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# Student perceptions of collaborative group work (CGW) in higher education

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## ABSTRACT

Despite the vast body of research surrounding collaborative group work (CGW) and its potential to enhance learning and engagement, questions persist in relation to the effectiveness of CGW initiatives in the development of teamwork skills amongst students in higher education. Prior studies have tended to measure the effectiveness of teamwork and group work through student grades, however, this is increasingly seen as problematic, with more researchers stressing the importance of student perceptions as a better measure of the efficaciousness of CGW. This paper presents the findings from an Australian study which set out to investigate student perceptions of the effectiveness of a technology-enhanced groupwork assessment on student learning outcomes, including teamwork skills and self-evaluative judgement skills. An unexpected event in the beginning of 2020, that being the global COVID-19 pandemic, affected learning and teaching in significant ways, with all students forced to learn online, inevitably impacting their experience with this CGW initiative. Adopting a qualitative inductive research methodology, the findings suggest that students perceive collaborative group work as beneficial in many ways, though it is not without its challenges, one of those being the global pandemic and its ripple effect of remote learning, isolation and increased difficulty with collaboration. This unforeseen event and its impact on the delivery of education elicited interesting results about CGW in the online context. Findings may advance the understanding and implementation of CGW in higher education, particularly in an online learning context.

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## Introduction

Collaborative group work (CGW) is recognised as a powerful tool in education to enhance student engagement and learning (Stanley and Zhang 2020). In the higher education context, CGW – where students work together in small groups to achieve a common goal – is considered indispensable (Sridharan, Tai, and Boud 2019). CGW has been shown to develop a range of soft skills including communication, empathy, teamwork, conflict resolution, leadership and self-management; all skills highly sought after by employers, recruiters and other key stakeholders (Clarke 2017). In the higher education context, it is also seen as responsive to calls by accreditation bodies to make education more relevant and responsive in terms of the learning environment (AACSB 2021). Further, in the current borderless working world, where collaborative work culture and peer learning have

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become integral to diverse organisations (Boud, Cohen, and Sampson 2014), CGW has the potential to hone students' ability to work with others in team environments and in diverse and multicultural contexts (AACSB 2021). Such skills are viewed as increasingly important in the globalised, technology-enhanced world of work today.

Collaborative learning has long been proposed as a way to achieve a raft of critical skills. Indeed, Panitz (1997) identified 67 specific benefits encompassing the academic, social and psychological including building self-esteem, reducing anxiety, fostering understanding of diversity, developing relationships and prompting critical thinking.

The theory undergirding collaborative learning for this study stems from Vygotsky's (1978) social development theory on the causal relationship between social interaction and individual learning. It is also premised on the constructivist idea that collaborative learning and constructive cognitive development go hand-in-hand (Piaget 1929). Bruner (1986) posited that learning is an active, social process enabling students to construct new ideas based on their existing knowledge. Constructivist theory underpins this process suggesting that learners play the role of the constructor of information and take an active role in their learning (Piaget 1968; Vygotsky 1978). New theories of learning and cognition are constantly emerging to address the needs of the contemporary virtual era, including the community of inquiry framework (Garrison, Anderson, and Archer 2010), networked learning model (Goodyear and Zenios 2007), and social interdependence theory (Johnson 2003). These progressive advancements not only support transforming learning through practical applications but also align with instilling much-needed soft skills such as civic values (Sullivan 2005) and socially responsible citizens (Beddewela et al. 2017).

To prepare tertiary students more efficaciously for their future careers, educators in higher education institutions have integrated CGW across the curriculum as a targeted learning approach for professional development (Lacka, Wong, and Haddoud 2021; Omodan 2021; Sokhanvar, Salehi, and Sokhanvar 2021). Research over the last decade has thus not surprisingly turned to identifying the key factors which influence group effectiveness and how these factors are related to each other (Qureshi et al. 2021). Extant research suggests that collaborative group work can enhance students' academic grades (Sridharan, Tai, and Boud 2019), acquisition of discipline knowledge (Currey et al. 2015), and development of a range of key skills as mentioned above (Lau et al. 2014).

