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Working Paper

Making Group Work Work:
Improving university group work for students and staff

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Abstract

The project's aims included exploring the challenges of group work and creating practical guidelines for staff, with the goals of enhancing student experience as well as contributing to academic discourse. Findings focus on the symbiotic relationship between skills-based learning and knowledge acquisition; beneficial use of formative and summative assessment; and the importance of transparency and facilitation to empower students as partners in group-based learning and enhance their experiences. Unlike many projects we read about, this research took staff experiences and approaches to group work as its starting point, though student surveys did augment our findings. We drew on the ideas of action learning to guide participants through a cycle of planning, doing and reflecting on their own experiences, though some did not participate in every phase. Participants – in total 14, across social and physical sciences – also shaped analysis of emerging findings through interactive Reference Group sessions. Staff found the reflective interviews unexpectedly beneficial for their thinking and practice. The project has led to collaboration on the Knowledge Exchange programme led by the School of Earth and Environment's Teaching Enhancement Scheme co-ordinator in order to begin to create space for generative reflective exchange, in addition to the practical resources produced by the project.

Introduction

This research arises from a need to improve students' – and staff's – experiences of university-level group work in a context spanning social and physical sciences. National Student Surveys for the School of Earth and Environment from 2012 to 2015, whilst overall positive, reflect students' significant discomfort with group work assignments. Correlating with these surveys, literature across higher education disciplines indicate that students often find group work challenging, despite – or perhaps because of – its established pedagogical benefits (Apul & Philpott 2011; Ellis & Weekes 2008; Borrego et al. 2013; Kamau & Spong 2015). Teaching staff, in turn, may understandably struggle to respond to student issues whilst maximising the learning and skill-building potential of group work. Thus the main question driving this research has been a practical one: How can we make group work work better for staff and students?

This pragmatic approach stems from our intentions to help respond to negative student feedback, better understand staff's struggles and successes, and offer recommendations for best practice which will be applicable across a broad range of disciplines. This research aims to:

- explore the challenges of group work – looking in-depth at how staff experience and respond to these challenges;
- create practical, responsive resources for university teaching staff;
- contribute to academic pedagogical resources; and
- help enhance the student experience of group work in higher education.

To address our question we chose an Action Learning approach, in which self-selecting participants took part in a cycle of planning, doing, reflecting and learning. Within this learning cycle, and also with additional participants who did not participate in an Action Learning cycle, we gathered data through qualitative interviewing and observation. A Reference Group helped guide the progression of the research and reflect on emerging themes, whilst student questionnaires provided a balancing perspective on the data collected with teaching staff.

Our literature review explores the known benefits of group work, in terms of knowledge acquisition and skills development, as well as the challenges staff and students face – along with various design approaches, strategies and tools which have been researched to enhance the benefits of group work and mitigate its challenges.

Findings about the benefits and challenges of group work largely align with those reported in the literature, as expected. However the Action Learning cycles with staff gave rise to insights across themes of learning enhancement, transparency, and fairness which expand upon and contribute further understanding and practical implications to the ideas in the literature reviewed.

The final section of this working paper reviews key conclusions and recommendations across three key themes: synthesising learning processes and content, using assessment to support group learning, and engaging students as partners in fair group work.

Literature review

Learning: content and skills

The positive reasons for using group work in higher education include practical and material advantages as well as cognitive and affective outcomes. Likewise, the skills students learn through group work are relevant to their professional, social and intellectual development. Alongside content- and knowledge-focussed learning outcomes, five benefits of group work identified by Mello (1993) include: "(1) students gain insight into group dynamics; (2) with group assessment there is an increased development of a more comprehensive assignment; (3) students' interpersonal skills are further developed; (4) students are exposed to others points of view; and (5) students are more prepared for the commercial world" (Gatfield 1999, p.366). As demonstrated by the literature discussed here, successful group work creates a mutually-beneficial relationship between skills development and knowledge acquisition to enhance and deepen learning.

Group work is suitable both for helping students grasp foundational disciplinary knowledge and for helping them consolidate and progress to higher-level knowledge and concepts (Melkert 2003; Apul & Philpott 2011; Alwi et al. 2012; Korkmaz 2012; Stanford et al. 2013; Villa et al. 2013). Where students are learning foundational knowledge, the opportunity to discuss in small groups allows them to interrogate ideas and deepen their understanding (Higgitt 1996). In addition to this, at higher levels, group work often requires students to apply their existing knowledge as a team, and the necessity for discussion or negotiation prompts students to consider ideas from different angles and synthesise knowledge through interaction and application (Melkert 2003; Chau 2007; Kim & Tan 2013). Group work also requires more independent working from students (within a collective), which appears to encourage knowledge consolidation and analytical thinking (Charlesworth & Foster 1996; Healey et al. 1996; Higgitt 1996).

Thinking skills – critical, practical, and creative – form a crucial part of the broader set of skills students learn and practice during group work, which spans academic skills and practical skills (Apul & Philpott 2011). In the literature examined, these include things like research skills, time-management, project management and technical skills (Ellis & Weekes 2008; Brown 1999). Such practical skills are arguably developed and honed through group work because they are tested and stretched in a context of interaction with others. Group work also develops more complex skills, such as interpersonal communication, conflict resolution, critical analysis and problem-solving by putting students in a situation which requires them to notice and understand particular dynamics or circumstances, then draw

upon their knowledge and experience to act upon their observations in interaction with others (Ellis & Weekes 2008; Panelli & Welch 2005).

Experiential learning appears crucial to both the knowledge increase and skill-building that students benefit from through group work, and it also often leads to changed perceptions. Several studies observe that students grow in awareness – for example, of environmental issues, institutional and social structures, industrial and policy contexts, the viewpoints and behaviour of others, social justice, sustainability, and the complex inter-linkages between these things (Stanier 1997; Melkert 2003; Simm & David 2002; Ameta et al. 2010; Glassey & Haile 2012; Crewe 1994; Bacon et al. 2011; Knox et al. 1998). Whilst students may experience these benefits to a certain extent through any group work, at least on a personal scale, projects which ask them to engage with real-world issues increase this development of awareness (Crewe 1994; Apul & Philpott 2011). Group projects which ask students to evaluate their peers, themselves and their own experiences engender still more personal development by helping students grow aware of their own strengths and weaknesses, the social dynamics of teams, and the value of taking part in interactive work (Burkill 1997; Maguire & Edmondson 2001; Panelli & Welch 2005). Student evaluations cited in studies where students have been asked to reflect on the value of group work demonstrate that this process leads students to feel more engaged with the material they are studying, more motivated to participate and more trusting of their group mates (Stanier 1997; Maguire & Edmondson 2001; Marvell et al. 2013).

Recognised benefits of group work	
Increased student engagement	Social, interpersonal & communication skills development
Development, consolidation, progression & deepening of knowledge & understanding	Technical skill development
Thinking skills development	Academic skill development
Increase self-awareness & self-reflection	Growth in awareness & experience of non-educational contexts

From a practical point of view, group work can lessen the work load for teaching staff, although this common assumption often requires qualification – staff may offset the time saved on marking individual assignments with that spent organising and facilitating (Panelli & Welch 2005). Although group work does not necessarily require fewer resources than individual work, it can certainly prove much more economically practical in situations where expensive lab or field equipment is needed (Haigh & Gold 1993). Other material benefits of group work, where students are required to engage with real-life issues and/or organisations, include the development of implementable solutions to real-life problems or community engagement and action prompted by student projects (Hynek et al. 2009; Apul & Philpott 2011; Bacon et al. 2011).

Lecturers take different approaches to designing group work: some may draw on research-based frameworks and approaches for designing group work and assessments, whilst others may design these in response to the practical and pedagogical needs of their course without reference to formal frameworks.

A recent thematic review of various approaches and frameworks for group work identified eight key components to the design of group work activities: "(1) interaction, (2) learning objectives and outcomes, (3) assessment, (4) task characteristics, (5) structuring, (6) guidance, (7) group constellation, and (8) facilities" (de Hei et al. 2016, p.33). Research-based frameworks for group work include problem-based learning (PBL) (Spronken-Smith 2005), team-based learning (Goff et al. 2007), cooperative learning (Villa et al. 2013) and cooperative problem-based learning (Yusof et al. 2012). Challenges to implementing these defined frameworks include the availability of resources and organisational willingness and time to 'roll out' a particular approach. Indeed, many lecturers may find the design components and pedagogical theory underlying such frameworks useful, without wishing to implement them according to a particular protocol.

Whether because of the challenges of implementing a defined group work protocol, a desire to draw from multiple frameworks, or a lack of awareness of these ever-evolving approaches, many lecturers structure group work from a practical, responsive standpoint. Group work design may respond to challenges such as creating an integrated cross-disciplinary curriculum (Bacon et al. 2011), combining technology tuition with skills development (Brown 1999), creating more empowering learning environments for students (Stanier 1997), improving student engagement in large classes (Waddington 2001; Goff et al. 2007), changes in disciplinary fieldwork practice (Kent et al. 1997), or increasing expectations for higher education to develop transferable and employability skills (Hindle 1993; Hindle 2000; Maguire & Edmondson 2001; Hallet 2012). Staff team composition and availability, resources, field work options, class size and time constraints shape group work design alongside pedagogical aims and desired learning outcomes.

Although it can be tempting to focus on finding a tried and tested technique which simply 'works' – and this may be the appeal of implementing particular group work protocols as standard practice – the variety of findings in the literature reviewed here suggests that technique and structure alone will not ensure students achieve desired learning goals, nor will it necessarily guarantee stress-free implementation for the lecturer (Kent et al. 1997; Spronken-Smith 2005; Smith et al. 2012). Successful group work requires conscious, responsive facilitation by the lecturer as well as clear communication of the learning goals to students (Apul & Philpott 2011; Borrego et al. 2013). This communication should address expected skills development processes as well as the understanding and assimilation of knowledge content (Paretti et al. 2010). By helping students understand that they are expected to undergo a process, lecturers invite them to take more responsibility for their

learning and increase the benefits derived from group work. Of course, drawing on specific tricks, techniques and tools aids the lecturer in this facilitation immensely; but these tools and techniques may need constant adjustment to remain relevant and responsive.

Challenges of group work

Despite the wide range of benefits that group work brings as a teaching style, many lecturers and students find it challenging. When difficulties with group work are not addressed, the benefits often are not fully realised and the experience is frustrating for students and tutors alike.

Students' common complaints about group work include perceived unfairness of assessment and the closely-related issue of group dynamics. In some cases students – particularly above-average performing students – believe their marks are dragged down by other group members (Knight 2004). Other groups experience difficulties with social loafing, where one member of the group contributes significantly less than others, so those who work harder feel it is unjust that the 'free-rider' receives an equal mark (Charlesworth & Foster 1996; Borrego et al. 2013). In other cases social dynamics between group members are conflictual, or simply unproductive (Hindle 1993; Smith et al. 2012; Borrego et al. 2013).

Problematic group dynamics can be intensified in groups comprised of students from diverse backgrounds, including nationality, race, gender, class, and ability (Kaenzig et al. 2006; Dingel & Wei 2014; Elliott & Reynolds 2014; Yssel et al. 2016). Although these elements are outside the stated scope of this research project – given its focus on staff's experiences – students' experiences of group work may be negative if diversity within groups is not taken into consideration. A number of studies indicate that female and male students experience group work differently (Kaenzig et al. 2006; Takeda & Homberg 2014). Kaenzig et al (2007, p.99) find that, "Further investigation into the power and role-taking dynamics in groups is necessary to understand what happens differently in group-learning settings for male and female students." Likewise, students who are accustomed to different educational cultures may experience group work as an unfamiliar and therefore frightening task (Elliott & Reynolds 2014). Students with disabilities – either physical or non-physical – may feel excluded from group activities (Yssel et al. 2016). Such problems are further exacerbated when students lack guidance on the processes of group working (Hansen 2006).

