outside the classroom, such as active and blended learning approaches, which is the focus of the present investigation.

Active learning encompasses a broad range of approaches that involve students actively engaging with content and constructing their knowledge on a specific topic (Bonwell & Eison, 1991). This, in turn, facilitates higher order thinking and supports students in developing key skills, such as critical thinking, communication, collaboration, and problem solving. Such approaches can range from providing opportunities for student input through audience response tools at regular intervals in the classroom to completely restructuring class time to facilitate a particular method such as problem-based learning. Active learning can involve learners engaging in activities individually and in groups (e.g.,

think-pair-share activities, small group discussions, problem-solving tasks). Peer learning involves students working together to share ideas and perspectives, engage in problem-solving, debate, and collaborate to achieve a common goal (Johnson & Johnson, 2008) and this has been linked with positive outcomes on learning, as well as facilitating the development and maintenance of a sense of belonging in a course context. Active learning approaches have been associated with higher learning gains amongst learners (Deslauriers et al., 2019; Freeman et al., 2014) and reduced achievement gaps between students in ethnic minority and non-minority groups (Theobald et al., 2020) in STEM disciplines. As such, active learning pedagogies reflect inclusive learning practice in comparison to more traditional methods of teaching (Dewsbury & Brame, 2019; Gin et al., 2020).

Ballen et al. (2017) investigated the effects of active learning versus traditional teaching approaches on students' academic outcomes, self-efficacy, and sense of belonging in an introductory STEM course at a university in the United States. Findings from this study showed that engagement with active learning approaches led to an increase in sense of belonging for non-underrepresented minority students and served to close performance gaps between ethnic minority and non-minority students. Structured active group activities led to increased self-reported confidence in scientific ability and belonging. These findings demonstrate that promoting active learning, such as in the form of collaborative problem solving, can positively impact the student learning experience.

Other studies, however, report that students may feel that they are learning less in comparison to more traditional approaches, which may be due to the perceived increased cognitive effort associated with active learning (Deslauriers et al., 2019). Other literature suggests that the way in which active learning approaches are embedded in the classroom, particularly with regards to student participation and social interactions, may create challenges for students who are typically underrepresented in science, including students with anxiety and disabilities (Gin et al., 2020). Factors contributing to increased anxiety in an active learning environment include fear of negative evaluation in the classroom (Downing et al., 2020) and being called on to answer a question, as opposed to working in groups or individually completing activities or participating through the use of technology (England et al., 2017). These findings suggest that, although active learning can have a positive impact on student learning, the approach taken to embed such pedagogies in the classroom can also have an impact on student engagement and learning gains.

Active learning and classroom participation have also been shown to influence students' sense of belonging in their course (Andrews et al., 2021; Ballen et al., 2017; Masika & Jones, 2015). A positive and supportive classroom environment is key to an effective and inclusive learning environment (Freeman et al., 2007) that can have the potential to promote students' sense of belonging (Dewsbury & Brame, 2019). In turn, a sense of belonging within a course community can help learners to see the value in participating in classroom activities and increase perceptions of self-efficacy associated with engaging with such activities (Zumbrunn et al., 2014). Lecturer-student interaction as well as peer-to-peer interactions, through peer collaborations and peer learning tasks with opportunities to learn from and support each other, can contribute to a positive classroom experience (Kirkby & Thomas, 2021; Solomon et al., 2020). Given that sense of belonging has been linked with course satisfaction, retention, wellbeing, and engagement

(Chemers et al., 2011), it is therefore, important to identify teaching practices that may encourage or hinder students' perceptions of belonging within their degree course.

Embedding active learning approaches within a blended learning environment: The case of flipped learning

One approach supporting the design of active learning classrooms that has received increased attention in the literature in recent years is the flipped classroom approach or flipped learning, a form of blended learning. Within the context of this pedagogical approach, direct instruction takes places outside the classroom through the use of digital tools, and learners engage with the content material in their own independent time, thus, enabling flexibility in learning. The classroom environment is then transformed into an interactive, active learning space where learners are given opportunities to engage in activities which require them to apply content to practice (Fisher et al., 2018). Flipped and active learning approaches often incorporate digital technology inside and outside the classroom, to engage students with content and provide a means for participating in meaningful activities (O'Flaherty & Phillips, 2015).

Flipped learning has received mixed results in the literature. Proponents of this approach suggest that this provides a flexible means to learning, where students can engage with the material at their own pace, freeing up class time for classroom discussion, group work, problem-solving activities, and opportunities for formative assessments and feedback on learning and progress (O'Flaherty & Phillips, 2015; Zain & Sailin, 2020). This approach would also enable students to manage their learning and cognitive load, and the opportunity to engage with and process information in a flexible way ahead of in-class activities, which may be particularly relevant for individuals with learning disabilities (Abeysekera & Dawson, 2014; Akcayir & Akcayir, 2018). On the other hand, this approach places responsibility on students, as it requires engagement with out of class materials in preparation for engagement with in-class activities (Hao, 2016; Kim et al., 2014), with studies reporting reduced engagement with pre-session activities. This can also raise questions about students' access to learning materials outside the physical institution, as students may be affected by lack of appropriate digital technology for independent study or may be living in more rural locations where internet connection may be less reliable and thus may find this expectation challenging. Given the utility of flipped learning pedagogy in higher education, it is important to understand the potential impact on students' learning experiences.

