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Entrepreneurship education: applying team-based learning to enhance inclusive group dynamics in entrepreneurial projects

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1. Introduction

Entrepreneurship plays a pivotal role in advancing the United Nations Sustainable Development Goals SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities). Small- and medium-sized enterprises (SMEs) drive job creation and economic dynamism while contributing to innovation and productivity (Kritikos, 2024). Beyond economic outcomes, inclusive and social forms of entrepreneurship can empower marginalised groups, challenge inequities, and promote fairer patterns of growth (Nurfaisah and Pertiwi, 2025; Butkevičienė and Kozma, 2026).

Entrepreneurship education (EE) has become a critical component of higher education worldwide, recognised for its role in fostering innovation, enhancing employability, and driving new venture creation (Nabi et al., 2017; Alibasic and Ibrisimovic, 2021). However, despite its progress, mainstream entrepreneurship and international entrepreneurship education have been slow to engage fully with the pressing challenges of diversity, equity, and inclusion (DEI). Traditional curricula often over-emphasise economic outcomes and individual entrepreneurial traits, while underexploring how inclusive practices and equitable participation shape entrepreneurial competencies and team success (Butkevičienė and Lawton Smith, 2024). This omission limits the ability of students to become entrepreneurs capable of addressing wider societal challenges, particularly those captured in SDGs 8 and 10.

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Against the above-mentioned shortcomings of current approaches to EE, the main goal of this chapter is to suggest an alternative approach that actively incorporates inclusion as a fundamental component of entrepreneurial learning. This contribution is realised through a case study of the MSc International Business programme at the University of Glasgow, specifically the Market Analysis for New Venture Creation course. In this course, students work in diverse teams to conceptualise, develop, and pitch new venture ideas with international potential. Team formation is guided by the innovative STAM-DEEP model, i.e. a Structured, Teacher-Assigned Model, that balances diversity, equality, and entrepreneurial potential among team members (Ikegwuonu, Bavdaz, and Fletcher, 2025). To support balanced team formation, the STAM-DEEP framework integrates diversity, equality, and entrepreneurial potential into group allocation, ensuring well-rounded and inclusive team compositions. Entrepreneurial potential is assessed using the General Enterprising Tendency Test (get2test), as described by Caird (2013). The model is intended to enhance group dynamics by ensuring diverse, equitable, and complementary distributions of entrepreneurial capacity. The chapter demonstrates how, by embedding DEI principles into both EE content and pedagogy, a team-based learning approach becomes a transformative method for creating inclusive entrepreneurship education. It demonstrates how DEI-informed group formation and further teaching process facilitation can strengthen student learning, enhance team dynamics, and prepare more competent, effective, and inclusive entrepreneurs capable of contributing to firm-level growth and societal impact.

Findings demonstrate four key contributions. First, role allocation increases resilience, as group members willingly cover tasks during periods of hardship experienced by team members. Second, competency-based design diversifies leadership, increasing the number of female group leaders and improving team management. Third, the model reduces free-riding by distributing accountability more evenly. Finally, it accelerates team bonding, enabling groups to reach high-performing collaboration more quickly. The chapter positions DEI-informed, structured team formation as a pedagogical innovation that bridges entrepreneurship and international entrepreneurship education.

Drawing from the EE literature on teamwork pedagogies, this chapter explores these key insights in the context of managing group work. Lessons learnt can be applied by educators in preparing students to become inclusive and equitable entrepreneurs. Finally, implications for

practitioners and educational practice, and opportunities for future research are discussed.

2. Literature: teamwork pedagogies in a DEI context

EE contributes to the number and quality of entrepreneurs in an economy (Hägg and Schölin, 2018; Matlay, 2006; Tiberius and Weyland, 2024). For the students involved, it helps develop such transferable skills as problem-solving, innovation, and teamwork (Fearon, Starr, and McLaughlin, 2011; Bachelet, Delmas, and Harnay, 2023; Steira et al., 2025). As a relatively young, fast-growing field of academic enquiry (Hägg and Gabrielsson, 2020), EE has shifted the spotlight from whether entrepreneurship can be taught (Kuratko, 2005), to how best to teach it, given the myriad of experience-based contemporary approaches centred around the learner (Biggs, 1996; Hägg and Gabrielsson, 2020). Teaching entrepreneurship requires a distinct pedagogy, as it aims at ‘instilling a sense of intuition into practice’ (Ratten and Usmanij, 2021, p.5).

