An examination of co-teaching in an online environment

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Abstract

Co-teaching, employed as a pedagogical tool, is a teaching method commonly used to improve students' collaborative learning. It can be defined as two or more professionals delivering substantive instruction to a diverse group of students in a single physical space or as blended delivery. Team teaching is an approach to co-teaching, a Business Education method since the 1990s. This case study examines tutor experience and observations of co-teaching on a level 4 specialist transport and logistics module delivered online in 2020-2021. We are the teaching team for the module at the University of Greenwich and worked as two co-tutors. Using a mixed methods approach, we have compared, across a range of parameters, student outcomes for a) co-teaching and b) teaching by a single person. The quantitative measures included attendance, marks awarded and student satisfaction (EvaSys scores) and the black, Asian and minority ethnic (BAME)/white module gap; the qualitative measures consisted of tutor observations. Across the quantitative measures, the results are consistent with the suggestion that students may have benefited from being co-taught. Similarly, the qualitative measures indicate greater student engagement with co-teaching than with teaching by one person. We feel that the initial findings from our analysis demonstrate that there is potential for further exploration of the benefits that might be gained from a wider application of team teaching across the Business Faculty.

Keywords: Co-teaching, Team Teaching, online environment, assessment, engagement.

1. Introduction

The importance of student engagement has increased in the higher education (HE) sector, owing to its role in student achievement. In the United Kingdom (UK), HE institutions (HEIs) are subject to evaluation through the IPSOS Mori National Student Survey (NSS), which may be viewed as a 'consumer' satisfaction score, with students as the consumers (Robinson and Sykes, 2014). This is the terrain in which HEIs operate, where programmes are marketed to increasing numbers of international students and resulting competition between HEIs to recruit students (Robinson and Sykes, op.cit.). This means that educators should design their modules to take advantage of current technologies to engage students in ways that best meet their educational needs (Ertmer and Newby, 2013).

Axelson and Flick (2010, p.38) define 'student engagement' in terms of the level of involvement or interest that students appear to have with respect to their learning, their connection to their classes/educational institutions and their classmates. The teaching and learning design of the co-taught module that is the subject of this case study followed a constructivist pedagogy and prioritised activities that could facilitate collaborative working within the classroom (Bada and Olusegun, 2015).

The sudden move to online teaching and learning in 2020 as a response to the COVID-19 pandemic meant that tutors found it challenging to engage students in online environments (Namboodiri, 2022). Online teaching formats include virtual, synchronous, asynchronous, blended and hybrid lessons (Groccia, 2018). Participation and learning require students to be comfortable with the material and to take an active role in analysing it (Khan et al., 2017). It has been observed that activities designed to promote student participation in physical classrooms do not necessarily work as well in an online environment. Khan et al. (op.cit.) reported that resistance to online instructional techniques may be frustrating for tutors and students. Students attending classes online have often been observed by tutors to turn their cameras off and remain on mute throughout the session. This behaviour creates a gap between students and tutors and may reduce student engagement during the sessions.

The online co-teaching approach that we (the authors – two tutors in the University of Greenwich Business School) adopted was an attempt to address the gap between students and tutors that had been observed in online tutorials. Joining the weekly online tutorial session from September 2020 to March 2021, we co-taught a level 4 transport and logistics module to eighteen students. The tutorial followed a lecture which had been pre-recorded and provided to students via Panopto. We enjoyed the collaboration, which led to the development of this case study.

The aim of our project was to compare student outcomes and tutor observations on the module that we co-taught with the outcomes on two modules, taught by individuals, that were also based in the Greenwich Business School. Several different outcome measures were explored: student attendance, results and satisfaction. Our intention was to highlight potential quantitative and qualitative benefits of co-teaching. In this paper, we discuss the literature on co-teaching and explain our methods of delivery and measures of success.

## 2.	Literature review

There are several definitions of co-teaching, but we will use the two most relevant examples. Co-teaching can be defined as "two or more professionals delivering substantive instruction to a diverse, or blended, group of students in a single physical space" (Cook and Friend, 1995, p.1). Co-teaching can also be defined as "two or more individuals who come together in a collaborative relationship for the purpose of shared work…for the outcome of achieving what none could have done alone" (Wenzlaff et al., 2002, p.14). The key aspects of these definitions are the involvement of more than one educator and the importance of working collaboratively.

