


Chapter 3

An Operating System Session Plan Towards Social Justice and Intercultural Development in Microteaching for Higher Education

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ABSTRACT

Microteaching has been successful in developing teaching practices of both novice and more experienced educators and in enhancing student learning. At Queen Mary University of London, they have a highly diverse body of students. Because of this, the authors wanted to explore the use of microteaching as a teaching strategy to enhance social justice in higher education (access, fairness, diversity, participation, and human rights). In this chapter, they offer a systematic approach to support academics to fully realize the potential of micro teaching utilizing an operating systems module from the Computer Science and Engineering curriculum to promote social justice for learners. This chapter offers a methodical approach to creating your own micro teaching lesson plan by taking social justice ideals into consideration when teaching in a multicultural context. A reflection on the microteaching session plan is also provided, and potential challenges to implementing this approach are also discussed through considering social justice and intercultural development in the classroom.

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INTRODUCTION

Microteaching is a teacher training strategy which provides teachers an opportunity to improve their teaching skills by receiving feedback from peers (Zalavra and Makri, 2022). It is a small group activity which consists of the performance of micro skills which is recorded. These micro skills involve the ability to plan, communicate, promote interaction and the ability to answer questions. The use of microteaching as a teaching strategy dates back to the early 1960s (Brown, 1975). The process of developing a microteaching was designed as a cycle involving 6 steps: 'plan, teach, observe, re-plan, re-teach and re-observe' (Higgins & Nicholl, 2003). More recently, this cycle was amended to fit a three-stage model: plan, teach and observe.

Microteaching is also a proven way to teach small groups to the best of their ability and eventually produce greater learning outcomes (Naeem et al., 2022). In this context, microteaching, or microlearning as it is also known, involves scaling back the course content so that every individual student can retain what's being delivered in little bursts. Microteaching is well known for teacher education, but microlearning is about how students learn during microteaching sessions (Aldosemani, 2019). Microlearning has been proven to assist convert short-term memory to long term, indicating that giving learning information in bite-sized portions may be very successful, if not the most successful form of learning (Chen et al., 2022).

Motivation and Contributions

Our faculty members have had some previous experience with microteaching (and microlearning). The idea of microteaching is nothing new, but it is gaining ground in the training industry because of its efficiency (Gill et al., 2022). Incorporating microteaching sessions (or mini interactive sessions) into learning materials has never been simpler than it is now, with the advent of new technologies like e-learning systems, knowledge bases, and multimedia tools. At Queen Mary University of London, as in many UK Higher Education Institutions, we have a highly diverse body of students. The University's mission is 'to open the doors of opportunity' and so we wanted to explore the use of microteaching as a teaching strategy to enhance social justice in Higher Education. This includes promoting values such as equality of access, fairness, diversity, participation, and human rights, to enable intercultural development for learners (Naeem et al., 2022). Taking an Operating Systems module from Computer Science and Engineering as an example we have developed this guide for building microteaching session plans with confidence and in order to promote social justice and intercultural development. A reflection on the microteaching session plan is also provided and potential challenges to implementing this approach are discussed through considering social justice and intercultural development in the classroom. We conclude with lessons learned and recommendations for the future.

The rest of the chapter is organized as follows: Background and analysis of literature is given in second section. Third section presents the analysis of an example session plan. Fourth section presents a reflection on the microteaching session. Fifth section shares the possible methods for data analysis after collecting data in the form of feedback and formative assessments. Sixth section discusses open challenges. A summary is given in seventh section. Eighth section discusses how microteaching aimed towards social justice and intercultural development. Finally, the last section concludes the chapter and offers recommendations based on the lessons learnt during microteaching session.

BACKGROUND AND ANALYSIS OF LITERATURE

After the Covid-19 epidemic, educational researchers need to look at e-learning from fresh angles, thanks to the wide range of online techniques that academics implemented throughout the outbreak (Naeem et al., 2022). Considering the approaches used to influence future curricula that foster teaching abilities for e-learning, it's important thinking about the growth of teacher education. A well-known practise in teacher education, microteaching, was explored by Zalavra and Makri (2022) as a way of promoting social justice and intercultural development. Microteaching, a strategy that relies primarily on face-to-face interaction, was severely affected by the compulsory online transfer as was the case with other teacher education approaches. It's also possible that this move into online microteaching may open up new opportunities for teacher education programmes to use this effective method of online and in-person teaching. This study is divided into two sections. In the first phase, Technology-Enhanced Learning (TEL) is explored to identify the possible implementation of microteaching. Due to the Covid-19 outbreak, TEL techniques were moved (which had been effectively used both online and in-person for more than a decade) completely online. Microteaching is used in two different ways in the design of this study. Two experiments were carried out: one in a normal face-to-face environment before the pandemic, and the second one in an online mode during the lockdown. Various common TEL-related issues were identified by analysing qualitative data from both scenarios. In the second phase, various unique obstacles were exposed in the online environment. These findings expand the breadth of earlier research into face-to-face microteaching practise. Technology-enhanced microteaching online presents new problems, including difficulties in handling technology and a decrease in class engagement. Based on this study, the use of microteaching in higher education can be used to promote social justice and intercultural development through transferring practise online.