EE includes a range of interwoven processes at different stages. A focus on the ongoing interactions between different levels, such as students, modules, and programmes allows for deep investigations of content, teaching strategies, and sequences (Steira et al., 2025; Fleming, 1999) and the uncovering of the development of entrepreneurial skills and attitudes. While extant research has prioritised the outcomes of EE programmes (Hytti et al., 2010), the process-driven pedagogy strategies used in class have been relatively neglected (De Sousa et al., 2024; Hägg and Kurczewska, 2016; Steira et al., 2025).

2.1 Pedagogical strategies in EE

Building on the distinction between outcome-driven and process-driven pedagogical strategies, outcome-driven approaches primarily focus on predefined learning results and content acquisition, whereas process-driven pedagogy emphasises the learning journey itself, including interaction, reflection, experimentation, and skill development through active engagement. In this context, Nabi et al. (2017), in a review of pedagogy strategies, conclude that ‘competence-based’ approaches, characteristic of process-driven pedagogy, are more effective for long-term EE impact than traditional teacher-centred methods. These approaches are grounded in communication, discussion, collaborative work, and reflective portfolios, all of which prioritise learning processes over static

outcomes. Similarly, De Sousa et al. (2024) find evidence that strategies centred on the student, through active learning, problem-solving, and collaboration, are more successful. Recently, the work of Branca et al. (2025) has shown how active and experiential learning approaches deliver the skills and competencies necessary for entrepreneurship. In terms of learning strategies, the authors highlight how design thinking, with its human-centred problem-solving approach, is contributing to creativity, and how workshops, case studies, and practical exercises simulate risk-taking propensity among students, improving that skill. Their review of 159 EE papers concludes that experiential and active learning approaches nurture essential entrepreneurial skills such as self-efficacy, creativity, risk-taking, and innovativeness.

Teamwork and collaboration are active learning strategies in EE, especially in process-based approaches (Steira et al., 2025) that evolve over time. This is understandable as the ability to work effectively within a team is a key skill for new ventures (Ensley et al., 2002) and major corporations (Pelled et al., 1999).

Team-based learning follows the principles established by Michaelsen and Sweet (2008), designed to provide students with conceptual and procedural knowledge. The principles are that: (a) groups are properly formed and managed; (b) they are accountable for their individual and group work; (c) students receive frequent and timely feedback; and (d) group assignments promote both learning and team development. Effective team-based learning strategies ‘achieve a depth of understanding that can come only through solving a series of problems that are too complex for even the best students to complete through their individual effort’ (p.24). In the context of EE, Michaelsen and McCord (2007) claim that team learning centred around real-world problems is effective as it supports the active construction of meaning by students, as a result of its direct and situated application (Biggs, 1996).

Teams need time to develop (Michaelsen and Sweet, 2008; Tuckman and Jensen, 2010; Takahashi and Saito, 2013), and groups go through phases of development (Tuckman, 1965; Li and Zhao, 2018; Suarez and Michalska Haduch, 2020). Chen and Agrwal (2018) found that teams functioned well as time went on, and when conflict was minimised, especially in the mid-point transition phase when conflict is likely to arise. Similarly, Walker et al. (2020) found that team dynamics improved over time, through trust and accountability. The authors conclude that team dynamics are made up of interpersonal processes (communication, personalities,

trust) and task orientation (preparation, accountability, participation). Although the study did not correlate team dynamics with grades, students acknowledged its importance for their future.

To achieve the positive impact on students' future through team-based learning environments, the active role of the instructor is pivotal (Michaelsen and Sweet, 2008). This is particularly relevant as peer evaluation in class leads to accountability for individual participants, and at the same time introverted students miss out unless the instructor monitors and creates an inclusive climate. Investigating cross-cultural group tensions, Mittelmeier et al. (2018) found that students' development of social relations outside class smoothed tensions, as did an inclusive environment created by the instructor. Lower-performing students were found to require the instructor's intervention more.

