**Peer assessment: the role of relational learning through communities of practice**

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Our work concerned the socio-cultural practices of tutors from diverse higher education institutes. The tutors were practising lecturers who had contributed to peer assessment studies published in refereed academic journals. Analysis of interview data considered the relational interdependency of tutors’ and students’ activity in the socially and culturally structured world of peer assessment. Undertaking peer assessment led to changes in: (1) relational learning between tutors and students, and (2) tutors’ and students’ perceived identities. The findings are discussed in terms of: (a) learning in communities of practice through boundary interactions with other communities, and (b) the participatory and acquisition metaphors of learning. The wider role of peer assessment in terms of interactions, communications and the balance of learning metaphors in higher education is considered.

Keywords: peer assessment, relational learning, communities of practice, identity, socio-cultural learning

**Introduction**

***Peer assessment***

Peer assessment has been defined by Topping (1998, 250) as ‘an arrangement for peers to consider the level, value, worth, quality or successfulness of the products or outcomes of learning of others of a similar status’. It involves four steps: task performance, feedback provision, feedback reception, and revision (Kollar and Fischer 2010). From this perspective, or variations of it, there is an extensive literature on peer assessment (for reviews see for example Ashenafi 2017; Gielen, Dochy and Onghena 2011; Topping 1998; Van Zundert, Sluijsmans and Van Merrienboer 2010). Early work regarding peer assessment was concerned primarily with the reliability and validity of peer assessed marking relative to tutor marking (for a meta-analysis see Falchikov and Goldfinch 2000). Subsequently there was a shift from comparison of marks to highlighting the benefits gained from undertaking peer assessment including motivating students to work harder (Fallows and Chandramohan 2001), revealing to students the requirements for achieving high grades (Sadler 2009, 2010), encouraging students to develop negotiation and other transferable skills (Sluijsmans and Prins 2006) and improving student engagement (Weaver and Esposto 2012).While both the provider and receiver of peer feedback learn from the process (Ladyshrewsky 2013), it seems to be particularly beneficial to the provider (Nicol, Thompson and Breslin 2014).Yet, despite this large overall literature, little is known concerning how peer assessment benefits from the collaborative learning processes it often engenders (Van Gennip, Segers and Tillema 2010).

Hence, current research on peer assessment focuses on the acquisition metaphor of learning which favours transmission and constructive approaches (Wegner, and Nückles 2015) and considers knowledge as an entity that can be transferred from tutor to student or between peers. To understand learning from peer assessment in its entirety, the participatory metaphor of learning (Wegner, and Nückles 2015) also needs to be considered. Here knowledge is considered as something a person does though relationships with others. Such relational learning favours community growth approaches to teaching where learning is not seen in terms of the individual, but as the development of a community of practice. Sfard (1998) considered both these metaphors and how they help in understanding learners’ identities. The acquisition metaphor focuses on learner identity from the perspective of possession of knowledge and attributes while the participatory metaphor considers learner identity in terms of being and becoming part of a greater entity. Ultimately, Sfard (1998, 11) concluded that we need both the metaphors to fully understand learning, as both ‘generate conceptual frameworks as offering differing perspectives rather than competing opinions’. This current study addresses the under-researched area of participatory learning through peer assessment. In particular, it considers learning through peer assessment within the context of communities of practice.

***Students’ relational learning through communities of practice***

Knight (2001, 377) stated that ‘a good curriculum would plan for learning to take place through communities of practice in which groupwork and peer evaluation are normal, interpersonal contact is common and networks of engagement are extensive’. In their seminal text Lave and Wenger (1991) considered learning to be not ‘merely situated in practice – as if it were some independently reifiable process that just happened to be located somewhere; learning is an integral part of generative social practice in the lived in world’ (35). There is a relational interdependency of ‘agent and world, activity, meaning cognition learning and knowing’ (50) and an emphasis on the ‘socially negotiated meaning where the social world is situated in the historical development of ongoing activity’ (51). Hence learning in communities of practice occurs ‘through mutual engagement in an activity [such as peer assessment] where meaning in what is learnt is negotiated both inside and outside the community’ (Fuller et al. 2004, 52).

