Exploring collaboration in online group based assessment contexts: Undergraduate Business Program

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Abstract

Focussing on a specific higher education online learning environment (OLE), this study aims to investigate and analyse instructional designs that employ Positive Interdependence, Individual Accountability, Teaching Presence, Authenticity and Group Skills Development as educational strategies to mitigate group work issues and subsequently encourage collaborative group work. Group work is a challenging learning space for both participants and facilitators in the higher education sector. Known issues such as free riding, unfair marking and a lack of existing group work skills in the student cohort, create a catalyst for conflict which can lead to negative perceptions and avoidance of group work. Isolation and the resulting independent learning culture typifying online study contexts further challenge collaborative and active learning pedagogies required in contemporary online adult learning and assessment contexts.

Keywords

Introduction

Australia's higher education sector is in an ongoing state of massive disruption. The rapid transition to online learning in response to COVID-19, alongside a pre-existing global trend toward virtual delivery, contribute extensively to the disruption. Severe resource constraints arising out of an economic climate of neoliberalism and financial rationalism exacerbate these challenges. Such ongoing disruption necessitates further research and the development of best practice pedagogies for online teaching, particularly regarding group work. Group work in educational settings is complex for both students and academic staff. Personalities, human-technology interactions and multifarious thinking processes embellish group dynamics and compound the complexities (Goggins et al. 2011; Troth et al. 2012). Creating and maintaining active and collaborative learning contexts in the online learning domain relies on the effective integration of Information and Communications Technologies (ICTs) to alleviate the isolation experienced by geographically dispersed student cohorts (Lee et al. 2016; Myers et al. 2014).

This paper aims to investigate the considerations and approaches academics undertake to mitigate complexities in designing and facilitating Distributed Online Group-Based Assessment Tasks (DOGBATs). Specifically, this research focuses on a small business college in a regional multi-campus (domestic and international) Australian university, where the Online Learning Environment (OLE) employs both synchronous and asynchronous communication strategies.

Defining DOGBAT

Distributed denotes geographically dispersed student group members. In Distributed online learning settings, task design excludes physically present, face-to-face interactions. *Distributed* excludes *limited* and *block* modes of delivery, while focussing solely on online subjects delivered in external mode to off campus students.

Online means that all teaching and learning interactions between academics and students, both synchronous and asynchronous, occur within the university's Learning Management System (LMS).

Group-Based refers to the necessity of a collaborative group environment in which the assessment task is undertaken. Groups form prior to the mid-point in a study period. Assessment tasks are summative, weighted, and due in the final weeks of the semester, dictating a group duration of between eight and twelve weeks. Therefore, Distributed Online Group-Based Assessment Task (DOGBAT) best represents the group assessment context.

Literature Review

Extant literature focuses on group work issues that challenge the level of collaboration and cohesion within group settings, highlighting five areas of student concern:

1) Unequal contribution between group members (Aggarwal & O'Brien 2008; Burdett 2003; Burdett & Hastie 2009; Delaney et al. 2013; Hall & Buzwell 2012; Riebe et al. 2016),

2) Subsequent unfair marking (Burdett 2003; Burdett & Hastie 2009; Delaney et al. 2013; Hall & Buzwell 2012; Riebe et al. 2016),

3) Group formation and composition (Oliveira et al. 2011; Roberts & McInnerney 2007; Seethamraju & Borman 2009),

4) Lack of group [skills] development (del Pozo-Rubio et al. 2014; Myers et al. 2014; Riebe et al. 2016; Senior et al. 2010; Troth et al. 2012), and

5) Conflict (Dimelow et al. 2013; Maiden & Perry 2011).

These issues impact deleteriously on the level of collaboration, inhibiting group processes and outcomes and contributing to negative perceptions of group work. To create positive student collaboration experiences group-work issues require resolution. Intentionally applied educational design elements may offer control of these issues and subsequently promote collaboration and cohesion.