Additionally, the role of gender seems to be tied to how group work is managed. Data collected from 247 students in the US showed how female students had a more negative attitude towards team-based work, with the authors claiming that apart from group composition, this can be explained by certain interpersonal and group dynamics (Ro and Choi, 2011). In their study on 60 students who participated in a team-learning experience Fowler and Su (2018) conclude that students from groups that are historically underrepresented in the subject 'might be particularly at risk, as their teammates' perceptions of them affect what they might feel "allowed" to do on the team, or they might self-select into particular roles' (p.316). Therefore, when designing EE with process-based pedagogies, especially those focused on team-based learning, instructors should adopt an active role when forming and managing diverse teams.

2.2 Diverse teams in EE

What we know on teamwork as a pedagogical approach within EE remains limited. This issue is pronounced as the centrality of teamwork in EE is met by a diversity imperative, given that universities become more multicultural and diverse (Montgomery, 2009). The intersection of EE and DEI has recently gained significant attention, particularly within higher education institutions (Sreenivasan and Suresh, 2023). Scholars emphasise that entrepreneurship is a vital driver of economic growth and can significantly contribute to sustainable development and sustainable entrepreneurial practices (Schaltegger et al., 2018; Hall et al., 2010; Koe et al., 2015; Wyness et al., 2015). Furthermore, incorporating DEI principles into entrepreneurial curricula aligns with the UN's SDGs, particularly Goal 8, which seeks to promote sustained, inclusive, and sustainable

economic growth, and Goal 10, which aims to reduce inequality (Nguyen et al., 2024). A crucial aspect of this conversation is recognising that incorporating DEI principles into entrepreneurship curricula is not only the right thing to do ethically but is also vital from an economic standpoint. It cultivates the competencies necessary for contemporary entrepreneurs who must navigate an increasingly diverse and global marketplace (*ibid.*; Raharjo and Harianingsih, 2019; Wyness et al., 2015).

The principles of DEI within EE not only mirror the complex realities of actual entrepreneurial environments but also equip students with essential skills that are increasingly critical in today's society (Koe et al., 2015; Osipovskaya et al., 2024). Internationally diverse classrooms enhance the learning experience and are particularly well suited for EE, which aims to embody inclusivity and reflect the dynamics of real-world professional settings. Students from various backgrounds contribute unique perspectives, skills, and experiences, creating a vibrant learning environment, enriching discussions, and fostering the development of transferable competencies (Giacomin et al., 2016; Osipovskaya et al., 2024). These competencies include adaptability and cultural competence, skills which are increasingly prioritised in entrepreneurial settings (Chen, 2022; Fanea-Ivanovici and Baber, 2022; Miço and Cungu, 2023; Salis, 2023; Steira et al., 2025; Zhou, 2021). Moreover, as Schiller et al. (2022) suggest that international students foster cross-cultural communication skills, essential for navigating the globalised economic landscape.

However, significant gaps remain despite the increasing recognition of the need for DEI in EE. Current curricula often overlook the challenges faced by diverse student groups in their entrepreneurial learning experiences. While the advantages of diversity in EE are clear, effective factors such as communication barriers, cultural differences, and varying levels of experience can lead to misunderstandings and conflicts among team members (Chang and Brickman, 2018; Lee and Bailey, 2020). For instance, international students might struggle to articulate their ideas clearly due to language barriers, leading to frustration and disengagement (Bianchi and Martini, 2023). Therefore, EE must adapt pedagogical strategies to ensure that all students, regardless of their diversity (comprising gender, age, ethnicity, social or educational background), can have a smooth interaction among diverse team members and learn how to thrive in entrepreneurial environments (Warhuus et al., 2021).

An innovative educational approach that addresses these challenges is the implementation of team-based learning strategies. This method not

only enhances learning outcomes by incorporating experiential learning principles but also nurtures an inclusive environment where all students can contribute meaningfully (Arpiainen and Tynjälä, 2017; Harms, 2015). Team-based learning encourages students to leverage their diverse backgrounds, thus creating a richer, more supportive learning experience that aligns with the objectives of DEI.

This context frames our research questions, specifically:

1. How can entrepreneurship students from diverse cultural and educational backgrounds work together effectively on group projects?
2. How can educators support positive team dynamics when students from diverse cultural backgrounds are faced with an entrepreneurial challenge?