Wenger-Trayner and Wenger-Trayner (2015) perceived the body of knowledge of a profession to be a complex landscape of different communities of practice that form boundaries with one another. Such boundaries form particularly rich learning zones due to the divergent competencies and experiences of the participants (Wenger 2010a). In such a landscape, learning can be considered as occurring through a process of legitimate peripheral participation where newcomers gradually move toward full participation in a specialist community of practice. As a result of such movement, identity development occurs, such that learning and identity are inseparable (Lave and Wenger 1991). More empirically, Orsmond, Merry and Callaghan (2013), who studied learning-orientated communities of practice in undergraduate biology students, demonstrated identity development as an apparent change from student practice to biological practice. It was also notable that these communities of practice exhibited a richness of situated learning that resulted from multidirectional processes occurring at the boundary between the student community and other social learning structures outside the community.

In sum, the current qualitative study is designed to contribute to the published literature on peer assessment by exploring the relational learning it produces within communities of practice during interactions at their boundaries between tutors and students. The overall aim of this study is to determine whether the concept of communities of practice is helpful in interpreting aspects of tutor and student learning that may occur during peer assessment. The following specific research questions were addressed:

* To what extent does peer assessment foster relational learning between tutors and students?
* How does such relational learning contribute to tutors’ professional identities and their perceptions of students’ professional identities?

**Methodology**

***Setting***

The participants were based in five different higher education institutions denoted as G, K, L, S and W. These institutions comprised one Australian university and four UK universities with the UK establishments being two Russell Group universities, a pre-1992 university and a post-1992 university.

***Participants***The nine participants were all experienced tutors holding university lectureships or more senior positions. Their range of experience of peer assessment usage was 2-16 years (mean 7.9, SD 5.6) with the less experienced participants working alongside more experienced colleagues within their university. GE and LP were the most experienced participants. SE and WB were the least experienced participants. All were participating in peer assessment staff development activities and had contributed to refereed academic publications on the topic. Despite working in different academic departments, there were commonalities in the tutors’ usage of peer assessment. All participants saw peer assessment as involving both peer grading and peer feedback provision. Furthermore, they exclusively did this as components of summative assessments, and in only one case (KD) was the process conducted electronically. Written laboratory reports were the predominant assignments, but other written or oral work was sometimes used. In the case of written assignments, per assessment was conducted anonymously. More diversely, student cohort sizes ranged from 25 to more than 150, and the groups ranged from first year undergraduates to masters students.

Recruitment of participants was both opportunistic and purposive to endeavour to increase the diversity of institutions and tutor specialisms. However, the strong presence of biological disciplines amongst the participants reflects the specialism of the authors themselves. The participants’ specialisms were: biochemistry (B); biomedical science (M); environmental biology (E); history (H); medical science (S); pharmacology (P) and education (D).

So as to be anonymous, participants were designated GE, KD, LH, LM, LP, LS, SE, WB and WP where the first letter indicates university affiliation and the second letter the participant’s specialism.

***Instruments***Semi structured interviews were carried out in order to investigate the participants’ experiences of undertaking student peer assessment exercises. The interview schedule primarily concerned:

* their usage of peer assessment within their teaching
* their preparation for peer assessment sessions
* the peer assessment procedures that they adopt
* changes that they have made to their peer assessment practices and the consequences of these
* their understanding of the value of peer assessment to their students’ learning

The interview schedule was developed as described by Fielding (1993). Briefly, this involved (i) identifying topics surrounding the research questions, (ii) clustering and sequencing relevant topics and (iii) designing informal interview probes.

The study documentation and procedures were approved by Staffordshire University Research Ethics Committee.

***Procedures***After giving informed consent each participant took part in a single semi-structured interview of approximately 45 minutes duration. An exploratory manner (Higgins, Hartley and Skelton 2002) was adopted during the interview. The questioning was both open ended and encouraging so that spontaneous information about underlying attitudes could be obtained (Fielding 1993). Furthermore, the interviewers were relaxed and informal to reduce the likelihood of unease in the interviewees. All interviews were confidential, and the data generated was anonymous.