The literature on co-teaching within business schools tends to use the term 'team teaching'. Helms, Alvis and Willis (2005) point out that team teaching is a popular trend in business education. Minett-Smith and Davis (2020) spoke about the "necessity of team-teaching" in their case study at the University of Bedfordshire Business School, which, like the University of Greenwich, is a modern university with a widening participation agenda and a diverse student body.

Historically, co-teaching has long been used in nursing programmes, which has been examined in studies dating back over forty years (Lock et al., 2018). Dumas and de Montigny (1999) have considered the advantages and disadvantages of co-teaching in nursing education from the perspective of both teachers and learners. These strengths and potential

limitations are set out in the tables below (see tables 1 and 2). They are an important consideration for tutors considering co-teaching.

Advantages for teachers	Disadvantages for teachers
Mutual support	Time-consuming
Constructive criticism	Energy-consuming
Intellectual stimulation	Constant communication required
Value of confrontation	Needs to be coordinated between teachers
Information-sharing	Precision of thoughts and actions
Sharing of decisions	Constant flexibility between teachers

Table 1. Advantages and disadvantages of co-teaching for teachers (adapted from Dumas and de Montigny, 1991)

The key challenges for tutors fall under the themes of time (scheduling teaching between tutors), energy (more needed to plan and prepare) and communication (more meetings and emails) (Dumas and de Montigny, *op.cit.*). Lock *et al.* (2018) point out that continuing and open communication between the tutors is necessary to develop their relationship and teaching practice.

Advantages for learners	Disadvantages for learners
Different points of view	Team efficiency
Enlarged knowledge base	Insecurity
Different role models	Need for more energy
Teamwork	Ambivalence
More objective evaluation	Stress

Table 2: Advantages and disadvantages of co-teaching for learners (adapted from Dumas and de Montigny (*op.cit.*))

Students' perception of the effectiveness of the teaching team (see table 2) is an essential aspect of co-teaching to consider (Floyd, 1975). Dumas and de Montigny (*op.cit*) state that when preparation and planning by the teaching team are clearly visible to students, they can more readily adapt to co-teaching.

The conditions needed for effective co-teaching are that the members of the teaching team communicate well with each other and understand each other's strengths, demonstrate mutual respect and commitment, maintain a focus on student outcomes and, importantly, welcome feedback, according to Lock *et al.* (*op.cit*) and Kelly (2018).

Bacharach, Heck and Dahlberg (2008) investigated the impact of a co-teaching initiative at a mid-western university in the United States. They utilised 'co-teaching strategies' developed by Cook and Friend (1995), which included "*one teach, one drift*" and "*team teaching*". We will explore these strategies and describe in more detail within this paper how we applied them.

3. Method

3.1 Sample

Our co-teaching case study is based on our experience of teaching a specialist thirty-credit level 4 transport and logistics module in the University of Greenwich Business School. We –

experienced tutors – co-taught the group of eighteen students in an online environment (MS Teams) over two teaching terms (twenty-four weeks).

Our cohort included mature students (some with work experience in the transport and logistics sector), students with disabilities, home and overseas students and students from a diverse range of backgrounds. There were individuals in our cohort who, based on our observations and interactions with them, appeared to have differing levels of motivation and engagement, which matches the experiences of Minett-Smith and Davis (2020).

3.2   Co-teaching approach

In 2020-21, the University of Greenwich adopted a blended approach to teaching in term 1 (alternating between on-campus and online tutorials) and an online-only approach (all tutorials online, taught in a synchronous way) in term 2, in line with Government guidelines.

We adopted a collaborative approach to the planning, preparation and delivery of our co-taught sessions. We alternated between 'one teach, one drift' (one teacher has primary responsibility to teach and the other assists the students) and 'team teaching' (both tutors actively involved in the lesson, with no division of authority) (Bacharach, Heck and Dahlberg, 2008).

