



Students' interpersonal perspectives on, conceptions of and approaches to learning in online peer assessment

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The purpose of this study is to qualitatively explore students' interpersonal perspectives (i.e., *psychological safety*, *value diversity*, *trust* and *social interdependence*) on, conceptions of and approaches to learning in an online peer assessment activity required for creating digital artistic works. Twenty-three college students in Taiwan volunteered for interview after the assessment activity. This study found that, the more positive interpersonal perspectives (i.e., high psychological safety, low value diversity for goals, trust in self as assessors and positive social interdependence) the students perceived, the higher level of conceptions and approaches (i.e., cohesive conceptions and deep approaches) they held. However, for certain students, high value diversity for criteria and trust in peers as assessors might play a role in their use of deep approaches, but not in their level of conceptions. Accordingly, a model of the associations between students' interpersonal perspectives, conceptions and approaches is proposed.

Introduction

Previous studies regarding peer assessment show that learners' project (or assignment) performance could be improved by the implementation of peer assessment (Liang & Tsai, 2010; Tseng & Tsai, 2007). Research also indicates the enhancement of meta-cognitive skills (e.g., critical thinking) through peer assessment (Lin, Liu & Yuan, 2001; Topping, 1998). However, peer assessment which involves making comments and responding to feedback is fundamentally a social interactional process (van Gennip, Segers & Tillema, 2009), and learners' interpersonal perceptions in a social interactional process might be related to their learning in peer assessment (van Gennip, Segers & Tillema, 2010). Several studies concerning learners' attitudes toward peer assessment have mentioned students' interpersonal perceptions. For example, students may consider their friendship with peers (Dochy, Segers & Sluijsmans, 1999; Magin, 2001), the fairness of peer scoring (Smith, Cooper & Lancaster, 2002; Kaufman & Schunn, 2011), the negative effect of remarks to peers (Wen & Tsai, 2006), and trust in themselves or peers as assessors (Ballantyne, Hughes & Mylonas, 2002; Dochy et al., 1999) in a peer assessment activity.

There are, however, relatively few studies of peer assessment focusing on students' perceptions of integral interpersonal factors from a social perspective, except for van Gennip et al.'s (2009, 2010) studies. Also, the procedure of peer assessment implemented in van Gennip et al.'s (2010) study was not Internet-based. As various

studies have indicated the advantages of conducting peer assessment through the Internet, such as being time-free, location-free and anonymous (Cho & Schunn, 2007; Lin et al., 2001), and developments in students' abilities in evaluation, feedback and review skills, for example if assisted by an online tool to support peer assessment (Raban & Litchfield, 2007), the current study reports upon an online peer assessment activity to help understand students' interpersonal perspectives.

Learners' conceptions of and approaches to learning have been discussed in different instructional activities, including peer assessment. In an online peer assessment activity, Yang and Tsai (2010) examined the associations between college students' conceptions of and approaches to English learning. Considering the social context in a peer assessment activity, van Gennip, Segers and Tillema's (2009) review claimed that there were relationships between learners' perceptions of interpersonal variables and their outcomes of peer assessment in learning (e.g., perceptions of the learning benefits). In van Gennip et al.'s (2010) empirical study, they further found that conceptions of peer assessment mediate interpersonal variables and perceived learning in peer assessment. According to Topping's (2010) commentary, the concept of interpersonal variables introduced by van Gennip et al. (2010) is novel; however, the quantitative measurement of the interpersonal variables in their study has the weakness of uncertain reliability. Therefore, the study reported here utilises a method of interviewing to examine students' interpersonal perspectives on, conceptions of and approaches to learning in an online peer assessment activity. By means of interview, this study may present more in-depth qualitative results from a social interaction perspective.

Conceptions of and approaches to learning

What an individual considers as learning objectives and process could be defined as that individual's conceptions of learning (Benson & Lor, 1999). Previous studies have found that learners have a variety of conceptions of learning, and have further classified them into several hierarchical categories (e.g., Marton, Dall'Alba & Beaty, 1993). For example, Marton et al. (1993) categorised students' conceptions of learning into six categories (i.e., increasing one's knowledge, memorising, applying, understanding, seeing something in a different way and changing as a person), which were also identified as broad types of *fragmented* and *cohesive* conceptions. Fragmented conceptions refer to thoughts about knowledge reproduction or accumulation as learning. Cohesive conceptions include ideas about restructuring knowledge as learning, thoughts of learning from different perspectives, or considerations about changing a person. Following Marton et al.'s (1993) categories, Yang and Tsai (2010) also classified students' conceptions of learning as fragmented and cohesive. In the context of online peer assessment, they identified fragmented conceptions as showing no or little understanding of associations between the learning environment and its promoted learning, and cohesive conceptions as showing a better understanding of the connections between the learning environment and students' learning. In other words, Yang and Tsai's (2010) interpretations of fragmented and cohesive conceptions of learning emphasise the interplay between the online peer assessment context and learning perceptions.

Furthermore, there have been several studies reporting that students' conceptions are related to their approaches in different learning domains and situations, for example from science (Lee et al., 2008), English learning (Yang & Tsai, 2010), and blended

learning (Ellis, Steed & Applebee, 2006). Approaches to learning are concerned with the methods by which an individual processes his/her learning tasks (Biggs, 1994). Students usually express a variety of approaches to learning and show qualitative differences (Marshall, Summers & Woolnough, 1999). Previous studies have identified approaches to learning as broad types of *deep* and *surface* approaches (e.g., Chin & Brown, 2000). Surface approaches are associated with external motivations and simple strategies (e.g., memorising pieces of knowledge or reproducing information to learn) to engage in learning activities. In contrast, deep approaches are related to internal motivations and sophisticated strategies (e.g., understanding knowledge thoroughly or reflecting on the meaning of the learning content) involved in learning activities. In the situation of online peer assessment activities for English learning, Yang and Tsai (2010) stated that students with fragmented or cohesive conceptions tend to use surface or deep approaches respectively.

Similar to the educational context in Yang and Tsai's (2010) study, therefore, this study follows their categories to explore students' conceptions of learning (i.e., fragmented or cohesive) and approaches to learning (i.e., surface or deep). Also, this study contends that there are associations between the students' conceptions of and approaches to learning in online peer assessment.

Interpersonal perspectives

Based on van Gennip et al.'s (2009) review, four interpersonal variables influencing learning in peer assessment, including psychological safety, value diversity, interdependence and trust, are explored in this study. To further elaborate the interdependence variable, this study attempts to examine it based on the social interdependence theory (Johnson & Johnson, 1998). The following is a brief outline for each variable.

