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Students' experience of peer-interaction in a blended learning course at a South African higher education institution

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Abstract: An investigation of students' experiences of peer-interaction in a blended eLearning course was conducted. In order to understand, evaluate and improve student experience of peer interactions, four learning facilitators revised the course, to align with current instructional design best practices which included a fair amount of peer interaction. In this qualitative study, activities were designed using a constructionist approach and structured to increase student engagement with content and peers including frequent collaborative group-work activities. Students had to design and develop four artefacts online while presenting findings and assessing the products and performance of their peers in contact sessions. The findings mitigate the importance of course design, peer assessment and group work activities that impact student experiences of peer interaction. Implications for practice and policy: (1) This study informs course designers of best practices in blended learning. (2) The findings re-iterates the value of group work and peer assessment in blended learning. (3) Peer interaction has an impact on student experience in blended learning. (4) Aligning course design, peer assessment and group work activities allows for successful blended learning.

Keywords: blended learning; peer-interaction; course design; group work; peer assessment.

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1 Introduction

In todays' digital world, a major part of our daily lives has been affected by 21st century technology (Kesharwani, 2020). This is not only true for adults, but also students who 'live and work in the 'on demand economy', *where* students are inclined to learn on the go' (Echo360, 2017). From an early age, digital natives have access to the internet and are bombarded with different learning materials. Learning facilitators are required to adapt their teaching strategies to enhance the learning experiences of the 'net'-generation (Preville, 2018), i.e. the people that live in an era where information is readily available.

The demands posed by the 21st century learning and the working environment, force learning facilitators to have a sound educational foundation. In addition, learning facilitators must possess not only an awareness of the opportunities to enhance learning experiences offered by technology but also the practical skills necessary to implement the technology in their teaching environments (Van Ryneveld, 2017). There is a mismatch between the technological knowledge of some teachers (digital immigrants) and that of students', with added pressure on teachers to use technology (Kesharwani, 2020). The volatile nature of ICT, calls for continuous educational innovation and it is by exploiting the capabilities of these ever changing technologies that new perspectives open up for university teachers (Das et al., 2017).

Taking in consideration the 'net generation', increased use of technology and demands of 21st century teaching, a eLearning course has been developed that not only aims to create an awareness and develop practical skills of the technology available, but also ground teaching in learning theories and instructional design models. Therefore, a constructionist approach was employed where students had to create artefacts to demonstrate their learning process (Papert and Harel, 1991; Resnick, 1998). These artefacts were built in an environment where the student was engaged with technology tools at the same time (Papert and Harel, 1991; Resnick, 1998). During a constructionist designed course, students share knowledge, think and reflect in a variety of ways while they are socially involved with others. These shared activities encourage learning (Walton et al., 2019). Since there is such a wide variety of technological applications available, group work was used. Each member in the group explored a different application to incorporate peer assessment in order for students to gain knowledge about a variety of applications. As rightfully stated by Harmes et al. (2016), technology alone could not be an educational intervention, it can however be used effectively to enhance learning.

It is to this end that the researchers decided to explore student experiences of peer-interaction in a blended learning course. The course was designed using constructionist approaches and demonstrated by example eLearning through constructionism. This study contributes to the body of knowledge by highlighting significant trends and patterns in the experiences of students as they engage in peer assessment, group work activities and explore different learning design strategies in a blended learning course. The purpose of this study is to explore the impact of these peer interactions in a blended learning course.

2 Literature

Blended learning is widely accepted as the integration of different types of educational techniques and technologies (Köse, 2010; Lin, 2007; Prasad et al., 2018), a combination of traditional face-to-face instruction and online learning. A blended learning approach, however, is an enhanced learning experience focussed to optimise learning by considering the learning needs of the students, presenting students with novel opportunities and challenges (Torrisi-Steele, 2011). Boelens et al. (2015) highlighted further that blended learning incorporates a deliberate attempt to combine classroom-based and online activities to initiate and support learning. It can thus be said that a blended learning approach is not merely implemented for the sake of its usefulness and convenience in offering timely, continuous and flexible learning (Prasad et al., 2018), but also to encourage student engagement through an active approach (Kenney and Newcombe, 2011) that supports deep and meaningful learning (Garrison and Kanuka, 2004).