Interviews were conducted in the presence of two interviewers (the authors of this paper) who made cotemporaneous notes. After each interview, the interviewers discussed and refined their interview notes as required. The interviews were also audio recorded enabling verbatim transcription. The interviewers and the transcriber had no other involvement with the teaching practice of the participants.

***Analysis***Qualitative analysis of participants’ interview data involved, firstly, both interviewers reading and rereading the interview transcripts and their interview notes to produce a sense of the whole. This was followed by delineating units of meaning relevant to the research questions and thereafter clustering these units to identify general themes (Cohen and Manion 1994). Finally, representative quotes were sought from the transcripts as illustrations of the themes. Verification of the outcomes of each stage of the process was sought through discussions between the two interviewers and further interrogation of the data.

**Results**

This study had two interrelated research questions. These concerned the effects of peer assessment on (a) relational learning of tutors and students and (b) identity development of tutors and students.

Our analysis of the study data revealed peer assessment as a major factor in stimulating dialogue between tutors’ and students’. This talk concerned negotiation of meaning and resulted from what the individual tutor and student did; their practices. However, while the talk was between individuals, the frequent use of ‘we’ and ‘us’ in the language used by both parties strongly supports the notion that a coming together of tutor and student communities of practice was taking place. Such ‘boundary encounters...generate new insights’ (Wenger-Trayner and Wenger-Trayner 2015, 18) and the development of such relational learning was the first general theme of the data. Associated with this talk, tutors became more aware of changes in their own and of students’ identities; a second theme of the data. The talking occurred throughout the assessment process with the concomitant and subsequent discussions inside the separate tutor and student communities of practice appearing to facilitate both tutor and student identity development.

***Relational learning and identity change***

The following quote illustrates that student feedback through discussion can cause tutors to reconsider assessment criteria and become open to change. Here, the use of ‘we’ and ‘us’ strongly exemplifies the tutor’s awareness of being part of a tutor community of practice.

(A1) It’s how students will interpret what you [tutor] think is a cast iron objective statement…we’ve learned that students can see them [assessment criteria] quite differently to us…it’s very often some feedback that we get from students…It’s ah!... You know, they said they didn’t understand that, well why didn’t they understand that? What have we [tutors] got to do to put that right? What I find useful about peer assessment is twofold. I start to think a bit more how I set the assessment criteria and I can imagine that the criteria I set will probably change. You kind of think of [assessment criteria] in theory and apply them in practice and you can get a nasty shock sometimes. (Tutor WP)

Furthermore, tutors’ discussion with students can promote congruence between tutor and student communities of practice. Boundary interactions between the communities are increased and power differentials are reduced. In this quote the tutor acknowledges that they have changed their approach to assessment criteria in response to student feedback.

(A2) I’m prepared to take your [students’] views into consideration. So that puts it on a more equal footing…to treat students as one’s peers and equals within an academic community, rather than mmm the people that get done to by the staff...[Assessment criteria] were developed initially by me and then they were improved each year by negotiation with the students. Reading them, even talking about them, is not going to mean anything until they’ve used them. So, it’s understanding the use of criteria. As preparation for reviewing each other’s work I got them to review the previous year’s work…and then we talk about them the following week. (Tutor KD)

Additionally, it seems that that the boundary interactions between tutor and student communities of practice can induce tutor changes that extend beyond the immediate module into other formal and informal teaching situations. In the following quote the overall identity of the tutor seems to have changed with the tutor gaining a perception that their teaching has improved and with students recognising this change.