Teaching students through microteaching is a growing trend among undergraduate and postgraduate students in higher education for professional development of the teachers. A comparison was made between the perspectives of those students who teach tissue engineering microteaching and those who get such training (Campos-Sánchez et al., 2013). The perceptions of 56 students were examined before and after a microteaching session using two comparable questionnaires containing items related to preparation and presentation of a microlesson. When it comes to developing a microlesson, students prefer to refer to specified objectives, textbooks, and online resources than they do when they are given one. After obtaining the microlesson, students prefer the use of a pre-programmed index throughout the presentation and the minimization of the usage of slides. The other alternatives were determined to have no statistically significant differences. According to these findings, microteaching is an effective strategy for promoting social justice and intercultural development across the curriculum due to the teamwork activity created in the microteaching session and its connection to feedback relevant to the self-learning process.

Ismail (2011) studied the opinions of sixty-one female teacher trainees from the English Language Education Program in the Faculty of Education in the United Arab Emirates University (UAEU) on the microteaching component given in two courses of English language teaching techniques. The information was gathered using a mix of quantitative and qualitative methods. Findings from the study suggested that prospective teachers identified a wide range of recommendations and directions for further research to understand the social values during the implementation of this study for multicultural environment.

Learning with technology, project-based learning, and social constructivist approaches were examined by Mahmud, & Rawshon (2013), who found that teachers produce microteaching effective projects and

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that this new teaching method increases the quality of higher education by developing students' understanding levels. Analysing secondary data on higher-level teaching instruments, this study technique was developed. The basic data is gathered via an experimental design in which students from the International University of Business Agriculture and Technology (IUBAT) were asked to participate in a class discussion and fill out several questionnaires. All data are assessed and analysed based on the respondent's input according to statistical analysis. For students who are interested in learning more about the learning process, microteaching can play a vital role and add significantly to their comprehension, especially for the inclusion of intercultural development incorporating learning component such as teamwork.

Chinese EFL (English-as-a-Foreign-Language) pre-service teachers' views on microteaching were explored by He & Yan (2011). Reflective writing was used to gain insight into the experiences of the student teachers. Researchers found that microteaching helped pre-service teachers improve their skills, but there were some drawbacks to this approach as well. The most prevalent shortcoming was artificiality, which seemed to restrict the student teachers' ability to build real-world classroom teaching competency. Microteaching should be reinforced with a variety of other educational experiences and practises, according to the study, which would be useful to promote higher education teaching with multiculturalism while maintaining the values of social justice (e.g., equal access, diversity, participation, and respect for human rights).

Microteaching can be implemented effectively during online teaching, according to Kusmawan (2017). Traditional microteaching is a manipulative approach intended to encourage students to engage in self-reflective and critical thinking processes while they're being taught. An online microteaching programme at Indonesia's University of Terbuka was used as a case study for preliminary research. Using the Smart Teacher Portal, a survey was conducted to gather instructors' thoughts on microteaching's effectiveness. Researchers conducted in-depth interviews with in-service instructors regarding their perspectives on online microteaching's advantages. 82.68% of those who took the poll agreed that online microteaching increased their ability to teach at the college level. Most participants in the online microteaching programme reported feeling more confidence in their ability to teach after participating in the programme. Most academics said that microteaching online had made them better critical thinkers and reflective practitioners, allowing them to teach more effectively while dealing with diversity and equality.

Merc (2015) conducted a 12-week microteaching process in the Distance English Language Teacher (DELT) Training programme, the goal of this single-subject case study was to capture a teacher trainee's experiences. Before and after the training programme, the student teacher subjects filled out surveys, posted discussion logs online, and answered open-ended questions. At the conclusion of the training programme, candidates were asked to participate in an online interview. Anxiety over foreign language instruction was shown to be a problem for distance EFL teacher trainees, according to data analysis. Despite several issues, the program's microteaching practice was deemed to be beneficial to teachers. The student teacher, on the other hand, found the e-portfolio system to be a useful tool for assessment and evaluation. The findings of the research led to a concise description of the difficulties and concerns faced by teachers studying at a distance. Distance teacher training programmes will need to provide students with additional guidance and assistance in the future to promote higher education teaching with multiculturalism and social justice.