Five educational constructs

Extant literature reveals five educational constructs that may alleviate student concerns:

1) Positive interdependence (Capdeferro & Romero 2012; Johnson et al. 1998; Lee et al. 2016; O'Neill et al. 2011),

2) Individual accountability (Aggarwal & O'Brien 2008; Capdeferro & Romero 2012; Delaney et al. 2013; Johnson et al. 1998),

3) Authenticity of the task (del Pozo-Rubio et al. 2014; Gikandi 2013; Herrington 2006),

4) Group [skills] development (Aggarwal & O'Brien 2008; Roberts & McInnerney 2007; Senior et al. 2010), and

5) Teaching presence (Goggins et al. 2011; Ke 2010).

Incorporating aspects of positive interdependence and individual accountability into the design and facilitation of group work contexts discourages and mitigates the effects of unequal workload contribution and unfair marking practices (Aggarwal & O'Brien 2008; Capdeferro & Romero 2012; Daniel & Jordan 2017; Delaney et al. 2013; Johnson et al. 1998; Lee et al. 2016; O'Neill et al. 2011). Free riding and social loafing are the two most common manifestations of unequal contribution. The terms *free riding* and *social loafing* reflect an imbalance of shared commitment to group goals, processes and outcomes, and are often used interchangeably (Capdeferro & Romero 2012; Chad 2012; Dimelow et al. 2013; Hall & Buzwell 2012; Swaray 2012). However, Burdett (2003) differentiates between the two by defining free loading as, "…individuals who fail to contribute to the activities of the group, but who benefit from the contribution of others who they believe can and will provide for task success" (p.184). In contrast, Burdett (2003, p. 185) and Maiden and Perry (2011, p. 452) assert social loafing occurs when, "…the effort an individual exerts when working collectively is less than the effort an individual exerts when working alone".

Contrasting and challenging the free riding context, Johnson and Johnson (2009) describe positive interdependence as existing when there is a positive correlation among individuals' goal attainments. Where positive interdependence exists, individuals perceive that they can only attain their goals if, and only if, the group attains its goals. "Positive interdependence results in promotive interaction, that is, individuals encouraging and facilitating each other's efforts to complete tasks in order to reach the group's goals" (Johnson & Johnson 2009, p. 366). Figure 1 outlines Johnson and Johnson's (2009) nine types of positive interdependence, highlighting the influence that positive interdependence has on collaboration and cohesion within group work contexts by way of promotive interaction.

Figure 1. Nine Types of Positive Interdependence

Type	Description
1) Goal	Common purpose is established. One achieves if all achieve
2) Incentive	All group members receive the same reward if every group member succeeds
3) Environmental	Group members are bound together by the physical [or virtual] environment
4) Role	Each member is assigned a complementary and interconnected role
5) Sequence	Overall task is divided into sub-units and usually performed in a set order
6) Simulation	Group members work through a hypothetical situation to succeed or survive
7) Outside Force	Groups compete against an outside force
8) Resource	One set of shared materials per group
9) Identity	Group members establish a mutual identity through a group name, motto, etc.

Source: (Bennett & Rolheiser 2008)

Discussion of free riding and social loafing reflect student concern around unfair marking practices. Most commonly discussed in the extant literature are concerns around the practice of grading the group assessment task without regard to individual contribution and associated employability skills (Burdett 2003; Capdeferro & Romero 2012; Dimelow et al. 2013; Maiden & Perry 2011; Riebe et al. 2016; Roberts & McInnerney 2007; Swaray 2012).

Whereas positive interdependence encourages individual contribution to group goals thereby challenging social loafing and free riding, individual accountability strategies measure and reward or penalize individual contributions or lack thereof. Individual accountability exists when each group member is assessed transparently such that the contribution of each individual may be compared against a standard of performance. (Capdeferro & Romero 2012; Delaney et al. 2013; Johnson & Johnson 2009). Intentionally designed positive interdependence elements force individual social and academic contribution which can then be assessed experientially and transparently (individual accountability).