While the benefits of CGW and its potential to develop key soft skills and prepare students for the world of work are well documented, it is not without its challenges (Sridharan and Boud 2019). Indeed, research shows that embedding CGW can be problematic and complex for a variety of reasons (Dean and Wright 2017; Hall and Buzwell 2013). Firstly, the act of merely allocating students to groups does not necessarily translate to the authentic development of soft skills or employability skills such as teamwork, empathy, conflict resolution and self-management (Jackson 2015). Secondly, the experience of group work is often fraught with frustration and dissatisfaction for many students (Medaille and Usinger 2020). Prior research shows that students have expressed dissatisfaction with group work for varied reasons.

Indeed, group work in summative assessments often does not allow for students to be graded at the individual level (Sridharan, Tai, and Boud 2019), and students have expressed dissatisfaction that group tasks are not designed in such a way that each student's individual contributions are 'fairly' graded (Glenn 2009). Student frustrations around grading at the group level stem from issues often experienced by students including social loafing, free riding (El Massah 2018) and 'sucker' effects (Sridharan, Muttakin, and Mihret 2018). Studies have shown that many students undertaking CGW 'express concern about the way in which marks awarded for outcomes produced by the group collaboratively are allocated to individuals in of the group' namely because 'some group members contribute more or less than others, students feel that awarding the same mark to all members of a group is unfair' (Kennedy 2005, 59) (also see Planas-Lladó et al. 2021). To address this issue, many employ 'peer assessment' as a fairer way of determining how group marks are to be distributed among individuals. Students have also articulated dissatisfaction with the fact CGW are often not authentic in simulating real-world practices; a view echoed by employers (Lohmann, Hathcote, and Boothe 2018).

Workload and task complexity are also problems often associated with groupwork (Bravo, Catalán, and Pina 2019). Workload has long been shown to be a key determinant of attitudes toward group work in that the more amount of work, the worse the experience will be for those involved (Bhardwaj 2020). Empirical studies suggest that a perceived excessive workload can result in a surface approach to learning (Nieminen, Asikainen, and Rämö 2021), while tasks which are perceived to be complex can make students feel overloaded (Gupta, Li, and Sharda 2013). The importance of assessing student perceptions of how complex a task is, is thus underscored (Lim et al. 2021).

### ***Defining and measuring effective CGW***

While the nomenclature varies across studies and countries, research is prolific on the various advantages and disadvantages of what we term 'CGW' in this paper, also often referred to as group work and teamwork. Recent studies point to the continuing challenges which remain in relation to students in higher education working together towards a goal, one of those being how to measure the efficaciousness of CGW.

Measuring team effectiveness is of course a complex task given that there is often a variance of teams being investigated and discussed (Kozlowski and Bell 2019; 2020). Most research on teams and group work in the education context tends to measure team effectiveness as achievement or performance centred on student grades (Pinter and Cisar 2018). However, as some researchers have argued, 'the use of grades as a measure of learning can be problematic' (Bravo, Catalán, and Pina 2019, 1486). Further, they suggest 'grades do not always necessarily reflect 'pure' learning but also incorporate other considerations, such as classroom participation and attendance'. An increasing number of researchers claim that learning outcomes can be better assessed through students' perceptions of learning outcomes. Thus, in the study to be discussed in this paper, CGW effectiveness is measured in terms of student perceptions relating to learning, satisfaction with the group work experience, and perceived quality outcomes. This study explores the question: how do we measure the effectiveness of building teamwork and associated skills based on students' perceptions of their consequential learning upon completing a specific group work task?

## **Materials and methods**

### ***Research design and procedures***

The study adopted an innovative technology-enhanced groupwork assessment design embedding a flipped feedback model trialled at an Australian higher education institution detailed below. The qualitative data was gathered from 48 students on their perceptions of their experience and the value of group work, self and peer assessment and their recommendations for improvement. The qualitative data collected stemmed from three sources: (1) feedback to instructors (F2I) comprising 493 qualitative responses; (2) feedback to students (F2S) totalling 1633 segregated responses; and (3) 34 qualitative comments to recommendations for improvement survey responses. The total of 2126 responses from the first two sources were produced through the web-based tool called Comprehensive Assessment of Team Member Evaluation (CATME) and the 34 responses from the third source were produced through a Qualtrics Survey tool exported into an Excel spreadsheet. CATME tool was used to facilitate anonymous formative and summative self and peer assessment and feedback tasks. Feedback instructor entailed open-ended qualitative anonymous comments to instructors in order to help them in the post-moderation of assessment. Feedback to students comprised both quantitative rating and qualitative feedback on four of the five systems' in-built dimensions<sup>1</sup> (Loughry, Ohland, and DeWayne Moore 2007). The fifth dimension namely 'having knowledge, skills and abilities' was excluded for the purposes of this research focus on teamwork skills.

