

Enhancing Employability and Quantitative Reasoning through Peer Leadership in PLTL: A Self-Determination Theory Perspective

Abstract: This study examines the implementation of Peer-Led Team Learning (PLTL) in quantitative modules for undergraduate business students at a UK university, focusing on peer leaders' benefits and challenges. Using 24 interviews conducted over three academic years (2022/23–2024/25), the findings reveal significant benefits aligned with Self-Determination Theory: autonomy, competence, and relatedness. Peer leaders reported enhanced quantitative skills, increased intrinsic motivation, and stronger interpersonal relationships. However, they also faced challenges in three key areas: work-life balance, such as managing preparation demands; group dynamics, including handling disengaged or disruptive students; and logistical barriers, like limited resources. Importantly, these challenges often transformed into opportunities for personal growth, with peer leaders developing confidence and leadership abilities through overcoming obstacles. The practical implication is that, by bridging the gap between instructors and students, PLTL improves the quantitative skills of business students, fosters a stronger sense of community, and addresses diverse learning needs, particularly in resource-constrained contexts.

1. Introduction

Peer-Led Team Learning (PLTL) is a well-established active learning approach that promotes collaboration, critical thinking, and student engagement (Lamina, 2020; Quitadamo et al., 2009; Stephenson et al., 2019). In contrast to traditional lecture-based teaching, PLTL empowers peer leaders—students who have previously excelled in the subject—to facilitate small group learning sessions. This model fosters active participation and a deeper understanding of course material among students while simultaneously providing peer leaders with opportunities for skill development (Gafney & Varma-Nelson, 2007; Narayanan et al., 2023). PLTL benefits not only the students but also the peer leaders themselves (Guden & Bellen, 2020; Hug et al., 2011; Riser et al., 2020).

At the intersection of education and motivation, Self-Determination Theory provides a valuable framework for examining how individuals are driven to engage in activities that fulfil their fundamental psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 1985; Cappetta & Paolino, 2015). Within the context of Peer-Led Team Learning, this theory aligns closely with the experiences of peer leaders, who enhance their leadership capabilities (Santiago et al., 2020), deepen their understanding of the subject material (Arvelo-Márquez et al., 2021; Reisel et al., 2014), and build connections with their peers by leading group learning sessions (Szteinberg et al., 2020). Despite these clear overlaps, PLTL has yet to be systematically explored through the lens of Self-Determination Theory, leaving a significant gap in understanding the challenges and benefits experienced by peer leaders, particularly in quantitative disciplines.

This study focuses on the implementation of PLTL in quantitative modules for undergraduate business students at a UK university. Business students often struggle with quantitative skills and lack confidence in these areas, posing significant challenges for their academic and professional development. Within this context, we aim to answer two research questions from the angle of peer leaders: (1) What are the benefits of PLTL for peer leaders? (2) What challenges do peer leaders face, and how are these challenges connected to the benefits they

experience? Using qualitative methods, we conducted 24 interviews with peer leaders across three academic years (2022/23 to 2024/25) to explore peer leaders' experiences.

Our findings reveal that participating as a peer leader brings significant benefits, which can be categorised into the three themes of Self-Determination Theory: autonomy, competence, and relatedness. These include enhanced quantitative skills, increased intrinsic motivation, and the development of interpersonal and leadership abilities. However, peer leaders also face challenges, which include three themes: work-life balance issues, such as managing overwhelming preparation demands and overlapping responsibilities; challenges in managing group dynamics and leadership, including handling disengaged or disruptive students and overcoming nervousness; and logistical barriers, such as inadequate room setups and limited access to resources. Importantly, many of these challenges are closely linked to the benefits, as overcoming these obstacles often facilitated personal growth and reinforced competence and leadership skills. These findings provide valuable insights into how the challenges of peer leadership can transform into opportunities for development, offering practical recommendations to enhance the effectiveness of PLTL while expanding the application of Self-Determination Theory.

The paper is structured as follows: Section 2 reviews the literature, Section 3 outlines the methodology, Section 4 presents the findings, Section 5 provides the discussion, and Section 6 concludes with key insights and future research directions.

2. Literature review

2.1. Benefits and challenges of PLTL

PLTL has emerged as an effective pedagogical model in higher education, particularly in quantitative disciplines (Guden & Bellen, 2020; Hug et al., 2011; Narayanan et al., 2023; Wilson & Varma-Nelson, 2016). Its benefits include fostering student engagement (Lamina, 2021), improving academic performance (Frey et al., 2018; Luthi et al., 2022), enhancing critical thinking (Quitadamo et al., 2009; Stephenson et al., 2019), and developing soft skills such as communication and leadership (Gates et al., 2015; Santiago et al., 2020). PLTL also enhances collaborative learning environments by encouraging active participation and peer-to-peer interaction (Varma-Nelson & Banks, 2013). Studies have shown that peer leaders themselves benefit significantly, gaining deeper subject understanding, improved interpersonal skills, and heightened confidence (Koren & Marchburn, 2022; Riser et al., 2021). Moreover, PLTL promotes cost efficiency for universities, as it leverages peer leaders to provide additional academic support without significantly increasing faculty workloads (Dreyfuss et al., 2015).