Present investigation

Learners may not all benefit from the same approach to teaching and learning, with individual differences influencing perceptions and experiences. This highlights the importance of inclusivity in the design of effective curricula and the classroom environment. Measuring student outcomes, in terms of performance, is one way of assessing effectiveness of teaching approaches (Freeman et al., 2014). Considering perceptions and experiences of learning, from the students' perspective, can also offer key insights into preferences, concerns, and potential barriers to engagement for learning (Dewsbury & Brame, 2019). Therefore, in taking a student-centred approach to curriculum development and teaching practice, it is important to capture such narratives which can have a positive impact on our target population (McMillan & Chavis, 1986). Pedagogy should be developed in partnership between students and educators, with the student

voice being instrumental in the design of inclusive curricula and teaching and learning practices (Bovill et al., 2011).

The present study, therefore, aims to capture the student voice through open-ended survey questions to assess the impact of adopting active and blended learning approaches on student learning, engagement, and sense of belonging, and to identify ways of overcoming potential barriers to engagement. The focus here is on ways of embedding active and blended learning approaches in the context of large class sizes, which is often characteristic of STEM courses in higher education. As such, the present investigation will address the following research questions:

1. What is the impact of active and blended learning approaches on students' engagement with their learning, their learning experience, and sense of belonging in their course?
2. What barriers and challenges are students faced with in engaging with active and blended learning approaches to teaching?

Method

Participants

Participants were recruited from large student cohorts in two undergraduate and one taught postgraduate psychology courses in a UK-based university, over two academic years. Participants were recruited through university online forums, email and social media in exchange for research participation credit or entry into a prize draw to win one of twenty £10 e-gift vouchers. Typical intake in these courses include around 250-350 students on the undergraduate courses and around 100-150 on the Psychology (conversion) postgraduate course. Students are from predominantly White, middle-class backgrounds.

Two-hundred and eighty-four students completed an online survey between March 2022 and March 2023, investigating their perspectives and experiences on teaching and learning approaches in their course. Participants' ages ranged from 18 to 37 years (M = 19.53, SD = 2.42). 95% of the sample were UK-based residents from a predominantly middle class (70% with IMD centile > 5) background. Participant demographic information can be found in Table 1.

Table 1. Participant demographic information

Gender	Ethnicity	Learning difference or disability	Year of study
Female (92%)	White (80%)	Presence of learning difference or disability (11%)	UG Year 1 (n = 221)
Male (6%)	Black, Caribbean, Black British (6%)	Unsure (8%)	UG Year 2 (n = 32)
Non-binary (1%)	Asian, Asian British (8%)	None (81%)	UG Year 3 (n = 11)
Gender fluid (<1%)	Mixed ethnic background (6%)		PG taught (n = 20)
	Other ethnic background (<1%)		

It is important to acknowledge the demographic of our sample. The demographics captured in this sample are comparable to typical student cohorts in our undergraduate courses. The objectives of this study were to capture perceptions and experiences broadly, and we were not able to capture the voice of specific groups. It is also important to acknowledge the context of the COVID-19 pandemic and the role this has played in the students' learning experiences (Ali, 2020). 129 students participated in the year 2021-22, where participants experienced purely online learning at the start of the academic year, followed by a transition to in-person teaching in the second semester of that year. One-hundred and fifty-five participants filled in the survey in 2022-23, when learning was in-person, with flipped learning approaches adopted in some elements of their modules.

Methods

Ethical approval was granted by the School of Psychology Ethics Committee at the University of Nottingham (Reference: F1325). Participants were provided with an anonymous link to the survey, and all data were collected via the online survey software, Qualtrics, on which they provided informed consent and received debriefing information upon completion of the study. The first and third authors lead and teach on core modules in both psychology courses from which participants were recruited from and provide curriculum leadership provision in the School of Psychology. Participants were informed of the objectives of the research study and nature of survey questions prior to providing consent to taking part. Participants were also explicitly informed that participation was voluntary, they were free to provide as much or as little information as they felt comfortable sharing in the open-text responses or to leave blank any questions they did not wish to answer, as well as their right to withdraw from the study. The survey took about 15-20 minutes to complete.

Questionnaire design

The survey was designed by the first and third authors. The first and second authors conducted analyses of the data and all authors were involved in the interpretation and reporting of findings.

Background and demographic information

Participants were asked a range of demographic and background questions to capture ethnicity, gender, learning differences or disabilities, as well as socio-economic status through postcode of home address, the latter in relation to UK-based residents.

Views and experiences with teaching sessions

We included closed-ended questions to capture student engagement with active learning activities and attitudes towards active learning approaches. Participants were asked a series of Likert-type questions with five-point response scales to assess attitudes towards lectures adopting a more active learning approach; responses were averaged to develop a single measure of attitudes, with higher ratings reflecting a more positive attitude towards active learning approaches to teaching. A series of Likert-type questions with five-point response scales (Strongly disagree – Strongly agree) captured participants' views towards interactive activities in a teaching session (e.g., ' I found lectures that incorporated interactive activities to be engaging'), with some of the items adapted from Cavanagh (2011).

Students' experiences with interactive and didactic teaching and learning activities in the classroom and through the virtual learning environment (e.g., pre-session work) and feelings of belonging were captured through a range of open-ended questions.

Participants were asked to comment on any benefits or challenges they may have experienced with lectures adopting an active learning approach to teaching and those adopting a didactic approach. Participants were also asked about their experiences of any pre-session work set by the lecturer and any challenges they may have encountered with engaging with this approach. Participants were further asked about aspects of their learning environment which supported or hindered their feeling of belonging in the School of Psychology community. Open-ended questions used in the analysis can be found in the Appendix.