1. *Psychological safety*

Psychological safety refers to a situation in which an individual feels safe to take interpersonal risks in a team or group (Van den Bossche, Gijsselaers, Segers & Kirschner 2006; Van Gennip et al., 2009; 2010). That is, "the team will not embarrass, reject, or punish someone for speaking up" (Edmondson, 1999, p.354). Edmondson (1999) also indicated that psychological safety is helpful to learning behaviour in a team, because it can reduce one's concerns about negative reactions from other members when expressing oneself. With regard to the research into organisational behaviours, May, Gilson and Harter (2004) argue that an employee's engagement at work can be increased by his/her perceptions of psychological safety. In virtual communities, high psychological safety facilitates an individual's confidence to support his/her behaviours of self-expression and the degree of intention to continue sharing knowledge (Zhang, Fang, Wei & Chen, 2010). Concerning the learning context of peer assessment, van Gennip et al. (2010) found that psychological safety significantly enhances the learning process in peer assessment. Therefore, this study hypothesises that high psychological safety may have a positive influence on students' conceptions of and approaches to learning in online peer assessment activities.

2. *Value diversity*

The differences in shared understanding of a workgroup's task, goal or mission are described as *value diversity* (Jehn, Northcraft & Neale, 1999). That is, the lower value diversity that group members perceive, the more thoughts in common they have.

Several studies have indicated that low value diversity contributes to better performance in a team (Van den Bossche et al., 2006). Similarly, in the context of collaborative learning, sharing goals in student groups (low value diversity) is raised as an important issue when involving in assessment tasks (Ching & Hsu, 2011). Peer assessment is a social interactive activity; hence, value diversity is also considered as a crucial interpersonal factor in the social context of peer assessment (van Gennip et al., 2009; 2010). When involved in a peer assessment activity, students have to think about the objectives or purposes of the assessment task (Topping et al., 2000), as well as the need to evaluate whether peers' work is good or not, according to certain criteria or standards (Ballantyne et al., 2002). In other words, the shared understanding of peer assessment may involve two dimensions, that is, goals and criteria. Furthermore, van Gennip et al. (2010) validated that low value diversity leads to favourable conceptions of peer assessment and perceptions of learning gains; however, they emphasised perceived value diversity among group members for group goals, rather than for assessment criteria. Taking this a step further, this study considers that value diversity for both goals and criteria should be investigated.

3. Trust

The interpersonal factor of *trust* has been discussed in several studies of peer assessment. Most of these studies are concerned with learners' perceptions of shared responsibility for the process of evaluating peers. For instance, McDowell (1995) indicated that students do not trust themselves when it comes to giving helpful comments and fair marks. Topping, Smith, Swanson and Elliot (2000) also addressed the problem that students feel uncomfortable and find it difficult to assess their peers. Besides the issue of trust in oneself as an assessor, research has also proposed the relevant topic of learners' confidence in others as assessors. For example, Liu and Carless (2006) have indicated that students doubt the qualifications of their peers for evaluation.

From an interpersonal perspective, van Gennip et al. (2009; 2010) clarified the perceptions of trust into two types: "trust in self as an assessor" and "trust in peer as an assessor". They found that students with a higher degree of trust in both themselves and peers as assessors tend to show more favorable conceptions of peer assessment. However, the conceptions of peer assessment in van Gennip et al.'s (2010) study were likely similar to the students' attitudes toward the activity. For example, one sample item they used was "Peer assessment is useful." The results of their study reflect what learners' perceptions of peer assessment are rather than how learners conceptualise learning in peer assessment. Since learners' conceptions of learning may represent their considerations of the learning objectives and process, how they learn in peer assessment may be better understood. Therefore, this study intends to explore learners' perceptions of trust in self and peers, and the associations with their conceptions of learning in online peer assessment rather than their attitudes toward it.

4. Social interdependence: Cooperation and competition

According to Johnson and Johnson's description (1998, p.11), "social interdependence exists when individuals share common goals and each individual's outcomes are affected by the actions of the others." They asserted that social interdependence presents two types: *cooperation* and *competition*. What type of social interdependence an individual shows might influence how that individual interacts with others. Whereas positive interdependence is conducive to promoting interaction and occurs in the cooperative process, negative interdependence is conducive to oppositional interaction and occurs in the competitive process (Johnson & Johnson, 1998). That is, students

perceiving positive interdependence tend to participate in a responsible manner to make a team activity be a cooperatively practised activity. By contrast, perceptions of negative interdependence may lead to competitive thoughts among team members to involve in a team activity.

In the social context of peer assessment, Prins, Sluijsmans, Kirschner and Strijbos (2005) indicated that perceptions of positive interdependence could hold the group members together for collaborative learning. That is, each member considers him/herself to be a significant element of the group for completing the assessing work successfully. Moreover, van Gennip et al. (2010) proposed that the process of peer assessment intervention and the alignment of students' participation may be facilitated when there is positive interdependence between peers. Negative attitudes toward online peer assessment have been surveyed by Wen and Tsai (2006). The negative attitude subscale in their instrument included items such as "My marks given to classmates are affected by the marks given to me" and "If I receive marks worse than I expected, then I will give lower marks to classmates." This study considers that these items potentially measure students' perceptions of competition in online peer assessment.

In van Gennip et al.'s (2010) study, the interdependence variable was examined by two subscales of dependence of the self and the peer; but they could not verify that interdependence was related to conceptions of peer assessment or perceiving learning. As a result, this study re-examines students' perceptions of interdependence on the basis of social interdependence theory.

Research questions

Until now, students' social perspectives on an online peer assessment have not yet been discussed extensively. This study expects to generate some interesting findings through the qualitative interpretations of students' interpersonal perspectives on, conceptions of and approaches to learning in online peer assessment. The research questions are as follows:

- In the online peer assessment activity, what are college students' conceptions of and approaches to learning? What are the associations with their conceptions of and approaches to learning?
- What are college students' perceptions of interpersonal perspectives in the online peer assessment activity?
- What are the associations between college students' perceptions of interpersonal perspectives on the peer assessment activity, and conceptions of and approaches to learning in the online peer assessment activity?

Method

Research participants

There were 40 students initially participating in the online peer assessment activity reported in this study, all being first-year students from a university in Taiwan. Of these students, 23 volunteers were interviewed after an online peer assessment activity (described later). They were majoring in communication and technology, and all had experience of traditional paper and pencil peer assessment, but none had experienced

peer assessment through online channels. The interviewees included 8 male and 15 female students whose mean age was 18.74 years (SD = 0.86).

