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# Medical student experiences of Case-Based Learning (CBL) at a multicultural medical school

Catherine Bruen[1*†], Jan Illing[1*†], Ronan Daly[2], Frances Meagher[3], Caroline Delany[1], Gozie Offiah[4], Sally Doherty[5], Ellen Stuart[6], Martina Crehan[7] and Helen Kelly[1]

## Abstract

**Background** Educational research highlights active approaches to learning are more effective in knowledge retention and problem-solving. It has long been acknowledged that adapting to more active ways of learning form part of the challenge for new university students as the pedagogical distance between the didactical approach largely followed by secondary school systems the world over differs quite significantly from the often more student-led, critical approach taken by universities. University students encounter various learning challenges, particularly during the transition from secondary school to university. Poor adaptation and low performance in the first year of tertiary education can lead to higher failure rates and potential withdrawal from study programmes. Adopting active learning strategies early in this transition phase is crucial for supporting students' adaptation and success.

Gaining student engagement with active learning can be a significant challenge when there is an expectation to participate in a discussion or voice an opinion. Case-based learning (CBL), with its scaffolded form of learning, is an approach that could provide the support needed to help multicultural learners adapt to their new learning environment in a non-threatening classroom-based setting. The research question in this study was: what features of CBL support active learning?

**Methods** Data was collected using Structured Group Feedback Sessions (SGFS) from 36 students from 12 different countries. Students were placed in eight Structured Group Feedback sessions, a method that facilitates structured discussions and is effect in curriculum evaluation and feedback. The Experience Based Learning model was used as the conceptual framework to guide the analysis, which was completed using the framework analysis method.

**Results** Themes were derived from the Experience Based Learning model: affective, pedagogical, and organisational and analysed according to the research question. We found CBL can be used to facilitate active learning with all students at a multicultural medical university. We identified six learning points to highlight features of CBL that support active learning: CBL increased contact with peers and facilitated student bonding; students need to feel psychologically safe to participate; prior learning can enhance confidence to participate; facilitators need to be aware of their role, know about psychological safety, and manage student participation including the dominant voice; some students have a lower tolerance of uncertainty and need additional clarity at the end either via the facilitator

[†]Catherine Bruen and Jan Illing are joint first authorship.

*Correspondence:
Catherine Bruen
catherinebruen@rcsi.ie
Jan Illing
janilling@rcsi.ie
Full list of author information is available at the end of the article

or additional notes that provide the key learning points to take away; students became more engaged when a case is aligned to a real patient case giving it authenticity.

**Conclusions** This study explores how CBL can support active learning in a multicultural medical school. We identified that CBL did facilitate active learning and students engaged with it and enjoyed it. We identified six learning points to support others going forward.

**Keywords** Case-Based Learning, Active Learning, International, Multicultural, Student Perspective, Undergraduate

## Background

### Students' learning challenges

University students encounter various learning challenges, particularly during the transition from secondary school to university. Poor adaptation and low performance in the first year of tertiary education can lead to higher failure rates and potential withdrawal from study programmes. Adopting active learning strategies early in this transition is crucial for supporting students' adaptation and success. Many studies report that students experience a significant challenge when they transition from secondary school to university [1]. Poor adaptation and resulting low performance in the first year of tertiary education can result in higher levels of failure and ultimately withdrawal from a program of study [2]. Helping learners adopt more active learning strategies early in their transition can help to support their transition and adaptation. However, in an international or transnational learning environment, there are added complexities such as managing expectation; integrating into larger class sizes, additionally dealing with new mixed gender groups for some, minimal feedback and reduced teacher-led contact [3]. Definitions of "foreign student" and "international student" vary from country to country. The Irish Higher Education Authority in Ireland [HEA] defines an international student as "an internationally-domiciled student" [4]. Its use here in our study aligns with the definition used by the HEA. However, the HEA definition excludes Erasmus, and other exchange students. According to the HEA definition, a student's domicile is the country of permanent address prior to entry to their programme of study. If the student is residing in Ireland for 3 of the 5 years previous to registering for their current course, then their domicile is considered to be Ireland [4]. At our university we have students from over 100 countries, which largely align with the HEA definition of international students. However, we will also be using the term "multicultural student population" as a definition which describes any learners from outside of the Irish Education system from a cultural perspective who may be challenged by any number of educational factors such as, Erasmus students and other exchange students. Multicultural student describes a diverse student body also with diverse learning. In higher education, "multicultural students" are often defined as individuals who represent a diverse range of cultural, racial, ethnic, linguistic, or national backgrounds. This diversity encompasses international students, ethnic minorities, and those who identify with unique cultural groups within a broader population. Common definitions emphasise their presence as a reflection of increasing globalisation and the growing need for institutions to address social equity and cultural inclusion. Multicultural students may also be defined based on their experiences navigating multiple cultural identities or integrating into academic environments where their background differs from the dominant culture. These students often bring unique perspectives and challenges, such as adapting to new educational practices, linguistic adjustments, or addressing social biases, which enrich the learning experience for all students in a diverse academic setting. Sources like McGee Banks & Banks [5], Andrade [6] and Lee & Rice [7] discuss multicultural diverse student challenges when it comes to creating equitable opportunities for students from various cultural groups, addressing the diverse needs of multicultural students in higher education [5–7].