During the first half of 2020, several practical aspects of face-to-face teaching had to be resolved with the new form of online or remote teaching for ESL and Teaching English to Speakers of Other Languages (TESOL) programmes. Additionally, Macquarie University, Australia's TESOL teacher training course had to be restructured in order to comply with the new challenges such as teaching in

multicultural environment while dealing with diversity and equality. The ideas of Learning-Oriented Assessment (LOA) and learner autonomy were used in the implementation of online microteaching activities by (Bodis et al., 2020) in order to overcome these issues. Using VoiceThread, an asynchronous multimodal platform, and a combination of videos, interactive H5P assignments, and forums, a series of asynchronous tasks were developed in response to the learners' requests, which has been adopted in our study. As a result of our research, we have discovered that the new strategy not only fulfilled the Intended Learning Outcomes (ILOs) but also provided additional advantages such as promotion of social justice and intercultural development in microteaching for higher education. Students' feedback literacy and Information and Communication Technology (ICT) skills will improve as a result of this method, as will their sense of society as learners and teachers, as well as a sense of belonging and engagement. In both completely online and face-to-face delivery modalities, the current task design may be used to ESP (English for Specific Purposes) and general English education situations.

Another research by Haryanto et al. (2021) studied how pre-service science instructors planned a 30-minute microteaching course. Five pre-service science instructors from each group participated in this research. Pre-service science instructors from two Indonesian national institutions were selected for the study using random sampling. Lesson plans, student reflections, and group discussions all played a role in gathering the data. For content analysis, authors used both qualitative and quantitative methods. In terms of themes and patterns, the qualitative analysis focused on the topic, while the quantitative analysis focused on its duration and frequency. It was decided to display the individual fields of study in the lesson plan, based on the findings of the analysis. The Technological pedagogical content knowledge (TPACK) framework, on the other hand, was rarely seen in action. This study's findings suggest teacher educators must become clearer in their usage of instructional technologies to promote social justice and intercultural development for higher education. In online microteaching classes, it is important to improve TPACK during preparation and undertake more research into how this planning is implemented for higher education teaching with multiculturalism while maintaining the values of social justice.

A review of the current literature has helped us to identify numerous successful approaches and methods. Finally, we've included these ideas into our session design in order to help advance multiculturalism in higher education while also upholding social justice ideals of equity and inclusion (e.g., equal access, diversity, participation, and respect for human rights).

ANALYSIS OF SESSION PLAN

One of the important topics from Operating Systems has been selected to show the promotion of social justice and intercultural development. This is a second year module for undergraduate students at Queen Mary University of London, who already have prior knowledge about multithreaded programming and process management. In this session, the concept of *Deadlock in Operating Systems* is discussed which offers the solution to prevent deadlock. The students considered for this session have greater diversity in terms of culture, nationality, educational background or experience, age of students, ethnicity, race, and gender. By the end of the session, students should be able to:

1. Describe the concept of deadlock in Operating Systems.
2. Identify the four necessary and sufficient conditions for deadlock.
3. Explain the solution for deadlock prevention.

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Table 1. Various activities designed for session plan

Time	Tutor activities	Student activities (individual/small group/plenary)	Aids/ Resources
0-1m	(Introduction) Introduce topic	Plenary	PPT slides
1-3m 3-4m 4-6m 6-9m 9-13m	2 minutes: check prior knowledge 1 minute: demonstrate Deadlock via Video using Bridge Cross Example 2 minutes: explain the concept of deadlock Present four necessary and sufficient conditions for deadlock 4 minutes: pairs to work together to find one feasible answer to avoid deadlock	Individual Watch the Video Plenary Plenary Write on post-it notes	Kahoot Video PPT slides PPT slides Post-its
13-15m	(Conclusion)	One-minute conclusion and assessment survey using two informal tasks.	Mentimeter
Formal or informal assessment tasks	Result of quiz can predict an effective assessment and solve the deadlock problem.		
Consolidation following the session	Tutor to share power point presentation and describes problem/solution to learners for analysis.		