Addressing group work issues and challenges in online group work environments highlights the centrality of considered and intentional task design. In DOGBAT environments, considered and intentional task design is necessary to create inclusive, supported and collaborative group contexts. Discussion around assessment task design in higher education contexts commonly focusses on the necessity of authentic assessment design (del Pozo-Rubio et al. 2014; Gikandi 2013; Herrington 2006). In examining authentic e-learning environments in Australian higher education contexts, Herrington (2006) identified ten characteristics of authentic tasks. Figure 2 lists Herrington's (2006) characteristics of authentic tasks which illustrate the potential for authentic group interactions. A case in point is the characteristic of *ill-defined*. An *ill-defined* task necessitates purposeful group interactions that reflect professional workplace praxis.

Figure 2. Ten characteristics of authentic tasks

Type		Description
1)	Real-World Relevance	Activities match as nearly as possible the real-world tasks of professionals in practice rather than de-contextualized or classroom-based tasks
2)	Ill-defined	Task requiring students to define the tasks and sub-tasks needed to complete the activity
3)	Complex	Tasks to be investigated by students over a sustained period of time: days, weeks and months
4)	Different Perspectives	Opportunity for students to examine the task from different perspectives, using a variety of resources
5)	Collaboration	Is integral to the task, both within the course and the real world
6)	Reflection	Activities need to enable learners to make choices and reflect on their learning both individually and socially
7)	Authentic	Tasks can be integrated and applied across different subject areas and lead beyond domain specific outcomes
8)	Assessment Integration	Seamlessly integrated with assessment in a manner that reflects real world assessment
9)	Output	Create polished products valuable in their own right rather than as preparation for something else
10)	Solutions	Competing solutions and diversity of outcomes open to multiple solutions of an original nature

Source: adapted from (Herrington 2006)

Applying aspects of positive interdependence, individual accountability, authenticity and group skills development requires a high level of teaching presence.

> Teaching presence begins before the course commences as the teacher, acting as instructional designer, plans and prepares the course of studies, and it continues during the course, as the instructor facilitates the discourse and provides direct instruction when required. (Ke 2010, p. 809)

The positive influences of teaching presence on student engagement, retention and satisfaction in relation to online learning experiences is discussed in the literature (Goggins et al. 2011; Ke 2010). Extant literature espouses the key role intentional pedagogical designs and resulting instructional strategies play in increasing instructional quality and student achievement (Corbin & Bugden 2018; Schneider & Preckel 2017). Higher education teaching staff need to further engage with pedagogical concepts in supportive and informed professional development programs, to improve the instructional quality of face-to-face and online programs (Kilgour et al. 2019).

This study answers calls from Herrington (2006), Oncu and Cakir (2011), Lee et al. (2016), Schneider and Preckel (2017), and Corbin and Bugden (2018) for further research into design elements that inform effective OLE designs. Specifically, this study aims to discover and describe how academics interact with the five educational constructs of positive interdependence, individual

accountability, authenticity, group skills development and teaching presence, in the process of designing and facilitating group work in DOGBAT contexts.

Methodology

Described as "an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem" (Creswell, 2014, p.4), a qualitative research methodology best serves to investigate the human element. Appropriate to exploring the how and why of a contemporary social phenomenon situated in a real-life context (Stake 2005; Yin 2003), this study employs a qualitative interview methodology to examine the design of online group assessment tasks in six subjects. Each subject employs individual DOGBAT design and facilitation practices.

A purposive sampling plan identified an eligible and attainable sample consisting of continuing academics who had been the subject coordinator, and therefore designer, of an external undergraduate Business subject. The sampling plan also required the inclusion of a mandatory group-based assessment task and delivery of the subject in two study periods in the previous two years. In-depth interviews with the six subject coordinators responsible for designing and facilitating the eligible DOGBATs occurred in the *natural* setting of each participant's office. Four face-to-face interviews ensued. Two interviews occurred in Skype or Blackboard Collaborate Ultra platforms, providing in-built recording and synchronous visual and audio facilities. The duration of the interviews varied between 15 minutes and 105 minutes.