Despite its advantages, PLTL has challenges, especially for peer leaders. Peer leaders often report difficulties in managing group dynamics, handling disengaged or disruptive students, and balancing their dual roles as students and leaders (Jenkins et al., 2020; Johnson et al., 2015). Logistical issues, such as inadequate training, resource limitations, and mismatched group compositions, can also hinder the program's effectiveness (Schray et al., 2009). Furthermore, the lack of institutional recognition or tangible rewards for peer leaders may demotivate participants, especially in competitive academic environments (Guden & Bellen, 2020). These challenges highlight the need for robust support mechanisms to ensure the sustainability and effectiveness of PLTL programs (Dreyfuss, 2022).

2.2. Self-Determination Theory and its application in Higher Education

Self-Determination Theory provides a valuable framework for understanding motivation in educational contexts. The theory posits that intrinsic motivation flourishes when three basic psychological needs—autonomy, competence, and relatedness—are satisfied (Deci & Ryan, 1985; Deci et al., 2017). Self-Determination Theory has been applied across various domains to explore customer orientation (Herhausen et al., 2018), well-being for workers (Konrad et al., 2013), organizational nostalgia (Leunissen et al., 2024) etc.

In higher education, SDT has been widely applied to explore how teaching strategies, learning environments, and assessment practices influence student motivation and engagement (Cappetta & Paolino, 2015; Cents-Boonstra et al., 2021; Niemiec & Ryan, 2009). Research has shown that SDT-aligned educational practices contribute to improved academic performance, increased persistence, and higher overall satisfaction (Deci & Ryan, 2008; Ryan & Deci, 2020). However, the application of SDT in peer-led contexts remains underexplored, particularly in understanding how the challenges faced by peer leaders may also contribute to fulfilling these psychological needs.

2.3. Gaps in literature

While existing research has extensively documented the benefits of PLTL on both peer leaders and participants, several gaps remain. First, the majority of studies focus on PLTL in STEM disciplines (e.g., Hug et al., 2011; Narayanan et al., 2023), with limited exploration of its application in business education, particularly in business analytics modules. This leaves a gap in understanding how PLTL can address the unique challenges faced by business students, such as low confidence in quantitative skills and limited exposure to collaborative learning models.

Second, while SDT has been applied to various educational practices, its integration into peer-led learning frameworks like PLTL has received insufficient attention. Existing studies rarely examine how the challenges encountered by peer leaders—such as managing group dynamics and balancing responsibilities—may simultaneously fulfill their needs for autonomy, competence, and relatedness.

Third, there is even less research on how technological advancements, such as AI tools, can be incorporated into PLTL to enhance its effectiveness, particularly in addressing resource constraints and improving teaching quality. This study aims to address these gaps by exploring the experiences of peer leaders in a UK Business School context, applying the principles of SDT to study the benefits, and examining the role of AI in evolving PLTL for the demands of the modern educational landscape.

3. Methodologies

3.1. Research context, research design, and data collection

This study is situated within the context of a UK Business School, focusing on peer leaders across three academic years (2022/23 to 2024/25). Participation as a peer leader was open only to students who achieved a performance of 70% or higher in the specific modules. Peer leaders were not monetarily compensated but were incentivised with unlimited reference letters from the leading academic staff and the potential to earn a Staff and Educational Development Association (SEDA) award. The structure of the PLTL program varied slightly across the three years. In 2022/23 and 2024/25, Year 3 students facilitated one module for

Level 5 (second-year) students. In 2023/24, the program expanded to include two modules, with Year 2 students delivering sessions for Level 4 (first-year) students.

This study adopts a qualitative research design to explore the dual perspectives of challenges and benefits experienced by peer leaders in the PLTL program. Semi-structured interviews were chosen as the primary data collection method to provide flexibility in capturing rich, nuanced insights. The interviews were conducted with peer leaders after they completed their teaching responsibilities. Each interview lasted approximately 30–45 minutes, allowing participants to reflect on their experiences while addressing specific research questions. The interviews were conducted with 24 participants: six in 2022/23, twelve in 2023/24, and six in 2024/25. Investigators recorded all interviews upon obtaining participants' permission.

To ensure privacy, each participant was anonymised and assigned a unique ID based on their academic year of participation: 2022/23 (A1–A6), 2023/24 (B1–B12), and 2024/25 (C1–C6). This systematic approach enabled a comprehensive analysis of the data while protecting participant confidentiality. The qualitative research design and structured data collection process ensured that the findings provide a credible and in-depth understanding of the peer leaders' experiences.

3.2. Sampling Approach

The study employed purposive sampling to select participants who had direct experience as peer leaders in the PLTL program. This sampling approach ensured that the data collected was relevant and aligned with the research objectives. A total of 24 interviews were conducted, with 6 peer leaders interviewed in 2022/23, 12 in 2023/24, and 6 in 2024/25. This variation in sample size reflects the evolving nature of the program and the increased participation during the second year of implementation.

3.3. Reliability and Validity

To ensure reliability, a consistent interview protocol was used across all three years of data collection. The protocol was piloted with a small group of peer leaders prior to the main data collection to refine the questions and ensure clarity. Validity was enhanced by examining the data longitudinally, which enabled the identification of recurring patterns and evolving themes across cohorts. Additionally, member checking was employed, with participants reviewing their interview transcripts to confirm the accuracy of their responses.

3.4. Ethical Considerations

This study adhered to the ethical guidelines of the host university and obtained approval from its ethics committee. Participants were provided with an information sheet detailing the purpose of the study, their rights, and the voluntary nature of participation. Written informed consent was obtained from all participants before the interviews. Confidentiality was maintained by anonymising participant data and storing recordings and transcripts securely. Participants were assured that they could withdraw from the study at any time without any consequences.