Descriptive statistics

The majority of participants in our sample (93%) reported having engaged in interactive activities in the classroom, and 7% reported that they either did not have the opportunity to do so or that they had the opportunity but chose not to engage. On average, 66% of participants reported positive attitudes towards active learning approaches to teaching. Participants' views towards interactive activities in a teaching session, based on a sample of 112 participants who responded to these closed-ended questions, are summarised in Table 2.

Table 2. Views and experiences with interactive teaching sessions

Statements	% of participants who agreed or strongly agreed with the statements
I found lectures that incorporated interactive activities to be engaging	85%
The activities have helped me to maintain interest during the lecture	80%
The activities have helped me to maintain attention during the lecture	80%
The use of interactive activities in lectures has supported my understanding of the lecture content	88%
The use of interactive activities in lectures contributed effectively to my overall learning of the subject	75%
Interactive activities improved my problem-solving, critical-thinking, or analytical skills	62%
I have found lectures which adopted active learning approaches challenging to engage in	27%
I would prefer to have fewer interactive activities in lectures	20%

Seventy-six percent of participants reported having engaged in pre-lecture work set by the lecturer, such as watching a video, or reading a resource. Of those who had engaged in pre-lecture work, 75% reported that they found it easy to engage with the tasks set, with 25% reported having found this challenging.

Data analysis

Data from the open-ended survey questions were analysed by means of qualitative content analysis, guided by the analytic steps outlined by Elo and Kingäs (2008). We

adopted an inductive approach, with the aim of gaining insights into students' experiences with their learning. The analysis comprised three phases:

1. Preparation. The first step in the analysis involved selecting and importing text-based responses to the survey questions into Excel for coding and reading through responses to gain familiarity with the data as a whole.
2. Organising phase. This involved coding participants' responses and developing subsequent content categories relating to our research questions. We adopted a realist/essentialist epistemological standpoint in the analysis of the data, where the focus of the analysis is on participants' experiences and meanings associated with those experiences (Braun & Clarke, 2006). The process of coding involved identifying data extracts in participants' responses relating to our research questions and providing a descriptive label (code); manifest coding was used, where codes reflected a semantic summary of participants' narrative. Once initial coding was completed, codes were collated, whereby duplicate codes or codes which represented the same idea conceptually but phrased differently were adapted to produce a final list of codes, each representing a unique idea in the dataset in relation to our research questions. Conceptually similar codes were then grouped into categories. Categories were reviewed and refined to ensure that each category was conceptually distinct with no overlap in ideas, and that the resulting categories captured the ideas in the coded extracts in relation to our research questions. Conceptually similar categories were grouped into an overarching theme, reflecting students' perceptions and experiences with their learning environment.
3. Reporting phase. Narratives were developed for each category. These are presented below, together with selected quotations from participants' responses.

Findings and Discussion

The present investigation sought to evaluate the impact of adopting active and blended learning approaches to teaching on student engagement, learning gains, confidence, and sense of belonging in their psychology course. Gaining the student perspective on experienced benefits and challenges associated with different teaching approaches can inform the development of recommendations for practice in the design of inclusive learning environments and overcoming barriers to engagement for students. Findings from our study provide evidence that students benefit from active learning, as opposed to purely traditional didactic methods often seen in large cohort courses, and point towards some considerations on how active learning can be embedded in the curriculum to support students in overcoming barriers to engagement and learning experience. We discuss these findings below, together with recommendations for practice.

One overarching theme was developed in the analysis, Design for learning, engagement, and belonging, with four content categories: (1) Engagement in active learning is associated with learning gains, (2) 'It's all in the way in which active learning is embedded in the curriculum', (3) Facilitating collaborative learning, and (4) Fostering a sense of belonging through the design of teaching and learning practice. These categories together with the full list of corresponding codes can be found in Table 3.

Table 3. Theme and categories developed in the analysis

Design for learning, engagement, and belonging	Engagement in active learning is associated with learning gains	• Interactive activities enable critical thinking • In-class activities, such as short quizzes, provide opportunities for self-assessment and self-regulation • In-class activities (e.g., MCQs) offer opportunities for instant feedback on understanding and clarifications • Applying knowledge facilitates deeper understanding by contextualising content • Embedding active learning techniques supports assessment preparation
	'It's all in the way in which we embed active learning in the curriculum'	• Embedding short activities at regular and appropriate intervals within a didactic session supports engagement, focus, and learning gains • Voicing perspectives openly in a large class can act as a barrier to engagement • Use of audience response tools can facilitate engagement in classroom activities • Clear communications around value and relevance of active learning techniques in learning as a motivator of engagement • Clear communications around expectations of engagement in in-class and out of class activities is key • Guidance around completing in-class activities to support engagement and learning gains • Consideration of the design of interactive activities in terms of nature and timing can influence engagement • Pre-session work within a flipped classroom setting can pose challenges for workload management and content engagement • Nature of activities in pre-lecture work can facilitate engagement and acquired benefits for learners • Mode of delivery to be clearly explained at the start of the module or course • Pre-session work needs to be clearly set and communicated in advance to avoid confusion • Pre-session activities can be useful to introduce a topic and aid with lecture preparation

	Facilitating collaborative learning	• Active learning approaches can facilitate peer learning • Group-based tasks in the classroom can expose students to diverse viewpoints on a topic • Small group discussions in the classroom can enhance confidence in voicing own opinions • Group work can pose challenges in a classroom setting as a function of social anxiety and social interactions • Negative perceptions around effective knowledge exchange in peer groups
	Fostering a sense of belonging through the design of teaching and learning practice	• Small group sessions facilitate development of belonging • In-person teaching sessions facilitate meeting course peers and community building • Opportunities for interactions in large classroom can facilitate belonging • Lecturers' approach and engagement play an important role in feeling as part of course community

Design for learning, engagement, and belonging

This theme captures students' experiences and perceptions around the ways in which active learning approaches are embedded in teaching and learning practice and how this can influence learning gains, facilitate and address barriers to engagement, and contribute towards developing a sense of belonging amongst learners.