We answer these questions by discussing the application of STAM-DEEP model, i.e. a Structured, Teacher-Assigned Model, that allows addressing DEI and entrepreneurial potential among team members (Ikegwuonu et al., 2025) during the team formation and team-based learning.

3. STAM-DEEP in market analysis for new venture creation

STAM-DEEP is a structured model of student team formation developed to create balanced, innovative, and effective entrepreneurial teams by integrating three diversity and equality domains (gender, nationality, and educational background) with one entrepreneurial potential factor. By intentionally combining diverse backgrounds and perspectives with an assessment of entrepreneurial capability, the model ensures that student teams are both inclusive and strategically composed (Ikegwuonu et al., 2025).

STAM-DEEP is introduced on the first day of class through the formation of student entrepreneurial teams. Students then work together in the teams over the course to conceptualise, develop, and pitch their team venture idea with international potential. The process begins with forming student teams. Student teams are formed balancing gender and nationality, then skills (business, finance, IT, etc.) are evenly adjusted across teams. After completing the *get2test* (Caird, 2013) to assess entrepreneurial potential, groups are adjusted to mix scores, ensuring a spread of high, medium, and low scores across all groups, while maintaining

diversity. The highest scorer becomes CEO, with other roles assigned by expertise, creating diverse, real-world entrepreneurial teams.

Once teams are finalised, usually within the first half of the session, a 5-minute break is observed. Upon return to the session, students begin team-based learning activities within their teams. Team-based learning is an active learning tool that involves developing and using learning teams as an instructional strategy (Michaelsen and Sweet, 2008). It shifts focus from instructor-led delivery to student-led application of course concepts (Huilaja et al., 2022).

From the onset, STAM-DEEP team members are aware of their role in their teams, which promotes accountability within group work. Further, STAM-DEEP encourages system 1 thinking (Kahneman, 2011), dynamic participation, critical evaluation, and a deeper level of engagement in group work; outcomes that cannot be achieved through traditional in-person lectures alone.

Throughout the course, students complete a series of tasks designed to strengthen both individual and team-based learning. A flipped teaching approach is used to teach a variety of learning content, featuring questions based on theory from prior reading of articles and case studies, guest lectures and shadowing entrepreneurs.

4. Applying STAM-DEEP model to manage team-based learning in inclusive EE

This chapter further presents how STAM-DEEP is applied to improve teamwork effectiveness in student entrepreneurial groups. STAM-DEEP fosters balanced, innovative teams across three diversity and equality domains, namely gender, nationality, and educational characteristics of students, and combines with their entrepreneurial potential to facilitate group performance and minimise disruptions in group work. Teams are allocated, ensuring a diverse mix of STAM-DEEP criteria.

Semester one projects inevitably result in some group tensions, where students experience learning in these diverse contexts, usually for the first time. Educators seek to provide additional support to students before embarking on the projects, and a team-based learning workshop is introduced at the beginning of the programme (see examples in, e.g. Fletcher et al., 2021; Fletcher and Honeychurch, 2021).

A feature of the management of the groups is the use of student diaries, which allow reflecting on participation in group work. Two diaries are submitted over the course period (typically weeks 3 and 6). Diary 1 captures information on students' individual contributions to group work, and Diary 2 is their assessment of team members' level of engagement with group work. During week 3, students submit Diary 1, allowing tutors to assess team dynamics and intervene early, and be able to address any issues that may arise in group work. At the end of the course, students submit their final assessment, alongside Diary 2, which is used to moderate individual contributions to group work. Written comments provided by students in the diaries provide meaningful insights into the group working processes and effectiveness. The diaries provide both qualitative and quantitative data. Qualitative data are in the form of comments from students about their experiences working in teams, while quantitative data are students' ratings/evaluations of team members' engagement and contribution to group work, which are submitted to the tutor. This peer evaluation score provides a measure of how effectively the groups are functioning. It supports the group work dynamics by enabling the lecturer to intervene and resolve issues early in the course.

