Students' informal peer feedback networks

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Abstract

The nature and significance of students' informal peer feedback networks is an under-explored area. This paper offers the findings of a longitudinal investigation of the informal peer feedback networks of a cohort of student teachers [n=105] across the three years of a UK primary education degree programme. It tracked the dynamic nature of these networks through the use of Social Network Analysis and gained qualitative insights into the significance of informal peer feedback through diaries and interviews of a smaller student group [n=12].

The research found that students were actively engaged in informal peer feedback networks from their first year of study. Where some students found strength within feedback 'cliques', others preferred the fluidity of relationships that were based upon identified needs and changing circumstances. The inter-connections between students' personal (ego) networks offered access to information flow across and beyond the cohort. Identified levels of informal peer feedback ranged from proof-reading aspects of assignment completion to the development of conceptual understanding that drew upon shared analysis of tutor feedback, assignment briefs and assessment criteria. While aspects of informal peer feedback built upon examples from tutor-led scenarios, trust and reciprocity were fundamental to the success of these informal peer feedback relationships.

Keywords

Informal; peer; feedback; network; trust; reciprocity.

Introduction

The UK's National Student Survey (HEFCE, 2017) has consistently identified 'Assessment and Feedback' as the area of least student satisfaction, with feedback considered the weaker of these two areas. While the survey's emphasis appears to lie with the quality of tutors' feedback with students as recipients, Nicol *et al.* (2014; 104) also highlighted the need for students to be actively engaged as producers of feedback, viewing 'the capacity to produce quality feedback [as] a fundamental graduate skill'.

In contrast with other disciplines, primary phase student teachers engage with feedback at two levels. At one level, they are higher education students partaking in assessment and feedback as it relates to their degree and professional studies: they complete assessments (academic assignments and school-based teaching practices), receive feedback and decide how and when to make use of their tutors' comments. At another level, through their academic and professional studies, these students are introduced to the theory and practice of assessment and feedback. They learn about the assessment and feedback cycle, summative, formative and ipsative approaches and the use of peer review and peer feedback. They have the opportunity to become providers of feedback; putting theory into practice as they assume teachers' roles during school-based teaching practices. Working with primary aged children (4-11 years), they experience the emotional impact of feedback and learn how to provide feedback with sensitivity (Black et al., 2003; Headington, 2003). In combination, these two levels of experience offer student teachers unique insights, knowledge and understanding as recipients *and* producers of feedback.

Citation

Studies by Topping (1998), van Zundert et al*.* (2010) and Geilen et al. (2010) identified the nature and value of peer feedback within the higher education context; it complemented tutor-student feedback and encouraged students to become both recipients and producers of feedback. Nicol *et al.* (2014) took this further, identifying peer review as a vehicle for enabling the dialogic and formative aspects of feedback that were considered as problematic within tutor-student feedback; mechanisms that were often hindered by tutors' limited availability when dealing with high student numbers.

Evans (2013) review of literature indicated the prevalence of research into feedback *within* rather than *beyond* the academic learning community. Tutor-facilitated peer assessments, within teaching contexts were necessarily more straight-forward to engineer and research. Although there was evidence that students interacted with each other beyond the academic learning community through their use of face-to-face and communication technology (Ryan *et al.,* 2008; Sutton and Taylor, 2011; Headington, 2012), far less was known of the nature and significance of students' informal peer feedback networks.

Researching students' informal feedback networks
This study sought to investigate the informal peer feedback networks of the 2011-12 entry cohort of undergraduate primary student teachers [n=105 approx] at an urban university in the south of England. A longitudinal approach was adopted to enable identification and investigation of the dynamic nature of informal peer feedback relationships across the three-year degree programme. The research aimed firstly to identify the students' networks and secondly to explore how and why they were used.

Social Network Analysis (SNA) (Waserman and Faust, 1994) was used to identify the informal peer feedback networks that existed within the cohort at the end of each year of study. Analysis of social networks can expose issues such as power relationships, access to knowledge, position, prestige and expansiveness through 'the structure of relations and the implication this structure has on individual or group behaviour and attitudes' (Carolan, 2014:7). With its roots in sociometry and the more recent use of software (e.g. PAJEK) to aid the mapping of relationships across large numbers, SNA provided, within this study, a vehicle for analysis at whole (i.e. cohort) level and ego (i.e. individual student) levels at three points during the taught programme. This quantitative data was supplemented by qualitative diary-interview data from a smaller group of students.