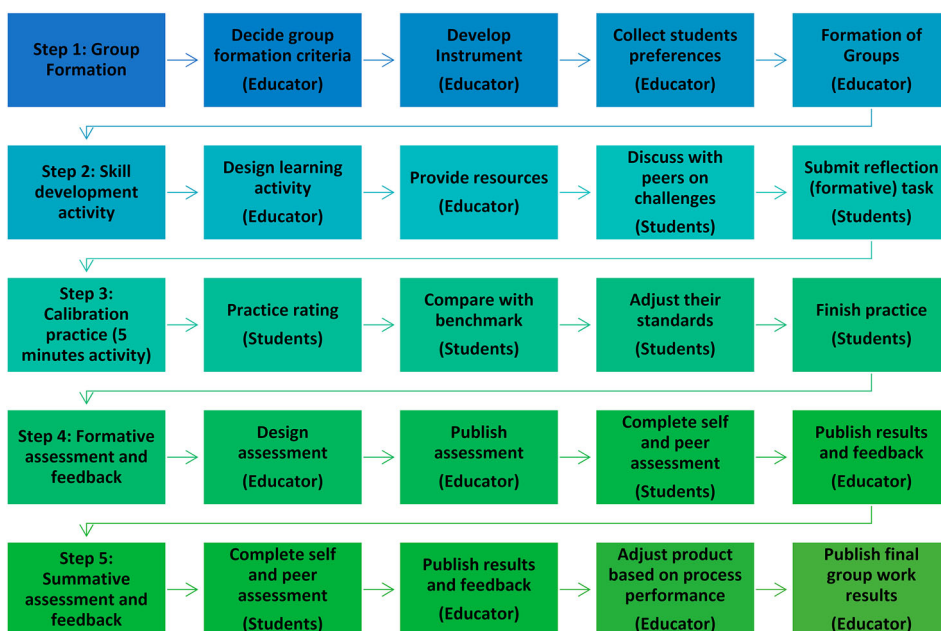
Content analysis was conducted using the total of 2160 qualitative data for this study. This was completed both as part of the assessment and completion of a survey at the end of the semester upon completing their group work and self and peer assessment tasks.

The target population for this study was students enrolled in a specific higher education course engaging with an innovative teaching and learning approach which required them to provide flipped feedback – feedback to self, peers and instructors. This approach draws on the work of Sridharan and Boud (2019) who found peer feedback may lead to enhanced teamwork behaviour and self-assessment ability; two skills often highly sought after by employers. Specifically, this study sought to explore the direct effect of formative performance rating and the mediating effect of praise and criticism in peer feedback messages on achievement in teamwork and self-assessment skills.

### *Group work assessment design and activities*

The group work assignment design comprised completion of the group work product task and the teamwork process task with assessment weight of 20% and 10% respectively. The teamwork process task involved self and peer assessment of team members on their teamwork behaviours based on pre-declared criteria. These criteria include: (1) contribution to work; (2) interacting with teammates; (3) keeping team on track; and (4) expecting quality (rating 1 to 5. 1- lowest and 5- highest). Additionally, team members also assessed the following characteristics of overall team functioning: teamwork interdependence, cohesiveness and peer influence.

Students were provided range of resources and tools to develop and manage their group work activity including: (a) using the discussion forum to brainstorm challenges of group work behaviours using the article on ‘coping with hitchhikers and couch potatoes on teams’ by Barbara Oakley; (b) giving and receiving feedback from peers; (c) how to do critical self-evaluation; (d) teamwork contract template; and (e) group meeting proforma. To implement the teamwork process tasks, the following five steps were incorporated (see Figure 1 below).