STAM-DEEP, including the above-described diary system for reflection on team dynamics, can be introduced to address various challenges, such as free-riding and unequal distribution of group work, when a minority of members carry the bulk of responsibility while others disengage or avoid tasks. It is also helpful to address communication barriers and exclusion, such as using separate group chats and foreign languages by group members from one cultural group, and parallel group chats that undermine inclusivity and transparency. It helps with weak deadline management and lack of shared responsibility that often results in increased stress but also risks compromising project quality. Finally, it allows addressing leadership struggles, especially with assuming leadership roles without being perceived as domineering. The absence of proactive leadership often results in stagnation and inefficiency. For example, some female students may experience challenges when they want to put themselves forward but are met with gender-based bias:

I have constantly tried to be a team player as I do not want to come across as bossy. However, I believe if I did not speak up the team would just sit in silence, and no work would get completed. (Quotation from female student diary)

This comment reflects the tension between the need for leadership and students' desire to maintain positive peer relationships. This suggests that gendered or cultural norms around leadership may have constrained assertive action, even when such leadership was necessary to move the project forward.

These challenges suggest that interventions were needed to support group accountability, foster inclusive team communication strategies, and provide frameworks for constructive course project leadership. These difficulties reflect barriers to effective team working within educational project settings, where structural inequities and group dynamics can reproduce broader patterns of exclusion, which may mirror conditions within start-up teams and SMEs. As Hofstede's (2001) cultural dimensions highlight, when team practices privilege norms of low power distance, individualism, and assertiveness, students from collectivist or high-power distance cultures may feel sidelined; conversely, when group norms lean towards orientations of deference, consensus, and strong uncertainty avoidance, those from more individualistic or egalitarian cultures may find their contributions constrained. In both cases, the dominance of a single cultural framework embeds inequities into team-work practices, limiting genuine inclusivity.

To understand how entrepreneurship students from diverse cultural and educational backgrounds can work together effectively on group projects and how educators can support positive team dynamics in their learning process, we have applied STAM-DEEP in our teaching and analysed the student learning process.

5. Empirically exploring the impact of STAM-DEEP for teaching entrepreneurship

Our study followed a mixed-methods approach (see e.g. Dharmawan et al., 2025). The course, within which the study took place, integrated an intensive, experiential learning pedagogy and is delivered using flipped classroom and team-based learning over six units (Ikegwuonu et al., 2025). Students worked in collaborative teams, gaining hands-on experience in developing and pitching a new venture. The course emphasised practical application, creative problem-solving, and teamworking. It equipped students with essential skills to navigate the challenges of

creating and scaling successful businesses. The students had an opportunity to meet and interact with real-life entrepreneurs within SME environments.

Participants for the case study were a cohort of students taking the course during semester 1 (September–December 2024) at the University of Glasgow; 93 students participated. The students came from ten countries, namely Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Taiwan, the UK, and the USA. The students' international composition enabled them to bring venture ideas from their home countries to address challenges they identified in Glasgow or vice versa.

5.1 Method of data collection and analysis

Data collection combined quantitative data from students' self-reported evaluation diaries (1 and 2, as described in the previous section) and direct tutor observations. The individual diary was a report of tasks students completed per week for group work. Diary 2 captured students' ratings of fellow team members' contributions to the group project, using a five-point Likert scale rating from +3 to -1. There was an additional box in the diary where students included justification for ratings. Qualitative data from two of the authors included observations of students' participation in the course, including notes and comments about attendance at lectures, workshops, and tutorials, patterns of absence, or clear leadership by any specific student. Overall participation in group work, engagement with course content, completion of formative assessment tasks, participation in class debates and discussions, how ideas were developed in group work, and how consensus were reached are included. In addition, the impact of tutor interventions between Diary 1 and Diary 2, and any observed changes in relation to engagement with group work and group dynamics were noted.

Descriptive statistics were used to analyse count data, and regression analysis was conducted to determine the moderation effect of diversity variables on group dynamics, represented by team members' peer evaluation scores, i.e. the overall contribution score each team member received based on peer ratings. Ratings explain dynamics within the groups. Higher ratings signal positive and collaborative team dynamics, whereas low ratings are evidence of non-cooperation and non-contribution to group work.

Group work participation in student entrepreneurial teams was analysed using multiple linear regression (with categorical predictors and

interaction effects). ANOVA was also used to compare participation scores across groups (see online appendix in the supplementary materials for detailed statistical tests). The analysis examined whether diversity factors predicted peer evaluation scores and whether entrepreneurial potential moderated the effects of nationality and gender. The direction of the effects was identified using regression coefficients (B values). Entrepreneurial potential was classified into three levels: high, medium, and low (see online appendix 1.4 for detail statistical tests). These layers are captured from the get2test (Caird, 2013).