Online peer assessment activity

In the present study, the students took a required course, *Communication Technology Practice*. It ran for a semester (18 weeks) from September 2010 to January 2011. The topics in the course included image processing and computer graphics. The purpose of the course was to develop students' abilities in the software skills required for creating digital artistic works. During the semester, each student was required to complete five assignments, including image editing, image composition, computer graphics outlining, computer symbol design, and computer self-portrait sketching. The students had to upload their assignments to the *eCampus* system (a web-based instructional and learning management platform similar to *Blackboard* or *Moodle*).

After the deadline for each assignment, a one-week online peer assessment activity was activated on the *eCampus* system. During the period of the activity, each student was required to assess anonymously the works of five peers who were assigned randomly by the *eCampus* system. The assessment task included grade giving (quantitative assessment) and comment making (qualitative assessment). The students were required to grade peers with 100 points as full marks, but they were not trained to make certain expected types of comments. Each assignment was accompanied by some requirements provided by the teacher. Taking 'assignment of computer graphic outlining' for example, the students were required to precisely outline the computer graphics provided by the teacher and creatively colour them in. The students evaluated peers according to these assignment requirements. When the online peer assessment activity was finished, each student could see his/her grades and comments from five peers on the *eCampus* system. The five assignments were thus accompanied with five online peer assessment activities, and so the students experienced the online peer assessment activity five times during the semester. All activities were conducted in Chinese, with translations to English being made by the authors.

Data collection: Interviews

The research data were collected by interviewing the volunteers (23 college students) at the end of the semester. Each volunteer was interviewed individually by a trained research assistant. Also, each volunteer answered the interview questions according to the experience of the online peer assessment activities during the semester. The interview questions concerning interpersonal data are presented in Appendix 1. To understand college students' conceptions of and approaches to learning in online peer assessment activities, this study adopted the interview questions used in Yang and Tsai's (2010) study. The interview questions concerning conceptions and approaches are shown in Appendix 2.

Data analysis

Similar to the qualitative method utilised by Yang and Tsai (2010), this study first analysed the interview data of the students' conceptions of and approaches to learning in online peer assessment activities to classify them into hierarchical categories. Then, the qualitative associations between the students' conceptions of and approaches to learning were examined.

With regard to the students' interpersonal perspectives on learning in the online peer assessment, this study carefully examined the interview data and extracted representative responses for in-depth discussion. To understand the qualitative associations between the students' interpersonal perspectives on peer assessment activities, and conceptions of and approaches to learning, their interview data of interpersonal perspectives were classified into bipolar categories (i.e., low/high and yes/no) for further cross-tabulation analysis.

In this study, the interviews were conducted in Chinese and audio-recorded. All of the individual interviews were fully transcribed to verbatim text in Chinese form. These verbatim transcripts were then examined and analysed by two researchers by extensive discussion. Also, the researchers discussed and agreed with the categories regarding students' perspectives on, conceptions of and approaches to learning. Finally, the translations into English were made by the authors.

Results and discussion

Categories of conceptions of and approaches to learning in online peer assessment

Through an analysis of qualitative variations in the students' conceptions of and approaches to learning in online peer assessment, the interview data were hierarchically classified into five categories, listed A to E. Each category was generated according to the students' descriptions of their experiences of the online peer assessment. The category descriptions and sample quotations of interview responses by the students are presented in Tables 1 and 2.

Following Yang and Tsai (2010), the conceptions were characterised as "fragmented" or "cohesive". In Table 1, it is revealed that categories A and B are characterised as fragmented conceptions, while categories C, D and E are characterised as cohesive conceptions. For instance, category A reflects the basic definition of online peer assessment, whereas category E shows more reflections on learning from classmates and critical thinking in the online peer assessment activity.

In Yang and Tsai's (2010) study, however, they classified college students' conceptions of learning in online peer assessment into six categories (i.e., A to F). Table 1 lists the comparison between the descriptions of the categories for conceptions of learning in Yang and Tsai's (2010) study and in this study. It reveals that the fragmented conceptions (categories A to C) addressed by Yang and Tsai (2010) were not revealed in the interview responses of this study. In other words, the students in this study were not concerned with technical exercises in the activity (e.g., a drill for some related computer skills, or a procedure for submitting assignments). For those expressing fragmented conceptions in this study, they would basically consider that online peer assessment was simply a procedure for evaluating their classmates. The possible reasons might come from the facts that the students (mean age was 18.74) in this study were somewhat more mature than those (mean age was 17.34) in Yang and Tsai's (2010) study and that the students in this study have had previous experience with paper-and-pencil peer assessment.

Following Yang and Tsai (2010), the approaches were characterised in terms of "surface" or "deep". Table 2 shows that categories A and B are characterised as surface

approaches, and categories C, D and E are characterised as deep approaches. For example, category A shows the students' engagement in evaluating peers according to their personal preferences, while category E reveals the students' reflections on their peers' comments to refine their own work.

Table 1: Categories of conceptions of learning via online peer assessment

Description in Yang and Tsai's (2010) study	Description in this study	Examples of interview responses by students in this study
Category A A drill for some related computer skills.	Category A A procedure for grading and commenting on peers.	"...When I uploaded my assignments to the system, everyone could have a look at my work and give me a grade. They also sent me suggestions or criticisms"
Category B A procedure for submitting assignments.	Category B A way to ensure the fairness of grading.	"...It is more objective to adopt either the teacher's grades or peers' grades..."
Category C A platform for learning new information.	Category C Training in appreciating peers' work.	"...I think peer assessment could foster my ability of appreciating and analysing artistic works..."
Category D A channel to exchange ideas.	Category D A way to understand ideas from different perspectives.	"...When I see peers' comments to me, I think we do not share the same point of view..."
Category E A way to understand ideas from different perspectives.	Category E A reflection on improving works (Training of critical thinking).	"...When assessing my classmates' work, I can reflect on the defects of my own work and have more ideas for my next assignments..."
Category F Training in critical thinking.		

Table 2: Categories of approaches to learning via online peer assessment

Description in Yang and Tsai's (2010) study	Description in this study	Examples of interview responses by students in this study
Category A Meet course requirements	Category A Evaluate the work of different individuals by intuition	"...I have no criteria for evaluating. I usually evaluate peers' work depending on liking it or not..."
Category B Collect extra information outside physical classrooms.	Category B Evaluate the work of different individuals by simple comparison	"...My strategy of evaluation is to compare peers' work with mine. Hence, I think that I could distinguish the quality of the work..."
Category C Get solutions for correcting possible mistakes	Category C Evaluate the work of different individuals by clear criteria	"...I will check whether peers' work matches the requirements of the assignment or not..."
Category D Carefully evaluate the work of different individuals	Category D Reflect on my work using peer comments	"...When the activity finished, I always expected to see peers' comments for making a comparison with my work...."
Category E Reflect on my work using peer comments	Category E Improve my work using peer comments	"...Peers' comments are important for me. I usually pay attention to the problems addressed by my classmates and try to avoid them in the next assignments..."