(A3) It [peer assessment] makes them [students] more vocal about what they want. You know, about what they think. So, we [tutors] get a lot more feedback from them than if they were just handing in reports and getting them back at some unspecified date…it’s very easy to do the practicals, but understanding [practicals] and explaining [them] to students in short sentences forces you to get it very clear in your own head. I need to look at implementation...it needs to be more vertical assessment. In January, I will have a group doing a module with me and then I will have the same group next year [on a different module]. So, I want to make the process of developing writing a report more [vertically] continuous across two modules...I think I’ve got much better at the teaching since I started doing the [peer assessment] marking sessions. It is interesting how [peer assessment] has changed the way I approach things...it makes me more reluctant to give [students] easy answers...I make them think through the answers for themselves. I’ve noticed a lot of second years come when on other [modules] to ask me about stuff. They know if they say ‘why does this happen’ I’m not going to tell them the answer, I’m going to make them work it out [with me]…and they still come and ask me. (Tutor LS)

Similarly, the boundary interactions between tutor and student communities of practice also seem to affect students’ identities. Students were perceived by tutors to become more able through taking greater responsibility for their own learning and power differentials are reduced. The overall identity of the students seems to have been affected in that these changes extend beyond the immediate module into a university learning and teaching committee.

(A4) I’ve watched them [2nd year students with prior peer assessment experience] doing it [peer assessment], and they’re very good at it!...Both the first and the second years have said [peer assessment] makes you go and look at the assessment criteria because you have to know what they are in order to talk about somebody else’s work, in order to give feedback that will be good...the staff are there with a group, giving feedback to students. And students are giving feedback to students. This peer and staff divide breaks down a little bit...[Students] like the responsibility...it’s getting [them] at the right point where they can take responsibility, so they feel they’re going to benefit by getting something, particularly feedback. It’s getting them [students] to trust each other. Peer assessment makes students feel part of the process. Students come to Student-Staff Liaison Committee meetings and talk to us…they come to us with constructive comments, they discuss teaching and learning with us and as we’re busy doing that ourselves we accept it from the students. (Tutor SE)

Overall, quotes A1-A4 indicate that peer assessment generates major boundary interactions between tutors’ and students’ communities of practice. Such boundary interactions are ‘learning assets’ (Wenger-Trayner and Wenger-Trayner 2015, 18) that are relevant to both tutors and students. Within these boundary interactions the participatory metaphor of learning predominates and is recognisable from the changes in tutors’ and students’ practice. Furthermore, identities are affected in the sense of being and becoming.

***Ongoing changes to the relational practice of tutors and students***

The previous quotes (A1-A4) suggest that feedback to tutors derived from boundary interactions between tutor and student communities of practice stimulates changes in tutor identity and this in turn leads to the tutor amending their future peer assessment practice. However, this view might be simplistic. The data presented in this section considers the evolving nature of the changes induced by peer assessment. In the following quote, firstly, the repeated use of the term ‘we’ indicates that the tutor’s practice is also influenced by discussion within their own community of practice, and, secondly, students’ feedback to the tutor is influenced by discussion between first year and second year students within the broader student community of practice. Here, the tutor’s practice seems to have ‘evolved’ with each of these factors making a contribution to the process.

(B1) When [peer assessment was] first introduced there was a lot of resentment...[students] said “it’s your [tutor’s] job...aren’t you paid to do this [marking]?” Now [first year] students talk to the second year [students who say] “yeah, we did that, it’s fine, you know you get used to it. You do it even more in the second year.”…it becomes part of the normal way we [tutors] do business here... [the peer assessment procedure] we worked out over the years has now evolved into something that works...it’s changed over the years, [is] accepted now and feedback usually is positive. (Tutor LP)

The following quote provides a specific example of how a tutor’s practice can be influenced by their own community leading to students’enhanced academic performance.

(B2) I’ve been on teaching courses and we were told it’s really good to get students to decide their own criteria for assessment. I thought we’ll try this with the [peer assessed] oral communication. I was happy. You get people talking to their friends [about peer assessment]. I think their [students’] ability to write practicals [and presentations] is definitely improved [by peer assessment]. You look at the first one they do, compare it with the third one they do…there is a big improvement....We’ve got posters on the wall downstairs…first year, second year and final years and you can see the progression [resulting from peer assessment]. (Tutor LM)

The final quote further illustrates the ongoing role of the tutor community of practice. Here the ongoing importance of peer assessment for less able students is noted and seems to be associated with changes to identity.

