Peer assessment effects on the self-assessment process of first-year undergraduates

Jessica To[1] & Ernesto Panadero[2]

[1]Faculty of Education, The University of Hong Kong, Hong Kong, China

[2]Departamento de Psicología Evolutiva y de la Educación, Facultad de Psicología, Universidad Autónoma de Madrid, Spain.

Correspondence concerning this manuscript should be addressed to: Jessica To, Room 667, 6/F Meng Wah Complex, The University of Hong Kong, Pokfulam, Hong Kong. Email: jkaryan@hku.hk

Notes on contributors

Dr Jessica To is a Post-doctoral Fellow at Faculty of Education, The University of Hong Kong. She is interested in investigating feedback, exemplar use and issues related to the implementation of formative assessment in higher education. http://orcid.org/0000-0002-0264-3160

Dr Ernesto Panadero is a Ramón y Cajal researcher at the Developmental & Educational Psychology Department, at Universidad Autónoma de Madrid and honorary professor at Deakin University (Australia) at the Centre for Research in Assessment and Digital Learning. http://orcid.org/0000-0003-0859-3616

Abstract

Peers carry potential in enhancing students' self-assessment development, but few studies have explored how peer scaffolding is enacted in the process. This qualitative study explores peer assessment effects on the self-assessment process of eleven first-year undergraduates and the factors limiting peer influence. Drawing on the data from students' journal, follow-up interviews, observations of in-class formative peer assessment activities and teacher interviews, we ascertained that peers could aid the self-assessment process by enriching student understanding of quality, refining subjective judgement and deepening self-reflection. Yet, peer influence could be reduced by distrust, tensions in feedback communication, competition and lack of readiness for peer learning. Implications for effective use of peers in supporting self-assessment development are discussed.

Keywords: peer assessment effects; self-assessment process; first-year undergraduates

Peer assessment effects on the self-assessment process of first-year undergraduates

Introduction

Self-assessment is one of the educational variables leading to academic improvement of performance (Brown and Harris 2013). It is defined as 'the involvement of students in identifying standards and / or criteria to apply to their work and making judgements about the extent to which they have met these criteria and standards' (Boud 1995, 12). Its benefits include developing students' ownership of assessment criteria and evaluative judgement (Tai et al. 2018), enhancing self-regulation and self-efficacy (Panadero, Jonsson, and Botella 2017), encouraging critical and reflective thinking (Cassidy 2007), empowering students (Taras 2010) and preparing them for lifelong learning (Boud 2000).

Boud (1995) and Dochy, Segers and Sluijsmans (1999) acknowledge the potency of peer involvement in supporting self-assessment, but empirical evidence to support this claim seems lacking. Considering peer-assisted learning principles (Topping 1998, 2010), we hypothesise that peers can facilitate self-assessment by clarifying misconceptions, providing emotional support, increasing task understanding and stimulating cognitive restructuring of schemata. These positive effects are maximised in reciprocal peer assessment wherein the dual role of assessor and assessee allows students to derive reflective insights for self-monitoring (Boud 1995).

In line with these ideas, this paper sets out to investigate peer assessment effects on the self-assessment process of first-year undergraduates. Our study targets at year one students because the school-to-university transition poses a challenge for them in pursuing academic demands and learner independence (Webster and Yang 2012) and their unfamiliarity with the university's assessment requirements could be a major hindrance to self-assessment (Yucel et al. 2014). By triangulating data from students'

journal, follow-up interviews, observations of in-class peer assessment activities and teacher interviews, we seek to explore how peers could inform the self-assessment process of first-year undergraduates and what factors could limit peer influence in the process. The significance of this paper lies in uncovering the link between peer scaffolding and self-assessment development and suggesting how to make effective use of peers in enhancing students' self-assessment capabilities.

Self-assessment process

When self-assessment is conceived as a strategic process to regulate one's performance, it becomes crucial to understand how this process is operationalised (Panadero and Alonso-Tapia 2013). However, to our knowledge, only a few studies have unpacked this process and not all in sufficient detail when it comes to external influences. Andrade and Du (2007) described self-assessment as a three-step procedure: (i) understanding teacher expectations for performance through analysis of models or rubrics; (ii) evaluating performance against standards; (iii) using feedback generated from self-assessment to revise one's work. Nevertheless, their summary provided limited information about students' interaction with external input. Sargeant et al.'s (2010) model highlighted the complexity of different components that affected self-assessment, for example sources of information, students' response to information, learning climate, tensions, etc. Nonetheless, their model failed to discuss students' specific actions in different stages of the self-assessment process. Yan and Brown's (2017) cyclical self-assessment model is more comprehensive in outlining the process. When students see the need for self-assessment, they first determine task criteria by referring to assignment guidelines and rubrics. Then, they seek feedback from others and themselves to perform self-reflection and subsequently make evaluative judgement.