Also, Table 2 lists the comparison between the descriptions of the categories for approaches to learning in Yang and Tsai's (2010) study and in this study. The students in this study expressed their understanding of using evaluation as a strategy instead of showing a tendency to reproduce or memorise knowledge in the online peer assessment activity (e.g., collect extra information outside physical classrooms).

Distributions of categories and associations for conceptions of and approaches to learning

Table 3 presents the frequency and proportion of the categories for conceptions of and approaches to learning. The results show that 78% (n=18) of the students had conceptions of learning in online peer assessment that were cohesive, and 22% (n=5) that were fragmented. Regarding approaches to learning in online peer assessment, 61% (n=14) of the students' responses were categorised as deep and 39% (n=9) as surface.

Table 3: The distributions of categories in conceptions of and approaches to learning (n=23)

	Type	Category	Frequency (%)
Conceptions	Fragmented	A	3 (13%)
		B	2 (9%)
	Cohesive	C	6 (26%)
		D	8 (35%)
		E	4 (17%)
		Total	23 (100%)
Approaches	Surface	A	3 (13%)
		B	6 (26%)
	Deep	C	5 (22%)
		D	5 (22%)
		E	4 (17%)
		Total	23 (100%)

Table 4 presents the associations between the students' conceptions of and approaches to learning in the online peer assessment activity. The results indicate that, in this study, most students possess cohesive conceptions and follow deep approaches (61%, n=14). That is, the students with cohesive conceptions were inclined to use deep approaches, while those with fragmented conceptions tended to apply surface approaches. Also, the results were in line with previous studies (Lee et al., 2008; Yang & Tsai, 2010).

Table 4: Cross-tabulation of conceptions of and approaches to learning (n=23)

Approaches	Conceptions	
	Fragmented	Cohesive
Surface	5 (22%)	4 (17%)
Deep	0 (0%)	14 (61%)

Associations between perceptions of interpersonal variables, conceptions of and approaches to learning

1. Psychological safety

The interview responses of the students' perceptions of psychological safety in the online peer assessment were classified into two categories, namely low and high. Table

5 shows that, in the present study, about 82% of the students (n=19) perceived high psychological safety in the online peer assessment activities. Most of them held cohesive conceptions (n=16) and deep approaches (n=13). In general, they indicated that anonymity was a major factor allowing them to participate in the activity without friendship concerns. For example, student F15 stated that:

F15: I can evaluate peers' work when others don't know who I am. Because I am anonymous to peers, I can make fair comments without the pressure of friendship... When I am evaluating peers' work, I always pay attention to the merits of their work and learn from them. If possible, I will try to improve or re-create my own work.

Interestingly, student F11 who was not concerned with anonymity still felt comfortable with evaluating peers via the Internet. She stated:

F11: When involved in the peer assessment activity, I believe that I can make valuable comments to my classmates instead of malicious comments. Hence, I think anonymity is not a big deal.

On the other hand, only 18% (n=4) of the students did not feel safe being involved in the activity. Some of their responses are extracted below:

F1: I still can't feel safe even if the online peer assessment setting is anonymous. When I score or comment on someone, I am often disturbed by the pressure of friendship in my mind.

F19: I can't feel easy in my mind. Even though the design of the online peer assessment is anonymous, some classmates evaluating me still disclose my scores on *Facebook*.

To summarise, the students perceiving high psychological safety mainly possessed cohesive conceptions and utilised deep approaches to learning in the online peer assessment. That is, learners taking less interpersonal risks in a group might use peers' suggestions to reflect on their work and sequentially improve it (e.g., student F15). In addition, anonymity plays an important role in the perceptions of psychological safety when the students are involved in the peer assessment activities through the Internet. According to the students' interview responses, most of them prefer anonymity for the reason of avoiding the pressure of friendships. In other words, with anonymity in the activity, the relationships between assessors and their peers may not be an obstacle to practising peer assessment. In the present study, however, student F11 would feel comfortable even if the setting of the online peer assessment was not anonymous. According to her interview responses, she was confident in completing the task of peer assessment; hence, anonymity is not essential for her. The result implies that confidence in evaluating peers might intervene with the perceptions of psychological safety.

However, there were four students who expressed unease about the anonymous online peer assessment. Although the setting of the peer assessment via the Internet could ensure their anonymity (Cho & Schunn, 2007; Lin et al., 2001), a few students were still concerned about the pressure of friendships and information about the assessment results being leaked. During the process of online peer assessment, it is suggested that instructors may need to guarantee students their anonymity; require them to disclose no information about the assessment results through any channel; and remind them to make assessments privately to reduce the worry about friendships and information leaks.

Table 5: Cross-tabulation of psychological safety, conceptions of and approaches to learning (n=23)

Psychological safety	Conceptions			Approaches		
	Fragmented	Cohesive	Total	Surface	Deep	Total
Low	2 (9%)	2 (9%)	4 (18%)	3 (13%)	1 (4%)	4 (17%)
High	3 (13%)	16 (69%)	19 (82%)	6 (26%)	13 (57%)	19 (83%)

2. Value diversity

This study examined the students' perceptions of value diversity from two points of view, namely goals and criteria. The interview responses regarding perceived value diversity for goals and criteria were classified into two categories (i.e., low and high). The results indicated that, in the online peer assessment activity, the students possessed different perceptions of value diversity for goals and criteria. Table 6 reveals that 74% (n=17) of the students perceived low value diversity for goals in the activities. Among these students, 14 had cohesive conceptions of and 10 used deep approaches to learning. For example, students F2 and F3 stated that:

F2: I think that my classmates perceive the same goals as me. We all have opportunities to see our peers' work and to avoid similar mistakes to those our peers made... Moreover, our creativity could be induced by the practice of appreciating and evaluating peers' work.

F3: We perceive similar goals of peer assessment. Each one could review flaws in his/her work by peers' comments. We could also exchange ideas about our work in the activity.

It should be noted that, on the other hand, 74% (n=17) of the students perceived high value diversity for criteria in the activity. However, most of them possessed cohesive conceptions (n=13) and applied deep approaches (n=11). For instance, students F7, F17 and F19 described their perceptions of high value diversity for criteria as below:

F7: Some classmates who did not take the peer assessment activity seriously may evaluate according to their free will, but I took time to carefully evaluate peers' work and make comments on it. Thus, I consider that we had different criteria.