In interdisciplinary groups, students may struggle to communicate because of different or competing epistemologies and knowledge bases (Hill et al. 2008; Bacon et al. 2011; Korkmaz & Singh 2012; Clark & Seidu Jasaw 2014). Conflicting timetables (Knox et al. 1998; Bacon et al. 2011) and workload pressures can mean students have difficulty fitting in group meetings (Spronken-Smith 2005; Paretti et al. 2010; Smith et al. 2012). Students naturally want to avoid these problems, which can be seen as taking them out of their comfort zones. 'Stretching' students beyond their comfort zones is important for learning to take place

(McClelland 2012); however, when students' perceptions of unfairness or ineffective group dynamics are not addressed, the pedagogical and developmental benefits of group work can be lost and student satisfaction decreases (Kamau & Spong 2015).

Tutors' negative experiences of group work are closely linked to students' complaints, with most being particularly concerned about avoiding unfairness to any student (Sharp 2006; Maiden & Perry 2011), as well as having limited time respond to student dissatisfaction. Practical issues like costs and risks of field-based group work also pose challenges (Haigh & Gold 1993; Waddington 2001; Clark & Seidu Jasaw 2014), though these can be lessened through a group work structure as compared to individual work (Brown 1999). Designing and organising group assignments can take more time and requires more involvement than lecture-based learning to mitigate risks of poor group performance (Hindle 2000; Panelli & Welch 2005; Kamau & Spong 2015), though this may be offset by a decreased marking load (Charlesworth & Foster 1996). Over and above these practical concerns, the literature suggests that lecturers' predominant challenges with group work are minimising student negative behaviour and maximising accountability in order to ensure student satisfaction, learning and fairness (Davies 2009; Swaray 2012; Borrego et al. 2013; Kamau & Spong 2015).

Common difficulties with group work	
Conflictual group dynamics	Perceived unfairness of assessment
Social loafing	Time & workload pressures
Problems communicating across disciplines, cultures or backgrounds	Practical / material challenges

Strategies for enhancing benefits and mitigating challenges

Strategies for mitigating the challenges of group work – and enhancing its benefits – are myriad but, for many lecturers, feasibility within available time and capacity is the most relevant factor. In cases where group work was not resulting in students achieving the learning aims for the course, or where student dissatisfaction was perceived to be too high, lecturers have abandoned group work (Haigh & Gold 1993). Indeed, group work may not be the most appropriate teaching method in every case, but the literature indicates that problems with pedagogical effectiveness and student dissatisfaction can be addressed through group work design, facilitation, assessment and evaluation techniques, and willingness and ability to try small adaptations within the limits of feasibility.

Tutors may design group work which is based on a particular framework or responsive to circumstance; in either case elements of authenticity, alignment to outcomes, and student autonomy contribute significantly to the activities' ability to achieve pedagogic aims (Ellis & Weekes 2008; Brown 1999; Borrego et al. 2013; Alwi et al. 2012; Spronken-Smith 2005). Group work which focuses on real-world issues – or realistically simulates them – increases student motivation and engagement with respect to both the subject matter and the

process of working with their peers (Goff et al. 2007; Ellis & Weekes 2008; Korkmaz 2012). Aligning project design to desired outcomes is helpful because it requires tutors to create clarity for themselves when planning and organising activities and thus makes it easier to share these aims clearly with students. Sharing learning outcomes with students – including intended skills development through experiential learning – helps increase student autonomy which, in turn, prompts students to take more responsibility for their learning and engenders increased engagement and motivation (Healey et al. 1996; Burkill 1997; Healey et al. 2014).

Though increased student independence improves learning and skill development (Brown 1999), it also requires more careful facilitation by tutors (Harun et al. 2012; Livingstone & Lynch 2000). Students are more likely to positively experience group work which has been more actively facilitated by staff (Elliott & Reynolds 2014). Project design can ease the uncertainty of facilitation – for example through careful consideration of how and why groups are formed, group size, and group composition if chosen by tutors (Spronken-Smith 2005). However one study shows that even carefully constructed groups 'balanced' according to Belbin team roles did not significantly improve groups' performance on assessment, though participating in the process of self and peer role evaluation did help students learn about teamwork and social dynamics (Smith et al. 2012). These results point again to the importance of student autonomy to deepening learning.

To encourage student autonomy within an appropriate focus on learning aims, tutors may employ strategies including guidelines for team working; record-keeping protocols; reflective diaries; questionnaires or videos; formative self-and peer-assessment; peer teaching; and e-learning collaborative forums (Davies 2009; Ameta et al. 2010; Mavroudi & Jöns 2011; Weaver & Esposto 2012; Borrego et al. 2013; Marvell et al. 2013; Kamau & Spong 2015). Activities which require students to reflect on 'how' and 'why' questions – rather than simply to try to adhere to top-down guidelines – improve skill development as well as encouraging deeper engagement with subject matter (Healey et al. 1996; Spronken-Smith 2005; Marvell et al. 2013). However, if tutors require students to produce reflective documents for hand-in, reviewing these must be realistic within the tutor's available time. Creating activities which incorporate reflection and action into the progression of the group's work could be more practical and effective than reviewing multiple reflective documents; on the other hand, 'snapshots' of students' thinking before the production of a final product can provide valuable feedback and insight about their progression to tutors, which can aid responsive facilitation (Mavroudi & Jöns 2011). Reflective activities, combined with project design which requires interdependence amongst group members or even different groups, help students gain the insight needed to take responsibility for their learning and help tutors act as facilitators rather than having to direct activity (Johnston et al. 2004; Mavroudi & Jöns 2011; Marvell et al. 2013; Healey et al. 2014). This altered

dynamic can also encourage students to take greater responsibility for resolving inefficacies or conflicts, thus reducing the likelihood and frequency of problems requiring significant tutor intervention.

Tools for assessment both within structured group work protocols and ad-hoc group work design range from awarding all group members a single mark decided by the lecturer to drawing on a complex variety of self-assessment, peer-assessment and formative assessment to arrive at summative marks for individuals (Davies 2009; Caple & Bogle 2013). Whilst some of these methods may be time-consuming, several examples in the literature show that involving students in assessment of group work deepens their learning of the content, enhances the skill-building opportunities of group work and makes students more likely to view their experiences of group work positively (Crewe 1994; Burkill 1997; Knight 2004; Spronken-Smith 2005; Weaver & Esposto 2012). However, it is important to be aware that students' perceptions of each other can be influenced by factors such as race, gender and other characteristics such as 'course performance' and 'group leadership' (Dingel and Wei 2014: 729). Where self- and peer-assessment tools can be used formatively during the course of group work, with input from tutors, students can benefit from the reflection and feedback they provide even if lecturers prefer to simplify summative assessment by retaining full control of the final mark awarded.

Evaluation of students' experiences of group work can be useful not only to lecturers seeking to improve the group work design but also to students through the reflection it requires. The literature shows that evaluation processes help students consolidate their learning and realise what skills they have developed through experiential group work (Maguire & Edmondson 2001). Where evaluation processes can be incorporated into group work activities over time – for example through the use of sequential, open-ended questionnaires or more informal feedback sessions – these processes can combine the benefits of reflective student activities with the collection of helpful feedback. Tutors can use this feedback both to adjust their facilitation or give attention to areas or groups of concern during the progression of the group work as well as to improve design of future group work. As with learning outcomes, sharing the purposes of and responses to evaluation with students increases their engagement, motivation and satisfaction (Healey et al. 2014).

Strategies and tools	Recognised benefits
Align group work design & assessment to learning outcomes	Clarify aims & objectives for staff & students
Share learning outcomes with students	Increase engagement & motivation Increase student autonomy & responsibility
Incorporate or simulate real-life situations or contexts	Increase engagement with subject matter & deepen learning Highlight relevance of teamwork processes to practical / professional work
Actively facilitate group interactions	Increase student autonomy & responsibility Mitigate conflictual group dynamics and/or social loafing
Give students guidelines on group working processes	Mitigate conflictual group dynamics and/or social loafing Increase student autonomy & responsibility
Incorporate reflective activities	Increase engagement with subject matter & deepen learning Highlight relevance of teamwork processes Enhance skill development & self-awareness Increase student autonomy & responsibility Mitigate perceptions of unfairness or irrelevance
Peer-assessment and/or self-assessment	Increase engagement with subject matter & deepen learning Highlight relevance of teamwork processes Enhance skill development & self-awareness Increase student autonomy & responsibility Mitigate perceptions of unfairness or irrelevance

Literature on group work provides many suggestions for techniques and methods of overcoming the challenges of group work, along with evidence of the benefits produced by effective application of such innovative practice. However, there is little exploration of why we resist such techniques which increase student autonomy, reflection and participation in creating learning opportunities. Many lecturers may feel understandably uncertain about introducing activities which change classroom dynamics, as giving increased responsibility to students also gives students increased power. Furthermore, many have not been trained to effectively facilitate group work (Rafferty 2013). Likewise, if a lecturer considers the aim of teaching to be 'directing learning' (a view which others would question), they might feel that the responsibility for teaching lies solely with the lecturer and so increasing students' autonomy through more self-directed group work raises feelings of discomfort, inadequacy or laziness. Sharing the pedagogical and developmental aims behind teaching choices with students can avert these worries and broaden one's conception of teaching (Elliott & Reynolds 2014), but again initiating such a classroom conversation could make some feel exposed. Facilitation requires different skills to lecturing, and university lecturers are required to be excellent researchers, administrators, project managers and strategic thinkers as well as educators, so it is unsurprising that not every member of staff feels

extremely confident placing themselves in a situation requiring responsive facilitation. Whilst training and practice help develop facilitation skills to make group work more effective, reflecting on the learning outcomes to be achieved, and sharing these clearly with students, can contribute significantly to lecturers' ability to design and implement group work teaching and learning activities which they feel confident facilitating and which engender effective learning and skills development for students.

Methodology

Approach

Our methodology combined an Action Research approach (Bradbury Huang 2010), combining action learning cycles (Revans 2011) conducted with self-selecting participants and supplementary qualitative data collection from additional participants. These complementary methods of data collection helped to ensure rigour and validity by providing comparison points and contextualising different data. Such an approach is widely accepted in education research (Kember 2000; Bath et al. 2004), and our approach to the rigour of this research aligns with Melrose's (2005, p.172) observations of "a widespread shift from the conception of practitioners as merely consumers of knowledge (especially teachers as consumers of educational research) to a conception of practitioners as producers and mediators of knowledge" (p. 172). An Action Research approach was coherent with our intention to understand and support staff praxis of pedagogical theories of group work, in order to enhance student experience through providing practical and responsive resources to help improve practice.