A more holistic approach to curriculum design, including active learning experiences for educational skill building, is advocated to facilitate a more effective, supportive and positive learning environment [8–12]. Case-based learning [CBL], is one such approach that fosters active learning through scaffolded, hands-on activities, discussions and problem solving within the context of clinical cases. This method encourages students to apply theoretical knowledge to real-life scenarios, promoting critical thinking, clinical reasoning, and decision-making skills. Within the (holistic) context of this study, it held potential as a supportive approach, helping multicultural learners adapt to their new learning environment in a non-threatening classroom-based setting. According to Srinivasan et al., [13] CBL can enhance student participation and knowledge retention and can also be highly beneficial to engaging an international learner group [13].

Case-based learning in medicine involves engaging students in the learning process through hands-on activities, discussions, and problem-solving within the context of clinical cases. This approach encourages students to apply their theoretical knowledge to real-life scenarios, promoting critical thinking, clinical reasoning, and decision-making skills. CBL has emerged as a prominent pedagogical approach in medical education, emphasising the integration of basic sciences with clinical reasoning and problem-solving skills. A review by Thistlethwaite et al., (2012) defined CBL as a "*learning and teaching approach that aims to prepare students for clinical practice, through the use of authentic clinical cases*" [14]. This Best Evidence Medical Education [BEME] review also stated that CBL improves student engagement and learning outcomes [14]. Since Thistlethwaite et al., more evidence has emerged on the benefits of CBL, and three meta-analyses all reported that CBL is an effective teaching method and helps improve student performance [15–17]. Research has shown the importance of structured facilitation during CBL sessions, with facilitators guiding students through problem-solving while encouraging active participation and reflection [18]. Moreover, cases should encourage active participation and collaboration among students, enabling them to apply theoretical knowledge to practical situations [19]. These features of CBL provide strong evidence for its role in supporting active learning and improving educational outcomes. These studies provide evidence supporting the effectiveness of active learning within CBL and are suited to international medical students.

### Study context and aims

CBL was introduced to first-year undergraduate students studying medicine at a multicultural medical school, where students from over 100 countries attend. CBL was used to scaffold, frame, and integrate curriculum content and themes. Fundamental scientific concepts and principles and their clinical application were linked through cases, and students worked together in small groups (10–12 participants) to discuss cases that prompted the discovery of the biomedical, behavioural, and clinical sciences underpinning each case. A facilitator supported each group. Cases operated over a two-week cycle per module, and as part of this cycle, students had six hours of small group facilitated sessions. The sessions facilitated students to:

1. Work and actively learn in groups.
2. Integrate prior and newly acquired knowledge.
3. Develop problem-solving skills and critical thinking.
4. Use self-study to consolidate learning that occurs in groups.

A specific context of this study was that CBL was being introduced into a new medical curriculum as a key component of the overall Learning and Teaching Assessment Strategy. The rationale for introducing a CBL model to the medical curriculum underpins an approach to learning that is based on experiential learning models that encourage and facilitate small-group learning [14]. In addition, educational strategies that promote learning among diverse student groups from varied learning backgrounds, such as this demographic here, also benefit from the social constructivist characteristics that form part of the learning pedagogy in a case-based learning environment [20].

An aim of this intervention within the curriculum was to leverage CBL to support students in developing personal and professional socialisation, which could grow into a sense of belonging for them [21] and support students to transition from being a scholar to a medical student and then a future doctor [22]. Within medical education, social constructivist theories can provide valuable templates for learning, developing, and applying learner's professional competencies, where individuals learn through observation, modelling, and critical discussion [20, 23, 24]. This model of mediating the curriculum can create a supportive environment and provide opportunities for feedback and reflection where educators can facilitate the development of professional competencies among medical students.