**Figure 1.** Five steps of the CGW task.

1. Step one was accomplished using CATME team-maker tool to support an optimal group formation strategy based on students' preferences for their team membership with parameters set by the educator. CATME is a web-based system that facilitates collecting data from students and the formation of teams according to preidentified criteria.
2. Students were given templates to plan their groupwork activity in terms of meeting times, responsibilities and policy agreements. They were provided an article on 'Coping with hitchhikers and couch potatoes on teams' to analyse and discuss with peers and publish a short self-reflection piece in a discussion forum. This was a formative learning activity to help students navigate the challenges of group work such as social loafing, hitchhiking, monopolising, and hoarding, among others.
3. Students were given an opportunity to practice self and peer rating (using the CATME rater practice tool) to calibrate student expectations around quality, standards and subsidiarity.
4. Students undertook a formative self and peer assessment and feedback on teamwork behaviour giving them an opportunity to learn from their mistakes.
5. Students completed the summative assessment, similar to step-4, however responding to how they actioned the peer feedback that they received. The relative performance score derived from this task was used allocate a teamwork mark for individual students.

This study sought to determine students' perceived CGW learning experience, satisfaction and outcomes (including teamwork skills and self-evaluative judgement skills) through content analysis of student feedback to peers and instructors. Increasingly, researchers are realising that learning outcomes may be better assessed through students' perceptions rather than grades (Bravo, Catalán, and Pina 2019). To this end, CGW effectiveness was measured by our study in terms of student perceptions relating to learning, satisfaction with the group work experience, and perceived quality outcomes, an approach supported by prior research (see for example Caspi and Blau 2008).

### **Data analysis**

Adopting a general inductive approach delineated by Thomas (2006), one experienced researcher used NVivo 19 to analyse the qualitative comments elicited from the student's feedback to instructors, to their peers and overall recommendation for improvement to the researchers to identify recurring themes related to what had 'worked' for the students in terms of the CGW task and process (Appendix A details the additional themes – outside the scope of the pre-declared dimensions – to emerge from the initial analysis). To enhance the analytical process, and the identification of themes, a second researcher undertook recursive examination and auditing to ensure validity and reliability (Whittemore, Chase and Mandle 2001). Based on this, the four key themes logically evolved from the pre-declared dimensions as discussed in the next section.

### **Results**

The key findings to emerge relate to four key aspects of the CGW process and task. The qualitative data to emerge from students in their provision of feedback relates to: (1) contribution to work; (2) interacting with teammates; (3) keeping team on track; (4) expecting quality. The key themes to emerge from the data will be presented, before these key themes are examined in relation to the overall effectiveness of the CGW experience (incorporating a flipped feedback approach) is discussed.

#### **Contribution to work**

Contribution to work was viewed as a critical issue by most students, and based on the qualitative data, it impacted their overall CGW experience significantly. These findings support prior research

which suggests that the degree to which other group members do or do not contribute to work has a significant impact on student feelings towards the process and overall experience (Sridharan, Tai, and Boud 2019).

The findings indicate that when all students were seen to contribute fairly and evenly, students were vocal in their praise of the CGW experience. One student stated in their feedback to the instructor, 'I am very happy with how my group worked. I feel as though the weight was all distributed equally, everyone did their part and was more than happy to take on extra tasks ... The members in my group worked ... efficiently and we all shared the same goal'. While this student acknowledged the even distribution of work helped to enable efficiency and a positive experience, they also alluded to the importance of a shared goal. Another student stated that when the workload was 'distributed ... fairly and all completed required sections in a timely manner' it resulted in team working 'really well' with 'no dramas or conflicts between teammates'. Another praised their teammate who had steered the task to completion:

I'd like to add that [student] was a part of this group, she was able to add a tremendous amount through the contribution of this assessment. She was able to coordinate all aspects of this assessment to ensure that it was completed in time. Even if it meant that she has to be forceful against some of the group members. She was able to cope with all the stresses of the group members.

However, as supported in the existing research (Pinter and Cisar 2018), many students identified the uneven distribution of workload amongst team members negatively impacted their overall experience. One student wrote: 'I felt my team did not put in as much effort as they made out ... nor were they capable of providing the quality of work I was expecting ... I did 70% of the research and writing and the majority of the organising of our zoom chats, but each time we met it seemed like they had only glanced at the material'. Some students felt like they were the ones 'pushing the remainder of the group to get the task done and on time'. They spoke of other students in the group lacking 'direction, drive and academic skills' with their 'contribution to starting it last minute ... affect[ing] the group's overall performance'. Others alluded to the difficulty when team members were not given the role they wanted which then resulted in them doing most of the work and 'constantly communicating with team members'.