Methods

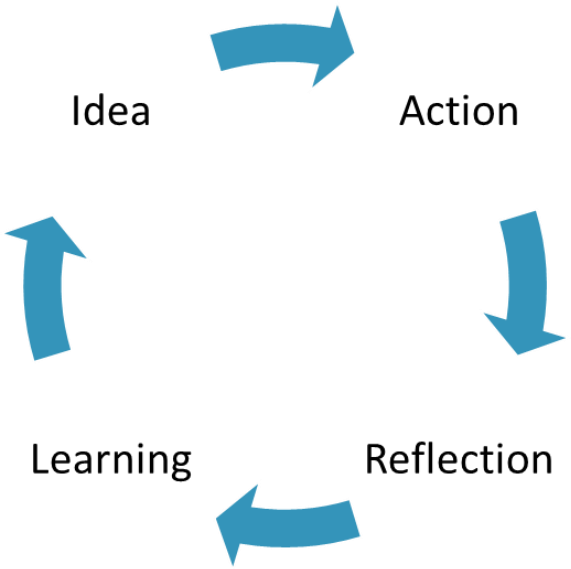
The 'practitioners' in this project included eleven members of teaching staff in the School of Earth & Environment who teach and/or lead teaching across disciplines in the natural and social sciences. Invitations to participate in the research were advertised to all teaching staff, and particular members of staff were contacted through a combination of opportunistic and snowball sampling. Methods of data collection included informal initial interviews, in-depth qualitative interviews, observation of classroom practice, self-reporting on classroom practice, and student questionnaires. In addition, participants took part in an ongoing Reference Group, including one practitioner who did not participate in any of the other research activities. This Reference Group reviewed the development of the research approach, helped to refine the aims and objectives of the research, and input into interactive analytical activities around emerging themes as the research progressed. Shaping and validating emergent analysis, the Reference Group helped to ensure that we could create responsive practical resources for staff through inputting suggestions on specific themes of 'enhancing relevance', 'supporting productive reflection', and 'theorising without overgeneralizing'.

Six self-selecting participants took part in an action learning cycle (see Figure 1) which included:

- an initial, informal discussion about the group work the participant had done in the past and ideas for using group work in the upcoming semester;
- an observation phase in which a researcher observed group work activities during the participant's teaching sessions; and
- a follow-up in-depth interview which included reflection on the participant's experience using group work in their teaching.

This reflective interview was designed to help capture the participant's learning and analysis of their experience and thoughts on planning for future use of group work, as well as feeding into the research team's analysis of the combined data which has sought to explore the challenges of group work and focus on practical needs and findings across the data.

Initial informal interviews were conducted with all participants, including those who did not go on to take part in an action learning cycle. Additional in-depth qualitative interviews with these participants explored themes which emerged from initial interviews, observations of others' classroom practice, and Reference Group input. This additional data enriched and broadened the analysis. Student questionnaires completed by students in participants' classes about their experiences of group work were used as a triangulation method in order to relate findings about staff experiences and viewpoints to students' experiences and viewpoints.



ACTION LEARNING CYCLE, ADAPTED FROM KOLB (1984) AND REVANS (2011)

Research activities			
Planning & understanding concrete experience		*Reflecting on & learning from experience*	
Initial interviews	11 completed (3x Geology & Geophysics; 2x Atmospheric & Environmental Sciences; 6x Sustainability & Business)	***In-depth interviews***	6 completed (6x Sustainability & Business)
In-class observations	10 completed (1x2 Geology & Geophysics; 4x2 Sustainability & Business)	***Student questionnaires*** *(triangulation)*	58 completed (across 6 cohorts)

Limitations

We are aware of some limitations to the research which are either inherent to the research approach or due to the practicalities and circumstances of the project. As with any qualitative research with human participants, it was impossible to control the exact numbers and characteristics of participants or the processes of collecting data. Furthermore, an action research approach is not necessarily best suited to establishing widely generalizable theory or direct causality (Melrose 2005; Bradbury Huang 2010); however as our objectives focussed on developing practical and responsive resources, enhancing relevance for participants, supporting helpful reflection, and theorising without overgeneralizing, we felt these limitations of the approach were acceptable within the scope and aims of our research.

The timescale and limited resources available to the project – which allowed for one member of the research team to dedicate two and a half days per week to the project for one year – meant that the scope of the research was necessarily limited. As such we decided to focus on depth over quantity, which shaped our decision to undertake action learning cycles with a limited number of participants in order to explore the topic matter as fully as possible within the limited scope of the research. Unfortunately the disciplinary spread of participants in action learning cycles and in-depth interviews was not as broad as we had hoped: all of the action learning participants were social scientists. This was due to the inevitable constraints on participants' time as well as the limited time of the primary researcher. However, initial interviews were conducted with participants across the range of natural and social sciences studied and taught in the School. Thus the combination of data collection approaches has helped to ensure the inclusion of perspectives of practitioners from the natural science disciplines. The response rate for student questionnaires was predictably low (from two to twelve respondents in each module), with

the lower rates corresponding to the disciplines which were less well represented in the interview and action learning data. However, one action learning participant conducted their own in-class survey, with thirty-three respondents, thus contributing important experience of the successful use of this technique to the range of practices examined in the findings.

Rigour & validity

There are many approaches to enhancing rigour in action research, and the perception of rigour depends on the viewpoint(s) of the audience(s) (Melrose 2005). In this project we have sought to ensure rigour and validity through several measures, whilst recognising that the scope and factors outside our control limit the extent to which the findings may be generalised. Drawing from Melrose's (2005) and Bradbury Huang's (2010) criteria of rigorous, high-quality action research, we present our strategies in a table below:

Criteria	Strategies
Repeating the cycle	Whilst there was not time to conduct repeated action learning cycles within this project due to the academic calendar, repeated instances of exploration, intervention and evaluation (Melrose 2005 citing Cardno & Piggot-Irine 1996) did take place within the repeated interviews and Reference Group meetings.
Maximising the credibility of the research group	The project actively sought and supported the involvement of knowledgeable and experienced higher education teaching practitioners from across the disciplines in the School.
Clarity and suitability of data-collection methods and processes	Methods were reviewed and refined by the Reference Group. They were "suitable" for the situation, "negotiated…rather than imposed," "inclusive, involving and informing for those supplying the data," "practical" and likely to lend insight, and "systematic and sustained" (Melrose 2005, pp.168–169).
Group interpretation	In addition to the refinement of approach and collective reflection on emergent themes by the Reference Group, data was collaboratively interpreted and analysed within the research team, ensuring more than one perspective.
Articulation of objectives, defensibility of knowledge claims & theorisation	Throughout the research and in this working paper, we explicitly address the objectives we believe relevant to our work and the choices made to meet those (Bradbury Huang 2010, p.102). Furthermore we have framed our knowledge claims as collaborative creation of practicable theory in a defined context of higher education group work. We provide transparency to readers about the context this

Criteria	Strategies
	knowledge was created in to enable them to reflect on the applicability of our contributions to their own practice.
Ensuring ethical partnership & participation	Our methodology conforms to Winter's (1996; cited in Melrose 2005) principles of ethical action research, including consulting on the principles of the research with those affected through the Reference Group; allowing participants to influence the work; respecting the wishes of those who do not wish to participate; keeping the development of the work transparent and open to suggestions; obtaining relevant consent and maintaining confidentiality to the extent possible; and negotiating the representation of points of view by sharing work (i.e. this working paper) before publishing.
Pragmatic actionability, significance & relevance	We have emphasised the importance of producing practical guideline for group work as requested by participants as a major aim of the research since the start. This working paper is clearly structured to communicate these, alongside the suggested '1-pager' (in production) and our organisation of reflective sessions as part of the dissemination process to respond to the usefulness that participants discovered of reflective conversations. In addition, the methods of data collection were structured to yield practical, actionable outcomes for the individuals involved, in the form of their own teaching practices, as well as to contribute to the project's more overarching outputs.

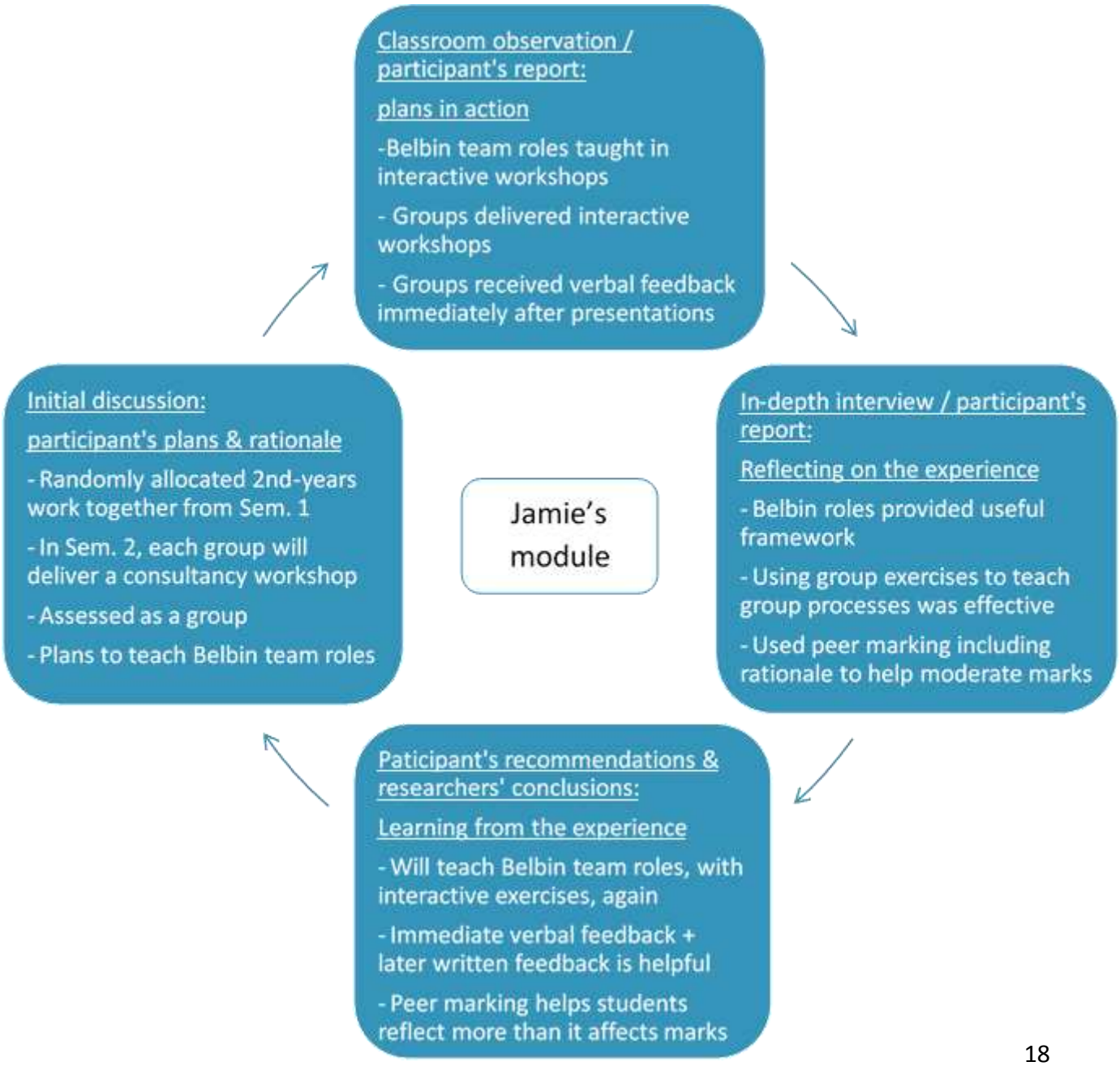
Findings & discussion

Case studies

This section presents four case studies from across the three years of undergraduate courses. Each case shows the progression through the action learning cycle.