4. Findings

4.1. Benefits for peer leaders in participating in PLTL

We conducted a thematic analysis of our interview data to explore the experiences of students participating in PLTL. The analysis identified three themes, competence, autonomy, and

relatedness, and corresponding codes and sample quotes, as grounded in Self-Determination Theory (see Table 1).

Benefit theme	Benefit code	Freq	Sample quotes
Competence	Improving quantitative skills	12	<i>PLTL really boosted my Excel and quantitative skills—it's like I went from barely knowing the basics to actually feeling skilled in these areas" (A1).</i>
			<i>"PLTL gave me the confidence I needed to start thinking about career options. Now, I'm even considering a role as a Business Analyst" (C3).</i>
			<i>Adding my PLTL experience to my CV was a game-changer for my MSc application. It definitely helped me get accepted into LSE's Business Analytics programme" (C1).</i>
	Enhancing subject understanding	10	<i>In PLTL, it felt like everything clicked. Concepts that used to be so abstract in our coursework suddenly made sense" (A2).</i>
			<i>Explaining the material to others in ways I hadn't thought of really clarified things for me. I understand the subject on a much deeper level now." (B3).</i>
			<i>"Looking back a year later, I can see that PLTL built a strong foundation for me. The understanding I gained there has been invaluable in my MSc studies—it's helped me tackle much harder material" (C1).</i>
	Increasing confidence in communication	8	<i>At first, speaking in front of others was really hard for me, but after going through the PLTL sessions, I'm so much more comfortable. It's not as scary as it used to be" (A3).</i>
			<i>PLTL really pushed me to think clearly about how to explain things. It wasn't just about learning the material; I had to figure out how to put my thoughts into words, and that's made a big difference in leading discussions" (A5).</i>
			<i>The confidence I got from presenting in PLTL has been huge for my postgraduate work. I'm presenting to groups all the time now, and I feel prepared, thanks to that experience" (C4).</i>
Autonomy	Enhancing intrinsic motivation	15	<i>Honestly, I never thought I'd enjoy studying this much. Working with my peers in PLTL made me curious, like I actually wanted to dive deeper and understand things better, not just to pass exams" (A3).</i>
			<i>Helping others made me realise I needed to understand the material better myself. It was motivating—I'd think, 'If I'm going to explain this, I need to truly get it first.' That kept pushing me to dig deeper" (B7).</i>
			<i>After PLTL, I found myself going back to topics on my own, even when there was no pressure to do so. It was like, for the first time, I just wanted to learn for the sake of learning, not just for a grade" (C2).</i>
	Increasing independent learning	9	<i>I was relying heavily on tutors and peers to understand the material, but PLTL sessions made me realise that I have the ability to tackle concepts independently" (A3).</i>
			<i>"I started developing my own strategies for studying, especially after PLTL. It pushed me to be self-reliant and find solutions on my own" (B11).</i>
			<i>PLTL has really shifted my approach to learning; now, I'm proactive in seeking out extra materials to deepen my understanding" (C2).</i>
	Increasing ownership of tasks	8	<i>Being a peer leader gave me the chance to take charge and manage our sessions. I felt responsible for helping my teammates understand the material, which made me want to be as prepared as possible each week" (A1).</i>
			<i>At first, I thought it was just another project, but soon I realized that I had a big role in guiding others. I started seeing our PLTL sessions as my responsibility, not just something I participated in" (A4).</i>
			<i>Through PLTL, I learned to step up and take charge. I wasn't just another student; I was a guide for others, which really shifted how I saw my own learning" (C2).</i>
Relatedness	Providing a supportive environment and one-to-one peer support	10	<i>"Knowing I was there to support my peers was a confidence boost for me too. It felt like I was creating a safe space where they could ask questions without hesitation, and the feedback from them, given in that safe environment, felt genuine and unbiased" (A2).</i>
			<i>"Taking the time to explain concepts to peers in a way that made sense to them was incredibly rewarding. That one-to-one guidance made a big difference to how I approached my role" (B6).</i>
	Building a sense of community	9	<i>There was a strong sense of belonging in the group; we worked through challenges together and celebrated small achievements, which strengthened our bond and made leading sessions enjoyable" (C1).</i>
			<i>By the end of PLTL, I wasn't just leading the sessions—I felt like part of a supportive community that we built together" (B4).</i>
	Facilitating decision-making in group work	6	<i>Our group had moments where getting consensus was challenging, but it was rewarding to guide everyone towards a solution that felt like it belonged to all of us" (A4).</i>
			<i>Facilitating discussions where everyone contributed taught me how to lead while letting the group shape the outcome together" (B5).</i>

Table 1. Thematic analysis of peer leaders' benefits.

4.1.1. Competence

The theme of competence encompasses three key codes: improving quantitative skills, enhancing subject understanding, and increasing confidence in communication.

One of the most prominent outcomes of PLTL was the improvement in peer leader' **quantitative skills**. Students expressed that PLTL provided support to engage with complex numerical problems, enabling them to build foundational and advanced skills. For instance, one peer leader shared, *"PLTL really boosted my Excel and quantitative skills—it's like I went from barely knowing the basics to actually feeling skilled in these areas"* (A1). This growth in quantitative competence not only enhanced their academic performance but also contributed to their career aspirations. As another participant noted, *"PLTL gave me the confidence I needed to start thinking about career options. Now, I'm even considering a role as a Business Analyst"* (C3). The peer leaders recognised the direct impact of these skills on their postgraduate opportunities. One participant reflected on how the experience supported their successful MSc application: *"Adding my PLTL experience to my CV was a game-changer for my MSc application. It definitely helped me get accepted into LSE's Business Analytics programme"* (C1). This suggests that the quantitative skills fostered through PLTL also positioned them for competitive opportunities.