We met after each co-taught session to reflect jointly on the class. In these reflections, we drew on Brookfield (1995) and focused on the four lenses 'students' eyes', 'colleagues' perspective', 'personal experience' and 'theory'. We have adapted the four lenses framework in figure 1 to reflect our action planning, which informed our reflections and helped us to develop and improve our co-taught delivery.
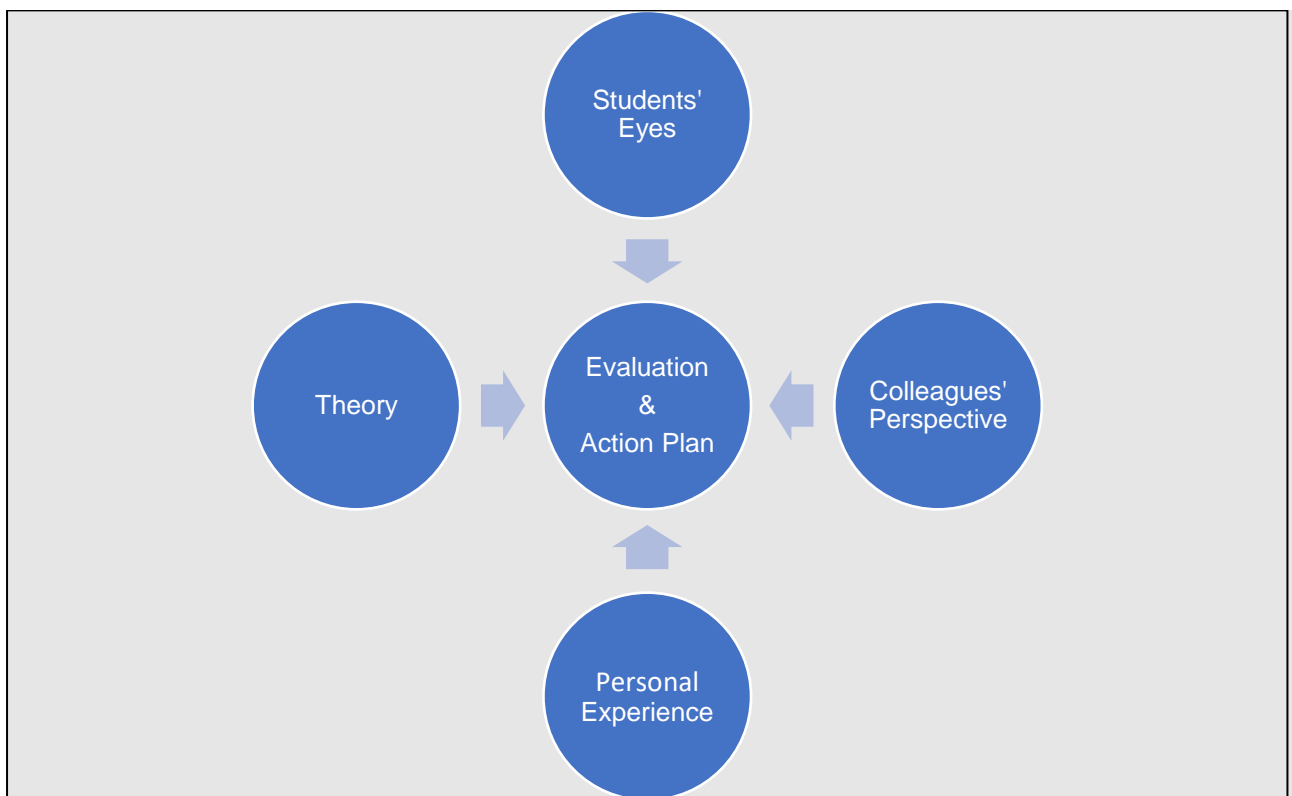

Figure 1. Framework followed by teaching pair for reflection (adapted from Brookfield,1995)

3.3   Analytical approach

We adopted a mixed methods design (Gray, 2013). We first explored quantitative indicators to make our comparison between co-taught and modules taught by a single person. For comparison, we used two thirty-credit level 4 modules (taught by a single person) which had similar numbers of students registered on them. We used the following comparative indicators: student attendance (based on student attendance records made by tutors on GREweb, following the University of Greenwich policy for taught modules), assessment results and student satisfaction (based on responses to the end-of-module survey `Evasys'. Additional qualitative data was obtained via tutor observation and verbal feedback from students on the co-taught module.