Martinez (2020) maintained that deep learning is enhanced when courses are designed such that students connect with each other through the formation of a learning community. Further, working productively and actively in groups empowers students to take ownership of their learning as they work with peers to solve problems. Another design principle emphasised by Martinez (2020) is to contextualise learning experiences to real-world problems, allowing students to work on materials which are personally relevant to them. Finally, she maintains that when technology is incorporated purposefully, rather than to automate learning, deeper learning occurs (Martinez, 2020).

Constructionism is a well- known learning theory that focuses on learning taking place through discovering, knowledge construction, and the making of objects in the real world while using what is already known. When teaching from a constructionist perspective, the teacher becomes a facilitator and reviewer (Parmaxi et al., 2013), while the students control and manage their own learning. The student takes on the role of a designer and creates tangible artefacts in a social environment (Cocciolo, 2011) and taking advantage, for example, of available computer technology (Papert and Harel, 1991; Resnick, 1998). In doing so, the process of thinking becomes visible (Papert and Harel, 1991). Resnick (1989) claimed that the designing of activities encourages students to be involved, share interdisciplinary knowledge, think in a variety of ways, and reflect while socially involved with others. These shared activities encourage people to learn (Walton et al., 2019).

Using technology mindfully, during blended learning, allows students to communicate, collaborate and design creative projects, which leads to the development of 21st-century skills. Researchers indicate that for students to be motivated, and have a positive attitude, they need to have regular assessments (Marriot, 2009), experience achievement, and have access to learning material (Al-Ani, 2013), use technology to personalise their studies and the examples need to relate to real life scenarios (Malinina, 2013).

Drawing on these principles, the researchers sought to design a blended learning course which incorporates technology, group work and peer assessment in order to enhance deep and meaningful learning. Group work and collaborative tasks were first promoted by Biggs (1999) as essential contributors to meaningful and deep learning. Since then, trends in collaborative group work integration in course design have evolved to emphasise self-managed teams, as it aids students in developing deeper learning required for complex and innovative professions (Sridharan and Boud, 2019). Sridharan and Boud (2019) caution that group work activities in themselves do not automatically lead to the development of skills such as self-management, teamwork, and engagement, but that proper design is required to avoid free riding.

In a study conducted by Horrocks et al. (2018) on student perspectives of team and group work assessment and management, students identified seven factors which contribute to effective group work design. These factors include 1) student preparation for group work, 2) facilitator support for the group tasks, 3) clarity on mark allocation for teamwork, 4) variety in group member allocation strategies, 5) individual and group assessment of outputs, 6) evaluation of individual contributions through peer marking and 7) assessment of the teamwork process, including presentations of work (Horrocks et al., 2018).

Several studies conducted on group work have reported positive student experiences such as appreciation of social support (Johnson and Johnson, 2005) and fluid peer-to-peer knowledge and skill transfer (Pfaff and Huddelston, 2003). There are however studies reporting on negative experiences of individuals involved in group work, such as feelings of anxiety and avoidance due to self-reported low socio-emotional and instrumental functioning (Lavy, 2017). In studies conducted on group work and personality types, introverts reported feeling ignored especially when requesting more relevant peer feedback (Webb, 1982).

With regards to peer marking, Sridharan and Boud (2019) maintained that incorporating peer assessment tasks serves as one design element to enhance skills development, as the feedback received from peers allows students to realise when

something is wrong and how to correct it. Adesina and Adesina (2018) found that peer assessment encourages participation and engagement. Peer assessment can be defined as learners' judgement of the value, level and quality of a product or performance of a peer (Topping, 2009). Rodríguez-Gómez and Ibarra-Sáiz (2016) emphasised that practicing ePeer assessment allows students to develop skills such as information analysis, making ethical decisions, analytical judgement and communication. In a number of research studies, students themselves reported that peer review increased their motivation and improved their learning (Meek et al., 2017). Arguably there is a great advantage in using peer assessment to encourage student participation.

Peer assessment not only influences the participation of the assessor (peer doing the assessment) but also that of the assesse (peer receiving feedback). Receiving peer feedback encourages students to learn more actively and produce better work (Lu and Law, 2012) while providing feedback to peers encourages self-reflection (Goh et al., 2019). Goh et al. (2019) maintained that peer review practices encourage students to interact more with course content because students engage in self-study of course materials in order to provide better peer feedback. In addition, Demir (2018) found that in a blended learning context, using online peer assessment before a face-to-face class encourages students to engage more actively during class and allows assessors to provide more objective feedback online. Teachers that fear the reliability and validity of peer assessment often deprive of the benefits (Falchikov and Goldfinch, 2000).