One student simply stated: 'My team worked well together and completed all their given tasks however it was challenging to distribute a fair workload'. Some students alluded to the difficulties meeting their obligations in relation to their designated tasks as a result of balancing paid work with study. One student stated a teammate 'took over some of my work because she wanted it done faster but I couldn't get it done ... until I had finished work which meant I was rushed'.

Student perceptions reveal the importance of having equal distribution of workload and contribution to work for CGW to be effective. Students were found to be critical of the CGW experience when they found themselves not sharing the workload 'fairly' or 'evenly'. The inclusion of a flipped feedback approach did however offer students an outlet to vent their frustrations where they existed with both educators and their peers. For example, some students were explicit in their feedback about corrective actions as well as praise:

I am disappointed in the delayed responses we got from you. We all were constantly waiting for you to reply and let us know how your progress was going but we had to wait a minimum of 5 days to hear back from you.

Thanks for all your work within our group – it was nice to have reliable team members who got their work done promptly and on time. It was a pleasure working with you.

The ability to offer peer feedback thus enabled students to offer constructive criticism and suggestions to their peers moving forward which enhanced the experience of the CGW task. Being able to express their disappointment in team members, or voice their frustrations, as evidenced in the above quotes, arguably enabled them to hone their communication and conflict resolution skills. The process offered students the opportunity to develop teamworking and interpersonal skills in reflecting and communicating on issues encountered in the group work process.



### *Interacting with teammates*

One of the most significant factors contributing to the effectiveness of CGW is that of a student's interaction with their teammates (Joo 2017). This factor was problematised by the 2020 global COVID-19 pandemic which meant students were forced to undertake the task remotely and online, preventing the ability to meet face-to-face (Devlin and McKay 2021). Many students easily adapted to the enforced online CGW task effectively using ICT technologies or social media sites for communicating and knowledge sharing. Others found the inability to socially interact with teammates a major barrier in their CGW experience, preferring a face-to-face approach.

Empirical studies have canvassed the effectiveness of both these approaches, concluding that each approach has its benefits and barriers (Nesrin, Sean, and Kareem 2020). Student perceptions themselves have been canvassed and while some students prefer the convenience and utility of time management of online group work tasks (Khalil et al. 2020), others feel a lack of face-to-face interaction is a significant barrier (Gillett-Swan 2017), in relation to communication and engagement, though these preferences may be informed by factors such as age, gender, and digital literacy (Martin and Bolliger 2018).

Research does show that educators are increasingly enhancing their online instruction and practice, better fostering collaboration and mitigating roadblocks for students as online learning becomes a new norm for many institutions and programmes (Lieberman 2018). Indeed, it is important to note that the university at which this study was undertaken does often adopt a blended learning approach, so students would most likely be familiar with some online learning. However, the emergency remote learning brought about by the pandemic clearly impacted student experience and learning in the CGW task and process as evidenced by the qualitative data, which revealed that many students found the experience isolating, challenging for those who lacked digital literacy capacity, or struggled in their communication or interpersonal skills. Students indicated it was difficult completing 'a group project in isolation', 'challenging at times to communicate ... as we are not seeing each other in class each week' and that it did not really feel 'like a group project due to everything being on zoom'.

The word 'difficult' was often used by students to describe having to communicate and form rapport and cohesion with teammates in a wholly online context. One student referred to the 'inability to meet in person' or 'work with each other face to face' as particularly 'difficult', while another student said it was 'difficult to communicate effectively with group members and establish cohesion'. Students in this study only met once before having to move their collaborative group work task online and as one student explained, 'It was difficult to communicate with people that you have only met once'. This was seen to detract from what could have been a more positive experience, as one student stated, 'moving online removes the ability for members to meet in person and work together' and thus the assessment task did not 'have the same value' as it would have if it had been a face-to-face group work task.

Students were clear and emphatic in their opinion that their groups 'would have worked a lot better if we got more time in class to bond as a group before covid-19'. One student viewed it as the most significant challenge in the task given 'that we hadn't met in person and all interaction was online'. Another stated, 'This was a particularly difficult group assessment task given that everyone was learning remotely and not on campus. It may have been easier to commence work on the assessment task if we had face-to-face contact'.