Jamie's module

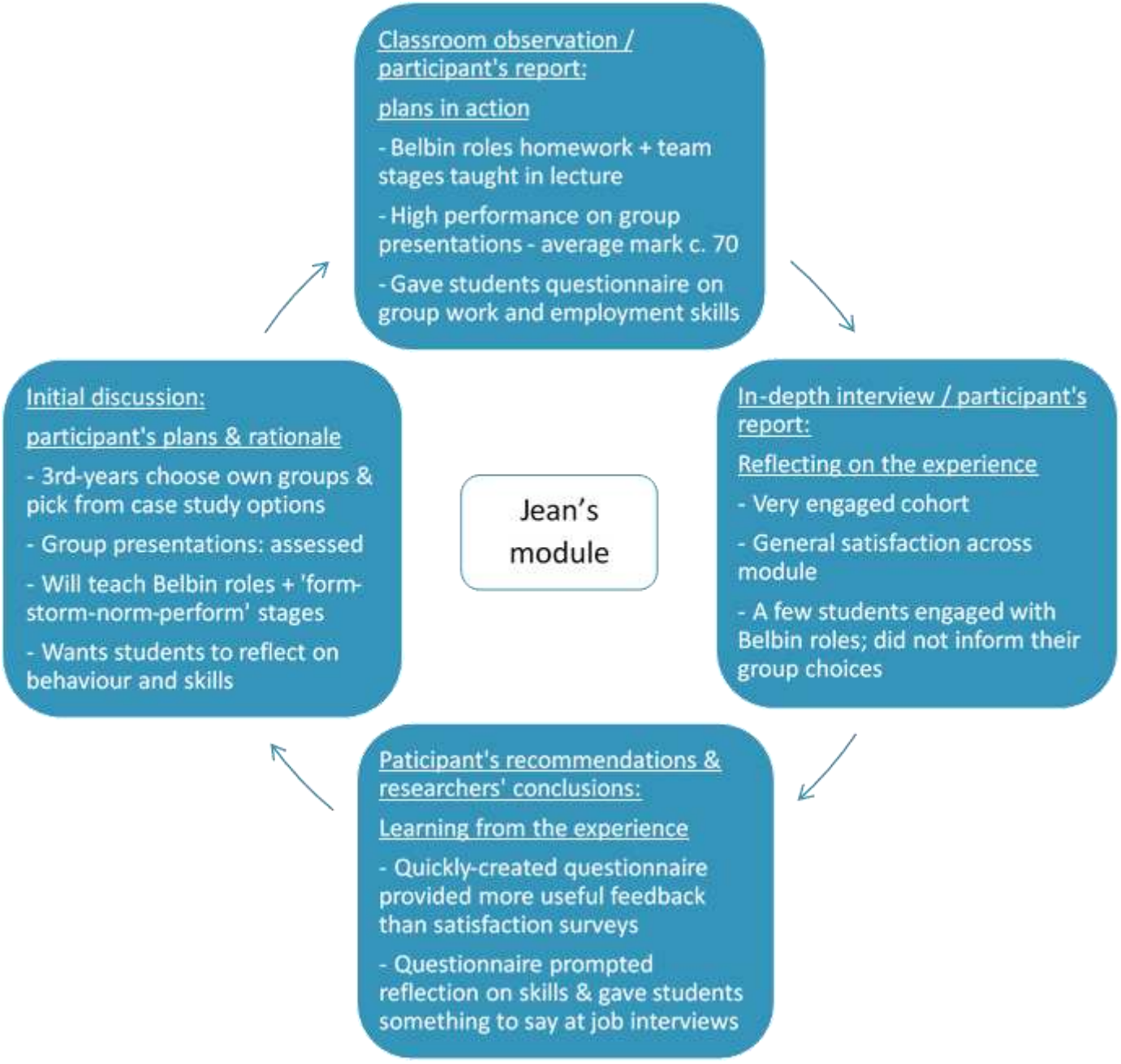
In this module, Belbin team roles were taught before group work assignments for the first time. The tutor found these provided a useful framework for students, and that doing group exercises in class on the topic of group working processes was particularly effective. Students peer-marked group members, including qualitative feedback, in order to moderate marks where necessary. This did not significantly change marks, but evidenced important self-reflection and reflection about group processes and roles.



The tutor also observed that verbal plus written feedback improved students' retention of feedback.

Jean's module

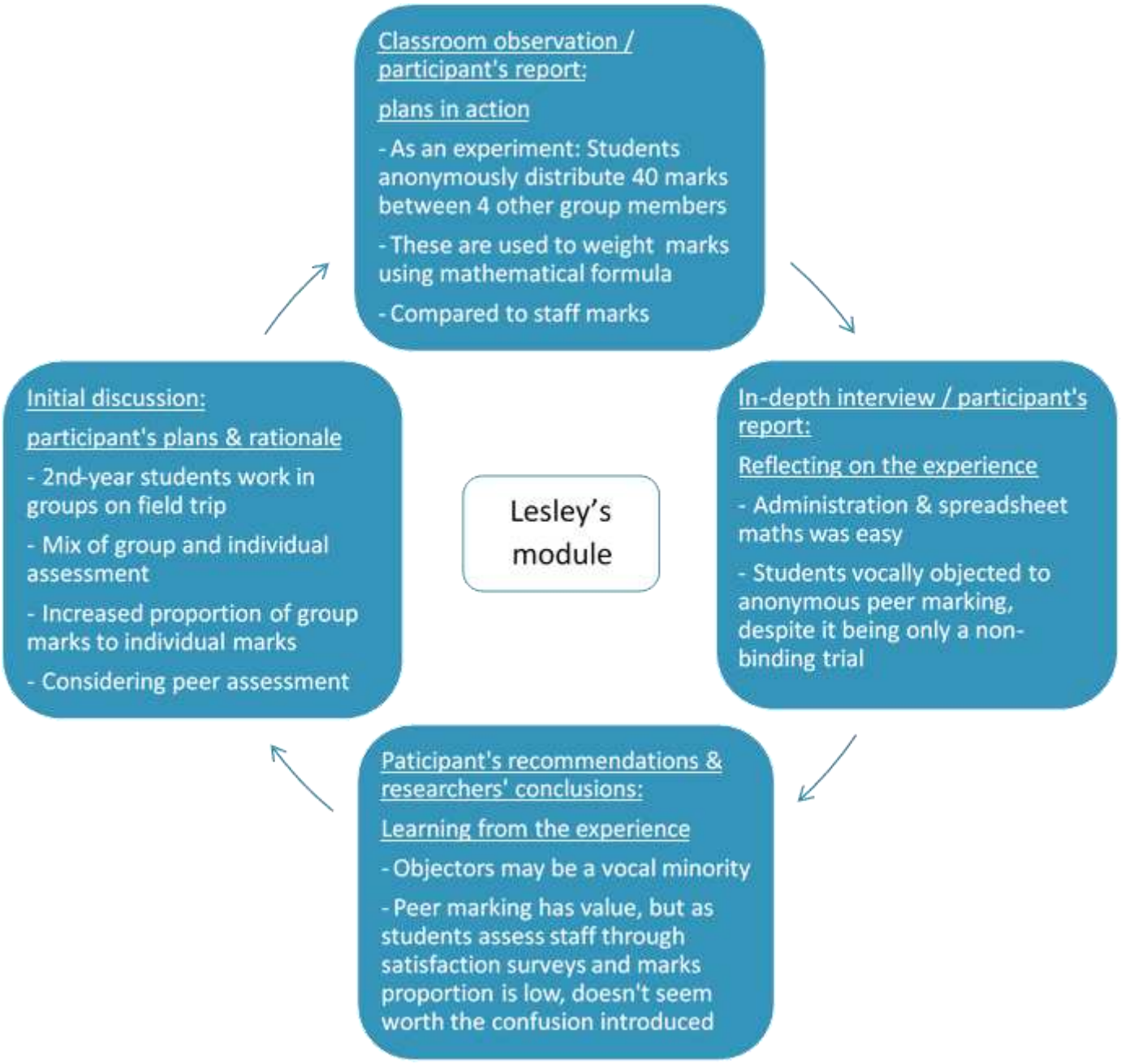
In this module, the tutor decided to teach students about Belbin team roles and group working processes of 'forming, storming, norming and performing' (based on Tuckman's model of small group development). Students were given a Belbin roles self-assessment quiz as homework and taught about group development stages in a lecture. Also for the first time when teaching this module, the tutor created a basic reflective questionnaire asking students for free-text responses about their experiences of group work as well as self-evaluation against employability skills. Although questionnaire responses indicated that



most students did not significantly engage with the idea of Belbin team roles, the tutor found the questionnaire very valuable in relation to the short time it took to create: it provided useful feedback on the module and group work structure, as well as evidently helping students self-identify group behaviours and valuable employment skills.

Leslie's module

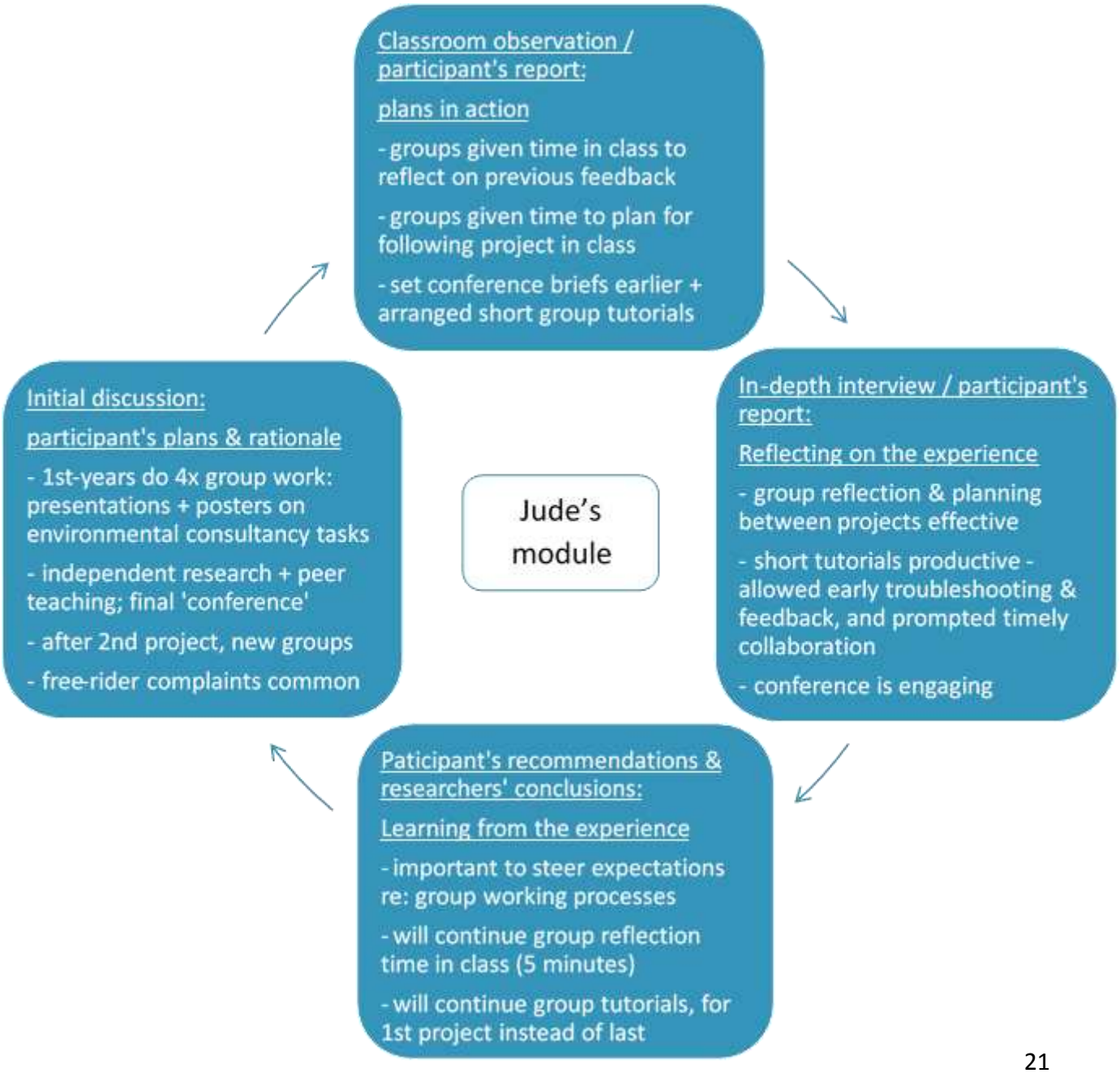
In this module, the tutor conducted an experiment in peer marking. Students, having worked in groups of five, were each asked to allocate forty marks between the other four members of their group. It was clearly explained that this was a trial and not binding. These marks were input into a spreadsheet containing mathematical formulae created by the tutor to use the peer marks to weight the original marks given by staff. Staff then compared the new marks to the original ones, to see how this process would affect marks if peer marking