The judgement informs them whether their criterion understanding requires refinement and how their initial judgement can be calibrated. Given the clarity of this model, we adopt it to base our discussion of the self-assessment process. Next we examine the self-assessment process in three major stages. These stages represent a purposeful and explicit self-assessment activity, but in many occasions students do not self-assess so strategically.

First, determining task criteria is the foundation of self-assessment because students require a yardstick to measure their fulfilment of task requirements. Their criterion understanding shapes their selection of task strategies and management of time, motivation and efforts for task completion (Boud 1995; Panadero and Alonso-Tapia 2013). However, determining criteria can be complicated because some undergraduates lack a clear understanding of criteria before task engagement (Andrade and Du 2007; Yucel et al. 2014). Their interpretation of criteria can be influenced by their goal orientation, prior knowledge, task and assessment experiences and self-efficacy (Nicol and Macfarlane-Dick 2006). It is likely that their understanding differs from their teacher's even if they are provided with a detailed explanation of assignment guidelines and rubrics (Andrade and Du 2007). Therefore, feedback plays a pivotal role in fine-tuning their interpretation.

Second, seeking feedback is critical in the self-assessment process as students need input to evaluate their performance and reflect on the cognitive processes and task conditions leading to the performance (Butler and Winne 1995). This is also the occasion where students exercise their agency in choosing feedback sources and the way of feedback uptake. Feedback can be external (comments from teachers, peers and others on task approach and application of concepts and strategies) and internal (students' personal feelings about their work, mastery of knowledge, strategy use and

their perception of task success) (Butler and Winne 1995; Nicol and Macfarlane-Dick 2006). At least three issues can arise during this stage. First, their perception of teacher as a content expert may eliminate their intent to seek feedback from peers (Panadero 2016). Second, the act of eliciting feedback may be discouraged by some personality traits such as shyness or fear of looking incompetent (Sargeant et al. 2010). Third, internal feedback may be inaccurate (Boud 1995) but is influential in the self-assessment process (Panadero and Alonso-Tapia 2013; Yan and Brown 2017). The contradiction between external and internal feedback constitutes an obstacle for students to make impartial judgement of performance. Their response to the dissonance, which could be ignoring, rejecting, distorting external feedback or using it to question their own assumption about task performance, largely depends on their learning beliefs and self-efficacy (Butler and Winne 1995).

Third, self-reflection is the stage where students critically evaluate their performance based on their understanding of task criteria and the feedback sought to generate evaluative judgement. When performing self-reflection, students compare their performance with their internalised standards and those perceived by external parties to identify strengths and weaknesses. Then, they attribute task success or failure to the task conditions experienced and decide whether the same or different strategies to be taken for improvement (Panadero and Alonso-Tapia 2013). The effectiveness of self-reflection may be influenced by two conditions: (i) how well students yield useful insights during and after an activity, also known as 'reflection-in-action' and 'reflection-on-action' by Schön (1987); (ii) whether they are free from embarrassment in revealing their realistic assessment to teachers and peers (Yan and Brown 2017). If psychological safety is absent, some low achievers may provide an overly positive evaluation for face saving (Brown and Harris 2013), and some high achievers may

refrain from acknowledging their outstanding performance for fear of looking boastful (Andrade and Brown 2016). This issue implies the necessity for an emotionally supportive environment to develop students' reflective skills.

In summary, self-assessment is a complex process shaped by individual's prior learning experiences, motivations, emotions, psychological factors and cognitive and metacognitive capabilities. The complexity presents a challenge to teachers in addressing individual differences in the self-assessment process. Keeping this in mind, engaging students in peer assessment seems to be a possibility to enhance their self-monitoring ability.

Peer assessment effects on self-assessment

Peer assessment is useful in sharpening students' self-assessment skills because students apply their understanding of criteria to comment on each other's work and explain their judgement in peer dialogues (Nicol, Thomson, and Breslin 2014; Reinholz 2016). Amongst the vast body of empirical peer assessment studies, three are selected for review based on their depth of discussion of peer assessment impacts on self-assessment development.

The study of Rust, Price and O'Donovan (2003) aimed to increase student understanding of assessment criteria and processes through a structured intervention. More than 300 first-year undergraduates engaged in exemplar marking, peer discussion of exemplar grades and teacher explanation of criteria in the pre-assessment stage. At the time of assignment submission, the undergraduates evaluated their performance for each criterion and gave themselves an overall grade on a self-assessment sheet. Despite the differences between their self-assessment grades and the teacher grades, the marking practice and the interaction around exemplars were effective in enriching student

understanding of tacit assessment criteria and boosting their confidence in judgement making.

In Yucel et al.'s (2014) study, the Developing Understanding of Assessment for Learning (DUAL) Programme was implemented to acquaint approximately 400 first-year biology students with the assessment criteria and standards of a scientific report. Their perceptions of the Programme were examined upon their participation in an exemplar report marking-cum-discussion activity and a peer review exercise. In the survey, the majority of them perceived exemplar marking helpful in clarifying task expectations (96%) and peer review useful in improving their performance (65%). However, no students commented how feedback provision in the review enhanced their evaluative judgement. Their study highlighted the importance of communicating the benefits of peer feedback provision to students.