Beyond numerical proficiency, peer leaders reported a deeper **understanding of subject concepts** through PLTL. For example, one participant explained, *"In PLTL, it felt like everything clicked. Concepts that used to be so abstract in our coursework suddenly made sense"* (A2). Another peer leader noted how delivering explanations to their peers contributed to their own understanding, stating, *"Explaining the material to others in ways I hadn't thought of really clarified things for me. I understand the subject on a much deeper level now."* (B3). This enhanced subject understanding was often described as a long-term benefit that continued to support students beyond the PLTL sessions. One student reflected, *"Looking back a year later, I can see that PLTL built a strong foundation for me. The understanding I gained there has been invaluable in my MSc studies—it's helped me tackle much harder material"* (C1). Such reflections underscore the enduring value of PLTL in helping students develop robust conceptual knowledge that extends into their postgraduate education.

PLTL also played a critical role in building students' confidence in their **communication skills**. Initially, many students found it challenging to articulate their thoughts in front of peers, but PLTL gradually helped them overcome these barriers. One participant recalled, *"At first, speaking in front of others was really hard for me, but after going through the PLTL sessions, I'm so much more comfortable. It's not as scary as it used to be"* (A3). Explaining complex ideas to peers was frequently cited as a turning point in developing confidence. For instance, a student shared, *"PLTL really pushed me to think clearly about how to explain things. It wasn't just about learning the material; I had to figure out how to put my thoughts into words, and that's made a big difference in leading discussions"* (A5). This confidence in communication directly enhanced the peer leaders' employability by preparing them for success in postgraduate interviews and equipping them with essential skills for collaborative communication in the workplace. One participant remarked, *"The confidence I got from presenting in PLTL has been huge for my postgraduate work. I'm presenting to groups all the time now, and I feel prepared, thanks to that experience"* (C4).

4.1.2. Autonomy

The theme of autonomy encapsulates how PLTL empowered peer leaders to take ownership of their learning, motivated them intrinsically, and fostered independent thinking. The three codes include enhancing intrinsic motivation, increasing independent learning, and increasing ownership of tasks.

PLTL ignited a sense of curiosity and **intrinsic motivation** in peer leaders, encouraging them to learn beyond exam requirements. This shift from extrinsic to intrinsic motivation was

transformative for many participants. One peer leader mentioned, *“Honestly, I never thought I’d enjoy studying this much. Working with my peers in PLTL made me curious, like I actually wanted to dive deeper and understand things better, not just to pass exams”* (A3). Such intrinsic motivation further pushed participants to deepen their understanding of the material. As one noted, *“Helping others made me realise I needed to understand the material better myself. It was motivating—I’d think, ‘If I’m going to explain this, I need to truly get it first.’ That kept pushing me to dig deeper”* (B7). This sense of purpose extended beyond the sessions, as another peer leader shared, *“After PLTL, I found myself going back to topics on my own, even when there was no pressure to do so. It was like, for the first time, I just wanted to learn for the sake of learning, not just for a grade”* (C2). The ability to derive enjoyment and purpose from learning highlights PLTL’s role in cultivating lifelong learning habits.

Another significant aspect was the development of **independent learning** skills. Peer leaders frequently described how PLTL helped them move away from relying on external help, encouraging them to tackle challenges on their own. One peer leader reflected, *“I was relying heavily on tutors and peers to understand the material, but PLTL sessions made me realise that I have the ability to tackle concepts independently”* (A3). Through their experiences, peer leaders built strategies to become self-reliant learners. As one stated, *“I started developing my own strategies for studying, especially after PLTL. It pushed me to be self-reliant and find solutions on my own”* (B11). This autonomy extended into extra study efforts, as noted by another participant: *“PLTL has really shifted my approach to learning; now, I’m proactive in seeking out extra materials to deepen my understanding”* (C2). The ability to independently seek resources and problem-solve empowered peer leaders to navigate more complex academic and professional challenges.

PLTL also fostered **a strong sense of ownership** and accountability among peer leaders, with many stepping into leadership roles and taking charge of their learning environments. One peer leader described this shift: *“Being a peer leader gave me the chance to take charge and manage our sessions. I felt responsible for helping my teammates understand the material, which made me want to be as prepared as possible each week”* (A1). This sense of ownership grew as peer leaders realised the significance of their role. One participant noted, *“At first, I thought it was just another project, but soon I realized that I had a big role in guiding others. I started seeing our PLTL sessions as my responsibility, not just something I participated in”* (A4). By taking on leadership tasks, peer leaders gained confidence in their abilities to guide and make decisions. As one reflected, *“Through PLTL, I learned to step up and take charge. I wasn’t just another student; I was a guide for others, which really shifted how I saw my own learning”* (C2). This emphasis on accountability fostered peer leaders' personal and professional growth.

4.1.3. Relatedness

The theme of relatedness highlights the importance of creating a supportive environment, fostering a sense of community, and promoting collaborative decision-making.