During peer assessment, student's attitudes differ from when they are assessed to when they are assessing each other. While some students are confident in assessing their peers, others experience it as being subjective and of a different level than being assessed by a university teacher (Mutwarashibo, 2016). Generally students do not mind assessing their peers, however they are less comfortable being assessed by a peer (Mutwarashibo, 2016). This does not mean that peer assessment in general is viewed more negatively than teacher assessment but rather that the overall impression was positive on assessing peers and negative on being assessed by peers (Mutwarashibo, 2016).

An interesting finding was that students with a positive attitude to peer assessment have a negative attitude towards participating in peer assessment. Often students put in so much effort in giving meaningful and constructive feedback that they get tired of continuing with it (Zou et al., 2017). However, when incorporating peer assessment university teachers must focus first on the students' beliefs about their interdependence on their peers as well as their confidence in their own abilities to assess (Zou et al., 2017). However, through guidance and training, Mutwarashibo (2016) and Zou et al. (2017) felt comfortable that attitudes can change from negative to positive.

In some instances unclear instructions can lead to inaccurate peer assessment. The basic assessment principles cannot be neglected when designing assessment (Tosuncuoglu, 2018). There are several factors that contribute to effective peer assessment. Jones (2015) emphasised the need for teachers to share assessment criteria with students to provide opportunities for learning. Criteria should be decided upon prior to students commencing with work and these criteria should be properly explained to ensure understanding. In order for students to commit to tasks they need to understand from the onset what is required of them. The criteria need to be communicated using the correct language and terminology.

Rubrics are often used in peer assessment as they provide a simple, and easy to follow format for students and outline the criteria and expectations clearly (Wolf and Stevens, 2007). Students are able to evaluate and assess the task based on the criteria

provided and make informed decisions and judgements. This promotes accurate and fair peer assessment. Peer feedback is seen to be of greater value, since more than one student could give feedback, students could benefit from more comprehensive feedback in contrast with teacher feedback (Topping, 2009). Teachers need to guard against valuing their judgements superior to those of students. Falchikov and Goldfinch (2000) maintain that even though marks are not a valid indicator of achievement, teachers' main concerns are with the agreement of their marks and those that are given by peers.

Since peer assessment involves active learning and the joint construction of knowledge through discourse it is seen as a manifestation of constructionism. Peer assessment often provides useful and detailed feedback that has formative benefits to improve students' learning (Chin, 2016).