We chose to discuss this problem as it is one of the biggest challenges, existing in the well-known industries such as Facebook, Google, Microsoft and Amazon. The main focus of this lecture was to understand the theory of deadlock in Operating Systems and discuss a solution to avoid the deadlock (Havender, 1968). Table 1 shows the various activities designed for session plan and important values of social justice have been considered carefully to enable intercultural development. In this micro session, every student has access to participate in all the activities which are discussing here to understand the concept of deadlock in Operating Systems. To ensure that all the students are treated fairly by receiving an equal level of help and assistance in order to grasp the idea of deadlock while working individually and in a team during think-pair and share activity. Queen Mary University has a very diverse group of students for every undergraduate program in terms of culture, nationality, educational background or experience, age, ethnicity, race, and gender. Approximately 41% of the student body at Queen Mary is international, with over 170 different nationalities represented. Most local undergraduates come from public schools, with 75% being people of colour and 49% being their first time in college¹. To complete this microteaching session successfully, students were required to participate in individual and team work activities. In order to promote inclusivity and equal access, every student had the right to join a team of their choice to participate in think-pair-share activities for finding the solution.

Initially, a quick brainstorm activity was used to stimulate students' prior knowledge. The chosen learning outcomes offer an innovative development technique to learn new ideas using active learning approaches to increase learner engagement (Freeman et al., 2014). Learning outcomes were developed using "Revised Bloom's Taxonomy" (Anderson et al., 2001) to articulate the skills required for identifying, understanding and then designing an improved plan to identify the four necessary and sufficient conditions for deadlock.

We started the session by activating students' prior knowledge using a brief Kahoot based quiz (Plump et al., 2017), which helps to introduce the topic to the students and enables them to recognize that they may know more about a topic than they believe. This activity helps support the participation of all learners, regardless of their background. *Van Kesteren et al. (2014)* showed the usefulness of prior knowledge

in undergraduate students to enhance their engagement in learning by boosting “brain connectivity”. Existing research (Plump et al., 2017) has also reported that prior knowledge can be used to activate memory, enable participation and promote active learning. While it is difficult to link neuroscience with education, Bransford and Johnson (1972) have given evidence to support the influence of activated learning to enable acquisition and memorization of prior knowledge (Brod et al., 2013).

Hartley and Davies (1978) identified that a one-minute video within a 15 minute micro session is very effective for activating learning and can increase student engagement. In this context, the video helps students to explain the concept of deadlock by discussing a bridge crossing example using an animated video and presentation, which would be useful for those students who have limited prior knowledge (Hailikari et al., 2008). Overall, a large part of this session utilized active learning approach to enhance student engagement with planned material and increased interaction. The utilization of constructivism theory, as recommended by *Bada et al. (2015)*, plays a vital role to develop the idea from experience using “collaborative technology with autonomy” to promote team work.

This activity is designed as a “*problem-solving task*” as *Powell et al. (2008)* suggested that the problem-solving methodology shows outstanding results in learner’s interaction and capability to solve real time challenges. The interaction among students is also essential and offers a vital knowledge indicating the interaction among the student, teacher and task. To enable interaction among students, we want them to solve the problem using think-pair-share activity to save time. The discussion between students using think-pair-share indicated it was an excellent method to assess the impact of deadlock on system performance and improve learners’ capability to design a new methodology while working together (Powell et al., 2008). This activity will show how this systematic approach to support academics completely appreciates the potential of micro teaching and coping with diversity as students have the right to join a pair as per their choice.

The animation-based power-point slides enable active learning and helping learners understand and analyse, “*the four necessary and sufficient conditions for deadlock*”. To encourage learners’ engagement, active learning utilizes various teaching approaches to promote learning process effectively (Anderson et al., 2001).

To implement the above-mentioned technique, this lecture is customized with two informal assessment tasks to ensure that all the students are engaging in the current session actively and acquiring meaningful knowledge. Following this, (1) an image was displayed to ask learners to memorize and self-examine the solution to avoid deadlock. Based on this, multiple choice and two questions was asked to observe student’s knowledge and display the right answers. (2) The evaluation survey improves learner engagement and long-term retention of concepts, further increasing the student’s performance (Dunlosky et al., 2013). To implement above-mentioned assessment tasks, session has been evaluated using short survey by asking 3 questions:”

1. Are you feeling that the session offered to you has helpful concepts, which can be used in your teaching? (Please answer on scale of 1-5)
2. Is there anything needed to add in this session?
3. Is there anything needed to remove from this session?

Two qualitative and one quantitative question have been framed, which can be used to plan future lectures on this topic using the feedback of students. All the above-discussed activities will be accessible to all students.