While some clearly viewed the online CGW task as a challenge, others were able to more effectively embrace the online learning mode and tools available to them. As one student stated, 'Overall as a group, I believe we worked really well. We Zoomed twice to organise our assignment and had a Facebook group chat where we were constantly chatting, sharing and clarifying ideas about what was expected, and what parts we were going to complete'. As well as harnessing organisational skills, some students embraced the digital aspect of the task and its 'new experience of coordinating and collaborating with team members'. Another commented, 'We used a Google



Doc and Google Slides, to share our work and keep up to date with how other team members were going, this also ensured our presentation flowed’.

These students appeared able to use the tools available to them to not only enhance the online learning experience to ensure a positive experience, but to alleviate the challenges of group work during the pandemic and lockdown. One student stated the capacity to have ‘twice weekly zoom meetings during isolation’ alleviated the loneliness of the lockdown with the capacity to ‘talk to some different people’. Another stated that despite the pandemic circumstances, their ‘group worked really well together’ and that ‘as a group’ they ‘overcame these barriers together’.

Beyond the variances in feedback to the online / face-to-face experience of the CGW task and process, the interaction with teammates was viewed as a mostly positive experience. Students indicated they had ‘cooperated’, ‘communicated effectively’, worked in ‘unison’ or ‘synergised together well’ thereby ‘making the assessment enjoyable and informative’. Positive interactions with teammates were also attributed to experiences where there was no ‘conflict or misunderstanding’ and ‘everyone respected each other’. The capacity to ‘actively’ share ‘thoughts, ideas and feedback on how to improve ... and ensure the highest quality’ was also noted.

Interactions with teammates were viewed as positive when there was ‘synergy’ and when students communicated effectively. However, student perceptions of CGW were not surprisingly negative when they experienced a lack of communication, bad attitudes, lack of effort or difficult teammates. One student spoke about a teammate who was ‘extremely difficult to work with. She provided no communication in the group chat and did not reply to emails. She had not replied in days and I had to follow up to ensure her part was done’. Another stated their experience was made negative by one team member who offered ‘limited responses ... lack of communication and participation’ and this was seen to ‘severely’ impact the overall ‘quality of the work’. One student explained, ‘Not all team members had a positive attitude and were involved ... a few members were unable to make scheduled meetings ... which made it difficult to complete the task’.

Students who found their interactions with teammates positive, tended to find the overall CGW experience a positive one. Positive interactions were dependent on attitude, communication, and an ability to overcome the lack of face-to-face contact and connection brought about by online learning in the pandemic era.

### ***Skills developed from the process/task***

Many students provided feedback on the usefulness of the process and task in developing certain key ‘invaluable’ skills. These included practical teamwork skills that would be useful for the ‘real’ world of work, ‘researching’ skills, and an experience that might be useful not only to a students’ ‘further studies’ but their overall ‘understanding of management and organisational problem solving’. Another student simply stated, ‘Fun assessment task – helped to build many skills’.

In particular, the flipped feedback model seemed to enable students to reflect on their own contributions to team interactions, developing self-judgement and self-evaluation skills. In their feedback to instructors, some students demonstrated their reflections, with one stating: ‘I believe I was the most organised person in the whole assignment and took charge immediately in times of high stress’. Another indicated they found the task ‘a great learning curve’ preparing them ‘with what to expect in the future when working with other people’. Similarly, another student noted, ‘Being able to establish relationships that were productive in achieving a desired target will place me in a more competitive position going forward at university as well as in my career’.

The qualitative data points to the benefits of CGW as perceived by students in terms of employability, interpersonal, communication and self-reflective skills.

### ***Evidence of self-evaluative judgement***

The data to emerge from the feedback to instructors shows that students were honing their ability to make self-evaluative judgements in relation to their contribution to the CGW task. One student reflected: 'Despite my strong negative comments about my group, I do have to accept the responsibility for not taking more initiative to find out who was in my group and get started on the assignment earlier'. Another student found themselves reflecting on whether their forcing conversations had come across as controlling:

At times I felt that I had to initiate conversations with my group ... but once I did everyone contributed timely and to a high standard. I hope me initiating conversations didn't come across to my team members as me trying to take control of the assessment as I believe we all worked fairly and contributed to the ... work.

The task appeared to prompt self-reflection on behalf of students, and in some instances a greater self-awareness, which is certainly important in the current world of work environment.