F17: I think that our criteria for grading are not the same. In my experience, some people always tended to give low grades for the reason of annoying others.

F19: We have different standards to evaluate others. When I receive grades and comments from peers, the results are never consistent with my expectations. But, it could lead me to think about my work being worse as they said.

However, there were still 26% (n=6) of the students who perceived low value diversity for criteria. Most of them (n=5) held cohesive conceptions but did not show a tendency to use certain approaches. For example, students F5 and F15 stated that:

F5: I think that everyone has similar criteria. We assess how delicate the peers' work is (e.g., realistic hair sketching of computer self-portrait). Then, we also compare the work to generate adequate scores.

F15: We all evaluate each other's work according to the requirements of each assignment. Hence, I think that we have the same criteria to evaluate and share ideas with each other.

In sum, most of the students had a common perception of peer assessment goals, and responded that their conceptions were cohesive and their approaches were deep. That is, there is a similarity between the findings of the present study and those of van Gennip et al. (2010), in that low value diversity for goals positively influences learning in peer assessment in spite of the different research context designs (small group in van Gennip et al.'s (2010) study vs. a class group in this study). Other interesting findings are that most of the students (74%) perceived high value diversity for criteria, and that they possessed cohesive conceptions and deep approaches. Since past studies have suggested the importance of a shared assessment standard in a peer assessment activity (Falchikov & Goldfinch, 2000; Smith et al., 2002), this study also found that a quarter of the students (26%) perceived consistency in criteria and tended to hold cohesive conceptions (e.g., student F15), but not to use certain levels of approaches. To summarise, the results may imply that the students who perceived low or high value diversity for criteria both have a tendency to possess cohesive conceptions. This probably indicates that the role of value diversity for criteria could not be exactly identified when discussing conceptions of learning.

However, the perceptions of high value diversity might lead to utilisation of deep approaches. For most of the students, this study contends that, in the context of a whole class group, there were variations in shared understanding of the assessment standards of the artistic works, even if the requirements of each assignment were provided by the teacher. The evaluation of artistic works involves more subjective judgments and leads to more concerns in the online peer assessment. For example, student F7 held high value diversity for criteria, but still devoted herself to the assessment tasks. The perceptions of high value diversity for criteria may also encourage learners to use deep approaches to think critically (e.g., the responses from student F19). In addition, this study suggests that further verification of the relationships between value diversity for criteria and conceptions of learning should be investigated.

Furthermore, according to the students' responses, they potentially express emotional arousal in response to unshared understanding of peer assessment criteria. For example, students F7 and F17 perceived high value diversity for criteria because of suspecting that peers' evaluations were made without concern (e. g., annoying peers, or assessing according to personal preferences). Hence, this study proposes that, in the interpersonal context, the emotional responses of perceiving value diversity for criteria might be a crucial issue in a peer assessment activity.

Table 6: Cross-tabulation of value diversity, conceptions of and approaches to learning (n=23)

		Conceptions			Approaches		
		Fragmented	Cohesive	Total	Surface	Deep	Total
Value diversity for goals	Low	3 (13%)	14 (61%)	17 (74%)	7 (30%)	10 (44%)	17 (74%)
	High	2 (9%)	4 (17%)	6 (26%)	2 (9%)	4 (17%)	6 (26%)
Value diversity for criteria	Low	1 (4%)	5 (22%)	6 (26%)	3 (13%)	3 (13%)	6 (26%)
	High	4 (17%)	13 (57%)	17 (74%)	6 (26%)	11 (48%)	17 (74%)

3. Trust

The students' interview responses for perceiving trust in peers were classified into the two categories of yes and no. According to Table 7, it reveals that most of the students (74%, n=17) trusted in themselves as assessors. Then, they mainly held cohesive

conceptions (n=14) and deep approaches (n=12). For example, students F7 and F11 stated that:

F7: I don't score my peers with considerations of friendship; hence, I believe I can fairly evaluate them. While I admire the creative ideas and encourage them to work harder on the next job, I also give suggestions to modify their work according to my experience doing the same assignment.

F11: I think I am qualified to evaluate my classmates because I always carefully examine their work. Based on the weaknesses of their work, I propose some advice for them to make improvements. I also compliment them on the merits of their work.

The students in the present study were not trained in how to give grades or make comments in the activity. Hence, the results may be similar to Sluijsmans et al.'s (2002) findings that students are confident in their assessing skills no matter whether they have received training in peer assessment or not. Moreover, van Gennip et al. (2010) verified that trust in oneself as an assessor is related to positive attitudes toward peer assessment. Taking this a step further, this study proposes that students with a high level of self-confidence regarding evaluating peers may also have cohesive conceptions and use deep approaches to participate in online peer assessment activities.

Moreover, Table 7 shows that the number of the students who trust in their peers for grading and commenting (57%, n=13) was slightly higher than that of the students who did not have such trust (43%, n=10). The students showing trust in their classmates for assessing mainly held cohesive conceptions (n=11) and deep approaches (n=9). For instance, students F3 and F9 stated that:

F3: I think my peers are qualified to do the job of assessment. Although everyone has different pressures of friendship or subjective thoughts, it could constitute objective evaluation by different points of view... I always review my work based on others' comments.

F9: Because my classmates have different perspectives from the teacher, I trust in my peers for assessing me... For example, some classmates' name card designs exactly reflect their personality, but the teacher may not tell their characteristics because of being unfamiliar with them.

However, almost half of the students (43%, n=10) still distrusted their peers. Most of these students also held cohesive conceptions (n=7). However, there was no consistency in their use of surface (n=5) or deep (n=5) approaches. Some interview responses regarding distrusting peers are extracted as follows:

F4: According to my observations, I know that some classmates always gave all high or low grades for each peer without careful consideration. Therefore, I don't have enough confidence to believe in the grades given by peers.

F11: I am concerned that my classmates are not professional enough for giving grades. They don't have adequate experience of artistic work to judge how much effort peers have put in. Hence, I don't think my peers are qualified to score me.

F12: Some people would be prejudiced by their first impressions of peers; thus, I can't trust them in assessing me. Moreover, some people's comments just reflect their preference for the work; I can't get useful suggestions to improve my work.

According to the abovementioned interview responses, the students trusting in peers perceived peer assessment as an activity to experience different perspectives (cohesive

conceptions, e.g., student F3 and F9) and critically reflect on their work according to peers' comments (deep approaches, e.g., student F3). On the other hand, the students who distrusted their peers' evaluation doubted their peers' background knowledge (e.g., student F11), ability at grading to make a judgment (e.g., student F4) or prejudiced impressions (e.g., student F12).