REFLECTION ON MICROTEACHING SESSION

Roffey-Barentsen & Malthouse (2009) mentioned, a teacher can improve his/her teaching skills by assessing himself/herself through a reflection. Gibbs reflective cycle is used to write reflection on given microteaching session (Gibbs 1988). A microteaching session on ‘Deadlock in Operating Systems’ was presented for undergraduate students of Computer Science and Engineering, who already had some prior knowledge about process management and multithreaded programming (Gill et al. 2022a). PowerPoint slides were used to deliver this session, which is a very important component of feedback. Overall, it was a very good microteaching session but delivered too fast because of the time constraint. Positive and constructive comments have been received from peers and tutor, specially related to enabling social justice while teaching in multicultural environments. However, one peer stated that “Kahoot based quiz contains lot of jargons” whereas another peer mentioned that “group activity was creative but not very interactive”. Reflecting on these feedback comments, there is a need to improve the overall structure of the session as follows.

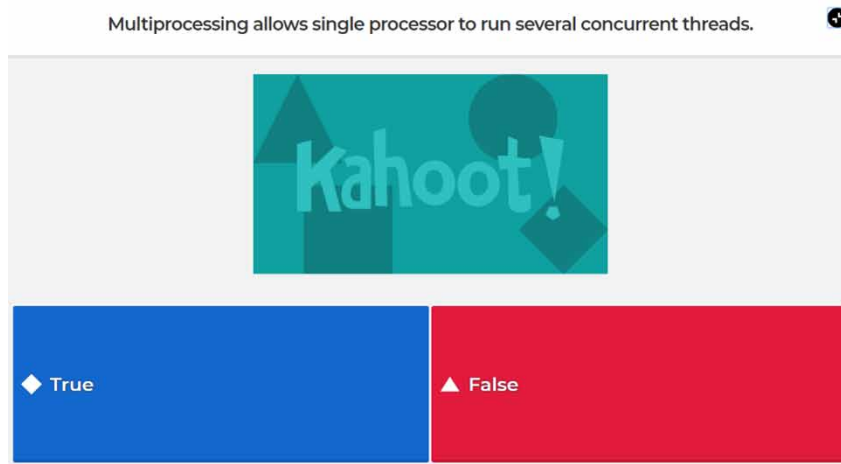
Improving Slides

One of the peers remarked that “questions in the Kahoot contain lot of jargons and only tested factual knowledge”; another stated that “group activity was creative but not very interactive”. This feedback has encouraged a focus on two main areas: firstly, Kahoot based quiz is using to test the real-world experience of students which is related to Deadlock in Operating Systems; and secondly, how the think-pair-share activity can be improved by asking students to write on the blank whiteboard which is available in Blackboard Collaborate to enable participation. The feedback from tutor was that “microteaching session was well presented and interactive, promoting social justice in in multicultural environment but you were slightly running out of time while completing your final interactive element”. To complete the session in given time, three slides were merged and converted the real-life examples into Kahoot based quiz to test the real-world experience instead of only factual knowledge. In the original presentation, there were six questions in the quiz with 30 seconds each. In the revised structure of session, the number of questions in quiz has been reduced to three with 20 seconds each, which saves two minutes more and improves the students’ participation. All comments suggested to improve the students’ interaction, enable active participation of learners and manage time effectively.

Craig and Amernic (2006) identified that the sessions based on PowerPoint slides can deter the association between learners and tutor. Only PowerPoint slides based session can decrease the interaction between students and teacher but inclusion of other active learning technologies such as Kahoot or Mentimeter based quiz, short video, animated slides, Think Pair & Share activity and real-life examples can increase student participation (Freeman et al., 2014). The active learning technologies have been adopted in this microteaching session (Dunlosky et al., 2013) and received very positive feedback from the participants boosting teacher’s confidence for the future sessions. Tomlinson (2015) focused on testing the prior knowledge of students, which is helpful to recognize their knowledge about the topic. Further, the tutor can also explain the concepts based on their previous knowledge.

The presentation was started with *Intended Learning Outcomes (ILOs)* for showing the content of microteaching sessions as it increases the learner engagement (Freeman et al., 2014); session was appreciated by the peers and tutor. “Revised Bloom’s Taxonomy” is used to achieve ILOs (Anderson et al., 2001), which helps to create essential abilities. These abilities are necessary for memorizing, grasping

Figure 1. Original Question



and subsequently designing an effective strategy to understand the concept of deadlocks in the Operating Systems.