Zheng et al. (2018) conducted an experimental study to explore whether synchronous discussion between peer assessors and assessees in a web-based assessment system improved peer feedback, students' writing performance, metacognitive awareness and self-efficacy. The experimental group evaluated peer work based on teacher-derived criteria, provided qualitative feedback, had a synchronous discussion of comments and revised their work accordingly. The questionnaire data showed that the synchronous discussion enhanced their writing performance, metacognitive awareness and self-efficacy. The interview data indicated that the discussion enabled the assessors to provide more affective and metacognitive feedback and the assessees to clarify ambiguities and reflect on their writing process.

Two insights could be derived from the reviewed studies. First, preceding peer review with exemplar marking and discussion would be an effective way to enhance student understanding of criteria and evaluative judgement (Rust et al. 2003; Yucel et

al. 2014). Such pedagogical scaffolding is crucial for self-assessment development because evaluating others' work develops students' 'distanced objectivity' (Reinholz 2016). With regular marking and review practice, students are likely to transfer their evaluative experience from peer review to self-review. Second, peer feedback dialogue clarifies students' misunderstandings and promotes their self-awareness (Yucel et al. 2014; Zheng et al. 2018). However, the operation of cognitive and metacognitive processes during peer feedback is underexplored with just a few exceptions (Panadero, Jonsson, and Alqassab 2018). Not all students are eager to participate in feedback provision (e.g. Yucel et al. 2014). Two peer assessment literature reviews (van Gennip, Segers, and Tillema 2009; Panadero 2016) found that students' struggles to use peer feedback were due to lack of competence trust and embarrassment in discussing peer mistakes. While intensive formative peer assessment approaches may alleviate such tensions (Panadero 2016), these problems may have a stronger impact on peers of similar ability. If peer feedback has influence on the self-assessment process, it is worth investigating what factors discourage student participation in peer feedback. The research gaps lead us to set the following research questions:

1. How do peers influence the self-assessment process of first-year undergraduates of similar ability?

2. What factors limit peer influence in the self-assessment process?

Method

A qualitative case study was chosen for this research because exploring peer influence on the self-assessment process requires an understanding of the interplay of students' perception and practice of self-assessment and the peer assessment activities

experienced in and outside class. This fits Yin's (2009) description that multiple sources of evidence and thick description of data shed light on the issue under investigation.

Participants and context

Eleven Chinese first-year undergraduates (6 females and 5 males aged 18-20) and 7 teachers at a research-intensive university in Hong Kong participated in this study. The students majored in different disciplines (Arts, Dentistry, Education, Social Sciences and Speech and Hearing Sciences). The participants represented a typical case sampling of students who had not received formal self-assessment training in the university and continued their self-assessment practice in secondary school at the outset of undergraduate studies. That is, they did proofreading to avoid language mistakes, compared their writing against sample essays and used checklists for self-monitoring.

In the first month of university studies, all students reported difficulty in performing self-assessment as they lacked a clear understanding of assessment standards. Upon participating in formative peer assessment activities (described in the subsequent subsection) and gaining more academic experience, they realised the importance of referring to assessment criteria and obtaining feedback for self-reflection. Their academic ability was similar, with only subgrade differences in their final course grades.

Their self-assessment process was traced when they performed self-assessment for the assignments of a module in semesters one and two. The modules encompassed University English (a common core compulsory subject), Educational Issues I and II and Human Development Theories (discipline specific subjects), Disaster Management and Society Development in Asia (common core electives). There were approximately

two assignments for each module, including analytical, argumentative and reflective essays, oral presentations and group projects.

Formative peer assessment activities

Two major types of formative peer assessment activities were identified in this study. The first type of activities was led by the teachers to familiarise students with task requirements and assessment standards in the assignment preparation stage. The second type was led by the students who wished to seek assistance during task engagement outside class. Table 1 below describes both types of activities in detail.

[Insert Table 1 here]

The teacher-led activities were identified from classroom observations. Regarding their implementation, the teachers first explained the rationale for the exemplar discussion and peer review and discussed assessment criteria with students. Then, the students compared each other's judgement and exchanged their views on standards. The peer interaction was followed by a plenary discussion in which the students could raise questions about the criteria and the assignment. The individual response to online peer feedback assessed students' ability to reflect on feedback. No particular arrangements were made to group the students. For in-class activities, the students usually formed their groups with those sitting near them.

The student-led activities were reported by the students in journal and interviews. These activities were conducted when they perceived the need for soliciting cognitive and emotional support from peers before assignment submission. This showed that peer assessment could occur even without teacher encouragement or arrangement. Different from the teacher-led ones, they enjoyed autonomy in selecting peer assessors who were either their close friends or more capable classmates.