### ***Confusion about the peer evaluation tool and task***

Another challenge identified in the qualitative data was the actual peer evaluation tool itself (in this instance, CATME). Some students found themselves 'confused' and one student reflected, 'I felt that the assessment was very confusing to understand what to do'. Some indicated they would have liked 'more solid information/instructions' about what was required of them in the assessment task: 'Please provide more direction for first years ... This for many, was their first semester at uni'. The need for clearer instructions on the peer evaluation tool was expressed by many students. As one student claimed, this is 'valuable information' in order to make the peer evaluation process 'legitimate' and to ensure a student's work/contribution can be 'reliably assessed by other group members'.

Some students were entirely opposed to the student feedback, expressing that, 'A student's role at a university is to study and improve on given topics which receiving feedback from knowledgeable teaching staff, not to take on the teaching role of assessing peer students on their own work'. Such views point to the need for educators to not only provide adequate instruction, but to also appropriately explain the pedagogical underpinnings and purpose of peer evaluation so that students understand its benefits.

## **Discussion**

One of the unexpected findings to emerge from this study was that the units in which the initiative was trialled were required to be delivered wholly online as a result of the COVID-19 pandemic. Students who had begun the university year on-campus attending face-to-face classes were suddenly forced to undertake the CGW task remotely. Research shows that online collaboration comes with its own raft of challenges; often just compounding those already identified in the research on group work in higher education as a source of dissatisfaction and frustration for many (Dean and Wright 2017; Medaille and Usinger 2020; Sridharan and Boud 2019). One of the most significant factors contributing to the effectiveness of CGW is that of a student's interaction with their teammates (Joo 2017). This factor was problematised by the 2020 global COVID-19 pandemic which meant students were forced to undertake the task remotely and online, preventing the ability to meet face-to-face (Devlin and McKay 2021). Many students easily adapted to the enforced online CGW task effectively using information and communication technologies or social media sites for communicating and knowledge sharing. Others found the inability to socially interact with teammates a major barrier, preferring a face-to-face approach. While the students involved in this study were familiar with blended models of learning, the wholly remote learning brought about by the pandemic notably impacted student experience and learning in the CGW task and process as evidenced by the qualitative data, which revealed that many students found the experience isolating and particularly

challenging for those who lacked digital literacy capacity or struggled in their communication or interpersonal skills. These findings point to a mixed outcome. Some students found group work as a great saviour in dealing with the feeling of isolation amidst the pandemic driven fully online delivery, a finding echoed in the post-pandemic literature (Moise et al. 2021). While those who are new to virtual models of learning felt that effective group work is not possible through virtual collaboration, an issue identified in the work of Cole, Lennon, and Weber (2021). These findings are paramount in discussions of wholly online teaching and learning contexts when considering CGW tasks.

This suggests students can find alternative ways of effectively collaborating and communicating in an online environment – which is aligned with the current model of the globalised employment world where borderless working is becoming a common phenomenon in the post-covid era (Donald, Ashleigh, and Baruch 2020). This is an important future ready skill for students (Ter Beek, Wopereis, and Schildkamp 2022). One way to improve is to either develop a Community of Practice between students to share how they overcome these barriers of collaboration and can learn from other groups. Incentives to engage with such initiatives will enhance engagement and impact.

The findings of this study and specifically the student perceptions to emerge indicate that CGW has the potential to develop a range of soft skills including communication, teamwork, conflict resolution, leadership and self-management; all skills which are now highly sought after by employers, recruiters and other key stakeholders (Clarke 2017). The addition of a flipped-feedback approach enabled students to further develop these skills as they learned how to curate and professionally offer feedback to peers, which required them to draw on their interpersonal, critical thinking, problem solving and communication skills. The flipped feedback model also seemed to develop students' reflective skills as they considered their contributions to team interactions and were required to make both peer and self-evaluations. Combined, the group work task and flipped feedback approach was seen by students to develop key 'invaluable' skills, including practical teamwork skills that were viewed as beneficial for the 'real world of work', as well as 'researching' skills, and 'problem solving'.