Since the students showing both trust and distrust in their peers tended to hold cohesive conceptions, this study considers that the qualitative association between the factor of trust in peers and conceptions of learning could not be verified. However, the students who trusted in their peers were inclined to use deep approaches. That is, when the students were willing to trust in the peer evaluations, they may expect peers' constructive comments or suggestions to be useful in re-examining and further improving their work. Hence, this study may conclude that the factor of trust in peers plays a role in the level of approach to rather than in conceptions of learning in the online peer assessment.

Table 7: Cross-tabulation of trust in peers, conceptions of and approaches to learning (n=23)

		Conceptions			Approaches		
		Fragmented	Cohesive	Total	Surface	Deep	Total
Trust in self	Yes	3 (13%)	14 (61%)	17 (74%)	5 (22%)	12 (52%)	17 (74%)
	No	2 (9%)	4 (17%)	6 (26%)	4 (17%)	2 (9%)	6 (26%)
Trust in peers	Yes	2 (9%)	11 (48%)	13 (57%)	4 (17%)	9 (39%)	13 (56%)
	No	3 (13%)	7 (30%)	10 (43%)	5 (22%)	5 (22%)	10 (44%)

4. Social interdependence: Cooperation and competition

To understand the students' perceptions of social interdependence in the online peer assessment, this study interviewed them concerning the two aspects, cooperation and competition. Their interview responses toward perceiving cooperation and competition were both classified into two categories, including yes and no. By cross analysis of the two aspects of cooperation and competition (2 categories x 2 categories), the four types of social interdependence were generated (i.e., *cooperation/competition*, *cooperation/non-competition*, *non-cooperation/competition* and *non-cooperation/non-competition*). As shown in Table 8, most of the students presented the cooperative/non-competitive type of social interdependence (48%, n=11). Also, cohesive conceptions (n=9) and deep approaches (n=7) were also mainly adopted by these students.

Table 8: Cross-tabulation of social interdependence, conceptions of and approaches to learning (n=23)

Social interdependence	Conceptions			Approaches		
	Fragmented	Cohesive	Total	Surface	Deep	Total
Cooperation/competition	1 (4%)	5 (22%)	6 (26%)	2 (9%)	4 (17%)	6 (26%)
Cooperation/non-competition	2 (9%)	9 (39%)	11 (48%)	4 (17%)	7 (31%)	11 (48%)
Non-cooperation/competition	0 (0%)	1 (4%)	1 (4%)	0 (0%)	1 (4%)	1 (4%)
Non-cooperation/non-competition	2 (9%)	3 (13%)	5 (22%)	3 (13%)	2 (9%)	5 (22%)

For example, the interview responses by students F14 and F19 were:

F14: Because I consider that everyone has to give grades to and make comments on peers, this is a kind of cooperative activity for learning... I don't think that the activity is competitive even if others' work is better than mine.

F19: The activity is close to cooperation. That is, everyone's comments are references to peers; grades from peers represent more fairness in the activity... It's not a competitive activity. In my opinion, competition in the activity may refer to giving peers with better work lower grades. However, I didn't perceive that kind of situation during this activity.

For those students who exhibit the cooperative/non-competitive type of social interdependence, some considered online peer assessment as cooperatively working for grade-giving and comment-making (e.g., student F14), or cooperatively improving each other's work by different comments (e.g., student F19). That is, most of the students showed positive social interdependence in perceiving the activity as being cooperatively practised instead of being competitive in terms of performance.

There were 26% (n=6) of the students presenting cooperative/competitive type of social interdependence. Most of them also had cohesive conceptions (n=5) and deep approaches (n=4). Though these students were not the main type in this study, some of them demonstrated a particular perspective on competition. For instance, students F11 and F23 stated that:

F11: ... Yes, it seems to be a competitive activity. During the peer assessment process, I always compare my work with that of peers to find out which is better... I think that peer assessment is an opportunity to train our ability of appreciation. If my peers' work is more creative than mine, I would like to learn from them.

F23: ... I consider that it is a competitive activity. When I evaluated others' work, I would reflect on mine. If I saw good work of a peer, I always told myself to work harder next time... For me, peer assessment is a chance to think about my work.

According to the responses of students F11 and F23, the perception of competition is an encouragement rather than a negative perception of social interdependence for them. They transferred the comparisons between self and peers to positive thoughts. For example, student F11 considered peer assessment as a training of appreciation (cohesive conception) and showed an inclination to learn from peers whose work was more creative than hers (deep approach). Student F23 thought peer assessment was a chance to reflect on his work (cohesive conception) and reminded himself to work harder (deep approach). Hence, these responses imply that they held cohesive conceptions and deep approaches.

To sum up, as the students who either presented cooperative/ non-competitive or cooperative/ competitive type perceive positive social interdependence, this study contends that it leads to cohesive conceptions of and deep approaches to learning in the online peer assessment. This situation also reflects Prins et al.'s (2005) finding about positive interdependence holding group members together for collaborative learning. In addition, those students who adopted the non-cooperative/ competitive (4%, n=1) and non-cooperative/ non-competitive (22%, n=5) types of social interdependence were not the major groups in this study; and they also did not show an obvious tendency to hold certain conceptions and approaches.

Implications and conclusions

Based on the qualitative results interpreted above, this study proposes a model of the associations between students' interpersonal perspectives on, conceptions of and approaches to learning in online peer assessment activities. As shown in Figure 1, in

general, the more positive interpersonal perspectives (i.e., high psychological safety, low value diversity for goals, trust in self as assessors, positive social interdependence) the students perceived, the higher level of conceptions and approaches (i.e., cohesive conceptions and deep approaches) they held.