The workplace research setting and the collegial relationship between interviewer and interviewees created potential for researcher and respondent bias. Adherence to Yin's (2011) strategies to avoid researcher bias informed and underpinned the interview conduct. Removal of educational construct terminology, speaking in moderation, staying neutral, being non directive, and using an interview protocol, limited researcher and respondent bias (Yin 2011). Methodical, systematic and objective crosschecking of procedures and data further enhanced the trustworthiness of this study.

Analysis

Analysis of the interviews in accordance with Thomas' (2006) general inductive approach required uninterrupted listening of interview recordings to become familiar with the terminology, sequence and tone. Review and transcription of the interviews, including time stamping to reflect location within the recording, ensured comprehensive data collection. Three reviews of each interview ensured the elimination of transcription errors.

Content analysis methods provided systematic extraction of evidence from the raw data. Research questions were pragmatic and focussed on creating the opportunity for the interviewee to describe and discuss the design and praxis around their specific DOGBAT. At no time were the titles of the five constructs employed in the interview process.

Initially, a manual review of each transcript to identify references relevant to concepts or procedures associated with the five constructs was undertaken. Each identified reference was hand coded, assigned a construct colour, the initial(s) of the relevant construct, and consecutive numbering to identify total quantities of references to individual constructs, within and across the interviews. These identified references were then organised into construct specific columns, maintaining separateness of each interview. Manual review of the construct columns monitored the consistency of interpretation of references' relevance to constructs, and the accuracy of consecutive numbering.

At this stage of analysis, quantities of references for each construct within and across interviews were evident.

Within the construct columns, each construct reference was analysed against characteristics or aspects of its construct and assigned the initials of the characteristic or aspect it referenced. This analytical process allowed manual record of the totals of each construct characteristic or aspect within and across interviews. Application of Excel's text count and total functions crosschecked manual collation and calculations respectively, providing verification of analysis and calculation.

Results

References to all five constructs were evident across the interviews, (see Table 1). The additional construct results in Table 1 reveal that a notable 45% of references pertain to teaching presence, while 22% of references pertain to authenticity. References to individual accountability, group skills development and positive interdependence together represent the remaining 33% of total references to the five constructs.

Analysis of educational constructs within each interview provides the following results, Table 1:
1) Four of six interviews referenced all five constructs,
2) Two interviews did not reference the positive interdependence construct,
3) Interview 1 referenced significantly more than the other five interviews (104 of 353 = 29%),
4) Interview 3 referenced significantly less that the other interviews (27 of 353 = 8%).

Table 1. Number of references to each construct

Five Educational Constructs	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Total	%
Teaching Presence	39	18	15	34	23	31	**160**	**45.0**
Authenticity	20	19	1	10	6	21	**77**	**22.0**
Individual Accountability	10	4	5	5	10	6	**40**	**11.5**
Group Skills Development	12	5	6	8	4	4	**39**	**11.0**
Positive Interdependence	23	2	0	0	5	7	**37**	**10.5**
Total (Interviews)	**104**	**48**	**27**	**57**	**48**	**69**	353	100
% (Interview)	**29.5**	**13.6**	**7.6**	**16.2**	**13.6**	**19.5**	**100**	

Teaching presence

In response to interview questions designed to elicit details of pedagogical praxis academics described their role, design choices and facilitation practices in relation to distributed online group-based assessment tasks (DOGBATs). This may explain the prominence of the teaching presence

construct. However, the comprehensive referrals to the three teaching presence aspects may imply its importance to educational designs and facilitation that works to encourage collaboration in DOGBAT contexts. Table 2 illustrates these proportions numerically in individual interview contexts.

Authenticity

Secondary to teaching presence were references to the authenticity construct. Each of the five interviews that referenced authenticity multiple times cited at least six of the eight characteristics of authenticity, as illustrated in Table 3. Notably, half of the authenticity references related to the real world (26%) and complexity (24%) aspects.