Data collection

Data was collected through four instruments. First, the students kept a journal entry to reflect on their self-assessment process within two days of assignment submission. Since they were not familiar with journal writing, guidelines were given to facilitate retrospection. Boud's (1995) definition of self-assessment was stated at the beginning of the guidelines to ensure that they had a shared understanding of the construct with the research team. Guiding questions were also offered, for example 'How did you monitor your performance?' and 'How did the peer activities influence your self-assessment practice?' They were welcome to discuss other issues in relation to self-assessment. No word limit was set for journal writing. Their entries ranged from 300 to 500 words in English.

Within one week of journal writing, an interview was conducted to seek explanation for unclear issues in the journal and explore student views on peer involvement in the self-assessment process. All interviews were carried out in Chinese (the students' first language) for effective expression of thoughts and feelings. Each one took approximately 40 minutes and was audio-recorded for transcription. Pertinent quotes were translated into English for data display.

Observations of in-class formative peer assessment activities were made to explore how the activities prepared students for self-assessment. There were two 30-minute observations for each module. The first author took field notes to record pre-activity instructions, peer work settings and the specific acts of the teacher and students in the activities. The notes were organised to aid her post-observation reflections and identify points of clarification in the subsequent teacher interviews.

A teacher interview of approximately 30 minutes was held after each observation to understand the pedagogical rationale behind the activities and the factors

reducing peer influence in the self-assessment process. All interviews were conducted in English and were audio-recorded for transcription.

Data analysis

Braun and Clarke's (2006) thematic analysis method guided our analytical process. Upon a close and repeated reading of the journal entries, interview transcripts and field notes, the first author identified initial codes from data extracts using NVivo 11. The literature review sensitised her to different self-assessment acts and peer assessment effects in the coding process. The acts not discussed in the literature were also coded to modify the theory-driven code list. Codes referring to similar ideas were collated into themes, for example 'discussing task approach', 'clarifying criteria' and 'comparing exemplars against rubrics' were grouped under 'understanding of quality'. The set of the candidate themes was refined by the first author and her research assistant by rereading the data extracts, checking the data sufficiency in support of a claim and examining the coherence of the data pattern emerged from the themes. The themes with little relevance to peer involvement during self-assessment were discarded.

To process the coded data, we employed Yan and Brown's (2017) model to categorise peer influence on the major stages of self-assessment (criterion understanding, feedback use and self-reflection). Data triangulation was performed in this way. The themes identified from the journal were counted to indicate the major peer influence on students' self-assessment practice. Interview transcripts were examined to look for students' elaboration of thoughts subsequent to the identification of the recurring themes. Regarding the factors limiting peer influence, a thematic analysis of student and teacher views was compared to see if both parties held consistent views.

Results

The results are organised around the research questions. Peer assessment effects on the self-assessment process are discussed, followed by the factors limiting peer influence in the process. Pseudonyms are used in the quotes to maintain participants' anonymity.

Peer assessment effects on self-assessment process

During the investigation, we noted that the sequence of self-assessment acts among the students was different. For ease of reporting, we present peer assessment effects according to criterion understanding, feedback use and self-reflection. The following subsections demonstrate how peers enriched student understanding of quality, refined judgement and deepened self-reflection.

Enriching understanding of quality

In the journal, seven students reported that the peer review and exemplar discussion allowed them to exchange views on quality. The interview quotes below explicate how they advanced their understanding of good organisation and rich content through peer interaction.

> While reviewing our drafts, we were uncertain whether problems and solutions should be presented separately or one problem followed by one solution. After discussing the pros and cons of each approach, we thought both fitted the description of good organisation. (Ann)

> I thought sample 1 was stronger because it covered six ideas. This was what I had learnt in secondary school. However, my peer said sample 2 was better as it had three ideas with more examples and analysis. Although we could not reach consensus, we discerned our point of disagreement. We decided to seek teacher advice. (Toby)

Both quotes illustrated how the students broadened their understanding of quality through resolving cognitive conflicts. In the first quote, the divergence between

Ann and her peer prompted a rational discussion of each other's perspective and alternative interpretations of appropriate organisation. In the second quote, Toby's prior understanding of rich content was different from her peer's accurate judgement. Their disagreement drew their attention to the argument over quantity and quality of ideas and inspired them to seek teacher assistance. Both instances imply that the peer assessment activities create a dialogic space for the assessors and assessees to pursue an in-depth inquiry about quality.

Refining subjective judgement

Eight students reported in the journal that they sought peer feedback for performance improvement. In the interviews, they elaborated how peer feedback shaped their judgement of performance. Their opinions are captured as follows.