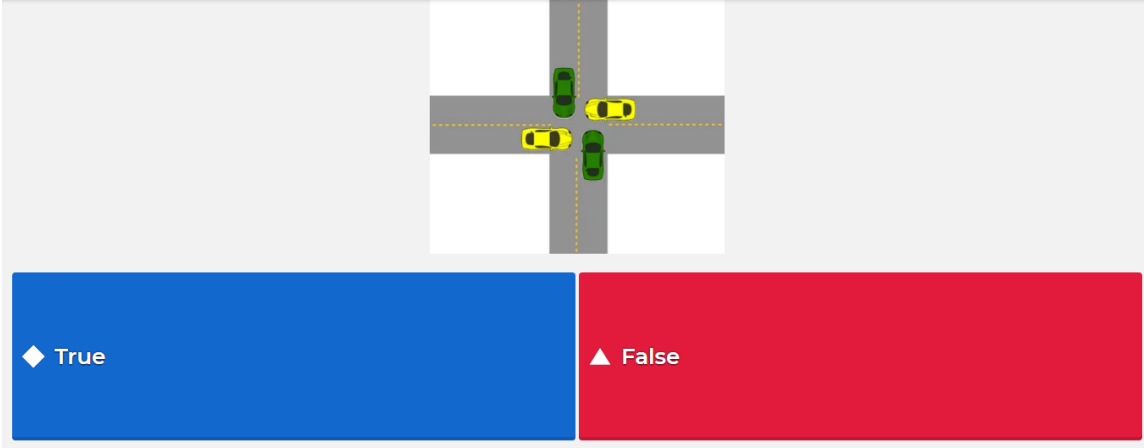
The subsequent use of an active learning activity with the Kahoot quiz which was well designed based on the core concepts of process management and multithreaded programming (Gill et al. 2022a). Kahoot based quiz is the best way to activate prior knowledge of learners by introducing the topic (Plump et al., 2017) and it is helpful for them to recall their prior understanding and increase their participation (Brod et al., 2013). However, participants found that the quiz was lengthier and tested technical knowledge only. Figure 1 shows an example of questions which was asked in the quiz. Based on the suggestions of the participants, we have updated the quiz with real-life examples with only three questions with 20 seconds each. Figure 2 shows an example of questions that was redesigned for the quiz which has benefited to reduce the time as well as enable more active learning using real-life examples. This quiz was developed so that every student in the class would have the opportunity to take part in it. It also permits anonymous contributions and maintains parity among the students, which contributes to the promotion of social justice in a multicultural environment.

Just after the quiz, a short video of 30 seconds was started to demonstrate the concept of deadlock, thus enabling active learning. This video contained a detailed example from real-life which explained the concept of deadlock based on daily activities. Hartley and Davies (1978) pointed out that a short video within microteaching session activates learning and improves the engagement of the students. Further, the technical concepts related to deadlock were explained such as process and resource, and which are listed in technical and general examples for better understanding.

Moreover, a bridge crossing example was used to describe the relationship between process and resources at runtime. Hailikari et al. (2008) identified that animated slides provide benefits to students who have no or limited prior knowledge to understand the concept. The occurrence of deadlock is further described using animated slides, which explain how four conditions lead to the occurrence of deadlock. To test the knowledge of the participants, a think-pair-share was used through 'Post It and Sticky Notes (as shown in Figure 3)', in which participants worked in pairs to find one possible answer to avoid dead-

Figure 2. Amended Question

In order to cross intersection, cars need free lanes but can't make progress unless someone backup, is called Deadlock.



◆ True

▲ False

lock (Jaques & Salmon, 2007). Powell et al. (2008) suggested that “*problem-solving task*” methodology helps learners to solve real-time problems together, which also increases interaction between students.

Participant feedback suggested writing on the blank whiteboard which is available in *Blackboard Collaborate*, in order to improve student participation and enable active learning. Based on the suggestions of the participants, the group based think-pair-share activity was redesigned as shown in Table 2, in which participants have to identify the feasible solution to avoid deadlock and write on provided space in pairs.