Engagement in active learning is associated with learning gains

Survey responses demonstrate that students respond positively overall to opportunities for active engagement in their learning and experience learning gains. Engaging in active learning offers students the opportunity to self-assess their understanding and regulate their learning accordingly. As one participant commented, "[…] it gives you time to reflect on what you have learnt so far and what you need to spend more time working on" (Participant 55), with participants benefitting from the immediate feedback they receive from activities in-class, such as in the case of multiple-choice quizzes (MCQs) via audience response tools. Students reported that they feel more prepared for assessments, as engaging with common active learning tasks such as MCQs, small group discussions and demonstrations, makes the content more memorable in comparison to more passive, didactic approaches, and further enables students to learn what to expect for the assessment. Engaging in interactive tasks also enable students to apply content to practice, facilitating deeper learning (e.g., "Discussions around concepts applied to real life examples – engaging with others and hearing different opinions, seeing how concepts relate to real world, and understanding nuance of situations that sound clear-cut in lecture", Participant 109).

Active learning techniques provide students with opportunities to engage in more critical thinking about the content. This was particularly linked with discussion-based tasks which were then followed with sharing ideas with peers in class through the use of digital tools. For example, one participant noted, active learning "really engages individual critical thinking rather than just typing up notes and not internalising the content" (Participant 19). Thinking about the content critically allows students to engage with the topic on a deeper level, providing confident understanding of the topic (e.g., "being able to apply knowledge to real-life scenarios allowed more confidence in my knowledge, as I felt I had a more secure and deeper understanding of the topic", Participant 17). These findings add to the body of literature demonstrating learning gains through engagement with active learning (Ballen et al., 2017; Deslauriers et al., 2019; Freeman et al., 2014). Active learning methods within STEM, which focus on problem-solving and peer interactions, provide opportunities for developing or demonstrating key 21st century competencies (Kember & Leung, 2005; Lavi et al., 2021), such as critical thinking. Students often experience challenges demonstrating critical thinking in their written work (Forbes, 2018) however our findings indicate the benefits of engaging students with active learning approaches, such as discussion-based tasks, as a means by which opportunities to engage in critical appraisal of content can be embedded in the curriculum.

'It's all in the way in which we embed active learning in the curriculum'

This category encapsulates students' perceptions on how the mode of content delivery and student interaction with content can act as a facilitator for engagement and confidence in participating in learning activities. Our findings suggest that the method of embedding active learning in the curriculum should be chosen carefully to help facilitate engagement and learning gains. To do this, it is vital to understand students' perceptions around benefits relating to different modes of content delivery, workload, and time management.

Interactive activities embedded meaningfully at regular intervals support engagement

Whilst acknowledging the benefits of opportunities to actively engage with course material, responses suggest that a balance between didactic and active approaches to learning can be particularly helpful in encouraging engagement and supporting learning, where interactive activities are meaningfully embedded at regular intervals within a 'lecture-based' session. For example, one participant noted, "The lecturer had pre-written questions on a [audience response tool] which we answered throughout the lecture when it was the relevant section [...] we were given enough time to communicate with peers, the questions were interesting and thought-provoking [...] fun but engaging activity which broke up the lecture [...]" (Participant 7). Students felt that they receive more content with didactic approaches, but that interactive activities embedded within appropriate intervals help students to maintain their focus and attention (e.g., interactive activities offer " [...] a break from listening to a monologue of information that some people struggle to concentrate on for long periods of time" (Participant 24), whilst others felt that they are still "doing something proactive" (Participant 119) in the teaching session. These findings highlight the benefits of adopting a blend of 'lecture' and interactivity in teaching sessions, helping to address some of the challenges associated with a primarily didactic approach, such as the negative impact on focus and motivation as identified in our sample, whilst facilitating student interest and participation.

Use of digital tools to support confidence and engagement in active learning

The way in which activities are designed to capture students' input in large class sizes can be a barrier to participation. As one respondent articulated, "the most challenging part of more active learning is my level of confidence when [...] students are expected to verbally respond" (Participant 6). To overcome participation barriers, findings highlight a preference and positive experiences around the use of digital technology to support engagement in classroom activities. Using audience response tools to deliver activities benefit students in terms of sharing perspectives among peers on a particular topic (e.g., "[...] when we are set a task using [an audience response tool] where we talk as a group and then put our ideas onto the [audience response tool], which the lecturer then talks through, as well as adding their own ideas [...] this method [...] gives me new ideas about topics and lets me think about things that I wouldn't have necessarily thought about", Participant 9). This, further, provides students with opportunities for anonymous participation, thereby, relieving the pressure of speaking out publicly (e.g., "[audience response tool] interaction works well as it is anonymous so there is no anxiety submitting responses and it gives a chance to hear everyone's ideas", Participant 224).