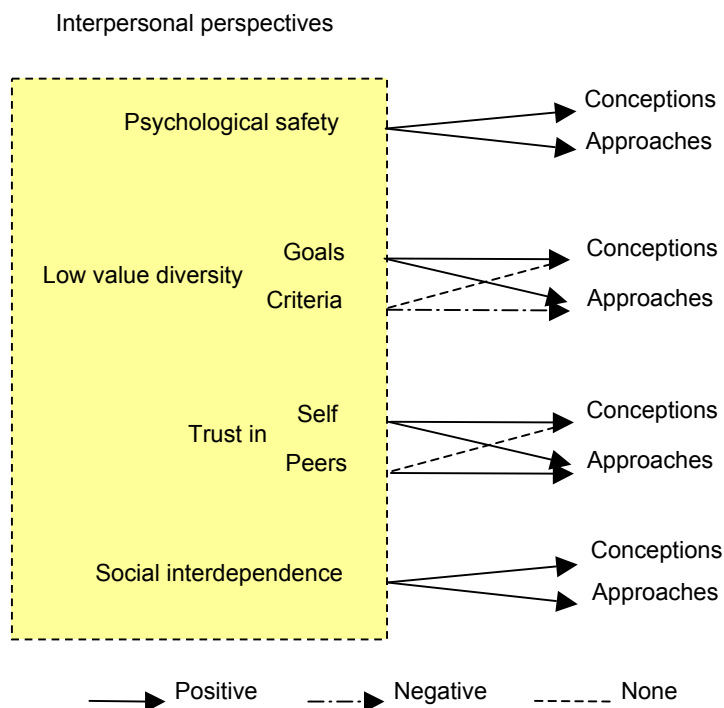


Figure 1: A model of the associations between interpersonal perspectives on, conceptions of and approaches to learning in the online peer assessment activity

However, the perceptions of high value diversity for criteria were qualitatively related to the level of approaches, but were not associated with the level of conceptions. For some students in this study, their perceptions of different evaluation standards for artistic creations may foster them to examine multi-dimensional viewpoints from peers' comments for reflecting on or revising their work. Although this finding is not consistent with the suggestion of a shared criterion in peer assessment (Falchikov & Goldfinch, 2000; Smith et al., 2002), it is supposed that, for those learners in the context of assessing peers' artistic creations in the online environment, high value diversity for criteria might play a role in their use of deep approaches. Hence, the perceptions of high value diversity may be helpful for certain learners to improve their artistic creations.

Also, the perceptions of trust in peers as assessors were qualitatively associated with the level of approaches, but not with the level of conceptions. When the students had confidence in their peers' competence in assessment, peers' comments may become an essential reference to review or modify their artistic creations. However, the difference between the number of students trusting in and distrusting in their peers was small. This study suggests that the reasons for perceiving distrust in peers, such as doubting

peers' background knowledge or prejudiced impressions of someone, should be carefully handled when implementing a peer assessment activity.

In the present study, some problems which occurred in the interpersonal context of the online peer assessment were discovered through the students' interview responses, such as concerns about the pressure of friendships (Dochy et al., 1999; Magin, 2001) or the leaking of assessment results. These findings may remind instructors that these interpersonal concerns should be paid attention to in the context of online peer assessment. In addition, the students' potential emotional arousals were found in their interview responses. For example, the students had doubts regarding their peers' unreasonable or arbitrary evaluation, or had an uncomfortable feeling about receiving doubtful comments from their peers. Therefore, the findings might evoke another interesting issue for exploring participants' emotional responses during the process of online peer assessment activities.

Finally, the sample size was the major limitation in the current study. In the future, the sample size could be enlarged; and questionnaires of interpersonal perspectives on, conceptions of and approaches to online peer assessment could be developed. By means of quantitative data gathering, the model of the associations between the students' interpersonal perspectives on, conceptions of and approaches to learning in online peer assessment activities proposed above might be validated further.

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References

- Ballantyne, R., Hughes, K. & Mylonas, A. (2002). Developing procedures for implementing peer assessment in large classes using an action research process. *Assessment and Evaluation in Higher Education*, 27(5), 427-441. <http://dx.doi.org/10.1080/0260293022000009302>
- Benson, P. & Lor, W. (1999). Conceptions of language and language learning. *System*, 27(4), 459-472. [http://dx.doi.org/10.1016/S0346-251X\(99\)00045-7](http://dx.doi.org/10.1016/S0346-251X(99)00045-7)
- Biggs, J. (1994). Approaches to learning: Nature and measurement of. In T. Husen & T. N. Postlethwaite (Eds.), *The international encyclopedia of education* (2nd ed., Vol. 1, pp. 319-322). Oxford, England: Pergamon.
- Chin, C. & Brown, D. E. (2000). Learning in science: A comparison of deep and surface approaches. *Journal of Research in Science Teaching*, 37(2), 109-138. [http://dx.doi.org/10.1002/\(SICI\)1098-2736\(200002\)37:2<109::AID-TEA3>3.0.CO;2-7](http://dx.doi.org/10.1002/(SICI)1098-2736(200002)37:2<109::AID-TEA3>3.0.CO;2-7)
- Ching, Y. H. & Hsu, Y. C. (2011). Design-grounded assessment: A framework and a case study of Web 2.0 practices in higher education. *Australasian Journal of Educational Technology*, 27(5), 781-797. <http://www.ascilite.org.au/ajet/ajet27/ching.html>
- Cho, K. & Schunn, C. D. (2007). Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system. *Computers & Education*, 48(3), 409-426. <http://dx.doi.org/10.1016/j.compedu.2005.02.004>
- Dochy, F., Segers, M. & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: A review. *Studies in Higher Education*, 24(3), 331-350. <http://dx.doi.org/10.1080/03075079912331379935>

- Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350-383. <http://dx.doi.org/10.2307/2666999>
- Ellis, R. A., Steed, A. F. & Applebee, A. C. (2006). Teacher conceptions of blended learning, blended teaching and associations with approaches to design. *Australasian Journal of Educational Technology*, 22(3), 312-335. <http://www.ascilite.org.au/ajet/ajet22/ellis.html>
- Falchikov, N. & Goldfinch, J. (2000). Student peer assessment in higher education: A meta-analysis comparing peer and teacher marks. *Review of Educational Research*, 70(3), 287-322. <http://dx.doi.org/10.2307/1170785>
- Jehn, K. A., Northcraft, G. B. & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict, and performance in workgroups. *Administrative Science Quarterly*, 44(4), 741-763. <http://dx.doi.org/10.2307/2667054>
- Johnson, D. W. & Johnson, R. T. (1998). Cooperative learning and social interdependence theory. In R. S. Tindale et al. (Eds.), *Theory and research on small groups* (pp.9-35). New York: Plenum Press.
- Kaufman, J. H. & Schunn, C. D. (2011). Students' perceptions about peer assessment for writing: Their origin and impact on revision work. *Instructional Science*, 39(3), 387-406. <http://dx.doi.org/10.1007/s11251-010-9133-6>
- Lee, M. H., Johanson, R. E. & Tsai, C. C. (2008). Exploring Taiwanese high school students' conceptions of and approaches to learning science through a structural equation modeling analysis. *Science Education*, 92(2), 191-220. <http://dx.doi.org/10.1002/sce.20245>
- Liang, J.C., & Tsai, C. C. (2010). Learning through science writing via online peer assessment in a college biology course. *The Internet and Higher Education*, 13(4), 242-247. <http://dx.doi.org/10.1016/j.iheduc.2010.04.004>
- Lin, S. S. J., Liu, E. Z. F. & Yuan, S. M. (2001). Web-based peer assessment: Feedback for students with various thinking-styles. *Journal of Computer Assisted Learning*, 17(4), 420-432. <http://dx.doi.org/10.1046/j.0266-4909.2001.00198.x>
- Liu, N. F. & Carless, D. (2006). Peer feedback: The learning element of peer assessment. *Teaching in Higher Education*, 11(3), 279-290. <http://dx.doi.org/10.1080/13562510600680582>
- Magin, D. (2001). Reciprocity as a source of bias in multiple peer assessment of group work. *Studies in Higher Education*, 26(1), 53-63. <http://dx.doi.org/10.1080/03075070020030715>
- Marshall, D., Summers, M. & Woolnough, B. (1999). Students' conceptions of learning in an engineering context. *Higher Education*, 38(3), 291-309. <http://dx.doi.org/10.1023/A:1003866607873>
- Marton, F., Dall'Alba, G. & Beaty, E. (1993). Conceptions of learning. *International Journal of Educational Research*, 19(3), 277-299.
- May, D. R., Gilson, R. L. & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77(1), 11-37. <http://dx.doi.org/10.1348/096317904322915892>
- McDowell, L. (1995). The impact of innovative assessment on student learning. *Innovation in Education and Training International*, 32(4), 302-313. <http://dx.doi.org/10.1080/1355800950320402>