The code of providing **a supportive environment and one-to-one peer support** was a cornerstone of relatedness, with peer leaders frequently emphasising the importance of feeling encouraged and supported. The opportunity to ask questions in a non-judgmental setting boosted confidence and reduced intimidation, as one peer leader described, *“Knowing I was there to support my peers was a confidence boost for me too. It felt like I was creating a safe space where they could ask questions without hesitation, and the feedback from them, given in that safe environment, felt genuine and unbiased”* (A2). Similarly, peer leaders who gave tailored support emphasised its importance, as one noted, *“Taking the time to explain concepts to peers in a way that made sense to them was incredibly rewarding. That one-to-*

one guidance made a big difference to how I approached my role" (B6). Peer leaders reflected on how this supportive foundation cultivated resilience and persistence in their own learning journeys.

The code of building ***a sense of community*** captured how PLTL fostered collaboration and belonging among peer leaders. Participants consistently described the group dynamic as integral to creating a comfortable and productive learning environment. One peer leader observed, *"There was a strong sense of belonging in the group; we worked through challenges together and celebrated small achievements, which strengthened our bond and made leading sessions enjoyable" (C1).* Engaging with the same group over time deepened connections and transformed the sessions into more than just academic exercises. By the end of PLTL, many peer leaders viewed their group members as collaborators and friends, with one reflecting, *"By the end of PLTL, I wasn't just leading the sessions—I felt like part of a supportive community that we built together" (B4).* This sense of community fostered trust and mutual encouragement, enhancing the overall experience of being a peer leader.

The code of facilitating ***decision-making in group work*** demonstrated how PLTL encouraged collaborative problem-solving and shared responsibility. Peer leaders often highlighted the value of considering multiple perspectives and helping their groups reach consensus. One explained, *"Our group had moments where getting consensus was challenging, but it was rewarding to guide everyone towards a solution that felt like it belonged to all of us" (A4).* The ability to help their peers collaboratively decide on approaches to tasks provided peer leaders with a sense of agency and ownership, as another reflected, *"Facilitating discussions where everyone contributed taught me how to lead while letting the group shape the outcome together" (B5).* These experiences not only enhanced teamwork skills but also prepared peer leaders for collaborative professional environments.

4.1.4. Consistency across the three years

Across the three academic years, a consistent positive impact is observed in all aspects of peer leaders' development, including competence, autonomy, and relatedness (see Table 1). One peer leader observed, *"During my initial weeks, there were very few students who were coming to the class" (B4).* This lack of consistent participation not only diminished peer leaders' sense of achievement but also hindered their ability to foster a supportive and engaging environment. These challenges are observed in 2023/24, particularly in relatedness (28%), as a peer leader remarked, *"I feel like it was annoying because you put in so much work and then you realise not many people are turning up. Even though I sent reminders before the session, participation was very low. It felt like the effort wasn't being appreciated" (B9).*

In 24/25, AI tools enabled more efficient teaching practices, enhancing the peer leaders' ability to independently manage tasks and improve their quantitative and communication skills. One peer leader remarked, *"The AI tools saved me so much time. I could quickly figure out what I needed to explain better and focus on that instead of spending hours preparing stuff students didn't even ask about" (C3).* Another commented, *"Using AI felt like having an extra pair of hands—it made all the data stuff way easier to break down, and I didn't feel as nervous teaching it to others" (C5).*

4.2. Challenges for peer leaders in participating in PLTL and their transformation into benefits

Our thematic analysis of the challenges reveals that the challenges faced by peer leaders in PLTL are not merely obstacles but opportunities for growth and development, with potential

transformation into benefits (see Table 2 and Figure 1). These challenges span across work-life balance, group dynamics and leadership, and logistical barriers, all of which contribute to improvements in autonomy, relatedness, and competence as per the Self-Determination Theory.

Challenge theme	Challenge code	Freq	Sample quotes
Work-life balance issues	Overwhelming preparation demands	7	<i>Some weeks were so busy that I barely slept. I thought, 'How can I keep this up?' But when I saw how much my teaching helped the students, it made the effort feel worth it. It encouraged me to keep improving (A5).</i>
			<i>At first, it was overwhelming, then I turned to AI. Self-studying how to integrate AI into my preparation helped me (C2).</i>
	Difficulties managing overlapping responsibilities	5	<i>I felt like I was constantly juggling deadlines, classes, and PLTL prep, and nothing got my full focus (A5).</i>
			<i>Balancing PLTL and my own study was tough, but it helped me take control of my responsibilities (C4).</i>
Challenges in managing group dynamics and leadership	Lack of Student Engagement	5	<i>Sometimes it felt like I was the only one trying in the room—it was really discouraging (B3).</i>
			<i>Most of the students were shy and so disengaged at first, but when I worked with them one-on-one, they started opening up (A3).</i>
	Difficulty handling disruptive behaviour	4	<i>One day, a student said right to my face, 'You know nothing, you get out.' I felt so hurt and thought, 'I don't deserve this—I'm volunteering without pay.' But then I realised, this is how the real-world works. I need to learn how to cope with such situations and not let them affect me (A3).</i>
			<i>I wasn't sure if I could handle students who didn't listen and kept chatting and making noises. Once I started involving them more and showing them they belonged to the team, it became much better (B5).</i>
	Nervousness and Fear of Leading	6	<i>I felt so anxious—I was sure I'd mess up and the students would notice (A1).</i>
Logistical barriers	Inadequate room setup	3	<i>I was so scared to lead the group, but over time, I learned how to guide discussions and help the team decide on solutions. It became less about me and more about helping everyone contribute (B12).</i>
			<i>The room was too small for group activities—it felt really limiting (B7).</i>
	Limited Access to Resources	4	<i>The room setup was terrible, but it taught me how to engage students regardless of physical limitations. I am now more skilled at handling such issues, like negotiating with IT staff to arrange better facilities for future sessions (C4).</i>
			<i>When I realised I didn't have all the exercise sheets I needed, I had to create my own examples and exercises. My skills in data analysis improved much faster than I expected (A4).</i>
			<i>We didn't get all the materials we needed for the sessions, there is always uncertainty. This made me research extra, but such research improved my understanding of the subject (B6).</i>