This study aimed to explore students' perceptions of their experience of CBL and address the following research question: *What features of CBL support active learning?*

The methodology to elicit the student's voice was valued as a key factor. Therefore, the goal was to investigate student-generated elements that both promoted and detracted from an effective learning experience. The related sub-questions are:

1. What elements do students perceive as working well and contributing to the active learning process in CBL?
2. What elements do students perceive as potentially hindering the active learning process in CBL?
3. What elements do students feel could improve the active learning process?

### Conceptual framework

Experience Based Learning [ExBL] model was the conceptual framework for this study [25–27]. Developed initially to understand clinical placements, it has been adapted and used more widely for medical students

starting that journey via patient cases as used in CBL [28]. Three particular supports were identified: affective, pedagogic, and organisational support.

Affective support is about relating to others. It included emotions and feelings experienced during the CBL towards self, but also towards others and the patient case. This can be both positive and negative but also involves feelings such as anger, anxiety, empathy and compassion. Pedagogical support focuses on student support during the teaching process. This includes modelling good practice, engaging students in the clinical case and helping them think about the learning they have experienced by listening, asking questions, discussing the case and providing a structure. Organisational support brings all aspects of the case together: a real patient case, student learning and leadership. This might include developing the learning resources to support the case, organising the group activities, providing expertise as needed, encouraging students to present an aspect of the case to the group, identifying the intended learning outcomes, debriefing and summing up at the end [27, 28].

## Methods

### Study design

A qualitative research design was adopted to explore the perceptions of the medical students regarding the effectiveness of CBL in promoting active learning. The study aimed to identify both supportive and inhibitive elements of CBL as experienced by the students. Specifically, we wished to investigate their perceptions regarding the features of CBL that either facilitated, obstructed, or held the potential for enhancing active learning processes.

Regarding the fit of methods adopted as most appropriate for this study, we considered using focus groups rather than interviews as the latter are very resource intensive. However, being aware of the "*dominant voice*" and *"groupthink"*, we decided to use *a* Structured Group Feedback approach. First described by Gibbs et al., *Structured Group Feedback sessions* [SGFS] are structured discussions which encourage students to consider and present their views first, then discuss their views with peers while allowing time for individual thought and reflection on the views of others [29]. This approach is often used in curriculum evaluation and feedback as it offers a three-stage process in which students develop their initial thoughts on a topic before being asked to consider other people's perceptions [30].

### Participants and recruitment

The study population consisted of first-year medical students who had just completed their first year of CBL. An invitation to participate in the study was sent to all first-year students via email at the end of the academic year ($n=344$). This communication included a participant information sheet detailing the study's purpose and methodology. Thirty-six students (10.4% response rate) consented to participate. Participants were unknown to the research team and assured of their anonymity and the confidentiality of their responses. Two pilot sessions, each with a group of 5 students, were conducted to refine the questions, process, and timing, resulting in no alterations to the study. Following the pilot, sessions were conducted at the commencement of MED year two, immediately following a CBL session.

### Data Collection

Data were collected using Structured Group Feedback Sessions (SGFS). The protocol adhered to the three-stage framework proposed by Gibbs et al. [29], as illustrated in Fig. 1.

Each SGF session was scheduled for 90 min, during which students were provided with lunch and beverages