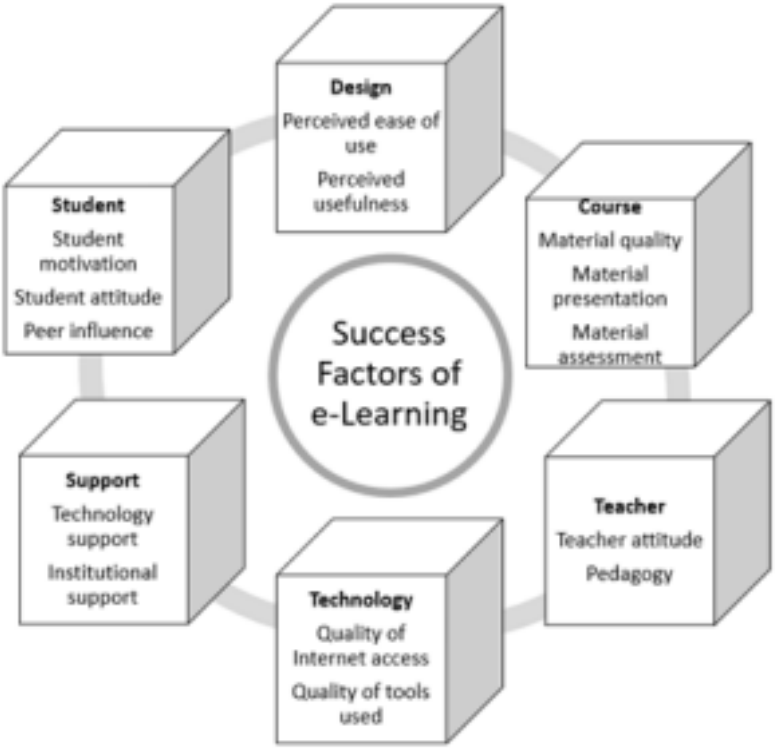
3 Theoretical framework

A theoretical framework forms the foundation for a research study and emphasises the perspective that the study was examined from (Sekaran and Bougie, 2013). It is important to note that even though the course was delivered in a blended mode the course aimed to teach eLearning using eLearning tools, principles, theories and approaches. For this reason an eLearning framework was chosen. In researching possible eLearning frameworks, the aspect of factors that contribute to successful eLearning implementation was considered as the students in the study would need to understand, design and develop content. Khan (2001) proposed the first eLearning framework and highlighted 8 components for successful eLearning, while Sun et al. (2008) proposed 6 components for successful eLearning. Haw et al. (2017) adapted the framework proposed by Sun et al. (2008) to fit the secondary school curriculum, keeping the same dimensions except changing the environment dimension to focus more on support.

The study draws from the theoretical framework of both Sun et al. (2008) and Haw et al. (2017). In their study 'Conceptualise the eLearning Framework for the Secondary School Curriculum', Haw et al. (2017) identified the LearnCube which consists of 6 dimensions. Each dimension relates to a different aspect involved in the Critical Success Factors for eLearning. The dimensions are suitable for this study as it provides a holistic outlook to the design and development of eLearning content and the attributes for each dimension. However, the attributes do somewhat differ for the current study (blended learning in higher education) and therefore the model has been adapted to regroup some of the attributes to form a new conceptual framework (see Figure 1) that will frame this study. For example, the Material quality attribute that was previously part of the Design dimension has been moved to the Course dimension and the Peer influence attribute that was part of the Teacher dimension has been moved to the Student dimension (see Figure 1).

These six dimensions and the key attributes indicated in Figure 1 were used to guide the researchers to formulate the questions in the survey instrument. However, to explore the impact of peer interactions in a blended course, we focused more on the Design, Course and Student dimensions.

Figure 1 Adapted LearnCube (Sun et al., 2008; Haw et al., 2017)



4 Methodology

In this interpretive study, the learning facilitators wanted to understand the learning environment and its influence on the student experience in terms of peer interaction, what students do, think, feel and say, and what was considered valuable (Erickson, 1986). Therefore, a qualitative case study approach was used (Denzin and Lincoln, 2000).

A constructionist approach to teaching in a blended mode (Boelens et al., 2015) was used to present the course, students attended five contact sessions with 18 weeks of online interaction with their peers and facilitators. The participants (29), conveniently and purposefully sampled (Salkind, 2010), all enrolled for a Postgraduate Certificate in Higher Education and were completing a course in eLearning. Even though the students originated from different disciplines, they were all involved in a teaching and facilitation role. The course focused on eLearning and technology tools suited for their needs as they also needed to combine technology and sound pedagogy to deliver content and design assessments.

The course was facilitated using a blended mode and a constructionist approach (Harel and Papert, 1991) to guide the students through the learning process. During this period, students handed in numerous assignments, either self-assessed, facilitator assessed or peer assessed. Additionally, students had to reflect on their experiences during each stage of the course since the influence of self-reflection on the learning

process is widely emphasised (Bers et al., 2002; Veenman et al., 2006; Tavil, 2014). From these weekly reflections, the attitudes of the students regarding the design and development of constructionist eLearning curricula could be seen.

Students completed a survey with open-ended questions to enable the facilitators to evaluate the student experience on specific design elements implemented in the course. The student responses to the survey and the self-reflections were extracted from the Learning Management System (LMS), and deductively analysed to reveal emergent themes (Kyngäs and Kaakinen, 2020). Survey items provided useful information regarding the students' attitude towards the course and their experience of peer interaction. Furthermore, it offered an opportunity to identify any change and personal growth through their learning journey. All ethical procedures were followed to uphold the anonymity and confidentiality of the students.