Additionally, we report tutor observations using their reflective summary. Analysis of students' Diary 1 from the 2022 cohort was used to set the scene for why intervention was necessary.

6. Key findings and analysis

6.1 Comparison of cohorts: 2022 no model vs. 2024 STAM-DEEP

Diary notes from the 2022 cohort highlighted persistent challenges with group work. Analysis of comments from 2024 participants shows significant differences between teams formed without STAM-DEEP in 2022 and those using the STAM-DEEP model in 2024. Notably, previous groups reported frequent frustration with free-riding, whereas STAM-DEEP teams demonstrated early understanding of individual responsibilities and collective goals. Sub-teams were observed forming naturally within STAM-DEEP teams, where two or more team members collaborate on specific group tasks within their role remit, then inform the wider group that the activity was completed, enabling smooth progression. For instance, marketing sub-teams would notify the finance sub-group when their contribution was ready, streamlining workflow and reducing bottlenecks. This practice directly addressed frustrations documented by the earlier cohort, where poor coordination and role confusion had led to duplication of effort and missed deadlines. Additionally, diary entries show that in 2024 using Microsoft Teams channels significantly improved communication, replacing fragmented chats and foreign-language silos that excluded some members in previous cohorts.

Within STAM-DEEP teams, role-playing replicates real entrepreneurial settings. Students are assigned leadership and functional roles based on academic background, experience, and entrepreneurial potential. For example, in project teams, the student with the highest EP score is

appointed CEO. Other roles are aligned with disciplinary knowledge: finance students serve as CFOs, operations or management students as COOs, and marketing students in related executive roles. This approach promotes practical, experience-based learning with strong real-world relevance. Role play, therefore, encouraged shared accountability, ensuring projects were completed professionally, collaboratively, and within set time frames; an outcome largely absent in the 2022 cohort.

6.2 Reflective summary of tutor observation: 2022 and 2024

We made educators' observations and reflections on how DEI factors impact group dynamics within the course. Student teams were formed in 2024 using STAM-DEEP. Each team member was assigned a specific role, based on educational background or previous work experience. This allowed for accountability and equitable contribution to group work to be assessed at the end of the course. We could hold individual students accountable for tasks associated with their role, hence, eliminating free-riding in the course. Free-riding was a concern with the previous cohort, especially when all students received the same grade for group work, whether they contributed meaningfully or not. Notes and comments from tutor observation allowed us to maintain equal accountability throughout the course, as students were expected to take responsibility for their role in completing group work. Furthermore, from our research and poster presentation, we know that STAM-DEEP teams are more agreeable compared to no-STAM-DEEP teams, where team members were intentionally allocated specific roles within the team (Ikegwuonu et al., 2025).

From the application of the STAM-DEEP method in 2024, balanced participation in group work was observed. Nearly all 93 students successfully completed their assigned tasks, except for two students who could not fully participate due to health and immigration challenges. The analysis indicates that students in STAM-DEEP formed teams are more likely to contribute meaningfully to group work compared to those in self-assigned or randomly assigned teams, based on evidence from cohorts 2022. In randomly assigned teams, we noted recurring patterns of free-riding, while in self-selected teams, students tend to exclude from communication peers perceived as outside their cultural background, sometimes establishing separate communication channels. Moreover, the practice of appointing group leaders frequently resulted in tensions within teams.

In the case cohort in 2024, we did not receive reports of conflicts within group work, a departure from previous experience, when we did not apply STAM-DEEP. From our observations, all team members bore the responsibility of group work due to balanced group working. STAM-DEEP teams operate with clearly defined roles assigned from the outset, ensuring a more balanced and efficient collaboration, and this was visible in team reflections. There was natural bonding around course themes, and very early in the course, the teams were making progress and discussing personal issues beyond the course task. There was open conversation. This corroborated feedback students provided verbally during office hour check-ins, which was a key aspect of course formative feedback. Some students referred to teammates as friends.