Figure 3. Original Slide



Post It and Sticky Notes

Group 1	Group 2	Group 3
Removal of Mutual Exclusion	Removal of Hold and Wait	Removal of Hold and Wait
Make resources shareable	Hold all required resources before start	Request other resources and release existing resources
Group 1	Group 2	Group 3
Condition 1	Condition 2	Condition 2

Table 2. Amended Document

Group Based Think Pair and Share Activity
1. How to remove the condition of ‘Mutual Exclusion’? Answer:
2. How to remove the condition of ‘Hold and Wait’? Answer:
3. How to remove the condition of ‘No-Preemption’? Answer:
4. How to remove the condition of ‘Circular Wait’? Answer:

Finally, two different tasks were planned for an informal assessment to identify failures and successes of the session (Lederman, 1990). In the first task, an image was displayed and students were asked to remember and self-examine the solution to prevent deadlock. In the second task, two qualitative and one quantitative questions were asked using Mentimeter to assess this session and get feedback to improve microteaching sessions in the future. This type of survey helps learners to retain the concept for a long-time, thus improving their performance (Dunlosky et al., 2013). The first question asked participants to rate the session on a scale of 1-5 to get points out of 5 on an average (see Table 3), which was a quite a good score. In the next two questions, learners were asked to suggest if there is a need to add or remove anything in this session as it is right of every participant to share his/her views as per Queen Mary University’s inclusive curriculum principles. At the last, the session was summarized and highlighted the concepts which were covered and also provided references for further reading.

METHODS FOR DATA ANALYSIS

In this section, we are highlighting important methods such as feedback and formative assessments can be used to collect data from students:

Feedback

At the end of the session, we will ask students to share their feedback about learning concept after microteaching session.

- *Are you feeling that the session offered to you has helpful concepts, which can be used in your teaching? (Please answer on scale of 1-5)*

Table 3 shows the feedback format on a scale of 1-5, where students can participate to feedback for the calculation of score out of 5, which shows that students satisfaction with this microteaching session.

Further, students can write comments after microteaching session to anything needed to add in this session or anything needed to remove from this session.

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Table 3. Students' Feedback after Microteaching Session (Scale of 1-5)

Number of Students	Very Satisfied (5)	Satisfied (4)	Neutral (3)	Less Satisfied (2)	Not Satisfied (1)	Average

Formative Assessment

For formative assessment, one QMPLUS-based quiz can be used at the end of the online micro session which can contain MCQ and T/F questions. This quiz can find out the students' technical understanding about the deadlock in Operating Systems. Table 4 shows the format of formative assessment. This quiz was created with social justice in mind, allowing anonymous submissions and distributing the results evenly among the class members.

Table 4. Quiz Format for Formative Assessment

Question	Type	No. of Participants	Correct Answers	Incorrect Answers
Q1: A problem provoked in multitasking when a process is continually denied necessary resources is known as _____. a) deadlock b) starvation c) none of the above d) all of the mentioned	MCQ			
Q2: To avoid deadlock _____ a) there must be a fixed number of resources to assign b) resource allocation must be done only once c) none of the above d) all of the mentioned	MCQ			
Q3: The circular wait condition can be averted by _____ a) specifying a linear ordering of resource types b) using thread c) none of the above d) all of the mentioned	MCQ			
Q4: Deadlock is possible if any one of the four necessary conditions holds. a) True b) False	T/F			
Q5: Deadlock avoidance means the same thing as deadlock prevention. a) True b) False	T/F			

OPEN CHALLENGES

Following reflection on the micro session, there are a number of challenges to address with this approach. The main problem within this session was effective time management. There were multiple activities in the session, which needed transition time from one activity to another resulting in delays. To solve this problem, there is a need of an accurate plan to ensure that all the required visual aids are ready, preventing any electronic/digital disruptions (Gill et al, 2022). The second challenge can be students' active participation and collaboration between the learner and tutor to promote social justice and enable intercultural development. Tutors can support the development of a supportive and inclusive atmosphere and observe the learning and engagement of students while students are working in a team or alone. To find the summary of failures and successes of the session, there is a need of complete evaluation from both tutor and learners, helping improve teaching skills of tutor. Active students feedback offers an efficient evaluation whether all the learning outcomes have been achieved (Naeem et al., 2022). At the end, feedback of students is used to evaluate their learning in terms of new concepts, their engagement, understanding and active participation.

DISCUSSION

To summarize, this microteaching session used a range of active learning methods to stimulate previous knowledge of the learners helping them to learn new concepts and increase their participation and engagement, drawing on ideas from various existing studies discussed in Section 2. Further, active participation of learners in problem-solving activities in teams supported the development of intercultural communication between students and the promotion of diversity and inclusivity in the classroom (Campos-Sánchez et al., 2013).

However, challenges were also identified as a result of this session through the evaluation and reflection process. There is a need for an effective session plan to manage the given time efficiently, because multiple activities are required to enable active learning (Singhal et al., 2021). So, it would be better to consider some slack time (Chickering & Gamson, 1991) because it always takes longer than we think!