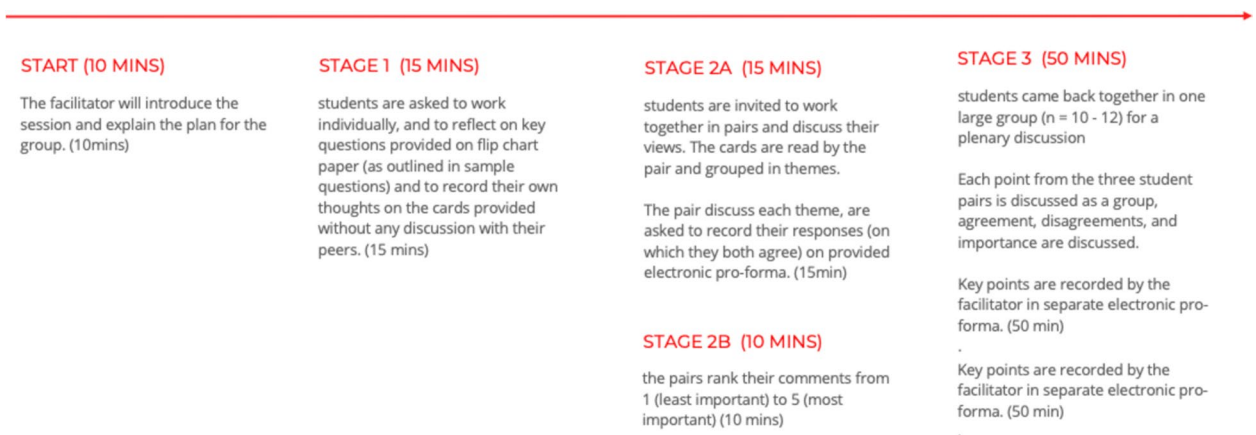


**Fig. 1** Structured Group Feedback Sessions method: a three-stage process commonly used in curriculum evaluation and feedback (Gibbs, 1998)

as a gesture of appreciation for their participation. The facilitators began by welcoming the students and reiterating the session's purpose and plan. At the outset, students were informed of the session's objectives and structure. Subsequently, they were presented with three questions, each written on a separate flip chart sheet.

During stage 1, students worked individually for approximately 15 min, jotting down their responses to each question on Post-it notes, using a distinct colour for each of the three questions and noting only one point on each Post-it. In stage 2, students collaborated in pairs, sharing, and discussing their comments to determine agreement and placing agreed-upon points onto the flip chart sheets while beginning to identify themes. Finally, stage 3 involved a group discussion where all students reconvened in their groups. Points from student pairs were discussed collectively, with facilitators guiding the grouping of Post-it notes and facilitating discussions around each comment's agreement, disagreement, and importance. Students in each group collectively ranked the comments in order of importance on each flip chart sheet.

### Data analysis

Data analysis was conducted using the five stages of the Framework Analysis Method as described by Ritchie & Spencer [31]. Framework analysis was facilitated by referring to the ExBL model developed by Dornan et al., [27] and used by Burgess et al., [28], which had been adapted to suit CBL for this study. This model provided a framework to identify how different elements of CBL influence the active learning process.

The "Post it" comments and rankings were analysed for all three questions using the five stages of Framework Analysis [31, 32], namely: Familiarisation, identifying a thematic framework, indexing, charting, and mapping and interpretation. Familiarisation involved all researchers reading and discussing the comments to agree on the framework. Each researcher then indexed the data under specific themes, followed by 2—3 meetings to finalise charting, mapping, and interpretation. All three questions were analysed using the ExBL model for affective, pedagogic and organisational themes [27] to identify aspects of support for active learning. The student rankings were a means of removing statements and did not identify any particular agreed hierarchy.

### Ethical considerations

Ethical approval was obtained from the university Research Ethics Committee [REC]. Consent was sought from all participants, who were informed of their right to withdraw from the study at any time without any adverse consequences.

## Results

### Demographic data

In total, 36 students participated in 8 small group sessions between June and September 2023. This was 10.46% of the total cohort of the Year 1 class ($n = 344$; 100%). Students came from 12 nationalities (representing 77.7% of the nationalities presenting in the cohort). Students from Ireland / Northern (22.2%) were also included in the data set as group members of the discussion sessions. Table 1 displays participants' demographics for gender, region, and nationality.

### Qualitative themes

Themes are presented as "affective and pedagogic and organisational support" for active learning as described in the conceptual framework above. The themes answer the research questions examining which elements students perceive as working well and contributing to the active learning process in CBL. Examining which elements students perceive as potentially hindering the active learning process in CBL and what elements students feel could improve the active learning process.