were used to moderate staff marks. Though the tutor found this information valuable, some students were vociferously opposed to the process. On balance the tutor felt that it was not worth the confusion caused, given the relatively low worth of the assignment in question and the potential for student dissatisfaction, especially in module satisfaction surveys.

Jude's module

In this module, the tutor took a new approach to formative feedback. For the first time, student groups were given a short time in class to reflect together on the feedback they received on their previous project, before beginning a new project with the same group. Groups were encouraged to note down what went well, what had not gone well, and what could be changed. They were also encouraged to share their plans for working on the next project together, based on this feedback and reflection, with the tutor in class. Additionally,



the tutor provided briefs for a final project earlier than usual, and instead of speaking with groups in class about this project, scheduled a fifteen-minute tutorial with each group a week into the project. The tutor will continue this practice, because it allowed for more effective and timely formative feedback, gave students a motivation to meet as a group early in the process, and provided an obvious reason to address any absenteeism early in the process.

Learning processes, learning content: maximising the benefits of group work

Our first analytical theme considers the significance of *content-focussed approaches* – e.g. emphasis on the subject matter to be learned and the knowledge to be gained – and *process-focussed approaches* – e.g. emphasis on how the learning will happen and the skills to be practised – in successful group work. Our research finds that, far from being contradictory or mutually exclusive, these approaches enhance group work when used in conjunction with each other.

Group work processes enhance engagement

Participants' experiences indicate that group work enhances student engagement, which in turn enhances students' learning of the content being taught. Participants stated that engagement is enhanced through:

- students' shared responsibility;
- increased student independence;
- a collective sense of fun;
- staff-student interaction;
- time for students to get to know each other;
- opportunities to apply knowledge in real-life and/or varying contexts;
- students' dealing with "power issues on a personal, practical level they can relate to" (GG-1);
- debate and discussion; and
- learning through experience.

In participants' experience, different formats of group work – beyond what is seen as 'the standard' group presentation format – increase engagement, as in participants' suggestions below.

Increasing engagement in group work

- Role play (e.g. in a mock debate) encourages students to "get into it and take it seriously".
- Field work is engaging because students' ideas evolve and change quickly.
- Special events, like an end-of-year 'conference', can be an occasion for celebrating students' learning and achievements.
- A flipped classroom increases students' sense of novelty and fun.
- In general, students enjoy variety.

However, group work becomes more challenging if students – even just some of them – do not want to participate: "A compulsory module plus disengaged students taints group work for everyone – discontent is catching" (MR-2). Conversely, a cohort which is already engaged with their broader learning programme, or enthusiastic about a given module, contributes to the success of group work. These observations, whilst recognising that some aspects are out of individual tutors' control, underscore the importance of drawing on the factors identified above to enhance engagement through group work as much as possible.

Engagement enhances learning

Participants observed and experienced several ways that the engaging aspects of group work processes broaden students' learning of the content being taught. For example:

"Group work massively extends the reach of what students learn, because there are multiple brains working together!"

- Peers learn from each other.
- Groups come up with more creative ideas than they would individually.
- It "massively extends the reach of what they learn" because there are "multiple brains" working on a project or topic (PL-2).

"Students realise they know more than they thought they did and consolidate their learning."

Tutors also observed that more engaged learning processes fostered deeper learning. Engagement in group work encourages synoptic learning because it requires students to bring together a range of knowledge and share it. Discussion improves responses to concrete issues or questions. Students can explore the detail and complexity of concepts through interaction. Learning processes of discussion and synthesis help students learn content, and more perspectives challenge them to think differently and deepen their understanding. Students become "experts in their topic" through group peer teaching and presentations (PL-1). Peer-to-peer learning causes students to reflect and

helps them explore ideas. Through these different processes, which often require repeated interactions and engagement with the learning content, students "realise they know more than they thought they did and consolidate their learning" (LM-1).

Group work processes help develop skills

Through group work, students not only enhance their knowledge and learning but also develop and practice a wide variety of technical, social, creative, vocational and thinking skills. Discussions with participants mentioned and corroborated all of the learning and skills benefits described in the literature review (LM-1, TF-1, KM-1, RS-1).

Recognised benefits of group work from literature review	
Increased student engagement (Goff et al. 2007; Korkmaz 2012)	Social, interpersonal & communication skills development (Apul & Philpott 2011; Ellis & Weekes 2008; Panelli & Welch 2005)
Development, consolidation, progression & deepening of knowledge & understanding (Melkert 2003; Higgitt 1996; Charlesworth & Foster 1996)	Technical skill development (Brown 1999)
Thinking skills development (Korkmaz 2012)	Academic skill development (Ellis & Weekes 2008)
Increase self-awareness & self-reflection (Stanier 1997)	Growth in awareness & experience of non-educational contexts (Crewe 1994; Korkmaz 2012; Stanford et al. 2013)

Additionally, participants pointed out that assigning group work early in their degree is a good way to ease students into skills they will need for university such as research skills, independent working, presentation skills, and an understanding of group dynamics, all of which will help them in more demanding projects later in their degree (RS-1). Group work help them develop essential skills for university study as well as working life, and-importantly – it also encourages self-reflection on their skills and abilities. The ability to articulate these to future employers is essential for job applications (MR-1).

Working in a group enhances students' ability to apply the content they learn within real-life contexts, and increases their skills, because, as our participants remarked:

> "Students experience applied theory in the form of problem-solving in a realistic context."

- students experience "realistic interdependence" (KM-1) in and across their teams;
- the experience of group work is "very relevant to the work place";
- activities like mock conferences, debates, reports, or presentations simulate real-life contexts where they would use their skills to share their knowledge;
- students can learn about and reflect on the different roles played in a group, and the stages of group work; and

- "Students experience applied theory in the form of problem-solving in a realistic context" (LM-1).

Group work also helps students synthesise knowledge and enables them to think critically about how personal and collective values affect the application of knowledge. Students learn about and experience processes of gathering, reproducing and synthesizing knowledge as a group – this is "as important as the knowledge itself" (PL-2).

Practising skills whilst learning deepens the learning

In group work, students must "apply generic skills, specific skills, and knowledge all together" as part of the process (MR-2). Through critical discussions, validating each other's ideas, presenting, and defending and adapting their own ideas, students gain confidence in their knowledge as well as practising communication, teamwork and collaboration skills.

Group work can be highly relevant to the desired learning of outcomes of a module, even where these emphasise knowledge acquisition over skills acquisition. Our participants' experiences show that group work improves synoptic learning – it helps students link different topics and disciplines (something they often struggle to do in essays). It also allows for a balance of activities and "a balance between teacher-led knowledge transfer and student-led development of their own knowledge" (GG-1). Furthermore, it requires students to test the knowledge they're learning by trying to apply it in context, therefore deepening their knowledge and understanding.

Participants felt that kills-based *and* knowledge-focussed learning are essential at all levels of university learning. Participants stated: "Though the degree is about the academic knowledge, it is implied that students will develop transferable skills during their time at university" (TF-1), and, "…a premium master's programme…needs to deliver research-based learning *plus* skills and capabilities to make a difference" (PL-1). However, it is important not to create "superficial engagement" through group work if it does not serve the pedagogical aims of a given module (EV-1).

Getting the balance right: facilitating group work

It can be challenging to engineer aspects of a successful group work process, i.e.:

- It can be difficult to decide how to allocate groups
- Group dynamics can become an issue
- Peer teaching feels risky (and students don't always pay attention to their peers).
- Facilitation feels risky – although it reduces 'performance pressure', the lecturer is less in control.

Many tutors find it difficult to know how best to allocate students to groups. For example, one says, "We don't want to support cliques…but when we mix them, how do we get the ground rules right?" (PL-2). Another finds "it doesn't make much difference, assigning them

or letting them choose [groups]" (LM-2). Another tutor's experience suggests that less-engaged students rarely sign themselves up to self-selecting groups, and this works out well because the tutor can then allocate them across the groups of more-engaged students so that the less-engaged students are pulled up by the others and/or their disengagement does not make a large impact in a group full of other engaged students (MR-2). On the other hand, tutors find that students who are disengaged prior to group work can make the process difficult for everyone. One tutor feels that group work is an important experience for his 1st-year students, but "it doesn't make for satisfied students" (RS-2).

"There's not one best way of facilitating group work."

Most of the tutors we spoke to feel that group work requires facilitation. It is important to "set ground rules" (EV-2), "engineer dialogue between the audience and the presenters" in group presentations (EV-2), and to develop "skills for quietening without oppressing, and for encouraging without scaring" in the context of group discussions (GG-2). As an approach to group work projects, one tutor finds "it's about scoping" – setting an overarching topic, with self-selected segments. This scoping needs to be "boundaried, but not prescriptive…supported but not restricted…a structure and purpose for [students] to 'leap off' from" (PL-2). Others emphasise that tutors must "try things out" and, "There's not one best way" of facilitating group work (EV-2, LM-2).

Transparency about the aims and goals of the group work process helps make it more effective in delivering its pedagogical and developmental goals, but many participants reflected that this was often not sufficiently emphasised.

Highlighting the aims of group work

- Students are often not aware of the benefits of the process of group work.
- Staff may not reflect on the purposes of group work either.
- We often do not tell students why we are doing group work.

Though tutors' experiences vary across age-groups of students, all agreed that, "Overall they're more satisfied if they understand why they're doing it, or more importantly see the value in doing it" (RS-2). Transparency throughout – including about assessment criteria and tasks, where appropriate – ensures the process is fair and underlines why group work was chosen. How tutors do this varies. Many feel that it is helpful to explicitly state the reasons for doing group work and acknowledge the difficulties inherent in it – this helps to manage expectations and reduce complaints (EV-2, GG-2, MR-2, LM-2). In reference to sharing the purposes of group work, one participant stated, "The more we can involve the students, the better" (HF-1). Some find it particularly useful to give students a framework for group processes – e.g. the concepts of 'forming,

"The more we can involve the students, the better."

storming, norming and performing' or Belbin's team roles (LM-2, MR-2) – and feel "we don't spend enough time doing this" (LM-2). Another states, "Being transparent about the range of ways I use to facilitate learning is part of my practice…Not all [students] are receptive to 'learning process' stuff…What I try to do is periodically bring some of the unconscious [learning] processes to the conscious level. For some, this makes things 'click'" (PL-2). Others find that including a reflective process at the end of group work helps underscore the relevance of group work for students and enhances their experience.