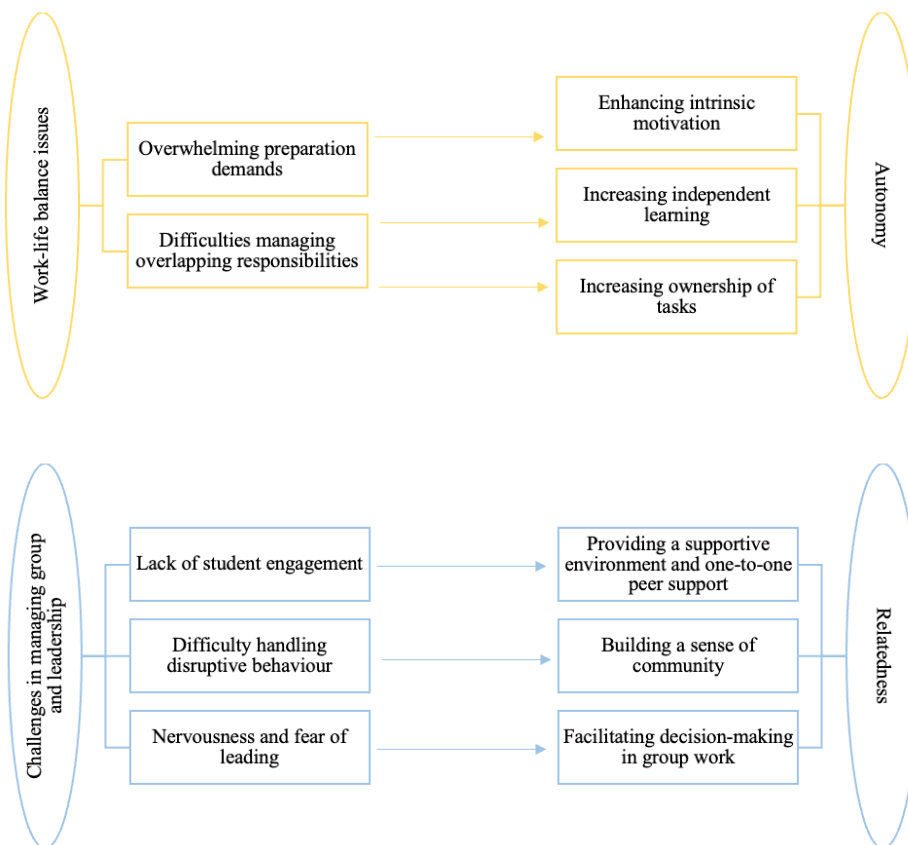
Table 2. Thematic analysis of peer leaders' challenges. The quotes show that the challenges can be mapped to the benefits based on the Self-Determination Theory.

Work-life balance issues posed significant challenges, particularly overwhelming preparation demands and the difficulty of managing overlapping responsibilities. As one interviewee noted, “*Some weeks were so busy that I barely slept. I thought, 'How can I keep this up?' But when I saw how much my teaching helped the students, it made the effort feel worth it*” (A5). This experience fostered enhanced intrinsic motivation. Similarly, integrating tools like AI into preparation allowed peer leaders to transition from frustration to increased independent learning, as one leader explained, “*At first, it was overwhelming, then I turned to AI. Self-studying how to integrate AI into my preparation helped me*” (C2). Furthermore, juggling multiple responsibilities helped leaders gain ownership of tasks, turning what felt like constant juggling into a sense of control over their commitments. As one leader shared, “*I felt like I was constantly juggling deadlines, classes, and PLTL prep, and nothing got my full focus*” (A5), while another reflected, “*Balancing PLTL and my own study was tough, but it helped me take control of my responsibilities*” (C4).

Challenges in managing group and leadership also emerged, particularly with student engagement and disruptive behaviour. Initially, the lack of student engagement left peer leaders feeling isolated and discouraged. One leader remarked, “*Sometimes it felt like I was*

the only one trying in the room—it was really discouraging” (B3). However, through one-on-one support, they cultivated a supportive environment, as another noted, “Most of the students were shy and disengaged at first, but when I worked with them one-on-one, they started opening up” (A3). Similarly, handling disruptive behaviour—such as being told, “You know nothing, you get out” (B5)—initially caused distress but ultimately fostered a sense of community by teaching leaders to involve all students and address underlying issues. One leader explained, “I wasn’t sure if I could handle students who didn’t listen and kept chatting and making noises. Once I started involving them more and showing them they belonged to the team, it became much better” (B5). Nervousness about leading also transformed into a strength as peer leaders learned to facilitate decision-making in group work, with one leader sharing, “I was so scared to lead the group, but over time, I learned how to guide discussions and help the team decide on solutions. It became less about me and more about helping everyone contribute” (B12).