Creating a learning environment where learners feel comfortable and confident in voicing their opinion can contribute towards building an inclusive classroom. Our findings suggest that providing time for students to think about an activity and to formulate their response (Tanner, 2013), providing prompts and clear instructions on how students are to engage with and respond to the task (e.g., timing, how to share their views in class; Penner, 2018), and providing different means of engaging in discussions and voicing their opinion in a group context can help to increase engagement and learning benefits for students (Gin et al., 2020).

Clear communications and guidance around value, relevance, and expectations for engagement are key for success

Our findings indicate that tasks encouraging active learning in the learning environment, whether online (e.g., via flipped learning) or in a live session, are deemed manageable if they are well-communicated, perceived as relevant and helpful in students' learning and the assessment, and not too burdensome, in terms of time management and cognitive demand. In particular, clear communication around work set, expectations, alignment with learning outcomes, and relevance in the broader context of the curriculum can support students in navigating their learning and engaging with curriculum activities.

Participants communicated that active learning tasks were seen as less valuable when the relevance to their learning, the learning outcomes of the topic and the assessment was unclear, with some students commenting that this would have an impact on their engagement. One respondent commented that if it's an "hour of just purely active lesson, no one will show up as they see it as pointless" (Participant 99), with further responses highlighting where students perceive that "active learning was not thoughtfully put in" (Participant 23), this can have an impact on the pace of the lecture or interactive tasks potentially deemed "distracting if not really relevant and useful" (Participant 269). Responses also reflect perceptions around how interactive activities are embedded in the classroom. For example, one participant commented "1 hours worth of materials gets crammed into 40 minutes when we do 20 mins of activities" (Participant 172) illustrating that sometimes lecture content can feel rushed if space is created within the lecture for interactive activities.

Our findings suggest that any one approach to active learning is not considered superior or more beneficial to students in comparison to others. What came out of the analysis was that students benefit from each type of approach or activity depending on how each may align with the learning outcomes and relevance to the content and the assessment. This aligns with previous studies which show that students will typically respond positively to interactive activities promoting active learning if they are perceived as meaningful, directly and clearly linked with learning outcomes and the assessment, and are appropriately challenging (Brame, 2016; Lumpkin et al., 2015). Our findings illustrate that short activities interspersed within a session can serve the benefit of increasing familiarity with that particular type of assessment, opportunities for self-assessment and immediate feedback, and opportunities to apply knowledge to practice. Group work and discussion-based tasks, with the support of audience response tools, create an inclusive way to engage students in critical thinking, deeper thinking of a topic, and sharing varied perspectives around a particular concept. In fact, prior literature shows that embedding multiple and very structured activities in the classroom which encourage active learning can offer benefits to all students, with the greatest impact on underrepresented minority students (Haak et al., 2011).

Participants also commented on the importance of clear communication around the expectations for both the lecturer and students from the outset. This includes information on teaching activity and content engagement within a module so that students have a clear understanding of how they are expected to engage with content inside and outside of the classroom. For example, one participant commented "keeping on top of the pre-lecture work was challenging at first, especially because I felt like it wasn't addressed in the introduction meeting when talking about the structure of the course" (Participant 111), whilst another noted "I have sometimes found that some pre-lecture work is not well shown on Moodle, so I do not see it before the lecture" (Participant 268). Lack of clarity perceived by students around pre-lecture work was found to negatively impact engagement and learning experience within a teaching session (e.g., "It was not always clear when we were supposed to have done pre-lecture work, which made some of these sessions less helpful than they could have been", Participant 105).

Clarity and guidance were also deemed important within the context of in-class interactive activities. Some participants felt that certain types of activities "are quite difficult tasks that people struggle to interact with as there is little guidance on how to complete [them]" (Participant 119), with large group settings potentially posing challenges in terms of students obtaining further guidance and clarification in relation to the activity (e.g., "due to large lecture groups, it can be hard to get clarification on them", Participant 4). Together, these findings suggest, that considerations around the design of in-class activities should be made, particularly in relation to guidance around how students can engage with the activities and offering a variety of means for students to input their thoughts and gain further clarification on task requirements, particularly within the context of a large classroom setting.

The structure, duration, and workload commitment associated with interactive tasks can influence perceived benefits and engagement

Engagement and benefits of interactive activities were at times lost if students felt they could not complete them due to time restrictions. For example, one participant commented "Sometimes there is not enough time to complete [audience response tool] tasks during lectures and so the activity becomes very rushed" (Participant 146), whilst

another mentioned "Little direction of what should be discussed, and too much time given for the task to be completed" (Participant 100), which can lead to reduced engagement with the actual activity. Guided activities broken down into smaller tasks with opportunities for student input and feedback from the lecturer or wider group may tackle some of the challenges we report, particularly in terms of students losing interest and motivation in longer activities. Responses in our survey also indicate that some students may view interactive activities as an add-on, rather than an integral part of learning activities relating to a given topic, suggesting that delivery of content is often sacrificed to create space within a session for active learning. These findings point towards considerations around structuring sessions where interactive tasks are planned in terms of timing and clear alignment with learning outcomes. For successful development of inclusive, interactive curricula, the importance of staff endorsing active learning approaches and having the necessary competencies, or willingness to develop related competencies to embed such approaches in their teaching and learning practice, must also be highlighted.