An important observation relates to leadership in group work. The 2022 cohort had leadership challenges, often assumed by male student-peers, who seemed to self-nominate as group leads and who may not have had entrepreneurial leadership skills or experience. However, when we introduced the entrepreneurial potential score as a criterion for selecting group leaders in 2024, we observed more female leads in the groups. In addition, most groups diversified their way of working that aligned with the overall group goal. We observed positive outcomes in terms of the time required for groups to complete tasks. Group leaders appeared to shape group dynamics through their communication style, decision-making processes, and ability to motivate and inspire members – effectively leading by example. These findings are consistent with our quantitative analysis, which indicates that entrepreneurial potential acts as a positive moderator with gender. Notably, groups with female leads worked more collaboratively and achieved group goals more efficiently. We know from Caird (2013) that people with high entrepreneurial potential are highly motivated and cultivate stronger independent leadership qualities, which informed the decision to nominate high entrepreneurial potential scoring students to group lead or project CEO roles within the student entrepreneurial project.

6.3 Assessment of group dynamics across DEI factors and entrepreneurial potential

We assessed group dynamics using peer evaluation scores to understand the effect on the main DEI factors: educational background, nationality, gender, and the interaction term entrepreneurial potential (see online appendices 1.1, 1.2). The nationality spread did not provide enough variation data; however, we included this as we had initially proposed to observe this in our regression analysis. To make sure our results were

accurate and that entrepreneurial potential added unique information, we first checked and confirmed that peer evaluation scores and entrepreneurial potential were not closely related before running the regression analysis.

Our results show that the connection between these background factors and group dynamics is weak. The model (online appendix 1.3a) explains only 10 per cent of the differences we see in peer evaluation scores. Overall, entrepreneurial potential and the background factors (gender, nationality, education) together do not strongly predict how groups function when we conduct joint predictor analysis using ANOVA (online appendix 1.3b). However, what was interesting in our study was when we sought to separate the effect of individual predictors to better understand which of the predictor variables was having a significant effect on group dynamics, given the weak effect of the combined predictors.

The table in online appendix 1.3c shows how each factor on its own affects group dynamics. The results suggest that the overall starting score for group dynamics, i.e. peer evaluation score, is meaningful, even before looking at other factors. Consistently, gender stood out as the only factor with a clear effect, with female participants scoring 5.5 points higher on group dynamics when interacted with entrepreneurial potential. This means gender may influence how effective and collaborative groups function when led by female participants who have high entrepreneurial potential. Other DEI factors, such as nationality and education did not show a meaningful impact, suggesting they do not directly affect group dynamics scores in this study. It is important to note that we have not attempted to analyse the effect of nationality, given extreme values, with some nationalities having a high number of representations compared to others in the course. Furthermore, our regression analysis findings align with both the students' diary insights and the tutors' observation notes regarding the influence of gender on the efficient management of group work.

7. Conclusion

7.1 Summary of findings

This study explored how diversity factors affect group dynamics within student entrepreneurial project teams. We found that gender had a significant positive impact on group dynamics when considered with entrepreneurial potential. We propose that assessing entrepreneurial potential

may help reduce gender-related disparities in group work, potentially enhancing collaborative group working, especially where group work leadership is informed by competency.

The main contributions of this study relate to factors that both support and improve group work effectiveness and overall group dynamics within entrepreneurial project teams. First, we found that deliberate formation of project teams and allocation of team members based on predetermined functional roles can lead to positive group work outcomes. This is in agreement with a previous study, which suggests complementary team roles may be more effective in achieving group goals than having all team members spending concerted effort on developing relationships where they may not matter for team success (Shuffler et al., 2018).

Second, from our research, prior cohorts of the course had leadership challenges, ranging from self-selected, male-dominated project team leads to poorly managed student entrepreneurial group projects. However, we could address this by applying a competency-based selection approach, which increased the number of female group leaders, compared to male group leaders. We observed that these competently managed groups fostered positive group dynamics.

The premise of our competency-based approach is derived from Caird (2013), which supports identifying students with entrepreneurial potential to lead groups. We know that people with entrepreneurial potential are characterised by a high need for achievement and for autonomy. Such people can set up and manage entrepreneurial projects because they are highly self-motivated (ibid.).