> Feeling satisfied with my part, I uploaded it to Google Doc for peer editing. My group members said my analysis was too narrow. I thought they were demanding. After reading their parts and listening to their explanation in the meeting, I knew my part was not so good. My work could benefit from incorporating the economic and political perspectives. (Amy)

> I had worked very hard on this essay. I thought it was perfect, but my friend did not see my work in the same way. I felt upset. After 'cooling down' myself a few days later, I reread the feedback form and realised my problem. (Susan)

Both quotes presented the scenario where the external feedback from peers differed from the students' self-judgement. The students were first disappointed when their judgement was not supported. Later, they used the peer feedback to refine their initial judgement of performance. The critical question here is what conditions led the assessees to switch from disappointment to judicious use of external feedback for impartial judgement making. Inferred from their instances, we believe that one of the conditions is the dialogic feedback opportunity in which Amy could make sense of her group members' thoughts and comments. Another condition is the comparison of

assessee's and assessor's work to enable the former to realise her weaknesses. The last one is a 'cooling-off' period for Susan to reduce her emotional attachment to work so that she could be more objective in evaluating her own work.

Deepening self-reflection

Eight students described in the journal that the review activities and the individual response to online peer feedback enabled them to derive insights for self-reflection. The excerpts below illustrate how they performed self-reflection.

> While I was reminding my peer to avoid the common problems, I became more aware of these problems. When revising my final draft, I paid attention not to make the same mistakes. (John)

> When explaining my comments, I knew which concepts I was good at and weak in. I planned to read more to enrich my knowledge of the weaker parts. (Emma)

> After the brilliant student had commented on my analysis, I read her essay on the E-Learning platform to see how she did it. In the individual response, I addressed the peer comments and stated my plan to strengthen my analysis. (Dickson)

The students generated reflective insights when they were explaining peer problems and responding to peer comments. Serving as an assessor, John raised his awareness about the major task problems and Emma was more conscious about her inadequacy. The 'reflection-in-action' helped them focus on particular aspects of task performance and devise a strategy for metacognitive monitoring. Being an assessee, Dickson worked out improvement strategies upon engaging in peer feedback. Two elements may be conducive to his 'reflection-on-action'. First, the online access to peer comments and work may have relieved his embarrassment during reflection. Second, the assignment requirement may have encouraged productive uptake of peer feedback. Their instances suggest that peer assessors and assessees reflect on their mastery of knowledge and strategy use while participating in formative peer assessment activities.

To recapitulate, peers could aid students' self-assessment process by enriching understanding of quality, refining judgment of performance and deepening self-reflection. Given that active participation in formative peer assessment activities creates a favourable condition for self-assessment development, it is essential to examine the factors limiting peer involvement in the self-assessment process.

Factors limiting peer influence in self-assessment process

Four major themes were identified from the student and teacher data sets regarding the factors reducing peer influence. These themes were: lack of competence trust, tensions in feedback communication, competition and lack of readiness for peer learning. Due to these factors, the students may not have been active in providing peer feedback and using it to perform self-reflection.

Lack of competence trust

As for the factors limiting peer influence, five students expressed doubts about assessors' competence in judging academic work in the journal. Their ideas are detailed in the following extracts.

> I do not think reviewing draft is useful. The comments I got are very brief and the person who gave me comments has little experience. I seldom read the comments when revising my work. (Jack)

> We are still learning about academic writing. My comments may not help my classmates a lot. I mainly commented on spelling and grammar, but not content development. (Sam)

The central thread of the extracts is students' lack of competence trust in peer assessors but both extracts refer to different situations. Jack did not believe his peer was proficient enough to be the assessor because of the quality of comments received and the academic experience of the peer. Sam lacked confidence about his own ability as an

assessor, so he tended to comment on language problems (an aspect requiring little reference to criteria in judgement making). Their distrust may reduce peer influence in the self-assessment process because assessees could not obtain useful feedback to revise their work. Feedback on language problems may not prompt assessors and assessees to have a detailed discussion of criteria.

Tensions in feedback communication

A recurring theme from the student data set is that peer relationship could affect the depth of feedback exchanges. Six students mentioned in the journal that they suffered from tensions in peer feedback communication. Their views are represented in the following interview quotes.

> It is hard to ask your peers to revise the entire paragraph as this may evoke hard feelings. We are seldom so definite to say a paragraph is not good … But if we do not articulate our views, we will not know whether our judgement is right. (Jack)

> I feel unease if my partner is very critical to me. So when it is my turn (to give comments), I would just mention a few problems. Our discussion may not go in-depth. (Ann)

The main idea of the quotes is the dilemma between relationship building and frank feedback communication. Students' psychological safety in feedback communication was at stake when they were confronted with intrapersonal and interpersonal tensions. Intrapersonally, Jack's self-doubt about feedback accuracy refrained him from voicing his opinions in the review. Interpersonally, Ann was reluctant in making criticism, for she worried that giving honest critical feedback may undermine her harmonious relationship with peers. Their reluctance in giving critical feedback may impact on self-assessment as they lacked a chance to calibrate each

other's judgement and their feedback discussion may not be in-depth enough to stimulate reflection on performance.