Finally, **logistical barriers** such as inadequate room setups and limited access to resources posed challenges but yielded gains in competence. Poor room layouts taught peer leaders to adapt and communicate effectively under constraints. One leader reflected, *“The room setup was terrible, but it taught me how to engage students regardless of physical limitations. I am now more skilled at handling such issues, like negotiating with IT staff to arrange better facilities for future sessions” (C4). Similarly, the lack of adequate resources led leaders to create their own materials, improving both quantitative skills and subject understanding. As one leader explained, “When I realised I didn’t have all the exercise sheets I needed, I had to create my own examples. My skills in data analysis improved much faster than I expected” (A4). Another noted, “We didn’t get all the materials we needed for the sessions, there is always uncertainty. This made me research extra, but such research improved my understanding of the subject” (B6).*



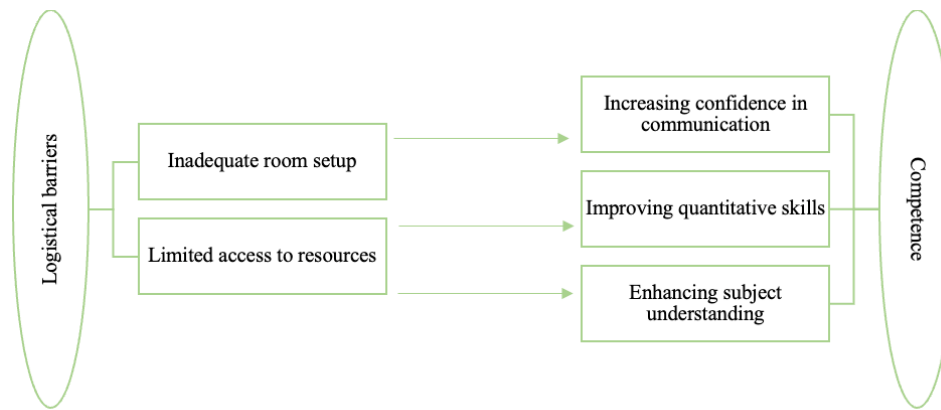


Figure 1. Challenges and their potential transformation to benefits

5. Discussion

Our study aims to examine both the benefits and challenges experienced by peer leaders in PLTL programs through the lens of the Self-Determination Theory (Deci et al., 2017; Deci & Ryan, 2004). The findings reveal that the peer leaders benefit from PLTL in the areas of competence, autonomy, and relatedness, aligning well with Hug et al. (2011) and Narayanan et al. (2023). Additionally, extending existing studies on the challenges of PLTL (Chase et al., 2020; Wilson & Varma-Nelson, 2016), our study specifically focuses on the duality of these experiences, exploring the interconnected nature of challenges and benefits for peer leaders—an area that has been underexplored in previous research. Although peer leaders encounter significant challenges, such as overwhelming preparation demands, group dynamics, and logistical barriers, these challenges often transform into the three benefits.

5.1. Enhancing quantitative skills for peer leaders in business school

The findings from this study are situated in the context of business students engaging with quantitative modules, who are less confident in quantitative subjects. Many of the peer leaders in our study began their PLTL experience struggling with quantitative skills, often avoiding these subjects. However, participating in PLTL, and even the challenges they faced, such as independently creating exercises and explaining complex quantitative concepts to peers, finally led to enhanced quantitative skills. This transformation aligns with existing research that highlights the role of PLTL in STEM education (e.g., Hug et al., 2011; Narayanan et al., 2023). Furthermore, the experience as peer leaders provided them with a competitive edge, enabling them to secure MSc offers from prestigious universities in Business Analytics, such as LSE, Imperial, and KCL, while some successfully transitioned into roles as business analysts. This aligns with studies that demonstrate the positive link between quantitative skills and employability among business students (Blau et al., 2022; Hossain et al., 2020).

These findings underscore the value of integrating structured peer-learning programs into quantitative modules to support business students, as highlighted in prior research on active learning strategies in business education (e.g., Becvar et al., 2008; McDonald et al., 2022). Peer leadership roles encourage students to move beyond rote learning, requiring them to engage critically with content and explore real-world applications (Leichliter, 2013; Priest & Paula, 2016), such as data analytics and statistical modelling.

5.2. Increasing intrinsic motivation, leadership, and resilience

Our findings show that participating as peer leaders in Peer-Led Team Learning (PLTL) programs significantly enhances intrinsic motivation. Although many initially struggled with preparation demands and balancing responsibilities, observing the positive impact on their peers' learning provided a sense of purpose and satisfaction. This aligns with Self-Determination Theory, which suggests that intrinsic motivation thrives when activities are meaningful and aligned with personal values (Deci & Ryan, 1985; Waterman et al., 2024). Contributing to their peers' success reinforced their sense of competence and relatedness, sustaining their intrinsic drive, echoing the conclusion of Pečiuliauskienė (2019).

These findings carry broader implications in preparing students for leadership roles (Dreyfuss et al., 2015). Intrinsic motivation not only supports sustained engagement but also enhances resilience in the face of challenges. Educators could design peer-learning initiatives that emphasise real-world impact, such as incorporating projects or case studies that allow students to see the tangible outcomes of their contributions (Detmer et al., 2010).