4.   Results

4.1   Attendance

The first criterion that we used for comparison between the co-taught modules and those taught by a single person was attendance. In figure 2, we compare the mean percentage of sessions attended by students on the co-taught transport and logistics module with attendance on two other thirty-credit modules at Level 4 that were taught by a single person. The average attendance on co-taught module was almost 25% higher than the two modules taught by a single person, which had similar attendance levels. We suggest that our co-teaching had a positive impact on attendance.
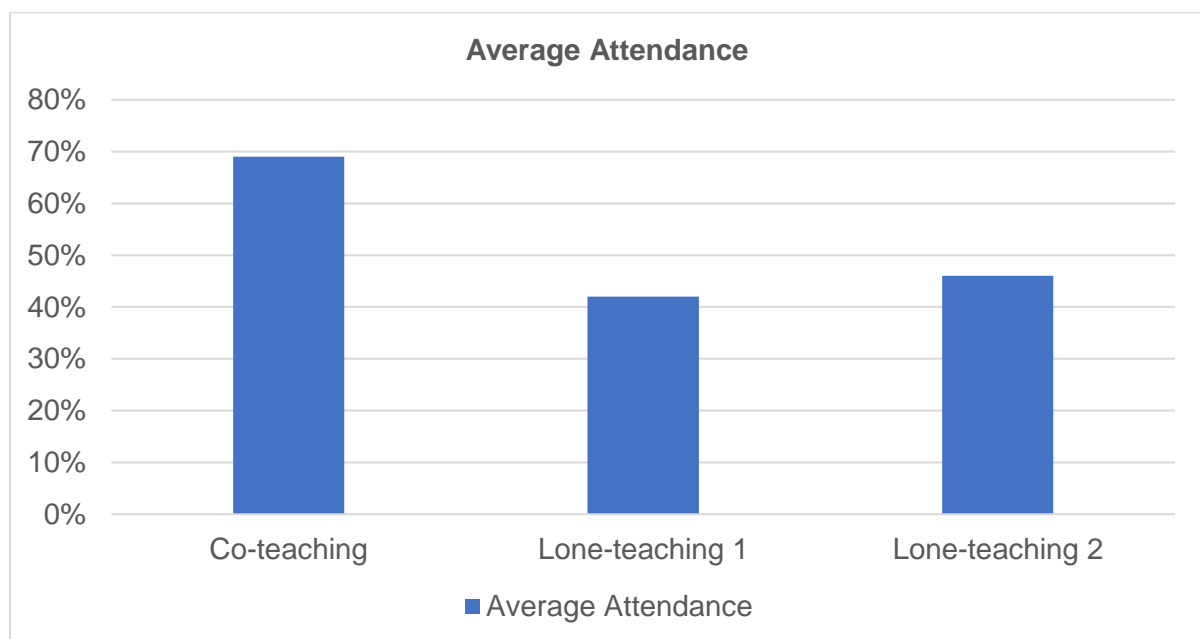

Figure 2: Average attendance on modules receiving co-teaching and single-person (lone) teaching

4.2   Assessment results

The second criterion that we examined was the mean marks obtained for the co-taught modules in comparison to the modules taught by a single person, as can be seen in figure 3.
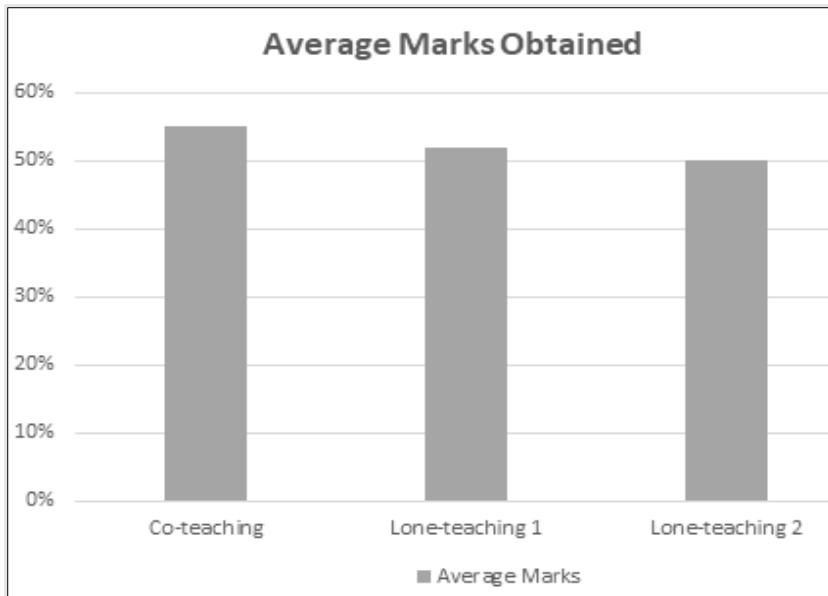
Average Marks Obtained