Individual accountability

All interviewees referenced group and individual accountability and unanimously referred to the assessment of group output. References to individual accountability presented various approaches to strategy, proactive or reactive, and method, integrated or separated. Table 4 below presents data illustrating the quantity and nature of each individual accountability approach.

Group skills development

Forty-one percent (41%) of references to group skills, offered interviewees' justification for not teaching group skills. Each interviewee referred to the impossibility of teaching group skills, stated group skills were not part of their subject's content, or affirmed that the development of group skills was the students' responsibility, (see Table 5). All interviewees stated that group skills development occurs through experience (28%), and five of the six interviewees referred to the benefits of making group skills explicit within the group task context (21%). The remaining 10% of references to group skills offer two more strategies for developing group skills in context, 1) through peer assessment (5%) and 2) via the assessment of the group product (5%).

Positive interdependence

Table 6 presents and unpacks the positive interdependence strategies referenced by four interviews. Two interviews did not reference positive interdependence.

Table 2. Results – References to aspects of teaching presence

Teaching Presence Aspects	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Total	%
Instructional Design	12	2	5	11	6	10	46	29
Supportive Facilitation	23	13	7	16	14	12	85	53
Administrative Facilitation	4	3	3	7	3	9	29	18
Total	39	18	15	34	23	31	160	100

Table 3. Results – References to aspects of authentic tasks

Aspects of Authentic Tasks	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Total	%
Real World	3	6	0	2	1	8	**20**	**26**
Complexity	9	5	0	1	1	2	**18**	**24**
Collaboration	2	2	1	1	1	4	**11**	**14**
Different Perspectives	2	3	0	2	1	2	**10**	**13**
Investigation	2	2	0	1	1	1	**7**	**9**
Multiple Solutions	1	1	0	1	1	2	**6**	**8**
Ill Defined	1	0	0	2	0	1	**4**	**5**
Polished Product	0	0	0	0	0	1	**1**	**1**
Total	**20**	**19**	**1**	**10**	**6**	**21**	77	100

Table 4. Results – References to individual accountability

Individual Accountability	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Total
References	10	4	5	5	10	6	**40**
Percentage	25	10	12.5	12.5	25	15	**100%**
Proactive (P) Reactive (R)	P	P	R	R	P R	P	
Integrated (I) Separated (S)	I	S	S	S	S I	**I**	

Table 5. Results – References to group skills development

Response Themes ↓	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	TOTAL	%
Not Possible to Teach/Not Subject Content/Student Responsibility	6	1	3	3	1	2	16	41
Learnt Through Experience	1	1	5	2	1	1	11	28
Making Overt	3	1	0	1	2	1	8	21
Peer Assessment	1	1	0	0	0	0	2	5
Group Assessment	1	1	0	0	0	0	2	5
TOTAL	12	5	8	6	4	4	39	100

Table 6. Results – References to positive interdependence

Positive Inter-dependence Types ↓	Interview 1	Interview 2	Interview 5	Interview 6	Total Reference	%
Goal	(14) Common purpose (live negotiation) requires reliance on all group members to achieve	(1) Common purpose (annual reports) requires reliance on all group members to achieve	(1) Common purpose (group wiki) requires reliance on all group members to achieve	(2) Common purpose (business pitch) requires reliance on all group members to achieve	18	48.5
Role	(7) Roles (Developers / Environmentalists – Researchers / Leaders)		(1) Roles (Task responsibility, e.g. person responsible for results and findings)	(5) Roles (Hacker, Hustler, Hipster, Herder)	13	35
Incentive	(1) Proactive incentive (marks) embedded into design	(1) Proactive incentive (marks) embedded into design			2	5.5
Environmental	(1) Shared electronic assessment space (Discussion board / group communication tools in LMS)		(1) Shared electronic assessment space (Wiki and other group communication tools in LMS)		2	5.5
Sequence			(2) Required task sequence		2	5.5
Total	23	2	5	7	37	100

Discussion

Unpacking and categorising the references into aspects, approaches and strategies aligned to the five constructs provides implications for contemporary online practice

Teaching presence

Instructional design influences the facilitative aspect of teaching presence. Referencing clear intentions toward all constructs, Interview 1 in Table 1, illustrates an implied relationship between the depth of the design and the supportive and administrative facilitation it necessitates, (see Interview 1 in Table 2).