(B3) After we’d finished the [peer assessment] process we met as a group of [peer assessment] tutors...[to] reflect on the good and bad points and discuss making changes as a result. We have a learning and teaching network in the university [with external speakers on peer assessment] and I’ve been to national learning and teaching conferences…and discussed peer assessment. We double marked the students’ marking and we found the first time they did it [peer assessment] the good students could do it straight away, the weaker students couldn’t do it straight away, but by the time they got to the second practical out of four, they were marking as well as the good students. [Students] were having to look at work [of their peers], but they were having to think about what was being done critically, and it is thinking critically [that is important]. Judgement comes with experience...[the students’] role is to take assessment seriously and realise that they are acting in a role of responsibility. I think they have. (Tutor WB)

In total, these representative quotes illustrate the extent of tutors’ and students’ relational learning through the practice of peer assessment. This learning engenders identity changes that are reflected by tutors’ perceptions of their practice and students’ accomplishments.

**Discussion**

The data from this study was viewed by the researchers through the lens of socio-cultural learning which considers the relational interdependency of the tutors and students in the socially and culturally structured world of peer assessment. In peer assessment, learning seems to occur at the boundary between tutor and student communities of practice. The findings of the present study fall into two broad themes: (1) relational learning; and (2) identity development. These are considered in turn within the broader framework of peer assessment’s immediate and ongoing effects.

***Peer assessment engenders relational learning and identity change***

Orsmond and Forsyth (2017) proposed peer assessment to be a suitable vehicle to study *participatory* learning gain and our data support this view.

*Recognising aspects of relational learning*

In the current study, peer assessment revealed relational learning through the negotiation of meaning between tutors and students. This negotiation is evident in quoteA1which provides evidence that what tutors may perceive as a ‘cast iron’ statement is open to interpretation. ‘We’ve learned that students can see them [assessment criteria] quite differently to us*’*. Here it seems that assessment criteria are an important relational focus for the negotiations. From a community of practice perspective, assessment criteria may be considered as boundary objects; artefacts that pass between the tutor and student communities of practice, and, as boundary objects, the assessment criteria are translated, not transferred. Hence, once within the student community of practice, a new reality is formed of the meaning of the criteria. As Wenger (1998, 80) commented, it is ‘the community that negotiates its enterprise’. In quote A1, the tutor can ‘imagine’ that their criteria will probably change. That implies a learning process, an aspect of which will require the tutor talking to module colleagues as indicated by the comment ‘what have we [module tutors] got to do to put that right?’ Overall, the learning experiences described in quote A1 are an ‘integral part of the generative social practice in the lived in world’ (Lave and Wenger 1991, 35).

The participatory practices and relationships required for such translation of assessment criteria are evident in the data. As indicated in quote A2, tutors are prepared to ‘take the views of students into consideration’ and this resonates with the statement of Wegner and Nȕckles (2015, 633) that ‘tutors and students are not seen as having different roles but having different degrees of expertise’. Quote A1 recognises that it is only ‘in practice’ that the meaning of criteria is established. The willingness of tutors to consider student views, and to recognise the gradual emergence through practice of the meaning of assessment criteria, allows for a different understanding of feedback to be derived. Feedback in higher education is often considered as information used by a tutor to influence the gap between the actual level of student performance and a reference level (Sadler 1989). However, Torrance (2012, 333-334) advocated not closing this gap, but rather to ‘explore and exploit’ such gaps ‘so that learners come to understand what the issues at stake are, and what learning means for them.’ Furthermore, Torrance (2012, 338) stressed the need to understand the ‘why’ of criteria; that is their use to make ‘legitimate judgement’. Quotes A1 and A2 provide evidence of how the ‘gap’ may be explored and the ‘why’ of criteria can be established. The negotiation and renegotiation that such an exploration entails may serve to uncover tutors’ tacit, ‘guild knowledge’ (Sadler 1989, 126).

In peer assessment it is evident that both tutors and students learn from the interactions at the boundaries between their respective communities of practice. In other words, both tutors and students are exposed to a different repertoire of ways of doing, and a mutual understanding of language and artefacts is negotiated. It is the tensions created by this process, for example from not understanding a ‘cast iron objective statement’, that provide rich learning opportunities. Since mutual understandings through negotiation generate learning changes for both tutors and students, power differences are reduced leading towards ‘horizontal accountability’ (Wenger 2010b, 195).