- Prins, F. J., Sluijsmans, D. M. A., Kirschner, P. A. & Strijbos, J. W. (2005). Formative peer assessment in a CSCL environment: A case study. *Assessment and Evaluation in Higher Education*, 30(4), 417-444. <http://dx.doi.org/10.1080/02602930500099219>
- Raban, R. & Litchfield, A. (2007). Supporting peer assessment of individual contributions in groupwork. *Australasian Journal of Educational Technology*, 23(1), 34-47. <http://www.ascilite.org.au/ajet/ajet23/raban.html>
- Sluijsmans, D. M. A., Brand-Gruwel, S. & van Merriënboer, J. J. G. (2002). Peer assessment training in teacher education: Effects on performance and perceptions. *Assessment and Evaluation in Higher Education*, 27(5), 443-454. <http://dx.doi.org/10.1080/0260293022000009311>
- Smith, H., Cooper, A. & Lancaster, L. (2002). Improving the quality of undergraduate peer assessment: A case for student and staff development. *Innovations in Education and Teaching International*, 39(1), 71-81. <http://dx.doi.org/10.1080/13558000110102904>
- Topping, K. J. (1998). Peer assessment between students in colleges and universities. *Review of Educational Research*, 68(3), 249-276. <http://dx.doi.org/10.2307/1170598>
- Topping, K. J. (2010). Methodological quandaries in studying process and outcomes in peer assessment. *Learning and Instruction*, 20(4), 339-343. <http://dx.doi.org/10.1016/j.learninstruc.2009.08.003>
- Topping, K. J., Smith, E. F., Swanson, I. & Elliot, A. (2000). Formative peer assessment of academic writing between postgraduate students. *Assessment and Evaluation in Higher Education*, 25(2), 149-169. <http://dx.doi.org/10.1080/713611428>
- Tseng, S. C. & Tsai, C. C. (2007). On-line peer assessment and the role of the peer feedback: A study of high school computer course. *Computers & Education*, 49(4), 1161-1174. <http://dx.doi.org/10.1016/j.compedu.2006.01.007>
- Van den Bossche, P., Gijssels, W. H., Segers, M. & Kirschner, P. A. (2006). Social and cognitive factors driving teamwork in collaborative learning environments: Team learning beliefs and behaviors. *Small Group Research*, 37(5), 490-521. <http://dx.doi.org/10.1177/1046496406292938>
- Van Gennip, N. A. E., Segers, M. S. R. & Tillema, H. H. (2009). Peer assessment for learning from a social perspective: The influence of interpersonal variables and structural features. *Educational Research Review*, 4(1), 41-54. <http://dx.doi.org/10.1016/j.edurev.2008.11.002>
- Van Gennip, N. A. E., Segers, M. S. R., & Tillema, H. H. (2010). Peer assessment as a collaborative learning activity: The role of interpersonal variables and conceptions. *Learning and Instruction*, 20(4), 280-290. <http://dx.doi.org/10.1016/j.learninstruc.2009.08.010>
- Wen, M. L. & Tsai, C. C. (2006). University students' perceptions of and attitudes toward (online) peer assessment. *Higher Education*, 51(1), 27-44. <http://dx.doi.org/10.1007/s10734-004-6375-8>
- Yang, Y. F. & Tsai, C. C. (2010). Conceptions of and approaches to learning through online peer assessment. *Learning and Instruction*, 20(1), 72-83. <http://dx.doi.org/10.1016/j.learninstruc.2009.01.003>
- Zhang, Y., Fang, Y., Wei, K.-K. & Chen, H. (2010). Exploring the role of psychological safety in promoting the intention to continue sharing knowledge in virtual communities. *International Journal of Information Management*, 30(5), 425-436. <http://dx.doi.org/10.1016/j.ijinfomgt.2010.02.003>

Appendix 1: Interview questions for interpersonal variables

1. Based on your experience, do you feel comfortable when you assess peers online? Could you describe what factors may influence your assessment for feeling comfortable?
2. Do you think that your peers perceive the same goals of the online peer assessment as you do? Why?
3. Do you think that your peers use the same criteria for the online peer assessment as you do? Why?
4. In the online peer assessment activity, do you trust yourself to grade and comment on assignments? Do you trust your peers to grade and comment on your assignments? Why?
5. Do you think that the online peer assessment is a cooperative activity? Why?
6. Do you think that the online peer assessment is a competitive activity? Why?

Question 1 explored perceptions of psychological safety; questions 2 and 3 probed perceptions of value diversity; question 4 explored perceptions of trust; and questions 5 and 6 investigated perceptions of social interdependence.

Appendix 2: Interview questions for conceptions and approaches

1. What do you think online peer assessment is?
2. What do you think the purpose of online peer assessment for learning is?
3. Why do you think that the teacher used online peer assessment as a method of learning? If possible, will you use online peer assessment as a method of learning in the future? Why?
4. What did you do during the online peer assessment activity?
5. What strategies did you use when you graded and commented on peers? Why did you use those strategies?

Questions 1 to 3 probed the students' conceptions of learning in online peer assessment, while questions 4 and 5 explored the students' approaches to learning in online peer assessment.

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