Microteaching Aimed Towards Social Justice and Intercultural Development

In this work, we have implemented various methods and approaches from the literature to deliver a microteaching session for the promotion of cross-cultural understanding among students (Singhal et al., 2021). It is essential to take into account fundamental ideals of social justice, such as equality of opportunity, fairness, diversity, and participation, as well as human rights while implementing session plan. Further, this work shows how in the context of Higher Education we can provide “practice of freedom” for students to learn to critically analyse and discover how to participate in the transformation of their worlds by promoting multiculturalism.

Students can engage in all of the activities discussed in Section 3 to better understand the idea of deadlock in Operating Systems during this micro session, which is open to everyone. All students will receive equal guidance and support in order to understand this concept while working independently and in a team during the think-pair-share exercise. Every undergraduate programme at Queen Mary University boasts a more culturally and racially diverse student body than any other university in the London (Gill et

al., 2022). In order to effectively finish this microteaching session, students will participate in both solo and team-based tasks. Every student has the right to engage in a think-pair and share activity in order to discover a solution to prevent impasse, which is the ultimate feature of social justice (Singhal et al, 2021).

A computer science and engineering operating systems module has been used as a case study to assist in the development of microteaching lesson plans focused on social justice and cross-cultural growth (Gill et al, 2022). This work gives a logical framework for designing a microteaching lesson plan by taking social justice ideals into account. In order to enhance intercultural communication, collaboration and inclusivity in Higher Education teaching.

CONCLUSION AND RECOMMENDATIONS

The main aim of this chapter is to promote the use of microteaching for inclusive HE teacher development, using an Operating Systems module from the Computer Science and Engineering curriculum and to present a logical way to build a microteaching lesson plan. We have provided the suitable methods to collect data from students which can be formative assessment and feedback. In addition, we have reflected on our microteaching session strategy to improve teaching, promote social justice and enable intercultural development. There are a few things to keep in mind when implementing this session plan in the classroom, including the possibility of unforeseen obstacles.

Key Practical Recommendations

Körkkö et al. (2016) suggested that reflection on microteaching session can improve the professional development of the tutor. The following lessons have been learnt from this microteaching session as key practical recommendations, which could be implemented in real classrooms:

1. Effective time management during microteaching sessions is essential because transition time from one activity to another in the session took more time than originally estimated in Table 1.
2. The tutor has to create a supportive and inclusive atmosphere. This can be done through including different active learning approaches which allow all students to participate, including those who may feel less able to speak up in front of peers, and valuing the responses and contributions of all students.
3. Group based activities enhances student's interaction and encourages them for teamwork, which is also helpful for developing intercultural communication and collaboration skills.
4. For the improvement of future sessions, the participant's feedback is very important and gathering and acting on student feedback is also an important demonstration of the value of the student voice, one of Queen Mary's principles of an inclusive curriculum.

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Teaching in Higher Education module in partial fulfilment of the requirements for the award of degree of *Postgraduate Certificate Academic Practice (PGCAP) – UK Teaching Qualification* submitted in *QM Academy* of Queen Mary University of London, UK is an authentic record of research work carried out by *Sukhpal Singh Gill (First Author)* under the supervision of *Stephanie Fuller (Second Author)* and refers other researcher's work which are duly listed in the reference section. This *Assignment* has been checked using *Tutnitin* at Queen Mary University of London, UK and submitted assignment has been stored in repository for university record.

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KEY TERMS AND DEFINITIONS

Deadlock in Operating Systems: In a deadlock, each of the computer processes waits for a resource that is being assigned to some other process.

Formative Assessment: Monitor student learning to offer feedback that may be utilised by instructors to enhance their instruction as well as the student's learning, the purpose of formative assessment.

Intercultural Development: Building organisations and cultures that incorporate individuals from a wide range of socially defined groups, such as race, gender, ethnicity, nationality, and religion.

Learner: This word is used interchangeably with "student" and "participant."

Microlearning: It is about how students learn during microteaching session.

Microteaching: It is a teacher training strategy which provides teachers an opportunity to improve their teaching skills by receiving the feedback from peers.

QMPLUS: It is the online learning environment (OLE) used across the university (Queen Mary University of London) and is based on Moodle.

Social Justice: The aims of social justice in education are to increase empathy, fairness, and equality.

Think-Pair-Share: Students work together to solve an issue or answer a question on a text they've been assigned.

ENDNOTE

¹ <https://www.qmul.ac.uk/about/facts-and-figures/>