5 Findings

The findings of this study reveal both positive and negative experiences of peer interactions. Owing the nature of the course design, most group work activities also involved peer assessment. This intertwined nature resulted in the participant responses to several questions having relevance to course design, peer assessment and group work. The questions in the survey were not specifically phrased to address the impact of peer assessment, but rather to focus on how peers' attitudes influenced interaction and how peers influence participation in activities. However, participants also mentioned the influence of peers in their interaction in questions that focused on course design, tools, course presentation, teaching and assessment strategies and motivation to do the course. The findings are structured according to the three dimensions selected in the theoretical framework to express how the design of the course influenced the development of peer assessments and how activities were then structured to achieve measurable and plausible outcomes.

5.1 Design

A conscious effort was made when designing the course to include well-structured activities (Boelens et al., 2015). Careful consideration towards time and methods of collaboration for cooperative learning were planned. The majority of participants confirmed that the structure and format of the course was well presented ([P28]). As one student mentioned, the course design was useful and contributed more to deeper learning than the achievable grades.

> *'... it's okay to get 50% for some things and rather take away a deeper meaning and learning' [P23: Week 2 Reflection]*

The use of a variety of tools to choose from, ensured increased exposure ([P13], ([P23]). Surprisingly, students had positive reactions to online groups as well as working in groups during contact sessions (Johnson and Johnson, 2005). Students further valued the presence of the facilitator coupled with their peers while they were busy with their activities. Emphasis was placed on the importance of support and scheduled sessions for questions and extra collaboration ([P26]). As one participant mentioned:

> *'having to work with my peers and have my facilitator along my side to explain and clarify have been amazing' [P10]*

5.2 Peer assessment

The value of peers and role of peers in their personal development was largely highlighted. Some participants claim that without the assistance of their peers, they might not have made it ([P9], [P12]). Peer assessment extended the learning opportunity because it saved time and they learnt from each other (Meek et al., 2017). It gave them a different perspective and channelled their thinking to be open to different approaches. Peer assessment proved to be very effective as, 'doing peer assessment and learning together helped cover more content quicker '[P4] which was also found by Goh et al. (2019). The ability to cover a large amount of content in short spaces of time is supported by [P16] who believes that the assessment strategies allowed them to track their progress and detect early on if they needed assistance. [P19] describes the assessment as relevant and authentic while [P16] describes the group activities and peer assessment as intriguing. In most groups the participants had positive experiences as their peers had positive energetic attitudes and were helpful and willing to learn, similarly mentioned by Meek et al. (2017). As P28 mentioned in the weekly reflection:

> *'I was very impressed with the video that I evaluated and it has provided me with more ideas that are creative. In addition, sharing ideas in groups divides the workload but also introduces other thinking dimensions'. (P28: Week 1 reflection)*

Additionally, the opinions of the peers (and facilitators) exposed the students to more than one approach/method/teaching strategy ([P6] [P19]), it provided positive criticism (P14]), and exposed them to variety of assessment activities from which they could learn ([P11]). The participants confirmed that although they might be kinder to their peers than the facilitators as suggested by Mutwarashibo (2016), the peer assessment created a relaxing environment ([P23]). The clear rubrics made the assessment easier as it provided structured criteria to guide their assessment ([P27]). This structure was also found to be beneficial in the study done by Jones (2015). Overall, the students respected their peers' opinions and suggestions and appreciated the lessons learnt from peer assessment as mentioned by [P26],

> *'most of the time you learned the most by peer assessment in class and learning from what others learned during their instructions.' [P26])*

Contrary to the benefits of peer assessment, some groups that were poorly managed experienced the peer assessment to be frustrating as their peers went over the time allocated ([P8: Week 3 reflection]). [P15] claims that the assessment strategies used were effective but there were too many assessment opportunities. [P17] and [P19] had negative experiences with peer groups as sometimes they spoke in other African languages ([P17]) or they were just introverted and preferred to work alone ([P19]).

5.3 Group work activities

Group activities contributed to a large extent to the bulk of the course as it was designed to promote 21st century skills that align to the constructionist approach to teaching and learning. Participants understood the value in group work activities as they described the learning from peers as priceless ([P28]) when they have to interact, explain and demonstrate practically to each other. This interaction was largely explored and found by Martinez (2020) who concluded similar findings. They also learnt that different members

in the group had different roles that could benefit them differently as explained by [P28: Week 2 reflections].