**Table 1** Population characteristics

| Demographics | Cohort ($n = 36$) | |
|---|---|---|
| **Gender** | **n** | **%** |
| Female | 21 | 58.3% |
| Male | 15 | 41.6% |
| **Regions** | **n** | **%** |
| Asia | 7 | 19.4% |
| Australasia | 1 | 2.8% |
| Europe | 11 | 30.5% |
| Middle East | 6 | 16.6% |
| North Americas | 11 | 30.5% |
| **Nationalities** | **n** | **%** |
| Australia | 1 | 2.8% |
| Canada | 8 | 22.2% |
| India | 1 | 2.8% |
| Ireland / Northern Ireland | 8 | 22.2% |
| Kuwait | 2 | 5.5% |
| Malaysia | 6 | 16.6% |
| Portugal | 1 | 2.8% |
| Romania | 1 | 2.8% |
| Saudi Arabia | 2 | 5.6% |
| United Kingdom | 1 | 2.8% |
| United Arab Emirates | 2 | 5.6% |
| United States of America | 3 | 8.3% |

#### *Affective support*

Affective support relates to feelings and emotions and comfort in expressing themselves while engaging with the learning material [27]. Students who did not speak English as a first language highlighted the benefit of "speaking in English", and the friendship groups that developed from these interactions. Our data also highlights the importance of empathy, encouragement, and a sense of belonging in fostering positive attitudes towards learning.

> *"... It feels like a group learning opportunity that I am comfortable asking a question and voicing ideas." (Group 1).*

> *"I learned a lot from these sessions when everyone actually put in the effort to answer the questions ... Grow friendships and bonds with the other students due to repeated interactions ...and an opportunity to talk english instead of [my native language]." (Group 1).*

> *"It engaged me more with my learning community. Got to know LC sub-group members. Very fun discussions with the group." (Group 2).*

Interestingly, students reported on challenges that hindered active learning, such as having members who continued to behave passively, and even worse having passive facilitators. Unexpected challenges occurred when there were negative group dynamics, a dominant personality, and when the facilitator was too active in terms of shaping the student discussion.

> *"Sometime facilitators weren't very engaging, they kinda sit back and don't engage except to read the answers at the end." (Group 2).*

> *"...there is a clear difference in personalities which leads to some people standing out more." (Group 1).*

> *"Some facilitators overpower what you're saying ... "let me be wrong" ... "Don't jump in to fast", but "prompt me" for a clearer answer." (Group 3).*

In relation to affective factors for improvement of active learning in CBL, there were some strong feelings in relations to aspects such as group dynamics. Additionally, keeping students in the same groups enhanced their feelings of psychological safety.

> *"Working in a small group, with the same classmates (was helpful) the psychosocial discussion questions." (Group 4).*

> *"Doing the questions in small group... working with the same group helps build a report." (Group1).*

> *"I find group discussions allow me to dispel any uncertainties I have with particular topics; and grow friendships and bonds with the other students due to repeated interactions." (Group 1).*

Students also valued opportunities for greater diversity and exposure to wider range of different ideas and culture while consolidating their learning through deeper engagement and collaboration.

> *"Exposed to many different aspects in the medical field, emotionally, socially, and mentally, role of doctors actually deals with people instead of passively studying; gets us to explore different ideas/cultures from your classmates; get to have a more engaged student environment." (Group 1).*

> *"The collaboration between the team mates to help consolidate our work. Easier to incorporate our work through this medium." (Group 4).*

> *"We think it's a great way of to strengthen bond between groups. ... ALSO, it gives us the chance to meeting facilitators we would normally never get to meet ... It offers diversity." (Group 6).*

#### *Pedagogical support*

Pedagogical support focuses on supporting student learning during the teaching process. This includes facilitators modelling good practice. Pedagogical support enabled active learning when facilitators posed questions and facilitated discussion in a structured approach, particularly around clinical problems, which students appreciated. Our data shows that from the students' perspective, they felt more encouraged to engage and reported taking a more in-depth approach to their learning as a result.

> *"Whenever we have very active facilitators, we learn a lot of useful information." (Group 2).*

> *"Questions that were opinion based fostered better discussion among the group. Facilitators that answered questions and spoke about their own experiences in hospital as doctors, nurse, etc." (Group 4).*

> *"Facilitators are excellent and a great way to stay focused on the talk. The wrap-up sessions are very helpful." (Group 5).*

Students reported taking a more in-depth and active approach to their learning and being more engaged. They reported being able to apply what they learned and even

consider treatments. They also acknowledged the use of empathy and understood the role of the multi-disciplinary team [MDT].

*"Exposed us to real-life scenarios; allowed us to not only explore the clinical importance but also emotions of a health care profession, a patient and their family members; insights on MDT" (Group 1).*

*"I really enjoyed the framework of CBL in terms of the continuity of following a case. Being able to collaborate and work with students, I found I was able to identify my weaknesses and gaps in knowledge and improve my treatment" (Group 2).*

They also reported that opinion-based questions fostered better discussion among the group and suggested that facilitators who spoke about their own experiences in the hospital as health professionals (e.g., doctor, nurse) were particularly effective in helping them stay focused on the discussion. They noted that the wrap-up sessions, in particular, were very helpful.