Figure 3. Marks obtained in modules receiving co-teaching and single-person (lone) teaching

We observed that both the means (see figure 3) and standard deviations (co-taught SD=21.89; single-person-taught 1 SD=19.37; single-person-taught 2 SD=19.59) were very similar across the three modules, with a very slight advantage for the mean mark achieved being observed on the co-taught module.

However, the third criterion that we considered was the distribution of module results across the marking bands (fail (0-39); 40-49; 50-59. 60-69 and 70+). This distribution was also compared across the co-taught module and the two single-person-taught modules (see figure 4). We have observed that greater numbers of students achieved marks in the 60-69 category for the co-taught module than both the single-person-taught modules. On the co-taught module, fewer marks fell into the lower pass categories compared with the single-person-taught modules. Again, this is consistent with our co-teaching having had a positive impact on the results achieved by students.
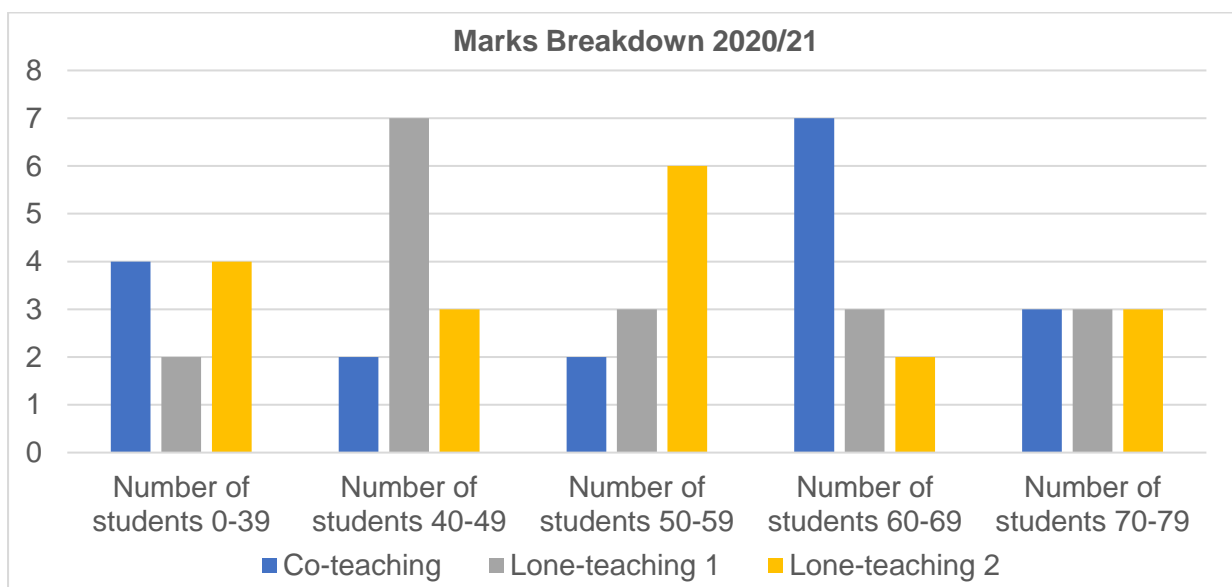
Marks Breakdown 2020/21

Figure 4. Marks breakdown for students in modules receiving co-teaching and single-person (lone) teaching

4.3   EvaSys survey score

The fourth criterion that we considered was the end of module survey responses, obtained from the EvaSys online survey software (www.evasys.co.uk) used by the University of Greenwich. Ratings of satisfaction on EvaSys can range from 0 to 5 and scores above 4.0 are considered 'good' satisfaction scores (Solomon, 2021).