Competition

Two students in the journal and one teacher in the interview raised the issue of peer competition. The student thoughts are elaborated in the following quotes.

> We are competitors. If I give them useful feedback on the draft, they may perform better than me in the final assignment. I do not feel good about that. I prefer reviewing the work by myself. (Jimmy)

> Our work will be compared with others' during grading; everybody wants to get a better grade. So some classmates may not offer constructive suggestions to peers. (Kelly)

The key message of the quotes is students' anxiety about losing their competitive advantage if constructive comments are given to peers. The quotes reflect that norm-referenced assessment may be deep-rooted in their mind. Their unfamiliarity with the criterion-referenced assessment practice in the university may have led them to believe that their grades were mainly determined by comparison of students' performance. Due to the anxiety, they may not be eager to participate in the review to provide peer feedback.

Their opinions were echoed by a teacher who unpacked this problem from the sociocultural perspective.

> This is slightly because of the competition culture in our society. We compete for educational resources. Students may think if I help you, I will have less chance getting an A. You 'steal' my A; my work would be B+. (Eric)

Eric related this issue to the competition culture in the society. The educational resources referred to publicly-funded degree places, scholarship awards and further education opportunities whose allocation was made mainly according to students'

academic results. Because of the competition pressure, some students may be accustomed to comparing their results with one another and may perceive peers as competitors instead of learning partners.

Lack of readiness for peer learning

This theme emerged from only the teacher data set. The lack of readiness for peer learning was one of the teacher concerns and mentioned as a factor limiting peer influence. Three teachers aired their views in the interviews.

> Not all students are convinced peer review is a good idea. When reading someone else's work, they can think how to edit their own work. But not many of them are aware of this benefit. (Kelson)

> When you read my assignment and I read yours, I might say you have a good argument. Next time I can use your approach to develop my argument. This is "stealing the approach" positively. Both parties can benefit, but some students worry about copying. (Eric)

> Some students are not ready to process peer feedback. Taking all peer feedback as truth could be a problem. They need a critical sense to interpret conflicting feedback and judge which feedback is useful. (Rose)

From teacher perspective, the students lacked skills to benefit from peer learning. The ideas of Kelson and Eric seemed to respond to the students' anxiety about competition. If the students could be inspired to derive insights from reviewing peer work, this would be beneficial to peer assessors and assessees in monitoring their own work. Rose's opinion related to students' competence in using feedback and indirectly echoed student concern about competence trust. She believed developing students' capability to interpret conflicting feedback would be an important skill for them to benefit from peer assessment.

In short, peer influence in the self-assessment process could be inhibited by lack of competence trust, tensions in feedback communication, competition and lack of

readiness for peer learning. The first three factors are concerned with students' affective experiences with peer assessment activities. The last one points to the direction for preparing students for peer assessment. Only if teachers are aware of these limiting factors can they make effective use of peers to support students' self-assessment.

Discussion

This study has explored peer assessment effects on the self-assessment process of first-year undergraduates and the factors limiting peer influence in the process. Our findings substantiate the views of Boud (1995) and Dochy et al. (1999) that peers could support students' self-assessment development by enriching understanding of quality, refining subjective judgement and deepening self-reflection. However, peer influence could be inhibited by distrust, tensions in feedback communication, competition and lack of readiness for peer learning.

While previous self-assessment studies (Andrade and Du 2007; Sargeant et al. 2010; Yan and Brown 2017) discussed the self-assessment process, ours examined the interconnectedness between peer support and students' self-assessment development. Contrary to Yucel et al. (2014) who found no evidence of students using peer feedback to enhance self-assessment skills, our findings showed that peer feedback exchanges could facilitate students' self-assessment by activating a number of cognitive and metacognitive processes. The cognitive conflict in peer assessment activities creates a genuine need for students to examine each other's criterion interpretation and co-construct understanding of quality through explicit reasoning and rational argumentation (cf. Topping 2010). Explaining feedback raises peer assessors' awareness about the major task problems and their own strengths and weaknesses, thus promoting 'reflection-in-action'. Peer feedback provides assessees with input to reflect

on their initial judgement and rethink their application of criteria. Our data also confirm Zheng et al.'s (2018) views that dialogic feedback opportunity and online access to peer work support the cognitive and metacognitive processes. We further propose that another favourable condition is an appropriate time period to minimise students' emotional attachment to their own work.

Notwithstanding the potential of peers in supporting students' self-assessment development, we discovered that students' anxiety about peer assessment activities could discourage their participation in peer feedback. The affective experiences identified from our study resemble the interpersonal variables discussed by van Gennip et al. (2009) and Panadero (2016), for example lack of psychological safety in feedback communication, distrust in peers' and students' own evaluative competence and competition. Another factor which is less frequently discussed in the literature would be students' readiness for peer learning. Inferred from the data, we argue that for students to benefit from peer learning, it is crucial to equip them with reflective thinking skills so that they could generate useful insights from peer assessment activities for self-improvement. Our views resonate with Taylor, Ryan and Pearce's (2015) idea of incorporating a reflective practices stance into the peer review process, and we emphasise the need for teacher scaffolding in developing students' reflective strategies.