While students generally wrote positively about activities encouraging active learning in the curriculum more broadly, a significant apprehension about managing workload and time were evident, and this was primarily related when module design adopted a 'flipped classroom approach'. In terms of positive aspects of this approach, students reported finding this approach helpful in supporting their learning, for example, in terms of introducing a new topic (e.g., "[pre-lecture tasks were] very straightforward and gave some insight into the material/topic we were covering", Participant 207), helping them prepare for a session and process content-related information ahead of a live class (e.g., "I watched a video and made notes […] This helped me have a basic understanding to the topic, and therefore I found the lecture easier to follow", Participant 71; "[…] all pre-lecture work […] has been really helpful because it has given me a sense of what we'll be covering in the sessions so I'm not thrown in at the deep end", Participant 2).

On the other hand, participant responses provided some insights relating to the negativity around experiences with flipped learning. This is often associated with increased workload by students, who often struggle to incorporate this in their independent learning time, leading to low levels of engagement. As one participant commented, "it was hard to have motivation to do pre-work. Sometimes the additional activities took multiple hours longer than the lectures, which made it hard to complete them and all other module content in a given day" (Participant 12), whilst others commenting that the expectations around this feel unrealistic. Students showed a preference for visual learning resources such as short videos introducing students to a specific topic, rather than reading tasks as a pre-session activity. As one participant commented "[short videos helpful to] understand the basic/core knowledge before going into more detail in the lecture" (Participant 208). As well as contextualising the content, video tasks were usually briefer and more straightforward than traditional reading comprehension tasks, helping alleviate the challenge of balancing a perceived high workload and cognitive load (e.g., "sometimes readings were hard to understand if we had not been taught the basic premise of the topic first", Participant 93).

Responses in our survey indicate, in line with previous literature (Masika & Jones, 2015; Pye et al., 2015), that students often experience challenges engaging with pre-session material or activities due to lack of clarity or information around when this is set and what students were expected to do, particularly when the mode of teaching varies within

or between modules in their course. A lack of a clear understanding of the requirements and expectations around engagement with flipped approaches can be a challenge and real barrier to engagement among students, with findings suggesting that learners may require some support right at the start of delivery of a flipped classroom approach with understanding the objectives and intended benefits, and key requirements of a potentially novel approach in their learning journey (Fisher et al., 2018; Mason et al., 2013).

Other findings suggest that students may view the expectation for personal responsibility of their own learning outside the classroom negatively (Wilson, 2013). Given that some students seem to benefit from flipped learning and the opportunity this provides for engagement with materials ahead of a session, and freeing some time in the live session for interactivity, considerations need to be made on how such approaches can be best implemented in practice to support learning, workload management, and engagement. In particular, present findings highlight the importance of considering the amount and type of pre-lecture work given to students in a flipped classroom setting. Our findings suggest that short video resources are typically seen as easier to engage in as opposed to reading material, before a topic is formally introduced and covered live in class. Our findings further suggest that the perceived and actual amount of time a pre-session task takes can also influence motivation towards engagement. It can, therefore, be argued that where a given live session is scheduled for a specific amount of time, considerations should be made in relation to whether some of the content can be taken away or replaced by an activity. This can ultimately reduce the burden of prolonged engagement with content for a particular course or module, where student motivation and time management are often spread between several simultaneous course demands. Our findings around low engagement with pre-session work echo challenges reported in the literature within this type of teaching approach (Hao, 2016; Kim et al., 2014).

It is possible that learners will not engage with the online materials ahead of a session for various reasons, therefore it is imperative that a plan is in place to support students who may have a genuine interest in coming in prepared but may not be able to do so on a given occasion. An example may include a brief re-cap at the start of the live session in the form of a short quiz delivered via digital technology, or a brief group task to summarise and highlight key learning. This would not only serve as a revision for students who have engaged, with opportunities to clarify online content, but it can also help in filling-in potential gaps for students who have not engaged. This will also likely motivate attendance and engagement in the live session. Communicating the learning outcomes of a given teaching approach and potential benefits that students can acquire through engagement with the different elements, should nevertheless remain a priority.

Facilitating collaborative learning

Active learning approaches can facilitate collaborative learning, which students identified as a key aspect of their learning experience. Participants wrote about opportunities for peer discussions as a means to support their learning. As one student explained, "I like being able to discuss the lecture content with my peers during class discussions as it often gives me new, different ideas that I would not have thought of myself" (Participant 9). Learning about other students' perspectives on a given topic supported students in developing confidence in expressing their own ideas (e.g., "more confident to put forward further ideas", Participant 89) and also provided opportunities for peer learning. For example, one participant noted, "discussion allows new ideas to flow in or for your

partner to help explain something the lecturer said that you don't understand" (Participant 205).

Whilst identifying benefits of peer learning, group work can also pose challenges for students. A number of participants found interacting in this context challenging, especially as it could "sometimes be quite awkward as not everyone was comfortable sharing their thoughts and opinions in front of others" (Participant 258) and "having the confidence to become involved in larger groups" (Participant 151). This was particularly prominent when students were new and more nervous, as they found it daunting to "get the ball rolling" (Participant 281) and speak up in front of people they did not know. Similarly, group activities were sometimes hard to participate in, as one student noted, "it does not always work if you sit next to people [who] might not be willing to participate, or you might not be sitting near anyone, which can be awkward since everyone is talking except you" (Participant 24).