We have presented the scores for the co-taught module and modules taught by a single person in terms 1 and 2 (2020/21) in figure 5. We found that the mean overall satisfaction score for the co-taught module was 4.5 in term 1 and 4.3 in term 2 (40% response rate). While the numbers are too small to allow for a statistical comparison, a small advantage was observed for the co-taught module compared to the single-person-taught modules.
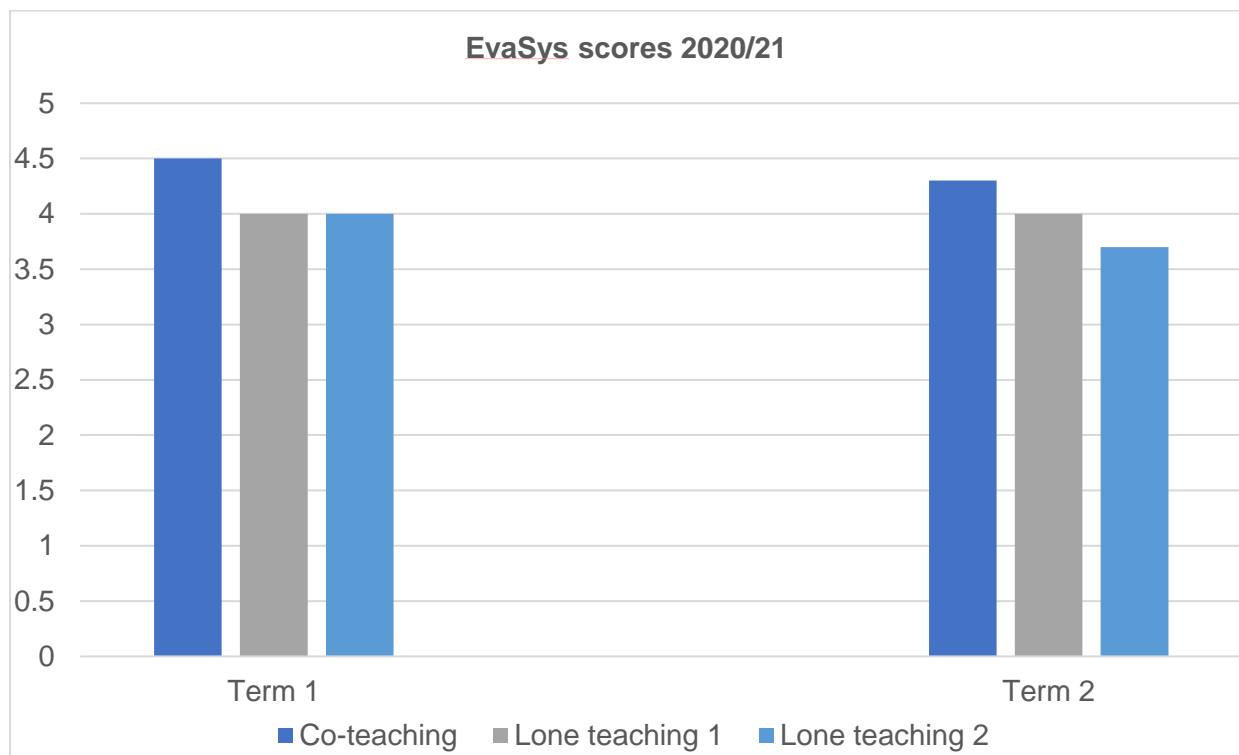

Figure 5. EvaSys scores for modules receiving co-teaching and single-person (lone) teaching

4.4   BAME module gap

The BAME/white module gap data indicates the difference between the mean scores awarded to students from BAME groups compared to those awarded to white students. Scores closer to 1 reflect a smaller gap between the marks awarded to the students in the two groups. We observed that the awarding gap for the co-taught module was reduced from -26.45 in 2019-2020 to -0.63 in 2020-21 (see figure 6).

One factor that likely contributed to this change was the 'no detriment' policy, which was in place for 2020-21. This policy used a comparison of the 'mean marks' achieved by students to provide a safety net to mitigate the impact of the COVID pandemic on their attainment (University of Greenwich, 2021). However, we believe that this improvement can also in part be attributed to our co-teaching approach. Co-teaching can facilitate a constructive work

environment and makes teaching more inclusive, as it caters to the diverse groups of students and varying class sizes (Walker, 1974, in Cook and Friend, 1995).