Previous literature suggests explaining the benefits of peer learning to students, guiding students to do peer reviews with structured forms and modeling feedback construction (Topping 2010; Yucel et al. 2014). While we see the value of these recommendations, we assert that effective coaching targets at increasing students' ability to make reflective use of peer feedback. This can be achieved by sophisticated pedagogical and assessment task designs. To assuage their anxiety about peer competition, teachers could demonstrate how to derive insights from reviewing others'

work and how to use the insights to formulate an improvement plan for the subsequent draft. The peer review could be followed by requiring students to discuss how the insights from peer feedback improve their final draft alongside assignment submission. These arrangements may divert their attention from peer competition to the enrichment of individual learning experiences. At the outset of peer assessment activities, it would be illuminating to inform students that the activities aim to increase their understanding of assessment standards, generate feedback for self-improvement and sharpen their evaluative judgement. Once they appreciate the value of peer assessment and acquire the reflective thinking skills, they are more likely to seek peer support for self-monitoring.

Limitations and avenues for future research

One of the limitations of this study is the difficulty to verify the accuracy of students' self-report data. Their retrospection could be influenced by their memory of task engagement, emotions during the recall and relationships with peers. We minimised these undesirable effects by making students recall the self-assessment process within two days of assignment submission and asking probing questions in the follow-up interviews to ascertain the factors impacting on the recall process. Future research could analyse students' interactions in peer assessment activities to triangulate the conclusions drawn from the journal, interview and observation data.

Another limitation is that our data display method failed to showcase individuals' response to peer support in the self-assessment process. We presented peer influence according to the key self-assessment stages. This method is systematic in discussing peer assessment impacts but unable to trace individual students' self-assessment trajectory and their response to peer scaffolding. It would be fruitful if future researchers could organise the findings around individual students, discuss their

response to peer support and outline their self-assessment developmental paths throughout semesters.

Conclusion

Our study has unpacked the role of peers in scaffolding first-year undergraduates' self-assessment and the factors limiting peer influence in the self-assessment process. Through participating in peer assessment activities, the students could enrich understanding of quality, refine subjective judgement and deepen self-reflection. However, distrust in peers' evaluative competence, tensions in feedback communication, competition and lack of readiness for peer learning could reduce their engagement in peer feedback. Thus, they would be deprived of the chance to negotiate criteria and obtain useful feedback for self-reflection. It is crucial for teachers to assuage students' anxiety by developing their reflective mindsets during peer- and self-assessments.

Self-assessment is one of the key competences university graduates need to develop. In the face of rising student-teacher ratio, it seems difficult for teachers to provide first-year undergraduates with timely assistance and cater for individual differences in the self-assessment process. So, using peers to support students' self-assessment development sets a promising direction for first-year curriculum design.

References

Andrade, H., and G. Brown. 2016. "Student self-assessment in the classroom." In *Handbook of Human and Social Conditions in Assessment*, edited by G. Brown and L. Harris, 319-334. New York: Routledge.

Andrade, H., and Y. Du. 2007. "Student responses to criteria-referenced self-assessment." *Assessment & Evaluation in Higher Education 32*(2): 159-181.

Boud, D. 1995. *Enhancing Learning through Self Assessment*. London: Kogan Page.

Boud, D. 2000. "Sustainable assessment: Rethinking assessment for the learning society." *Studies in Continuing Education 22*(2): 151-167.

Braun, V., and V. Clarke. 2006. "Using thematic analysis in psychology." *Qualitative Research in Psychology 3*(2): 77-101.

Brown, G., and L. Harris. 2013. "Student self-assessment." In *SAGE Handbook of Research on Classroom Assessment,* edited by J. McMillan, 367-393. Thousand Oaks: SAGE.

Butler, D. L., and P. H. Winne. 1995. "Feedback and self-regulated learning: A theoretical synthesis." *Review of Educational Research 65*(3): 245-281.

Cassidy, S. 2007. "Assessing 'inexperienced' students' ability to self-assess: Exploring links with learning style and academic personal control." *Assessment & Evaluation in Higher Education 32*(3): 313-330.

Dochy, F., M. Segers., and D. Sluijsmans. 1999. "The use of self-, peer and co-assessment in higher education: A review." *Studies in Higher Education 24*(3): 331-350.

Nicol, D., and D. Macfarlane-Dick. 2006. "Formative assessment and self-regulated learning: A model and seven principles of good feedback practice." *Studies in Higher Education 31*(2): 199-218.