Students reported challenges that hindered active learning including being very uncomfortable and being asked questions about topics or content that had not been covered (yet) in lectures. They valued more certainty by gaining knowledge from the facilitators and wanted access to 'the answers' However, students acknowledged that the active learning process aims to foster more independent and self-directed learning.

*"It is so unhelpful having CBL session based on lectures we haven't done". (Group 2).*

*"We would like to receive the CBL facilitators' handbook of answers after the case is over so we can reference it back in the future and ensure we have all the answers we need." (Group 3).*

*"... [We] know it's to try to make us more independent, but we think it just makes it less helpful." (Group 3).*

*"More discussion questions. More facilitator involvement (their knowledge and experience is very valuable)." (Group 3).*

Students suggested areas for improvements pertaining to pedagogical factors, including factors impacting the overall experience of CBL. Areas for improvement included further training for facilitators, the quality of learning experienced by participants working in CBL groups, the structure of the cases, and suggested improvements to the CBL tasks.

*"As much as I value input from my peers, at times such as the wrap-up, input from people who have more knowledge and experience would be appreciated." (Group 4).*

*"Writing the cases based on actual patient experiences, tying it in with the healthcare symposium (could promote attendance for wrap-up sessions)." (Group 6).*

*"Revising lectures by preparing to answer CBL questions ... patients were realistic from GP point of view ... helped me understand diseases and conditions from both the doctors' and patients' perspective." (Group 7).*

At this early stage of becoming an active learner, students wanted more guidance from the facilitator. They were less tolerant of uncertainty, and some wanted to be told the right answers or be told from credible facilitators who were ideally clinical. Unfortunately, some staff interpreted the role of facilitator differently in terms of how much information was provided about each case. Student indicated they wanted facilitators to help them and those who sat back were less helpful to their learning.

*"Facilitators are very different; some give great answers and help our learning, while others step back and don't answer and say it's up to us." (Group 4).*

*"Having doctors be instructors—helps to answer questions." (Group 4).*

*"I like having facilitator rather than self-directed." (Group 3).*

*"Get professors to answer the questions in the wrap-up instead of peers." (Group 1).*

#### *Organisational Support*

Organisational support relates to when the learning activity sits appropriately within the curriculum and provides opportunities to participate actively. Organisational support allows for the use of real patient cases and authentic learning opportunities. This exposure to real-life scenarios aims to optimise the conditions for learning and helps create effective learning [27, 28]. Active participation aligned with learning and curriculum outcomes and how CBL was delivered. The organisation domain reflects every level of a curriculum, including core learning and activities that contribute to learning about authentic clinical practice. Positive factors relating to organisation support included students reporting being able to apply what

they learned and even consider treatments, using empathy, and understanding the role of the MDT.

*"Helps me look at disease in a different way and real-life scenarios; group discussions; sitting with a specialised instructor who knows beyond the curriculum … Exposed us to real-life scenarios; allowed us to not only explore the clinical importance but also emotions of a health care profession, a patient, and their family members; insights on MDT." (Group 1).*

*"Reconsidering concepts from lectures … Has opened my eyes to the psychosocial and ethical side of medicine. Has made me appreciate the value of MDTs." (Group 4).*

*"Helps give an essence of what we could expect in a clinical setting; improves knowledge of what we learn in lectures." (Group 5).*

Features that could have worked better regarding the general content included consistent and timely access to the preparation material in advance, so they have more time to prepare, reduce their sense of uncertainty and access to the facilitators' script after the session to increase their sense of certainty, and access references. Some students felt that the content of the cases was often repetitive, resulting in boredom or worse if the case was already labelled so less critical thinking or differential diagnosis was required. As regards the quantity and frequency of the CBL sessions, most groups felt that there were too many wrap-up sessions.