BAME/White Module Gap			
Module Level	Module	2019/20	2020/21
Level 4	Co-taught module	Average Score (BAME) 36.55	Average Score (BAME) 54.00
		Average Score (White) 63.00	Average Score (White) 54.63
		Gap -26.45	Gap -0.63

Figure 6. BAME/White Module Gap for the co-taught module

4.5 Tutor observations

We have incorporated our tutor observations as part of our qualitative data collection. Our observations included in-class student engagement using a range of parameters, including the use of the 'Chat' function on MS Teams, unmuting and speaking to the class, which may or may not involve turning on cameras. We have also monitored engagement in breakout rooms and responses to Mentimeter activities. Throughout both terms, we found that students tended to be quite active in the Chat, but less confident about speaking to the class, as only one or two students would actively participate in this way. On the occasions when Mentimeter was used, we observed that the levels of student engagement were good; their feedback was also broadly positive.

5. Discussion

We set out to explore our experience of co-teaching a thirty-credit level 4 specialist transport and logistics module online during the COVID-19 pandemic of 2020-2021. We aimed to begin an exploration of the effectiveness of the co-teaching approach by comparing the outcomes of the students who were co-taught by us with the outcomes of students on two modules taught by a single person.

Our findings suggest some potential benefits for student outcomes that require further and more systematic exploration with larger sample sizes. There are indications that students who were co-taught may have improved outcomes over a range of parameters, including attendance, results and satisfaction and that co-teaching may contribute to a reduction in the BAME/white module gap. These results are consistent with tutor observations.

In addition to improving outcomes for students, we propose that co-teaching may offer benefits for inducting new staff to the Business Faculty, with the potential for a more active approach to mentoring offered by "*one teach, one observe*" and "*one teach, one drift*" (Bacharach, Heck and Dahlberg, 2008). Minett-Smith and Davis (2020) have observed that team teaching provides a stimulating challenge for teaching staff and offers them the chance to feed off the energy that they jointly create in the classroom.

However, at this stage we present the findings with caution. This study has considered only the attendance during the pandemic, as pre-pandemic attendance was on-campus only. Future research should compare attendance in different modes and between cohorts.

We are also open to the possibility that the students performed better on the co-taught transport and logistics module for reasons related to the contents of the module; for example, it may have been more closely connected to their chosen specialism than the core business modules we used in our comparison.

Our planned research will include interviews and focus groups with the co-taught students, the better to understand their experience. This research should give us more clarity on different student perceptions of teaching on specialist and core business modules, allowing us to explore the effects of co-teaching in greater detail.

The relationship between the tutors (Dumas and de Montigny, 1999) is as important to success as the relationship between the tutors and the students. The tutors need to work well together and support each other; both need to engage with the students. It is important to acknowledge that co-teaching worked well for us, as we have been able to develop a good working relationship with each other. Again, this issue will be explored in more depth in our next project: to look in more detail at what co-teaching consisted of and how it worked in the online context.

We acknowledge that this case study has presented a rudimentary approach to co-teaching, which is a complex topic. We feel that it is not possible to claim that the results are generalisable to the whole of the Greenwich Business School. Co-teaching appears to be applicable to different cohorts and, so far, we have focused only on the online environment. However, we see this as the first part of a wider study into the potential impact of co-teaching on teaching in Business Education. We have ethical approval from the University of Greenwich to proceed with this research. We intend to focus on the students who were co-taught in 2020-2021 and find out more about their experiences in the Greenwich Business School. We intend to conduct interviews with a wide range of teaching staff, looking at their experiences of team teaching (Minett-Smith and Davis, 2020).

6.   Conclusion

We had a positive experience of co-teaching the specialist transport and logistics module in 2020-21, by working together and using a team-teaching approach. We feel that the initial findings from our analysis demonstrate that there is potential for a wider application of team teaching across the Business Faculty and that this is worthy of further exploration.

From a pedagogical perspective, we feel that co-teaching offers opportunities for improved engagement with students, which is a continuing challenge as we transition back to face-to-face teaching on campus. If the active involvement of two or more tutors can encourage students to engage more fully in their classes, then it certainly requires more detailed consideration.

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