*Identity development*

From a community of practice perspective, identity, discussion and practice are intertwined where ‘a person’s professional identity is boosted through experiencing success in their own...context as a result of their involvement in a CoP’ (Mercieca 2017, 13).

A finding of the current study was that tutors undergo identity changes because of peer assessment. For example, Quote A3states that the tutor believes they have become ‘much better at teaching’. It seems that the learning experiences resulting from their peer assessment practice have led to an identity change whereby the tutor regards themselves as a different type of teacher. Wenger (1998) referred to identity trajectories where identities from a history of practice and a vision of the future are encompassed in the present negotiations. Quote A3 shows both historical practice and future practice; what was done and what will be done. It is particularly notable that practices developed by the tutor through undertaking peer assessment were subsequently used when they were approached by students informally. It seems that the tutor’s new identity was recognised by students with whom they had little contact. Tutors are in and between their time, have provisional identities (Ibarra, 1999), and the traditional acquisition metaphor does not capture adequately this transient nature of identity.

Similarly, student identity changed in response to peer assessment. Quote A4 refers to students taking responsibility with the tutor ‘getting [them] at the right point where they can take responsibility’. It seems that peer assessment made students feel part of the process and take ownership of their learning beyond assessment criteria and classroom peer assessment activities. Students and tutors then talked openly and constructively about teaching and learning matters during formal liaison committee meetings. As quote A4 comments, tutors ‘accept it from the students’ and this resonates with quote A2 showing a willingness of the tutor to take student views into consideration.

***Peer assessment engenders ongoing changes occurring in the practice of tutors and students***

*Relational learning development*

In this study tutors revealed how the development of their peer assessment practice is ongoing; Quote B1 states it ‘has now evolved’. The evolution has resulted from relational learning developments which include discussions within a local module team or with the wider community through visiting speakers or attendance at conferences. It seems that these discussions maintain and develop a learning practice that extends beyond the classroom. It is acknowledged that the tutors participating in this study have already contributed to peer assessment publications. Hence, developing their own practice may be their norm. However, the recognition and understanding of how peer assessment practice is maintained and developed through local and wider community discussions is important for other tutors wishing to develop peer assessment within their own institutions. If peer assessment is not maintained and developed in this way, it might explain why it can remain an isolated process within institutions (Ashenafi, 2017).

It is interesting to note that students seem to have developed their peer assessment practice in an analogous way to tutors. Quote B1 indicates that first year students talked to second year students, and quote B2 describes students talking to their friends. Quote B3 also supports the notion that students’ learning from peer assessment can be developmental; a finding that resonates with Ashenafi’s (2017) advocacy for students to experience multiple peer assessment events. It seems likely that an underlying cause of the developmental nature of students’ learning from peer assessment is the requirement to continually negotiate and renegotiate meanings within their communities of practice

*Ongoing identity development*

Quote B3 reveals that the developmental nature of students’ learning from participation in peer assessment was most apparent for ‘weaker students’ who were shown to become better markers when they experienced peer assessment on a second occasion. This is further evidence for the importance of the participation metaphor of learning which, unlike the acquisition metaphor, opens options for learners even if they ‘carry a history of failure’ (Sfard 1998, 8). Orsmond and Merry (2013, 747) found that ‘non-high achieving students saw tutors as being overall right and accepted the tutor’s view’, and this reluctance to negotiate may have delayed the ‘weaker students’ in the present study from reaching peer assessment competence. In this context it is also noteworthy that in quote A4 a tutor speaks of watching experienced students undertaking peer assessment ‘...and they are very good at it!’ Here, it seems the tutor is watching student learning through the participatory metaphor and the consequent reconciliation of their identities in practice.

(Please insert Figure 1 here)

As shown in Figure 1, peer assessment promotes discussions at the boundaries between students’ and tutors’ communities of practice. These lead to participation in practice which influences identity development and promotes students to act increasingly in ways characteristic of a professional community of practice. All students make a statement of identity intent when they enrol on to a specific course and the development of this nascent identity is a key aspect of their professional development. It seems that, even if they make no commitment to the discipline beyond graduation, students do engage in developing the framework for discipline analysis (Pace 2009).