However, echoing the existing research, the findings indicate that while there are clear benefits of CGW in terms of its potential to develop key soft skills and prepare students for the world of work, it is not without its challenges (Sridharan and Boud 2019). Student perceptions reveal the importance of having equal distribution of workload and contribution to work for CGW to be effective with many students critical of the CGW experience when they found themselves not sharing the workload 'fairly' or 'evenly'. The inclusion of a flipped feedback approach was, however, seen to offer students an outlet to vent their frustrations with both educators and to a lesser extent, their peers. Indeed, the ability to offer peer feedback enabled students to express constructive criticism and suggestions to their peers which appeared to enhance the experience of the task for some. Further, it offered students the opportunity to develop teamworking and interpersonal skills in reflecting and communicating on issues encountered.

Students also spoke to one of the challenges being a general confusion around the tool or task. While ample video resources were provided to educate students on how to do peer evaluations using the CATME tool, it appears that lack of uptake of these resources led to this confusion. Future CGW tasks might avoid this confusion either by demonstrating 'how to use the tool' in class and reinforcing resources with regular reminders to ensure better engagement and uptake overall. The findings indicate that students can find themselves 'lost' in information overload resulting in them failing to fully engage with all of the resources provided, an issue which has previously been identified in the literature (Feroz et al. 2022). One way to overcome these challenges is to use the backend analytics to send automated personalised messages to non-engaging students and running boot camp sessions to demonstrate the system and answer any queries. The creation of searchable 'frequently asked questions' within the LMS to address these pressure points might also help alleviate confusion.

## Limitations

One limitation of this study is that even though most respondents in our study began the CGW task in an on-campus context, the emergency shift to online learning brought about by the COVID-19 pandemic meant that the task was completed in a wholly online environment. This may have impacted the overall experience and sentiment towards the CGW task. Another obvious limitation is the small sample size (48 students), and future research would ideally explore CGW in the context of a larger cohort of students.

## Conclusion

The findings to emerge from this study suggest that students perceive collaborative group work as beneficial in many ways, though it is not without its challenges. Echoed in the extant research, CGW was found to have some key challenges that educators and assessment designers need to consider. Needless to say, the key enablers and barriers impacting the student experience of CGW experience in this study was the global pandemic and its ripple effect of remote learning, isolation and both opportunity to socialise with peer and at the same time difficulties of virtual collaboration. This unforeseen event and its impact on the delivery of education points to some interesting results about CGW in the *wholly* online context including challenges with communication, building team member rapport, understanding the assessment task. Findings may advance the understanding and implementation of CGW in higher education, particularly in a wholly online learning context.

Specific take-home lessons and improvements garnered from this study include the following: (1) knowledge sharing between groups (perhaps through a Community of Practice exercise to share how some teams could overcome the barriers of online collaboration; (2) mechanisms to enhance engagement and reduce information overload (this might include short summary boot camp sessions before students commence their evaluation activities); (3) the importance of preparatory work (decision making upfront relating to responsibilities of each group member and possibly using a roles and responsibilities proforma which can be submitted along with the assessment task; and (4) greater education and clarification on the value of group work (students need to understand the importance of CGW and its capacity to prepare them for the future world of work). A greater understanding of the pedagogical underpinnings may also result in more positive attitudes relating to group work.

It is hoped the findings and suggested improvements relating to CGW which have emerged from this study might assist other academics in addressing the various challenges and insights around group work in higher education.

## Note

1. See <https://info.catme.org/features/catme-five-dimensions/>

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## Appendix A Full list of themes to emerge from the data analysis

- The benefits of collaborative group work
- Collaborative group work and its challenges
- The global pandemic
  - Remote learning
  - Isolation
  - Virtual collaboration
  - Socialising with peers
  - Hard to establish a connection online
- Challenges with communication
- Building team member rapport
- Understanding/confusion around the assessment task.
- Knowledge sharing between groups
- Information overload
- The roles and responsibilities of each group member
- Engagement in the task
- Adequate instructions on the evaluation activities
- Distribution of work
- Technology as a helpful tool in communication (e.g. Zoom)
- The importance of organisational skills
- The importance of positive team members
- Contributing team members vs non-contributing team members
- Group cohesion
- Difficulty providing feedback on peers
- The distribution of marks (fair/unfair)
- Individual tasks vs CGW task
- Team members working to different standards / quality
- The assessment task as enjoyable and informative
- Conflict in the team
- Non-responsive team members
- Stress related to having to rely on others
- Confusion about the CATME tool
- Learning from others during the task
- Learning about one's own strengths / weaknesses
- Time management
- Division of work
- Team presentation
- Technical issues