*"In the modern day, some CBLs are quite repetitive (a culture of swiping up has reduced attention span). Having the same patient for 3 cases becomes boring & repetitive – similar plot a little different: too slow." (Group 6).*

*"Prefer if we didn't already know what the disease was. For example, sometimes the title of the case is literally the disease." (Group 2).*

*"Having a wrap up session after each CBL is sometimes too much (especially if we are following the same patient)." (Group 3).*

Students expressed their thoughts regarding organisational factors that could improve their CBL experience. Organisation factors comprised a significant portion of the data analysed regarding suggested improvements. Over a third of participant responses highlighted areas linked to the organisation, specifically around the delivery of the CBL including factors that hindered active learning such as noise during the discussion and factors that enabled better participation i.e. prior learning and time to learn.

*"CBL is conducted with large groups of students. This creates a noisy environment which makes discussion difficult at times." (Group 1).*

*"Maybe coordinate the dates and cases with our lectures so that we can discuss the topics after we have had exposure to them in class." (Group 4).*

*"Only 2 CBLs per module with a two-week break at the start of the module. Gives us a chance to learn." (Group 5).*

## Discussion of findings

Our principal aim was to support multicultural students in the process of transitioning from secondary level education to becoming more active learners using case-based learning as the intervention [11]. Research has shown that international students can benefit more than local students; not only does it facilitate deep learning [33], but it also provides opportunities to improve their communication confidence and supports opportunities to adapt culturally and develop friendships [2, 34]. Active learning is underpinned by social constructivism, which emphasises the role of social interaction to encourage participation and support students to take part in discussions, gain confidence, share opinions, and develop cognitive ability [35].

### Affective factors

The data was analysed using EXBL as the conceptual framework (22, 23, and 24). This enabled us to break down CBL into the elements of affective, pedagogical, and organisational to identify how CBL supported the transition to the active learner. The analysis identified that the *affective* theme of the ExBL model was critical to its success as it was this theme that reflected students' engagement, energy, and enjoyment of CBL. In addition, the students reported having the opportunity to speak in English [36], as a strength, rather than talk mainly in their native language with peers from the same country. Clearly, students unfamiliar with active learning and managing the expectation of speaking up need to feel psychologically safe to do so. We noted psychological safety was an important element at this early stage in the transition to active learning, which was reflected in the student comments made about being in the same group with the same faculty member. Another element that

made CBL work was prior learning, which enabled students to contribute with confidence.

Although CBL was viewed positively, there were some criticisms: when other students were allowed to dominate the discussion, when faculty failed to moderate the discussion; and when faculty failed to provide a structure that enabled all students to contribute. Our students, who were in the early stages of their transition from passive to active learners, required more from the facilitator to enhance their participation and support their perceptions of psychological safety. Managing group dynamics is an area that can help or hinder active learning and confirms the need for psychological safety faculty training before CBL learning begins as suggested by Gassim et al. [37]. These findings show a need for student preparation for group learning, which concurs with research for enhancing student performance and equipping students to deal with group challenges [38].

#### Pedagogical factors which impact active learning in CBL

The *pedagogica*l theme reflected the interactions and the support provided by the facilitators as well as role modelling. Students were aware of the range of faculty who were moderating CBL. Understandably, students valued contact with medical staff, some of whom could provide more information about the case being discussed and on occasion, provide other examples from their practice. However, generally, students valued pedagogical support from faculty who drove up their engagement with the case and were not too quick to provide the correct answer. Instead, they enabled them to explore options, consider the evidence, ask questions, and provoke both interest and engagement. Such faculty drove deeper thinking and required a greater level of cognitive ability.

Our students were at the start of their journey to become active learners and preferred the guidance from the faculty to facilitate the discussion, rather than students self-directing the session. Other research has also identified the moderator role can strongly influence the CBL outcome [37].

Suggested improvements from the data related to sharing information before the CBL session to enable prior learning to improve participation. Again, previous research has highlighted that this student population particularly benefits as they can take time to gain familiarity with the content before the session and feel more confident about their input during the session [36]. Many students said they would like to receive a copy of the facilitator information sheet after the session as a learning tool, reflecting elements of Hofstede's cultural dimensions [39] where students from none Western cultures, in particular, have a lower tolerance of uncertainty and require more support in the transition from passive to active learning and by being given the 'right answers'.

Additional improvements suggested by the students included a preference for the final wrap-up session to be led by the facilitator to ensure all learning points were included. This preference for the facilitator to guide the wrap-up aligns with the early stage of active learning for this participant group. Typically, students in the early years of their training tend to prefer more input from those whom they perceive to be the *"experts"* [23, 40, 41]. This is also borne out across all the qualitative data analysed here.