> *'Everyone has their role and potential. We have different ways of thinking and sharing ideas will definitely benefit each of us as individuals.' [P28: Week 2 reflections]*

Group work improved their understanding ([P1]) and they learnt more ([P19]). The improved understanding through group work is confirmed by two of the participants that said:

> *'Group work provided more insight OBVIOUSLY' [P16]*

> *'It really is important to network and work together!' [P26: Week 2 reflections]*

When working in a group, it is not only the contribution of knowledge of group members that has an influence on the group working, but also the attitudes of the members in the group. The participants in this study indicated that the positive attitude of the group members encouraged them to learn, and supported them throughout ([P4], [P5], [P9]). This continuous support and encouragement is not the case in all groups though. Some experienced group work as unhelpful, members not committed and others prefer to work on their own ([P17], [P19]). The lack of commitment and unhelpful nature of group members is similar to the findings on peer assessment above. This quote expressed the contrasting experience of group work versus working with your peers.

> *'I don't like groupwork and peer assessment. My peers also taught me some very important stuff.' [P8: Week 4 reflections]*

One positive aspect of group activities was the idea of group learning. Students experience a sense of group cohesion ([P25]). They could share information ([P3]), offer and receive assistance ([P4]), and have a feeling of togetherness ([P12]). They were proud of what they accomplished and shared ([P6]). Students confirmed that they not only learned more ([P24]), but they also learned the importance of working in a community of practice ([P1]) and the unlimited support they get while they are learning ([P2], [P9], [P11]). These findings were also highlighted previously by Martinez (2020). This is evident by the response of two participants that mentioned:

> *'I have learned more from my peers as some were good in some applications as used in e- learning so helped me to understand them' [P18].*

> *'We were able to support and help each other when we did not understand what was happening. We also shared our frustrations which helped. They were superduper I would not have completed this without them.' [P12].*

> *'I consider the group times as powerful learning moments for me because through listening to the others and the way they think about things and the input they have on the different topics helps me think about things from different angles' (P4: Week 1 reflection).*

Although not part of the survey questions, students stressed the effect that their peers had on their motivation which is also emphasised by Meek et al. (2017). Responses like 'I can share …with my peers kept me motivated' [P6], 'most of the time it was my peers (that motivates me)' [P8], 'motivation to have a better presentation and delivery of task' [P6] and 'motivated me to know that it's possible, i can also do it' [P13] confirms that peer assessment and group activities has an element of motivation attached to it. It

encouraged them and built their confidence to freely express their understanding and motivate their own choices. Peer feedback also featured as a valuable aspect to peer assessment similarly mentioned by Topping (2009). For example, a participant mentioned:

> *'I found the peer feedback on Social Media Apps very insightful.' [P28: Week 2 reflection]*

This quote summarises the experience of many of the participants in this study. It demonstrates the importance of detailed design, descriptive and varying assessments and carefully thought through activities. It also highlights that participants need to have a positive attitude and motivate and support one another throughout the course.

> *'I have met and interacted with more peers in this class than in the others. The mood in this class is also more positive, with less complaining, which is more favourable for learning. I have learnt about various tools/apps from peers. In addition, peers have assisted me with tool/technology when I have struggled.' [P28]*

6 Discussion and conclusion

Peer-interaction as necessitated by Rodríguez-Gómez and Ibarra-Sáiz (2016) forms a vital part in the development of knowledge, skills and values required for 21st century learning. Using blended learning as an approach to communicate and deliver content; and enhance peer interaction contributes to the development of successful eLearning moments (Demir, 2018). The findings of this study highlight three main contributing factors to enhance peer-interaction. Students reflect on the course design, peer assessment opportunities and group work as providing them with opportunities to communicate and collaborate with peers. However, the study also magnifies the subjectivity and individualism of learning, learning design and interaction with others. For example some students are introverted and work best alone. The role of peer feedback propagates meaningful learning from peers and provides a collaborative outlook to learning material.

Even though students work differently and have different methods, the students' voices highlight the value of reflection not only for student course evaluation but for personal reflection. These reflective practices form a significant part of learning design and assist learning designers to improve content delivery in accordance to best practice and ensure student satisfaction. Further recommendations for study on student reflections of peer interaction is to compare the student voice in blended and fully online (distance) modes of delivery. This comparison between blended and fully (online) distance modes will emphasise and highlight differences and similarities in course design, peer assessment and group work and how they should feature to promote student success.

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