Some participants also shared negative perceptions around the capacity for effective knowledge exchange within a group of peers, with one reporting, "I haven't found that discussing lectures with other students really helps me to learn things THAT much - it's more like sharing ignorance" (Participant 84). This demonstrates that students may feel that as they are at the same level of understanding the content as their peers, they are not benefitting in the same way as through the 'expertise' of the lecturer and may be passing on incorrect ideas.

Collaborative learning can provide beneficial opportunities for peer engagement and sharing of diverse perspectives, the success of which depends on the willingness and confidence of the students involved. Therefore, teaching staff should carefully plan and facilitate activities using this learning approach to mitigate anticipated challenges. Group work can have profound benefits for learners, in terms of enhancing communication, problem-solving, and team working skills. Communicating the learning outcomes of group tasks to learners can offer a way of articulating the potential benefits of this approach. Our findings suggest that considering how a group task is designed, particularly in a classroom setting can also influence engagement and gained benefits. We must acknowledge that this setting may pose some challenges for some specific individual learners, linked to their demographics. This may relate to social anxiety and challenges around social interaction. Openly providing opportunities for students to complete a given activity either as a small group, in pairs, or individually may help to address individual preferences. Further, our findings suggest that designing a group task in a way that fosters individual voice to be included and shared within the larger group is likely to enhance engagement and learning benefits for group members. This can be achieved by allocating specific roles and ways in which individual voice can be communicated, and clear expectations on how as a group, discussed and negotiated outcomes can be shared within the larger classroom setting (e.g., via specified digital tools in the classroom or the virtual learning environment).

Fostering a sense of belonging through the design of teaching and learning practice

This category reflects students' perceptions and experiences around teaching and learning practices that provide opportunities for community building and developing a sense of belonging in their course. Findings demonstrate that students show a preference for learning in smaller group classes, such as workshops and seminars. The opportunity

for increased peer interaction and group visibility was linked with increased feelings of belonging. As one student commented, "there is just a lot of people [in lecture halls], so it's easy to be lost in the crowd" (Participant 3), whilst another participant commented "the practical methods sessions and seminars increase my sense of belonging, especially because they're actually in the school of psych building and you get a chance to work with groups of other students towards a shared goal with guidance of a member of staff. You just don't get that to the same extent in lecture halls" (Participant 95).

Participant responses also suggest that large classroom sessions can still facilitate feelings of belonging among learners to an extent, particularly when such sessions are held in person. As one participant reported, "just the fact that we now have lectures in person instantly makes me feel more part of the community" (Participant 9). The overarching agreement about the benefits of in-person lectures may result from an extended period where teaching took place purely online as a result of COVID-19 related restrictions, which left schools and universities worldwide teaching remotely. This seemed to negatively impact sense of belonging among students, with one student explaining, "being in person has been really good [...] I've actually met people on my course [...] helped me feel more part of the uni [...]" (Participant 98).

Within the context of large lectures, active approaches to learning were discussed positively by students in terms of providing opportunities to interact with lecturers in class. As one participant noted, "Interactive lectures allow for interaction between staff and students which doesn't happen if they stand up and just relay information. It was this interaction with staff which aided me feeling a part of the School" (Participant 92). Interactive lectures, which may include using digital text-based audience response tools to ask questions and facilitate discussions, were identified as a means of facilitating a community feeling in the classroom, with one participant noting that "having more interactive sessions and being asked questions to see whether I understand the material makes me feel like I belong more in the Psychology community, as I am not simply a listener but an active member of the community who is learning and engaging with material" (Participant 134), whilst another commented "The Psychology community is very diverse and welcoming and our teachers including e.g. answers [captured through an audience response tool] from a diverse group of people allows a more holistic understanding" (Participant 189). Opportunities for group work and interactivity with peers provided further opportunities to enhance a feeling of community in the course (e.g., "Having discussions makes it easier to talk to others in your lecture and makes you feel less alone and isolated. Seems like you are more in a community [...]" (Participant 184).

Lecturers' engaging approach with students was perceived to play an important role in making students feel that they belong. Students felt that having friendly, open and engaged lecturers makes the student community feel included and valued. Lecturers inspire this sense of belonging by being happy to engage with questions that students may have, as a student explained, "when lecturers do not seem like they rush off [...] and stick around to see if anyone has any questions, it's nice as you feel valued" (Participant 23). Their content delivery method also has considerable impact, as "warm lecturers who engage with students on a personal level and reference real-world events and deliver lectures as if not a copy/paste model help foster a sense of community" (Participant 100). These findings demonstrate that staff engagement is key in the success of any approach to teaching and learning adopted.

Beyond learning gains, our findings, therefore, illustrate that providing opportunities in the classroom for interactivity with content, peers, and lecturers can strengthen students' sense of belonging in a course context. The traditional university experience is valued, as in-person learning environments offer chances for face-to-face social interactions which were missed during periods of remote learning. Whilst smaller group teaching was often favoured by students in relation to community building, embedding strategies, such as short group-based tasks in a larger teaching session, can support feelings of being part of the course community (Kirkby & Thomas, 2021; Solomon et al., 2020). Overall, participants emphasised the importance of engagement and interaction within the learning environment for fostering a sense of belonging. The elements mentioned, such as smaller group settings and the approachability of teaching staff, are seen to foster a more inclusive, engaging and personable learning experience, encouraging a stronger sense of community and making them feel valued within their learning environment. Findings suggest that this may be a two-way process, whereby interactivity can support feeling of belonging, and perceptions around belonging can have a positive impact on students' response to active learning in STEM classes (Graham et al., 2023). This highlights the significance of ways in which sense of community and belonging can be developed and maintained amongst learners through the way in which we design teaching and learning activities in the curriculum.