Further suggestions relating to the theme of pedagogical improvements associated with the quality of learning experienced by students. Learners reported valuing the interactivity of the sessions. However, some more confident students preferred the challenge more, with the inclusion of an option to find the solution or uncover the differential diagnoses of the patient case where relevant. There were also suggestions for cases to be as closely based on real patient cases or aligned with previous real patients, which is a feature of the curriculum. This is borne out in the research suggesting that the use of real-world tasks in active learning helps to increase knowledge and understanding in these contexts [42].

#### Organisational improvement factors which impact active learning in CBL

We agree with Burgess et al., that CBL enabled students to apply their knowledge and solve clinical problems within a small, safe group and through facilitator feedback [28]. We agree that our findings also represent these strengths of CBL and further enable students to be more active contributory learners. In relation to the organisational theme, students were satisfied with this element of the CBL and particularly the authenticity and breadth of the case; however, some were critical of having a case based on material not yet covered in lectures as this inhibited their confidence in participation and discussion.

#### *Learning points*

1. CBL can be used to facilitate active learning and provides students with the opportunity to speak in English, increase student bonding and create enjoyment.
2. Students need to feel psychologically safe to participate, and working in the same peer group with the same facilitator is helpful.

3. Asking students to engage in prior learning is likely to enhance their confidence to participate.
4. Facilitators need to aware of the importance of psychological safety, be clear about their role (when to stay quiet and when to offer guidance), manage any students who dominate the discussion and provide a structure that invites all students to participate.
5. Some students who are at the early stages of becoming an active learner may have a lower tolerance of uncertainty and need clarity at the end of the case either from a facilitator who is perceived as credible (i.e., clinician) or additional information is provided to reinforce the key learning points.
6. Students became more engaged when a case is based on or aligned with a real patient case giving it authenticity.

### Limitations of this study

The current work has several strengths and certain limitations. Strength points include the exploration of the transition to active learning for a cohort of multicultural students, and the application of CBL to a population of 12 nationalities. Limitations of this study were the relatively small number of participating students, which constituted 10.4% the total cohort. This study has started to identify how we can facilitate and support the transition to becoming an active learner in, we have identified learning points, however we would recommend that further research be undertaken to learn more about how to further support students to become active learners and identify other interventions that work.

## Conclusion

This study explores how CBL can support active learning in a multicultural student cohort who are less familiar with active approaches to learning. We identified that CBL did facilitate active learning and students engaged with it and enjoyed it. We identified six learning points to support others going forward.

#### Abbreviations

| | |
|---|---|
| HEA | The Higher Education Authority (Ireland) p.4 |
| CBL | Case-Based Learning p.5 |
| BEME | Best Evidence Medical Education p.5 |
| ExBL | Experience Based Learning model p.8 |
| SGFS | Structured Group Feedback Sessions p.9 |
| REC | Research Ethics Committee p.11 |
| MDT | Multi-Disciplinary Team P.16 |

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#### Authors' contributions

CB and JI led the facilitation but were joined by four others who supported the student groups (HK, CD, FM, RD). CB and JI were not involved in the CBL teaching and only three of the authors (RD, GO and FM) had any involvement in teaching, they acted as support rather than leading the session. CB, JI & HK conducted the data analysis and drafted the paper. All authors read and reviewed the final version of the manuscript. JI, HK and CB revised the paper following reviewer comments. All authors agreed on the final version.

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#### Data availability

The datasets analysed during the current study are available from the corresponding author on reasonable request.

## Declarations

#### Ethics approval and consent to participate

Written informed consent was obtained from each student, who were informed of their right to withdraw from the study at any time without any adverse consequences. This study was approved (application No. 212624603) by the Research Ethics committee of RCSI University of Medicine and Health Sciences.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

#### Author details

[1]Health Professions Education Centre, RCSI University of Medicine and Health Sciences, Dublin, Ireland. [2]Department of Obstetrics and Gynaecology, Rotunda Hospital, Dublin, Ireland. [3]Department of Medicine, RCSI University of Medicine and Health Sciences, Dublin, Ireland. [4]Department of Surgery, RCSI University of Medicine and Health Sciences, Dublin, Ireland. [5]RCSI Medical University of Bahrain, Manama, Bahrain. [6]Department of General Practice, RCSI University of Medicine and Health Sciences, Dublin, Ireland. [7]Teaching Enhancement Unit, Dublin City University, Dublin, Ireland.

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## Publisher's Note