5.3. Building community and working as an additional supporting mechanism

According to our findings, participating as peer leaders fosters a strong sense of relatedness. Peer leaders reported that working closely with their peers helped create inclusive learning environments, where students felt more connected and engaged. This sense of belonging was beneficial for the peer leaders as well, as it enhanced their interpersonal skills and made the overall learning experience more collaborative. These findings align with research suggesting that fostering relatedness in educational settings enhances motivation and engagement for both learners and facilitators (e.g., Escandell & Chu, 2023; Niemiec & Ryan, 2009; Perlman, 2015).

The one-to-one peer support in PLTL offers a resource-efficient solution for universities, reducing academic staff workload while maintaining or improving teaching quality (Dreyfuss et al., 2015). By addressing diverse student needs with minimal additional resources, PLTL fosters a community-driven learning model that enhances educational experiences and establishes itself as a sustainable approach to higher education.

5.4. Crossing pedagogical borders in the AI era

PLTL holds the potential to reshape higher education in the AI era, fostering a balance between technological innovation and human-centred learning. As AI tools become integral to education, PLTL provides a framework where peer leaders use these technologies to enhance their teaching, create personalised exercises, and support peers more effectively (Dsouza et al., 2023). This evolution bridges the divide between traditional pedagogy and AI-driven approaches, reflecting the growing need to navigate the boundaries between human creativity and technological efficiency. By equipping peer leaders with AI literacy, universities prepare students to critically integrate it into real-world problem-solving, making education more relevant to the needs of an evolving workforce.

Additionally, PLTL addresses the shifting dynamics of higher education, where traditional boundaries of instruction are becoming increasingly fluid. Peer-led models decentralise teaching (Varma-Nelson et al., 2004), fostering collaboration and adaptability (Gates et al., 2015)—qualities essential for navigating today's globalised and technology-driven learning environments.

6. Conclusions

This study explores the benefits and challenges experienced by peer leaders when delivering quantitative modules for undergraduate business students. The benefits identified align with the three themes of Self-Determination Theory: autonomy, competence, and relatedness. These include enhanced quantitative skills, increased intrinsic motivation, and a strengthened sense of community. Challenges are also grouped into three themes—work-life balance issues, difficulties in managing group dynamics and leadership, and logistical barriers—manifested through codes such as overwhelming preparation demands, handling disengaged students, and limited access to resources. A key finding of this study is the transformation of the challenges into the benefits, with peer leaders often developing skills and gaining confidence through overcoming obstacles, demonstrating a strong mapping relationship between the two.

6.1. Theoretical implications

This research extends the application of Self-Determination Theory by providing empirical evidence on how peer leadership fulfills the basic psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 1985). The findings reveal that peer leaders experience personal growth and increased intrinsic motivation as they take ownership of tasks, improve their quantitative skills, and build meaningful connections with their peers. These insights highlight the role of PLTL as an active learning approach offering significant developmental opportunities for the peer leaders themselves (Coorey, 2016; Narayanan et al., 2023).

Moreover, this study contributes to understanding of how challenges encountered in PLTL can transform into benefits. This interplay between challenges and benefits underscores the experiential nature of PLTL, aligning with active learning theories that emphasise the importance of engagement and reflection in fostering deep learning (Young, 2018; Mystakidis, 2021). By studying PLTL through the lens of SDT, this research examines how active learning models can simultaneously address psychological needs and prepare participants for real-world challenges.

6.2. Practical implications

This study positions PLTL as an additional supporting mechanism that complements traditional teaching methods (Arvelo-Márquez et al., 2021; Tien et al., 2002). By integrating PLTL, universities can provide student-centred, personalised, small-group learning opportunities that enhance student engagement and outcomes without significantly increasing staff workload (Quitadamo et al., 2009). Peer leaders bridge the gap between instructors and students, delivering relatable and accessible support, particularly in challenging quantitative modules.

Consequently, one of the key benefits of PLTL is its ability to foster enhanced quantitative skills among business students, who often struggle with confidence in this area. Additionally, the program increases intrinsic motivation, nurtures a strong sense of community, and offers one-to-one support that addresses individual learning needs effectively.

PLTL is also a resource-efficient strategy, enabling institutions to improve teaching quality and foster a sense of community while minimising costs (Dreyfuss et al., 2015). As a scalable and flexible model, PLTL functions like a "Deliveroo-style" teaching system (Fazackerley, 2024), delivering tailored support directly to students and addressing diverse learning needs effectively. This makes PLTL an invaluable addition to the educational framework,

particularly in resource-constrained environments (Gates et al., 2015; Shahid et al., 2022; Varma-Nelson et al., 2004).

To improve the effectiveness and sustainability of PLTL programmes, universities should offer targeted training sessions for peer leaders focused on managing group dynamics, including techniques for re-engaging disengaged students (e.g. using inclusive questioning, rotating roles, or small prompts to reintroduce withdrawn members into discussions). Scenario-based training and role-play exercises can prepare peer leaders to navigate common disruptions while maintaining a supportive learning environment.

6.3. Limitations of the research and future research

While this study provides insights, it is limited by its focus on a single UK institution and business analytics modules, which may not capture variations in PLTL implementation across different contexts. The sample size of 24 interviewees, though appropriate for qualitative analysis, restricts broader generalisability. Furthermore, the study relies on self-reported experiences, which may introduce bias.

Future studies could explore PLTL in diverse academic and cultural contexts to assess its broader applicability. Longitudinal research could provide deeper insights into the long-term impacts of peer leadership on career outcomes and academic development. Additionally, deeper investigating the integration of emerging technologies, such as AI, into PLTL frameworks could further enhance its effectiveness and relevance in the evolving landscape of higher education.

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