Context of current investigation and potential limitations

It is important to acknowledge the context of this research and potential limitations. Participants in this study reflect students in a School of Psychology in the UK, where policy around teaching and learning reflects encouraging staff in adopting active learning in their teaching practice and for students to engage actively in their learning. The survey questions are framed around capturing experiences with active and blended learning approaches which may lead to demand characteristics in some participants' responses. Nevertheless, the questions aim to capture broad experiences, they are open-ended in nature and allow perspectives both in terms of potential benefits and barriers on engagement, learning, and learning experience. A second limitation reflects the diversity in our sample. Individuals taking part in the survey are primarily first year undergraduate students, with the majority of White ethnic background and no reported learning differences or disabilities. The approach adopted in this study enabled the researchers to identify the impact of teaching and learning practices across our sample of participants. Furthermore, students in their first year of study will have had, by majority, up to a year's worth of experience of learning in higher education. The nature of class sizes and the need to follow a set curriculum aligned with the courses' accreditation body limits the nature of active and blended learning practice within the first two years of the psychology course in comparison to later years where students undertake more specialised modules in smaller classes. Therefore, experiences range from participating in short quizzes in a lecture to engaging in discussion-based collaborative work and flipped learning in some taught modules. Responses reflect experiences within this context of learning activities.

Conclusion

In conclusion, our findings suggest that students are open to and experience benefits when engaging with active and blended learning approaches to teaching in their course, in terms of learning gains and student experience. A classroom setting often needs to cater for diversity and individual needs in our cohort of learners and one approach does

not fit all. To maximise benefits within a diverse undergraduate and postgraduate student cohort, active and blended learning approaches should be embedded in ways that support inclusivity, with varied opportunities for participation and engagement. Our findings show that adopting relatively low-stake approaches in our teaching and learning practice (e.g., short activities embedded within meaningful intervals in a larger session, structuring guided discussion-based activities) can offer students opportunities to experience the benefits of active, blended, and technology-enhanced learning. In particular, clearly communicating the objectives of curriculum design, including flipped approaches and in-class activities, and how activities promoting active learning are aligned with broader learning outcomes and the assessment, as well as clarity and guidance on expectations of engagement can support with reducing confusion and potential low engagement among learners. Our results indicate that offering students a range of options to capture their voice in the classroom, often via individual or small group work, and the use of digital tools to facilitate those discussions, can help to reduce anxieties associated with participation in large classroom settings and potentially increase engagement. Importantly, considering the challenges that students may face in such learning environments, our findings point towards the significance and need for research studies to embed the student voice and partnership initiatives with learners in the context of building inclusive and effective learning environments.

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Appendix: Survey questions

Views and experiences with teaching sessions in the past academic year

- Please indicate whether you have engaged in any of the following in-class activities in your modules generally this past academic year, either during online lecture engagement sessions or your in-person lectures
    - I have not engaged in any interactive activities during lectures this past academic year
    - I have been given the opportunity to engage in interactive activities during lectures but chose not to participate
    - I have been given the opportunity to engage in interactive activities during lectures and have engaged with these
    - I have actively participated in small group discussion
    - I have actively participated in a group activity and then fed back to class (e.g. through an audience response tool)

- o I took part in an in-class quiz (e.g. MCQs)
- Please use the text box below to tell us which in-class activities you have found most useful. In what ways have you found them useful?
- Thinking about the modules where teaching follows a more active approach (as defined above), either within the whole module or within specific lectures within the module:
- Please tell us your experiences with these types of lectures. In your answer, please include details of what you feel the benefits are of lectures adopting an active learning approach to teaching.
- Overall, what have you found the most challenging, if anything, with lectures adopting a more active learning approach (i.e. those that included in person activities, or completing some pre-lecture work)?
- Please provide an example of a teaching session adopting an active learning approach which you felt worked well. Please do not specify the module or lecturer's name but do provide details of your experience and engagement with the session (and any resources you may have engaged in prior to the session), including why you felt it has worked well.
- This past academic year, for your in-person lectures, have you engaged in any pre-lecture work set by the lecturer (e.g. watch a video/video recording, reading a resource etc.)?
- Please provide examples of pre-lecture activities set by the lecturer which you engaged with prior to attending an in-person lecture.
- If you answered 'Yes' to the previous question, how easy did you find it to engage with these tasks?
   - o Overall, I found it easy to engage in any pre-lecture work that was set.
   - o I found it challenging to engage in any pre-lecture work that was set. Please outline the reasons for this in the textbox below.
- Thinking about the modules where teaching follows a more didactic approach (i.e. a lecture primarily with very few or no interactive activities or elements):
   Please tell us your experiences with these types of lectures.
   In your answer, please include details of what you feel the benefits are of more didactic lectures to you.
   Please tell us what, if anything, you found challenging in this type of learning environment (didactic approach to teaching).

Sense of belonging in student and staff community

- Thinking about your feelings of 'belonging in the School of Psychology community', which aspects of your learning environment do you feel help to support your feeling of belonging in the School of Psychology community and which aspects may hinder your feeling of belonging in the School of Psychology community.
   In your answer, please focus on the impact of the nature of your teaching sessions (e.g., lectures) on your sense of belonging in the School of Psychology community.