Practising and learning group work tools through experience supports students' skill development as well as their knowledge acquisition. However, group work draws on and assesses some different skills to those which may help high-performing students succeed at essay- or exam-based assessments. Some participants found that reflective processes, such as end-of-project questionnaires, reduce or mitigate student dissatisfaction by encouraging them to reflect on their roles in the group work process (MR-1). Reflective processes can be particularly good in helping students to reflect on the different skills they have used, helping them feel empowered through self-assessment, and helping them be able to articulate their skills and personal strengths to potential employers.

Effective & transparent assessment of group work: supporting learning & development

Methods of summative & formative assessment

It is important to achieve a balance between the diversity of assessment across a learning programme, whilst giving students the opportunity to improve on different types of assessment through repetition. In any case, the assessment method must be justified in line with the aims of the module. (EV-1, RS-1).

Staff undertake summative assessment of group work in various ways. Some tutors may prefer group assessments because it reduces the marking load or because of the variety of format: as one participant said, "The presentations are fun to assess" (LM-1). Alternatively, students may not be assessed in groups, but group work may be inextricably linked to their performance on individual assessments. Different practices of summative assessment include the following examples.

- An assessment of a group written project might be supplemented with individual assessment of individuals' respective, defined parts of the assignment, e.g. chapters (KM-1).
- Initial group work assignments may be non-assessed, with later assignments assessed (HF-1, RS-1, GG-1, TF-1).
- Individually assessed assignments might include reflection on group work processes and learning (PL-1).
- Non-assessed group work may provide the necessary knowledge for individually assessed assignments (GG-1, RS-1, PL-1, TF-1).

Formative assessment through group work is just as significant to students' learning for several reasons, and can be accomplished in various ways:

- Students receive on-going suggestions for how to improve their team work in long-term projects (KM-1).
- Many staff use non-assessed small group exercises in practicals or seminars to gauge understanding and provide immediate feedback (HF-1, PL-1, GG-1, PT-1, TF-1).
- Early group presentations help students practice and let staff gauge baseline skill levels. Small group tutorials provide feedback on various assignment types (GG-1).
- Verbal feedback on presentations helps give students immediate understanding, and can be captured on video for future reference if presentations are recorded (PL-1).

However, students often may not realise they are receiving feedback through more informal group work processes unless this is made clear to them.

Deciding what & how to assess

Tutors' views differ on what it is easier and more difficult to summatively assess through group assignments – most commonly group presentations. For example, some feel it is relatively easy to assess students' knowledge and analysis of the relevant content, whilst others feel the knowledge displayed in this format is fairly superficial (although it is still easy to see the breadth of a group's collective knowledge). Some feel that it is very difficult to see the processes behind the end product – for example how well the group have worked together – whilst others believe that the quality of the product reflects the quality of the teamwork and organisational skills. Despite this, most agree that it's possible for some students to be 'let down' by the group work process and for this to escape attention through summative assessment methods. Most agree that a group presentation allows tutors to see the communication and presentation skills of some students but not all, and may mask other students' strengths in non-presenting roles, such as background research. As such, one staff member pointed out that the criteria for a group assessment must be carefully chosen to reflect what would be produced by a good group learning process, and marks must be weighted towards these criteria.

A balance of assessment types is important, as well as pedagogical justification. Where the development of group working skills – in a context that "really matters" to students, because of the significance of a mark – is not one of the principal learning aims, tutors may choose to assess students individually, but link the content of these assessments to the content being explored through group work. Thus the emphasis on what is being assessed is changed. It is also important to consider what can be expected from group assignments – for example, one tutor realised that students' weaknesses in writing only became apparent too late in the module, because previous group work assignments had not developed these skills, and decided to consider changing the spread and type of assessments to help develop

writing skills as well. Assessment choices for effective group work depend on both practical issues (i.e. available time) and the pedagogical aims of the group work.

Communicating about assessment

As several participants expressed, group work works best when there is a clear reason for doing it, and the same applies to group assessments. Whether students are being summatively assessed as a group or as individuals, ongoing formative assessment on group-working skills development is particularly important. While students may receive a mark which reflects their overall group performance, group working skills are less easy to assess in a specific, targeted way through summative assignments. Thus, formative assessment is essential to their individual development of skills through group work. The importance of transparency is highlighted once again, in that students may need to be told explicitly that they are receiving this feedback in order for it to be beneficial. Reflective exercises are another helpful tool in helping students explicitly take note of what they have learned, what skills they have developed, what feedback they have received, and how they might view assessment as part of the learning process.

Making group work fair: helping students overcome challenges

What does 'fair' mean?

Staff we interviewed all spoke passionately about what one termed the "absolute principle" (PL-2) that marks must fairly reflect students' performance against the criteria being assessed. Fairness of assessment is important for students' confidence, self-awareness and ability to develop. If group assessment is chosen, the mark must recognise students' skill in working together to synthesize different contributions. Participants reasoned that, as this is "a collective task" (RS-2), "it's fair that this [mark] be collective" (LM-2).

However, students often perceive group marks as unfair: "Student complaints are the main reason group marking has been minimised" in some participants' teaching (TF-1). Many things contribute to students' perceptions of unfairness in the processes and procedures of group work. Time constraints may mean some students have schedule clashes and are absent or difficult to contact. Some students act as 'social loafers' and don't contribute equally. High-achieving students often expect to do well and perceive that others bring their marks down (PL-1, EV-1, PT-1). Tutors find it challenging to know how to best allocate students to groups and observe that group dynamics can disadvantage some students, and that diversity across disciplines, language skills, and cultural backgrounds can contribute to difficulties within groups. Student perception of fairness is important both for students' satisfaction with their experience and to prevent administrative and facilitative difficulties for staff.

Nonetheless, several participants felt strongly that it would not, in fact, be fair to remove all factors of

"'Fair' is us providing students with a good quality education, not giving them information…"

imbalance and perceived unfairness within groups. Some participants stated that it would be unfair to accommodate students' difficulties with group work beyond a certain extent: rather than remove these challenges, we must help students develop the skills to deal with them. Many echoed this sentiment, feeling that dealing with such challenges provides important life lessons which will serve students well in their post-university lives. As one staff member put it: "'Fair' is us providing them with a good quality education, not giving them information: teaching them to get and utilise knowledge and their intellect; to think critically and work hard, as an individual and as a team" (MR-2).

Furthermore, many participants felt, on reflection, that the contributions of individuals to a collective task cannot be objectively measured, because of people's different abilities and contributions. The fairness of this process is really a subjective assessment which can only be done by those who experienced it, e.g. the students in a given group. As many staff expressed in varying words, "Different people have different skills and contributions. Disaggregating that could be very unfair in itself and do a disservice to the different types of contributions made" (RS-2). The experiences of the tutors we interviewed suggest that, ultimately, attempting to ensure or enforce entirely equal contributions amongst group members from outside the group is a thankless and impossible task.

The real importance of equity in group work processes is that perceiving their environment as fair enables students to learn more, and more effectively. We must be cognisant and respectful of students' stresses, including marks and time pressures, and recognise that they learn better when they feel they are being treated fairly by staff and their peers; being allowed to contribute; and not being required to take on a disproportionate amount of work.

Options: Helping students achieve equity & mitigating complaints

- Set ground rules for group work.
- Give students clear guidance on what to expect when working in groups.
- Ensure, and communicate, that group marks make up a low proportion of total marks.
- Explain at the beginning of a group project that students will be required to account for their contributions.
- Use a formal process of peer assessment in case of complaints or obvious inequality.

Tutors as facilitators can do several things to help student groups achieve a working balance between themselves that they perceive to be fair, both to avoid problems and complaints

and to enhance students' learning experiences (see box above). However, many participants expressed difficulties around effectively using peer marking systems, or attempting to quantify individuals' contributions to group assessments. This is hardly surprising in light of above-mentioned reflections on the practical impossibility of quantifying different contributions objectively. Thus, there remains a tension between attempting to ensure equity in group working processes and maximising the opportunities within these processes for skill development (RS-1). Most importantly, where group work is assessed this must be linked to the need for students to practise group working skills and synthesise individual contributions into a collective product. If this is not key to the learning aims, a different form of assessment – perhaps similar to the practices listed above – may be more appropriate and fair.

Reflection and transparency to empower learning

"Teach the process!"

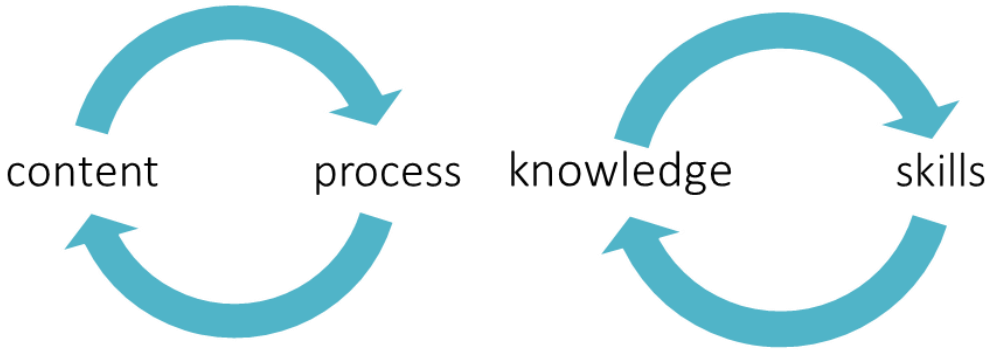
If part of the aim of group assessment is to give students the opportunity to develop and practice team-working skills in a context that really matters – because their mark will count – then this underscores why we need to "teach the process" of successful group work, so that students are empowered to meet assessment criteria instead of feeling that the goals set for them are unfair. Students experience a "realistic interdependence" through group assessment (KM-1), and this can be used as an opportunity to help students gain life skills for dealing with challenging team-work situations in the workplace (GG-1, LM?). Speaking with students about the Belbin roles in team work and about the 'forming-storming-norming-performing' stages of group work can also help them develop useful skills, and mitigate complaints (LM-1, MR-1). In-class discussions about feedback students receive on their group work can help students identify and address issues of unequal contributions within groups (RS-1, LM-1). Facilitated opportunities for reflection, whether linked to marked assessment or not, help students develop skills to meet the challenges of group work more effectively; to become more aware of their development; and to better understand the valuable learning opportunities group work provides.

Tutors can empower students to deal with these challenges for themselves by being transparent about what assessment criteria apply to group assignments and why; by teaching students about the skills necessary to achieve those criteria; and by helping them understand the value of these skills. Emphasizing the purpose of group work, making it clear which skills are being valued in a given assignment, and teaching students about these skills enable students to navigate challenges for themselves, develop skills, and enhance their learning, whilst also reducing perceptions of unfairness and lessening stress for students and tutors alike.