Extract 1: The framework I provide sorts out most of the problems…Sorts out the free rider problem…Framework in terms of the tasks and the penalties for not completing those tasks. My approach takes away the free rider conflict, which is the biggest conflict…. Most of the conflicts that would occur in a group get managed because of the regime you set in place…Keeps workloads/contribution requirements [leader and researcher student roles] balanced …You have to give them rigidity but maintain the flexibility at the same time

Intention manifests depth of design, creating a framework of rules, guidelines, and processes, which in turn necessitates facilitation to guide, support, and manage the design. The extensive references to both supportive and administrative facilitation verifies the influence *degree of intention* has on the creation of teaching presence opportunities. In all interviews, the total facilitative references were at least double the quantity of design references. Extract 2 also highlights this interrelatedness:

Extract 2: if you are going to take marks off them or give them marks, you have got to justify why you are and let them know very clearly that if they don't do five posts. That's a requirement…That has to be laid out very clearly…If you are going to assign them tasks to manage the free rider problem, you have got to be very clear about what tasks they have to do… When you get into groups, there's a lot of work you have to do… It's much more complicated than giving that number of students an essay to do

Implicit in this design-facilitation cycle is the degree of engagement the lecturer will demonstrate, and the intentioned level of engagement aimed at the student cohort. *Presence* in direct opposition to *aloofness* is required of all stakeholders.

The concepts and associated language of the constructs operationalises, and provides a dialogue for sharing, reviewing, and fostering the abstract concept of teaching presence in DOGBAT contexts. Further implications for practice exist when teaching presence is underpinned by educational constructs that encourage and capitalise on collaboration within DOGBATs.

Authenticity

The results suggest two platforms for the promotion of real-world relevance: 1) industry-like or industry-based processes and products, and 2) explicit relevance to contextualised employability skills and resulting personal professional development. References to the complexity characteristic of authenticity imply its role in ensuring the relevance of the group-based nature of the task. Extract 3 illustrates the instructional design considerations of the *real world* and *complexity* aspects of authenticity.

Extract 3: …thinking about an actual exercise …in terms of whatever the group's doing and who are the sorts of people that might be involved in that… The other thing is the complexity of the topic. If you want something quite complex then you may need more people…but when you're dealing with a social negotiation where there's a range of competing issues and those issues interact with each other…they require a fair amount of research… Looking at the real world and saying for something as complex as this how many people in an organisation might be involved in this…If I've got 14 or so students they can actually develop sub groups within the group to work collectively on those issues…So I am all for having larger groups. Larger groups you can do more complex topics, and you can get them thinking together although it does create some problems…would happen in the real world anyhow…A lot of things that they will do in their future will be group-based projects in firms, in non-governmental organisations and in government. All critical things they are doing will involve more than one person…Different sorts of groups in industry - hierarchical groups, formal groups, informal groups...Will be working in groups down the track and they have got to have some understanding of that. The skills, sorts of things that matter working in groups and also the benefits of groups in terms of dealing with complex issues…No one student in this negotiation subject or the policy subject could do what I am asking them to do, individually…Can get them to appreciate the complexity of the world, and the differences that happen and the competing views and getting them to solve a problem in a group task…Grappling and talking with each other about how to solve problems…Get different ideas…Problems we confront can only be solved with people with different sorts of skills: political, economic, business…It is a bit complex for students. That's why you have got to lay it out very clearly…Got to have the technology set up so that you can do it in a way that makes sense in terms of what happens in the real world

The authenticity construct provides meaningful context for DOGBAT designs and offers opportunity to develop employability skills directly related to the real world. It is reasonable to draw implication around the prerequisite role real world and complexity aspects play in creating meaningful and group-relevant tasks.