Nicol, D., A. Thomson., and C. Breslin. 2014. "Rethinking feedback practices in higher education: A peer review perspective." *Assessment & Evaluation in Higher Education 39*(1): 102–122.

Panadero, E. 2016. "Is it safe? Social, interpersonal, and human effects of peer assessment: A review and future directions." In *Handbook of Human and Social Conditions in Assessment*, edited by B. Gavin and L. Harris, 247-266. New York: Routledge.

Panadero, E., and J. Alonso-Tapia. 2013. "Self-assessment: Theoretical and practical connotations, when it happens, how is it acquired and what to do to develop it in our students." *Electronic Journal of Research in Educational Psychology 11*(2): 551-576.

Panadero, E., A. Jonsson., and J. Botella. 2017. "Effects of self-assessment on self-regulated learning and self-efficacy: Four meta-analyses." *Educational Research Review 22*: 74-98.

Panadero, E., A. Jonsson., and M. Alqassab. 2018. "Providing formative peer feedback: What do we know?" In *The Cambridge Handbook of Instructional Feedback*, edited by A. A. Lipnevich and J. K. Smith, 409-431. Cambridge: Cambridge University Press.

Reinholz, D. 2016. "The assessment cycle: A model for learning through peer assessment." *Assessment & Evaluation in Higher Education 41*(2): 301-315.

Rust, C., M. Price., and B. O'Donovan. 2003. "Improving students' learning by developing their understanding of assessment criteria and processes." *Assessment & Evaluation in Higher Education 28*(2): 147-164.

Sargeant, J., H. Armson., B. Chesluk., T. Dornan., K. Eva., E. Holmboe., J. Lockyer., E. Loney., K. Mann., and C. van der Vleuten. 2010. "The processes and dimensions of informed self-assessment: A conceptual model." *Academic Medicine 85*(7): 1212-1220.

Schön, D. A. 1987. *Educating the Reflective Practitioner*. San Francisco: Jossey-Bass.

Tai, J., R. Ajjawi., D. Boud., P. Dawson., and E. Panadero. 2018. "Developing evaluative judgement: Enabling students to make decisions about the quality of work." *Higher Education 76*(3): 467-481.

Taras, M. 2010. "Student self-assessment: Processes and consequences." *Teaching in Higher Education 15*(2): 199-209.

Taylor, S., M. Ryan., and J. Pearce. 2015. "Enhanced student learning in accounting utilising web-based technology, peer-review feedback and reflective practices: A learning community approach to assessment." *Higher Education Research & Development 34*(6): 1251-1269.

Topping, K. 1998. "Peer assessment between students in colleges and universities." *Review of Educational Research 68*(3): 249-276.

Topping, K. 2010. "Peers as a source of formative assessment." In *Handbook of Formative Assessment*, edited by H. Andrade and G. Cizek, 61-74. New York: Routledge.

van Gennip, N., M. Segers., and H. Tillema. 2009. "Peer assessment for learning from a social perspective: The influence of interpersonal variables and structural features." *Educational Research Review 4*(1): 41-54.

Webster, B., and M. Yang. 2012. "Transition, induction and goal achievement: First-year experiences of Hong Kong undergraduates." *Asia Pacific Education Review 13*(2): 359-368.

Yan, Z., and G. Brown. 2017. "A cyclical self-assessment process: Towards a model of how students engage in self-assessment." *Assessment & Evaluation in Higher Education 42*(8): 1247-1262.

Yin, R. 2009. *Case Study Research: Design and Methods*. 4th ed. Thousand Oaks, California: SAGE.

Yucel, R., F. Bird., J. Young., and T. Blanksby. 2014. "The road to self-assessment: Exemplar marking before peer review develops first-year students' capacity to judge the quality of a scientific report." *Assessment & Evaluation in Higher Education 39*(8): 971-986.

Zheng, L., P. Cui., X. Li., and R. Huang. 2018. "Synchronous discussion between assessors and assessees in web-based peer assessment: Impact on writing performance, feedback quality, meta-cognitive awareness and self-efficacy." *Assessment & Evaluation in Higher Education 43*(3): 500-514.

Table 1　　　　**Formative peer assessment activities**

Type	Activity	Description
Teacher-led	Exemplar discussion	In groups of four, students exchanged views on the quality of two different exemplars and explained their judgement.
	Peer review on first draft	In pairs, students read each other's draft, wrote comments on a peer feedback form and discussed peer comments.
	Individual response to online peer feedback	Each student read two peers' essays and gave feedback on an E-Learning platform. Then, as a part of assignment requirements, he / she wrote a 200-word response explaining the insights from peer feedback.
Student-led	Peer review on final draft	A few days before assignment submission, students showed their final draft to one or two peers to seek suggestions.
	Peer editing of group projects	The work of individual members was uploaded to Google Docs (an online editing app) so that other members could comment on each other's work. All members attended a review meeting to discuss improvement plans afterwards.