Conclusions & recommendations

Synthesising learning processes & content

Content-focussed and process-focussed approaches to group work are far from mutually exclusive. Group work is not skills training. It increases knowledge acquisition at the same time as, and perhaps because, students are also learning and practising group working skills (Melkert 2003; Chau 2007; Ellis & Weekes 2008; Apul & Philpott 2011). Students rarely learn skills without learning knowledge at the same time. This is true in reverse as well – when students apply themselves to learning knowledge through any given process, they also develop the skills necessary to learn that knowledge. Group work provides an essential mechanism for students to supplement the skills they develop through other forms of learning – e.g. listening and retaining information from lectures, or assimilating knowledge learned through independent reading and research – with skills they need for putting the knowledge they learn into action with others, whether in a professional, community or personal context. At the same time, the process of group work can enhance students' progression and consolidation in their knowledge learning (Healey et al. 1996; Charlesworth & Foster 1996). Group work enhances both knowledge acquisition and skills development;



the relationship between these different kinds of learning is mutually beneficial, not binary.

Group work is not a panacea – in some cases it is not the appropriate tool to achieve the desired learning outcomes. However, as we've seen in the previous section, well-designed and facilitated group work processes can enhance knowledge acquisition, progression and consolidation. Group work also allows for a balance between knowledge-transfer and independent learning, and caters to different learning styles. In addition, group work helps students with the challenge of synoptic learning. By requiring students to test their knowledge through applying it in a realistic context, it helps them deepen their knowledge and make links across different topics and disciplines. Perhaps the challenging aspects of

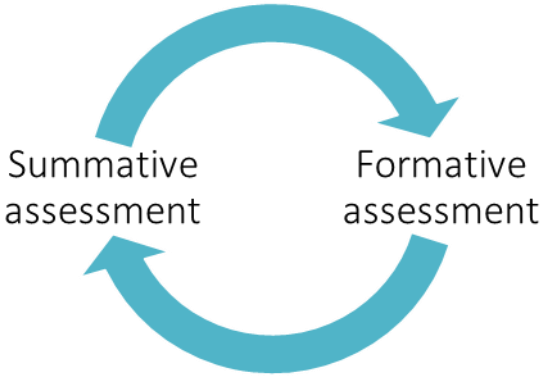
group work create space for students which enables them to articulate new learning and new skills.

The array of technical, social, creative, vocational, practical and thinking skills that group work can engender help students not only to better succeed in university studies but in the work place (Brown 1999; Ellis & Weekes 2008; Smith et al. 2012). Indeed, group work can improve students' employability not only by allowing them to practice and develop the skills they will need at work, but also by requiring them to reflect on the skills they have developed through navigating these processes. Being able to articulate these skills to employers is a gateway to the opportunity to apply them in a professional role. Staff who participated in this study believe that skills as well as knowledge are now an essential and expected part of a university education. Practising and encouraging transparency, not only on the part of the tutor but also inter- and intra-personally among students, is a key area for improvement of group work facilitation.

Using assessment to support group learning outcomes

Although group assessment may be a focal point for students' awareness of group work (Knight 2004; Gatfield 1999), summative assessment of group work is not the only way to effectively achieve the aims of group work. Tutors may individually assess parts of a group assignment, ensure that students can experience non-assessed group work before being assessed as a group, or ensure that group assessment makes up a relatively low proportion of students' overall marks. Alternatively, students may not be assessed in groups, but group work may be inextricably linked to their performance on individual assessments.

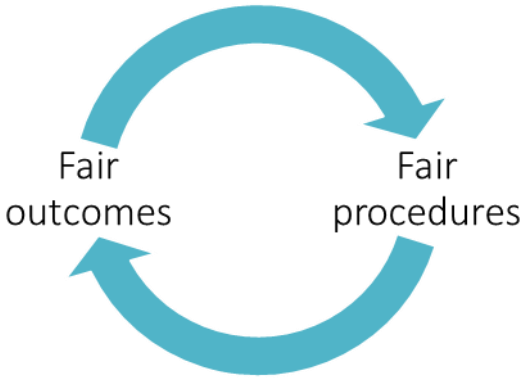
Formative assessment and feedback may be one of the most beneficial aspects of group work for students' learning (Shah 2013). However, especially in the case of informal group work, students may not realise they are receiving this feedback. It is important for tutors to increase transparency around these processes for students to receive maximum benefit from this aspect of group work.



It is likewise important to achieve a balance between the diversity of assessment across a learning programme, whilst giving students the opportunity to improve on different types of assessment through repetition. In any case, the assessment method must be justified in line with the learning aims of the activity or module (Davies 2009). Group work does not necessarily need to be formally or summatively assessed to provide learning benefits and contribute to students' enhanced success on individual assessments.

Engaging students as partners in fair group work

Tutors feel strongly that objective fairness of any marks given is crucial to the integrity of students' university education. However views and experiences differ on how best to deal with students' perceptions of (un)fairness during the process of group work. Empowering students as partners in their own learning – through increased explanation of group work processes as well as reflective tasks – can play a key role in changing their perceptions of unfairness by helping them develop skills to address group issues themselves (Livingstone &



Lynch 2000; Maguire & Edmondson 2001; Marvell et al. 2013; Healey et al. 2014).

Where assessing group work is not crucial to achieving the learning aims, staff may eliminate group assessment to preclude student concerns or complaints about unfair marks, without necessarily eliminating group work itself (Knight 2004; Gatfield 1999). In other cases – where assessment of group work is linked to the need for skills – many feel it is not helpful to yield to students' objections to group work, because part of the aim is to help them gain the skills to deal with real-life teamwork situations in which they are very likely to experience a degree of inequality. Many participants in this study feel that the pedagogical benefits of group work in a given context are worth the effort of engaging with students' perceptions of unfairness. Being fair to students may require engaging them in the solutions to perceived issues with group work, and helping them learn the skills, tools and processes needed to overcome these issues in their own ways. Transparency of process and reflective tasks both help empower students to deal with difficulties, minimise complaints, and maximise students' learning of both content and skills.

Concerns for equity in group work processes can be addressed through commitment to helping students understand and gain the skills to navigate those processes. Careful facilitation, appropriate guidance and teaching about group working processes may be particularly important where students with diverse characteristics work in groups together. Teaching staff must remain aware of the effects students' diverse characteristics on their experiences of group work, as well as being mindful of unconscious bias – for example, students' perceptions of each other's background, ethnicity, nationality, race, gender, ability, and other characteristics may influence their expectations of each other's roles, performance, and contributions in group work (Kaenzig et al. 2006; 2007; Dingel & Wei 2014; Elliott & Reynolds 2014; Yssel et al. 2016). Alongside activities designed to be as inclusive as possible, providing guidelines and insight on team working processes can help teams function well (Hansen 2006). Our study did not focus on students' experiences of group work. However, staff's experience and reflections suggest that these approaches to 'teaching the process' and prompting reflection could potentially help students gain awareness and appreciation of the challenges and benefits of diversity within their teams, as well as enabling students to achieve equity within group work processes more broadly.

Directions for further research

This research focussed on staff experiences of using group work and has aimed to provide practical insights as well as pedagogical reflections on how group work works well, and why. Further research might usefully compare or explore the relationship between staff's experiences and students' experiences of group work. Studies investigating the observable and qualitative effects of the practices analysed here on students' experiences – and particularly on the experiences of female and disabled students and those from different ethnic, cultural and socio-economic backgrounds – would be especially valuable in

developing a deeper and more nuanced understanding of the effectiveness of staff's approaches to group work in enhancing students' learning experiences in a variety of circumstances. Research which attempted to apply this study's findings in other disciplines – or which sought to link the findings of this study to those reported in similar studies in a wider range of disciplines – would bring valuable breadth to the understanding of the use of group work across higher education.

Summary of practical suggestions

The following practical recommendations are excerpted from the additional resource created as part of this study: a 4-page booklet titled 'Making Group Work Work: A resource for planning and reflection'. Please consult this resource for a condensed and accessible presentation of the research detailed in this paper, including key considerations, practical suggestions, and recommended reading.

Top tips from people who've been there	***Excerpts from our action learning research***
• **Be honest & transparent: "Explain what you're doing and why."** • **Manage expectations: "Set ground rules."** • **"Teach the process" of working in a team.**	Research participants emphasised the importance of explaining the practical and pedagogical reasons they had chosen group work to students. They found this worth the time. Some participants set ground rules about work distribution and processes of interaction for students, or guided students to do this for themselves, to manage expectations. Moreover, some found group work more effective when they taught students theories of group work, e.g. Belbin's team roles and/or Tuckman's team-building stages.
• **Use peer marking, questionnaires, or an in-class task to prompt reflection** • **Help students take responsibility for sorting out conflicts, free-riding, & communicating—for themselves.**	Research participants had different views on the value of peer marking. However they all thought it was useful to explicitly ask group members to reflect on their contributions. Participants found that prompting students to identify and resolve problems through reflection on the process reduced complaints and improved students' social learning.

Top tips from people who've been there	*Excerpts from our action learning research*
• **"Tailor the activity" to students' abilities and maturity.** • **Repeat the process.** • **Facilitate sensitively, and don't be afraid to give some control to the students.** • **"There's not one best way" – "try stuff out!"**	Participants teaching first-years often chose less-formal small group work or very structured presentations, for example, whereas postgrads were asked to conduct research and peer-teach on topics set by the lecturer. Participants recommended that tutors get to know names and meet with groups. Some found it effective to facilitate in-class group interactions using "a loose structure, with prompts, but not too directive."
• **Make sure you know where else in the programme group work takes place.** • **Talk to students about how group work helps meet their learning aims for their overall degree.** • **Talk to peers about problems and ideas that have worked well.**	Participants underscored the need to build on learning and skills already developed and to help prepare for group work later in the programme. They recommended talking to the Programme Leader, looking at the programme Assessment Map for, and talking to others teaching on the programme. Finally, many found it unexpectedly helpful to take part in informal interviews—just talking about group work helped them plan and problem-solve.

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References

Alwi, R.S.W. et al., 2012. Sustainability Education for First Year Engineering Students using Cooperative Problem Based Learning. *Procedia - Social and Behavioral SciencesSocial and Behavioral Sciences*, 56, pp.52–58.

Ameta, G., Panchal, J.H. & Pezeshki, C., 2010. A Collective-Learning Approach to Sustainable Design Education. *International Journal of Engineering Education*, 26(2), pp.265–270.

Apul, D.S. & Philpott, S.M., 2011. Use of Outdoor Living Spaces and Fink's Taxonomy of Significant Learning in Sustainability Engineering Education. *Journal of Professional Issues in Engineering Education and Practice*, 137, pp.69–77.

Bacon, C.M. et al., 2011. The creation of an integrated sustainability curriculum and student praxis projects. *International Journal of Sustainability in Higher Education*, 12(2), pp.193–208.

Bath, D. et al., 2004. Beyond mapping and embedding graduate attributes: bringing together quality assurance and action learning to create a validated and living curriculum. *Higher Education Research & Development*, 23(3), pp.313–328.

Borrego, M. et al., 2013. Team effectiveness theory from industrial and organizational psychology applied to engineering student project teams: A research review. *Journal of Engineering Education*, 102(4), pp.472–512.

Bradbury Huang, H., 2010. What is good action research? *Action Research*, 8(1), pp.93–109.

Brown, G.H., 1999. A Group-learning Approach to Academic and Transferable Skills Through an Exercise in the Global Positioning System. *Journal of Geography in Higher Education*, 23(3), pp.291–301.