Third, our model addressed issues of free-riding and lack of individual accountability in group work, which were found in previous studies (El Massah, 2018; Francis et al., 2024; Monteiro et al., 2022), and in earlier cohorts of our course (Fletcher et al., 2021). Application of STAM-DEEP in the formation of student entrepreneurial project teams, which prioritise role allocation within group work (Ikegwonu et al., 2025), was able to reduce free-riding, and where it existed, we could identify and apply grade reduction individually, rather than punishing other group members for the lack of engagement of their peers.

Finally, our model fast tracks the bonding time within groups; therefore, it contributes to the discussion on the time it takes for groups to form, norm, and progress to performing teams. Existing evidence suggests

teams experience five stages from formation to dissolution (Tuckman, 1965). While there is not clarity on how long this takes, the stages are clear. According to Tuckman (*ibid.*), the initial coming together as a team is considered stage one. This stage may bring feelings of excitement or concern. People's reaction to the excitement is considered stage two, the norming stage. Stage three is the storming stage, when individuals assert their opinions or attempt to influence the group. By endeavouring to address group conflicts, teams enter the norming stage. They earn each other's trust and become more collaborative. This collaborative stage leads to stage four, performing, where team members show shared commitments to achieving group goals. The final stage is the adjourning stage when teamwork concludes. This stage brings both a sense of accomplishment and feelings of loss.

In STAM-DEEP classes, student teams are formed on the first day of class, and quickly they progress from introductions to collaboration within 45 minutes. Through dynamic role-play that engages system 1 thinking, students develop intuitive decision-making skills (Kahneman, 2011) by actively identifying problems and taking rapid, low-stakes actions. In fast-track evaluations and deep-group interactions during short, five-minute timeslots, they generate a series of documents, outputs, and decisions that would be impossible to achieve in traditional lecture formats.

7.2 Implications for practitioners

This study increases our understanding of factors influencing student group work effectiveness. Educators can apply the STAM-DEEP model to their entrepreneurship courses and have the opportunity to adapt the model to other courses that have diverse students. Specifically, educators should explicitly apply the STAM-DEEP model when structuring group activities in entrepreneurship courses. This could involve assessing students' skills upfront to form balanced teams and guide collaborative tasks, so students are effectively contributing to group work. By applying STAM-DEEP, educators can simulate real-world team dynamics in group projects, closely mirroring the challenges faced by SMEs, such as managing diverse roles, resolving conflicts, and navigating limited resources. The STAM-DEEP model recognises that students come with different backgrounds, experiences, and learning styles. EE educators should provide scaffolding, like clear role definitions, communication protocols, and peer-feedback mechanisms to enhance group effectiveness across diverse teams.

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This course mirrors real-life teamwork dynamics and has lessons for SMEs. By intentionally avoiding self-nominated leaders and ensuring the clear allocation of roles within diverse teams, firms can reduce interpersonal tensions and foster more inclusive collaboration. This is especially important for SMEs, where teams are frequently small, collaboration is greatly influenced by personal relationships, and hierarchies are less formalised. In such environments, clear role distribution and inclusive team structures improve trust, communication, and productivity – critical factors for SMEs to expand and be resilient over the long term.

SME managers can apply STAM-DEEP in team formation by deliberately assigning roles based on employees' previous experience and expertise. By assessing skills, past project involvement, or personal strengths, managers can structure balanced teams where members' capabilities complement each other. When training the workforce, STAM-DEEP can be applied through role-play exercises that simulate real business scenarios, allowing employees to practise tasks aligned with their skills or slightly beyond their experience to stretch their abilities. This experiential approach encourages learning by doing, builds confidence, and develops problem-solving and decision-making skills in a safe environment. Managers can rotate roles in these simulations to expose employees to different functions, provide structured feedback, and reinforce performance-oriented behaviour, ensuring that training is both practical and directly applicable to workplace challenges.

7.3 Limitations and future research

A limitation of this study relates to the small sample size. For example, it was not statistically possible to interrogate nationality data due to the small sample size. While students from ten different nationalities participated in the course, 55 per cent came from China and 10 per cent from India. The remaining 35 per cent are shared amongst the other countries. This potentially underreports the complexity of national diversity in our study. We suggest future research with sufficient diversity in student country representation to address the impact of nationality. However, findings from our study suggest that factors beyond demographic diversity, such as teamworking skills or leadership styles, may offer stronger predictors of group work success; therefore, it calls for a large-scale quantitative study to investigate these assumptions within student entrepreneurial project teams.

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