Individual accountability

References evidence the existence of individual accountability approaches in each DOGBAT. Analysis of the approaches reveals various strategies and methods. Individual accountability strategies illustrate a propensity towards either proactivity or reactivity. Proactive strategies, characterised by task design that avoids unequal contribution and resulting unfair marking, were described by Interviewees 1, 6, 2 and 5 (see Table 7). Interviewees 5, 3 and 4, (Table 7), describe reactive strategies, characterised by task design that enables unequal contribution and applies reactive strategies in response to student complaint. Reactive strategy enables and responds to a negative group experience. Proactive strategy intentionally inhibits unequal contribution and resulting unfair marking practices.

Analysis of the method used to evaluate individual contribution also provided insight into the use of integrated/contextualised/ or separated/generic tools. Table 7 categorises and describes each method and evidences the various combinations of strategies and methods within and across interviews.

Table 7. Individual accountability methods and strategies

#	Marking Method (Integrated/Separated)	Marking Strategy (Proactive/Reactive)	Prevalence
1. →	Integrated: Minimum contributions per role are set as evidenced tasks with marks allocated. *(a variety of platforms evidenced, e.g. recorded web conferences, discussion boards, emails to lecturer)*	Proactive: All receive group mark less marks not achieved through omission of individual task meeting contributory criteria	**Interview 1** (10 marks off individual's group mark for each task not evidenced)
	Integrated: Team performance appraisals (TPAs) are submitted individually after each team meeting – TPAs reviewed and individual weighting applied to group score	Proactive: Team performance appraisals and minutes of meetings provide evidence of level of contribution – individual weighting calculated and applied to individual's group score	**Interview 6** (Team performance appraisals reviewed, weighting applied individually to group score)
2. →	Integrated: Recording/documentation of contributions, communications and or group evaluations is mandated *(a single collaborative electronic space where final assessment is created, e.g. wiki)*	Reactive: Responsive to student request for review/complaint. Weighting, determined by level of contribution, applied to group mark	**Interview 5** (Wiki review – weighting calculated according to contribution – marking penalty or reward applied)
3. →	Separated: Peer Assessment Individual's weighting or score from peer assessment applied to group mark individually *(web based self and peer assessment)*	Proactive: (a) Integrated into design as part of process/task OR Reactive: (b) Responsive to student request/complaint – removed from group or adjust individual mark	**Interview 2** (Peer evaluation - Non contributor marked down) **Interview 5** (Online peer evaluation facility – weighting calculated and applied) **Interview 3** (If no complaint, all get Collaboration marks, if complaint, peer evaluation and penalty applied) **Interview 4** (Peer evaluation upon complaint, weightings adjusted)

Empirical evidence is required to attribute a value to the various strategies and approaches. However, the revelation of strategies and approaches, and analysis of their intention towards fostering fair and positive online group-based assessment experiences, provides the basis for pedagogical consideration and dialogue in relation to DOGBAT design and facilitation.

Group skills development

All interviewees stated that by operating within group environments and within the designed and designated frameworks of group projects, students developed group skills. Each of the interviewees outlined a framework that served to create rules, processes, and guidelines that, in the implementation process, required teaching staff to make explicit the group behaviours, skills and processes expected. Five interviews outlined supportive facilitation practices involving openly discussing group skills, processes and potential group issues with students. Interviewees also described administrative facilitation practices that included outlining the procedural responses for conflict situations, and explaining fair marking methods and strategies and their applications.

The implementation of group task frameworks evidences the opportunity for experiential development of group skills within a context of guidance and support. The complexity of the frameworks appeared commensurate with the extent to which educators actively intended to encourage collaboration and the development of group skills. Implications exist for the design and facilitation of DOGBATs in relation to the intentional development of collaboration and other employability skills. Implications also exist for the potential benefits of professional development that would validate and extend experiential teaching and learning practices.