Burkill, S., 1997. Student empowerment through group work: A case study. *Journal of Geography in Higher Education*, 21(1), pp.89–94.

Caple, H. & Bogle, M., 2013. Making group assessment transparent: what wikis can contribute to collaborative projects. *Assessment & Evaluation in Higher Education*, 38(2), pp.198–210.

Charlesworth, S.M. & Foster, I.D.L., 1996. "Water and environmental systems": achieving student-centred learning objectives with an undergraduate journal. *Journal of Geography in Higher Education*, 20(1), pp.45–54.

Chau, K.W., 2007. Incorporation of Sustainability Concepts into a Civil Engineering Curriculum. *Journal of Professional Issues in Engineering Education and Practice*, 133, pp.188–191.

Clark, G. & Seidu Jasaw, G., 2014. Evaluating team project-work using triangulation: lessons from communities in northern Ghana. *Journal of Geography in Higher Education*, 38(4), pp.511–524.

Crewe, L., 1994. Adaptation and change in the teaching of economic geography: innovative

assessment methods for group research projects. *Journal of Geography in Higher Education*, 18(2), pp.207–213.

Davies, W.M., 2009. Groupwork as a form of assessment: common problems and recommended solutions. *Higher Education*, 58(4), pp.563–584.

Dingel, M. & Wei, W., 2014. Influences on peer evaluation in a group project: an exploration of leadership, demographics and course performance. *Assessment & Evaluation in Higher Education*, 39(6), pp.729–742.

Elliott, C.J. & Reynolds, M., 2014. Participative pedagogies, group work and the international classroom: an account of students' and tutors' experiences. *Studies in Higher Education*, 39(2), pp.307–320.

Ellis, G. & Weekes, T., 2008. Making sustainability "real": using group-enquiry to promote education for sustainable development. *Environmental Education Research*, 14(4), pp.482–500.

Gatfield, T., 1999. Examining Student Satisfaction with Group Projects and Peer Assessment. *Assessment & Evaluation in Higher Education*, 24(4), pp.365–377.

Glassey, J. & Haile, S., 2012. Sustainability in chemical engineering curriculum. *International Journal of Sustainability in Higher Education*, 13(4), pp.354–364.

Goff, R., Terpenny, J. & Wildman, T., 2007. Improving learning and engagement for students in large classes. In *Frontiers In Education Conference - Global Engineering: Knowledge Without Borders, Opportunities Without Passports, 2007. FIE '07. 37th Annual*. Milwaukee, WI: IEEE, pp. 1486–1491.

Haigh, M. & Gold, J., 1993. The problems with fieldwork: a group-based approach towards integrating fieldwork into the undergraduate geography curriculum. *Journal of Geography in Higher Education*, 17(1), pp.21–32.

Hallet, R., 2012. *The Rhetoric of Employability: Bridging the University-Employer Divide. University Teaching Fellowship Project Report and Recommendations. University of Leeds, Faculty of Arts.*,

Hansen, R.S., 2006. Benefits and Problems With Student Teams: Suggestions for Improving Team Projects. *Journal of Education for Business*, 82(1), pp.11–19.

Harun, N.F. et al., 2012. Motivation in Problem-based Learning Implementation. *Procedia - Social and Behavioral Sciences*, 56, pp.233–242.

Healey, M. et al., 1996. Learning in small groups in university geography courses: Designing a core module around group projects. *Journal of Geography in Higher Education*, 20(2), pp.167–180.

Healey, M., Flint, A. & Harrington, K., 2014. *Engagement through partnership: students as partners in learning and teaching in higher education*, York.

de Hei, M. et al., 2016. Thematic review of approaches to design group learning activities in higher education: The development of a comprehensive framework. *Educational*

Research Review, 18, pp.33–45.

Higgitt, M., 1996. Addressing the new agenda for fieldwork in higher education. *Journal of Geography in Higher Education*, 20(3), pp.391–398.

Hill, T.R. et al., 2008. Clear the Mind of Pre-conceived Ideas and Get Your Hands Dirty! An Approach to Field-based Courses: The SLUSE-southern Africa Experience. *Journal of Geography in Higher Education*, 32(3), pp.441–457.

Hindle, B.P., 1993. The "project": putting student-controlled, small-group work and transferable skills at the core of a geography course. *Journal of Geography in Higher Education*, 17(1), pp.11–20.

Hindle, P., 2000. Developing Employment Interview and Interviewing Skills in Small-group Project Work. *Journal of Geography in Higher Education*, 24(1), pp.29–36.

Hynek, A. et al., 2009. Sustainable Deblín Region: Educational Project. *ENVIGOGIKA*, 4(2), p.npn.

Johnston, L. et al., 2004. Assessing contributions to group assignments. *Assessment & Evaluation in Higher Education*, 29(6), pp.751–768.

Kaenzig, R. et al., 2006. Gender differences in students' perceptions of group learning experiences. *Academy of Educaitonal Leadership Journal*, 10(1), pp.119–127.

Kaenzig, R., Hyatt, E. & Anderson, S., 2007. Gender Differences in College of Business Educational Experiences. *Journal of Education for Business*, (November/December), pp.95–100.

Kamau, C. & Spong, A., 2015. A student teamwork induction protocol. *Studies in Higher Education*, 40(7), pp.1273–1290.

Kember, D., 2000. *Action Learning and Action Research: Improving the Quality of Teaching and Learning*, London: Kogan Page.

Kent, M., Gilbertson, D.D. & Hunt, C.O., 1997. Fieldwork in Geography Teaching: a critical review of the literature and approaches. *Journal of Geography in Higher Education*, 21(3), pp.313–332.

Kim, M. & Tan, H.T., 2013. A Collaborative Problem-solving Process Through Environmental Field Studies. *International Journal of Science Education*, 35(3), pp.357–387.

Knight, J., 2004. Comparison of student perception and performance in individual and group assessments in practical classes. *Journal of Geography in Higher Education*, 28(1), pp.63–81.

Knox, R.C. et al., 1998. Teaching Engineering Design with Practitioner Supervision: A Case Study. *Journal of Professional Issues in Engineering Education and Practice*, 124(4), pp.105–109.

Kolb, D.A., 1984. *Experiential Learning: Experience as a source of learning and development*, New Jersey: Prentice Hall.

Korkmaz, S., 2012. Case-Based and Collaborative-Learning Techniques to Teach Delivery of Sustainable Buildings. *Journal of Professional Issues in Engineering Education and Practice*, 138(2), pp.139–144.

Korkmaz, S. & Singh, A., 2012. Impact of Team Characteristics in Learning Sustainable Built Environment Practices. *Journal of Professional Issues in Engineering Education and Practice*, 138(4), pp.289–295.

Livingstone, D. & Lynch, K., 2000. Group project work and student-centred active learning: two different experiences. *Studies in Higher Education*, 25(3), pp.325–345.

Maguire, S. & Edmondson, S., 2001. Student Evaluation and Assessment of Group Projects. *Journal of Geography in Higher Education*, 25(2), pp.209–217.

Maiden, B. & Perry, B., 2011. Dealing with free-riders in assessed group work: results from a study at a UK university. *Assessment & Evaluation in Higher Education*, 36(4), pp.451–464.

Marvell, A. et al., 2013. Students as scholars: evaluating student-led learning and teaching during fieldwork. *Journal of Geography in Higher Education*, 37(4), pp.547–566.

Mavroudi, E. & Jöns, H., 2011. Video Documentaries in the Assessment of Human Geography Field Courses. *Journal of Geography in Higher Education*, 35(4), pp.579–598.

McClelland, G.P., 2012. The influence of randomly allocated group membership when developing student task work and team work capabilities. *Journal of Further and Higher Education*, 36(3), pp.351–369.

Melkert, J.A., 2003. Sustainable Development as an Integral Part of the Design and Synthesis Exercise in Aerospace Engineering. *Global Journal of Engineering Education*, 7(2), pp.219–226.

Mello, J.A., 1993. Improving individual member accountability in small group settings. *Journal of Management Education*, 17(2), pp.253–259.

Melrose, M.J., 2005. Maximizing the rigor of action research: why would you want to? How could you? [2001]. In B. Cooke & J. Wolfram Cox, eds. *Fundamentals of Action Research, vol. 3*. London: Sage, pp. 439–461.

Panelli, R. & Welch, R. V., 2005. Teaching research through field studies: A cumulative opportunity for teaching methodology to human geography undergraduates. *Journal of Geography in Higher Education*, 29(2), pp.255–277.

Paretti, M.C., Richter, D.M. & McNair, L.D., 2010. Sustaining Interdisciplinary Projects in Green Engineering: Teaching to Support Distributed Work. *International Journal of Engineering Education*, 26(2), pp.462–469.

Rafferty, P.D., 2013. Group work experiences: Domestic MBA student experiences and outcomes when working with international students. *Journal of Further and Higher Education*, 37(6), pp.737–749.

Revans, R., 2011. *ABC of Action Learning*, Surry: Gower.

Shah, S.Z.A., 2013. The use of group activities in developing personal transferable skills. *Innovations in Education and Teaching International*, 50(3), pp.297–307.

Sharp, S., 2006. Deriving individual student marks from a tutor's assessment of group work. *Assessment & Evaluation in Higher Education*, 31(3), pp.329–343.

Simm, D.J. & David, C. a., 2002. Effective Teaching of Research Design in Physical Geography: a case study. *Journal of Geography in Higher Education*, 26(2), pp.169–180.

Smith, M., Polglase, G. & Parry, C., 2012. Construction of Student Groups Using Belbin: Supporting Group Work in Environmental Management. *Journal of Geography in Higher Education*, 36(4), pp.585–601.

Spronken-Smith, R., 2005. Implementing a Problem-Based Learning Approach for Teaching Research Methods in Geography. *Journal of Geography in Higher Education*, 29(2), pp.203–221.

Stanford, M.S. et al., 2013. Evaluating Student and Faculty Outcomes for a Real-World Capstone Project with Sustainability Considerations. *Journal of Professional Issues in Engineering Education and Practice*, April, pp.123–133.

Stanier, L., 1997. Peer assessment and group work as vehicles for student empowerment: A module evaluation. *Journal of Geography in Higher Education*, 21(1), pp.95–98.

Swaray, R., 2012. An evaluation of a group project designed to reduce free-riding and promote active learning. *Assessment & Evaluation in Higher Education*, 37(3), pp.285–292.

Takeda, S. & Homberg, F., 2014. The effects of gender on group work process and achievement: An analysis through self- and peer-assessment. *British Educational Research Journal*, 40(2), pp.373–396.

Villa, E.Q. et al., 2013. Affinity research groups in practice: Apprenticing students in research. *Journal of Engineering Education*, 102(3), pp.444–466.

Waddington, S.B., 2001. Working with the Community: improving the learning experience for large classes. *Journal of Geography in Higher Education*, 25(1), pp.67–82.

Weaver, D. & Esposto, A., 2012. Peer assessment as a method of improving student engagement. *Assessment & Evaluation in Higher Education*, 37(7), pp.805–816.

Yssel, N., Pak, N. & Beilke, J., 2016. A Door Must Be Opened: Perceptions of Students with Disabilities in Higher Education. *International Journal of Disability, Development and Education*, 63(3), pp.384–394.

Yusof, K.M. et al., 2012. Cooperative Problem-based Learning (CPBL): Framework for Integrating Cooperative Learning and Problem-based Learning. *Procedia - Social and Behavioral Sciences*, 56, pp.223–232.