Communities of practice seem to form spontaneously (Orsmond, Merry and Callaghan 2013; Wenger 1998) and their natural occurrence may mean that students and tutors do not fully appreciate the rich relational participatory learning that occurs through peer assessment. Consequently, this learning is *invisible* (see Figure 1). Students and tutors may feel different because of the peer assessment process but may not register this difference in terms identity development. In this study, it is evident that students, through negotiation, were working in partnership with tutors, and, within this process, there was constant interaction and communication at the boundaries of communities of practice so that assessment criteria evolved through negotiation, and curriculum change occurred from identity change. In decontextualised teaching, such as a question and answer session about assessment criteria or a teaching session linked to communities of practice, it would not be possible to generate such participatory learning. The participatory learning within peer assessment, which led students to change their practice and become ‘vocal’ (see quote A3), had a powerful influence on tutor identity, tutor practice, and on wider tutor/student interactions.

An argument that has been made against the usefulness of both the participatory metaphor of learning and communities of practice is that situated knowledge cannot be transferred to new learning settings (see for example Edwards 2005; Sfard 1998). This study has suggested that peer assessment enables students and tutors to take a new identity and a history of negotiation of practice to their next module. With that, they will be able to learn and demonstrate learning in many interrelated settings. The invisible participatory learning can therefore be made visible by peer assessment where ‘the ebb and flow of thought through the students [and tutors’] minds both shapes and is shaped by the conceptual residue of past engagement in communal thinking’ (Northedge and McArthur 2009, 111).

***Limitations of the study***

This study has provided rich data on an under researched topic. While comprising very experienced individuals, the participant number was small and predominately from a single discipline. Subsequent studies are therefore required to investigate to what extent these findings can be generalised. A larger cohort of participants, perhaps from multiple studies, might allow worthy comparisons to be made between the effectiveness of peer assessment in different settings, types of institutions or types of assignment.

An important caveat in the interpretation of the study findings is that no students were interviewed. In this study the authors’ focus was to explore how tutors’ practice influenced learning rather than how tutors’ and students’ perceptions of that learning are aligned. From this perspective it is reasonable to assume that tutors who were experienced in making professional judgements concerning student learning could also provide insights concerning students’ professional development. This being said, the reported changes of students’ identity and practice are tutors’ perceptions of these changes, and these may have been influenced by tutors’ interactions with particular students and by tutors’ inherent desire for their teaching practice to be successful. The implications of the data should therefore be considered tentatively until similar interviews of students undergoing peer assessment have taken place.

**Conclusions and implications**

In this study, the authors are documenting what is a naturally occurring, previously unrecognised learning phenomenon, and, in so doing, enable a better understanding of tutor and student learning. Peer assessment has been shown to produce extensive boundary interactions between tutors’ and students’ communities of practice where important bi-directional learning takes place. Furthermore, participatory learning also takes place within each of these separate communities of practice, and this learning both benefits from and contributes to the boundary interactions.

The importance and implications of this *invisible* learning can be understood at several levels. Firstly, the individual tutor or student may undergo identity change as their professional practice develops. Secondly, the historical context of communities of practice is such that their negotiated meanings reflect members’ positions, understandings and interests, and these, in turn, affect how learning cultures develop and progress over time. Thirdly, at an institutional level, tutors’ social learning practices not only enrich the student learning experience, but can also affect their working relationships with other stakeholders in matters such as curriculum reform (Annala and Mäkinen 2017).

In sum, there is little realisation or acknowledgment that tutors and students, within and between their communities of practice, are transforming not only the social individual, but also the social context of higher education. This is a key reason why we all need to become aware of the invisible learning within higher education.

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**Communities Peer Assessment Changed Communities**

**of Practice Practice of Practice**

Students Students

Students

Changed

*Invisible Learning*

Approach to Peer

Tutors

Assessment

Tutors Tutors

Identity change

**Figure 1: Relational learning within Peer Assessment**