Positive interdependence

The lens of positive interdependence enables review of the degree of collaboration within the student groups and offers a framework of positive interdependence types to manipulate into the DOGBAT design. In this context, the prerequisite nature of goal interdependence (see Figure 1) is noteworthy as is its intersectionality with the real-world aspect of authenticity (see Figure 2). There are further implications for the importance of contrived and contextualised incentive interdependence in education settings to replicate the real-life incentives and benefits of effective collaboration and subsequent production of valued group outputs. The symbiotic nature of the inferred relationship between role interdependence and individual accountability is also worthy of consideration.

Practice implications

Viewing intentioned DOGBAT design through the lens of the five educational constructs allows articulation. The various types, characteristics, methods and strategies of the constructs supplies a conceptual and linguistic framework that enables a common professional dialogue among online educators in the higher business education sector conducive to sharing and reviewing DOGBAT designs.

Employing the five constructs framework to articulate pedagogical justification of existing design and facilitation strategies may offer verification of practice as well as an opportunity to refine the design. When unpacked into effective strategies that are applicable on a sliding scale, the five constructs offer the potential to serve as five foundational aspects of instructional design choices for the design of online collaborative assessment. The constructs could provide the foundation for a structured approach to group skills development within a subject and across a discipline or program. Mapping the construct relevant strategies applied within and across subjects can provide a visual audit of the scaffolded development of collaboration skills within subjects, courses, programs, and disciplines. Consequential improvement of student experience, outcome, retention and satisfaction, exist as inferential implications.

Future research

This study points to the need for further research into the effectiveness of each of the five constructs. For example, the implications of a proactive rather than reactive approach to individual accountability could provide definitive guidance to learning designers. Further research investigating the impact of DOGBAT design choices may reveal any difference in the level of student satisfaction between DOGBAT designs that employ, and those that do not employ, a specific construct. Do DOGBAT designs that employ a high level of all five constructs achieve better student outcomes than those that do not? Does the *why*, that is, the motivation for designing the online assessment task as a group task, reflect in the design choices (the how)? Is it coincidental or consequential that Interview 1 has the highest amount of references to the five constructs? Conversely, is it coincidence or consequence that Interview 3, motivated by increasing administrative obligations and resource limitations recorded the lowest number of references to the five constructs, including omitting intentional positive interdependence strategies from the design?

Subsequent research implications would support the promotion of pragmatic strategies and approaches to incorporate the five constructs into online group-based assessment practice. Appropriate and targeted research may provide the foundations for the development of a set of guidelines that inform a student centric pedagogical approach based on the five constructs. The approach potentially provides focus on presence and engagement in meaningful and relevant online group contexts, necessitating collaboration that develops group skills in an experiential learning context and is administered and assessed within fair marking practices. This pedagogically considered approach is applicable regardless of the motivations for establishing online group-based assessment. Research informed design models and facilitation practices in DOGBAT contexts will offer much needed assistance and support to academic teaching staff.

Research into the appropriateness and effectiveness of designing and facilitating intentional and considered DOGBATs across disciplines, programs and institutions, both domestically and internationally, would also beneficially inform academic teaching practice.

Limitations

A small sample of six interviews conducted in a single higher education institution negates generalization or transferability to broader contexts. Investigation of student responses falls outside the scope of this study.

Conclusion

This initial research confirms that six academics intentionally designed online group-based assessment tasks that aimed to encourage collaboration to varying degrees. The five educational constructs of teaching presence, authenticity, individual accountability, group skills development and positive interdependence are evident. However, the level of application and complexity vary within and across the DOGBAT designs. Therefore, this research reveals that the design considerations are arbitrary in nature and depth and consequently could benefit from a structured framework that will guide and inform systematic and comprehensive DOGBAT design choices. Current and foreseeable economic, social, political and technical disruptions to higher education in Australia warrant further research into online pedagogy.

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