In its simplest terms, SNA data collection is based upon a question which asks individual actors to identify others with whom they have a stated relationship. While an SNA diagram, or sociogram, provides a visual representation of the data, showing the ties between all actors within a defined boundary, more detailed exploration is enabled by analysis of quantitative 'centrality measures'[1] from the SNA data. These identify an actor's importance within the whole network. Wasserman and Faust (1994) stated that the questions asked and responses made were pivotal to SNA data collection as these determined validity and reliability, with questionnaires being the most common form of SNA data collection. However, along with the familiar issue of low return rates for questionnaires (Cohen *et al.,* 2011), SNA questionnaires posed ethical issues regarding anonymity (BERA, 2011) as they required the respondent's name and those of others within the cohort. A respondent's refusal to provide data had the potential to reduce the return rate and reliability of the data. A high (i.e. 70+%) return rate was necessary to aid reliability.

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[1] Centrality measures used within this study were 'in-degree', 'authority' and 'closeness'. 'In-degree' measures the number of times an actor is chosen by others; 'authority' measures an actor's level of influence over the whole network based upon position and connectedness; 'closeness' measures how closely connected an actor is to all other actors in the network.

To aid collection and manageability of the data, this study's SNA questionnaire was presented at the end of each year's final cohort lecture. It posed a single question which asked respondents to use recall to identify up to three students within the defined boundary of the cohort who had 'provided feedback, or helped to interpret the feedback received from assignments or school experience placements' across the academic year'.

The three sociograms produced from the questionnaires (i.e. SNA1 in 2012: SNA2 in 2013: SNA3 in 2014) were analysed individually and collectively. Additionally, the initial questionnaire (SNA1) was used to identify students' memberships of 'cliques' (i.e. a group of three actors, all of whom shared mutual ties). Students [n=20], who were members of the seven cliques identified in SNA1 were then invited to participate in qualitative diary-interview data collection across the second year of study. The diary-interview design aimed to provide an insider's perspective through key informants within acceptable ethical and logistical parameters (Cohen et al., 2011). Corti (1993:1) suggested that when used to ask 'detailed questions about the diary entries', interviews can become 'one of the most reliable methods of obtaining information'. A subset of the invited students [n=12] provided full data sets of at least three interviews and four diary entries and the resulting verbatim transcripts underwent detailed thematic analysis. While the three sociograms identified the dynamic nature of informal peer feedback across the 'whole' network, quantitative and qualitative data were brought together to investigate students' 'ego' level experiences.

With two levels of feedback experience, these students were seen as potentially feedback literate. Consequently, they were not provided with a definition of 'feedback'; rather, their understanding of the term was explored through the data they provided and through direct questioning during the final interview. This paper reports on the opportunities for information to flow across the cohort's informal peer networks and, in particular, the experiences of two students, Abby (BR) and Finn (DI). The study's findings culminate in a model of informal peer feedback.

Whole networks

The three whole network sociograms (Figure 1) were based on return rates of 80.0%, 78.22% and 89.90% respectively, giving them high reliability. By the end of the first year of study (SNA1) ties between actors (shown by directional lines and nodes respectively), demonstrated that some students had become key sources of informal peer feedback. These 'stars' showed high levels of in-degree centrality. From the sample of 12 students for example, CJ was a source of informal feedback for six peers and CS and DI were each sources for five peers. Through these connections, feedback from stars had the potential to reach others in the cohort.
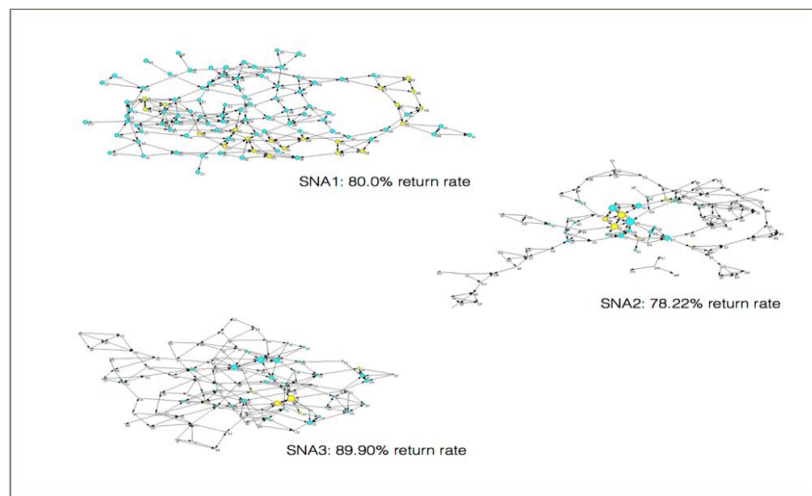

Figure 1. The three 'whole network' sociograms.

Information flow across the cohort was aided when network 'paths' (the shortest journey between two actors on a sociogram) were kept to a minimum. However, SNA1 identified that, for some, this flow was restricted by a 'structural hole' (Figure 2). For example, while Finn (DI) was centrally positioned within the cohort, a structural hole led to Abby (BR) being distanced from much informal feedback. Students such as Abby would need to rely on the one or two students who 'bridged' the divide between the two parts of the network to enable, rather than restrict, access to the information that flowed more freely for Finn.
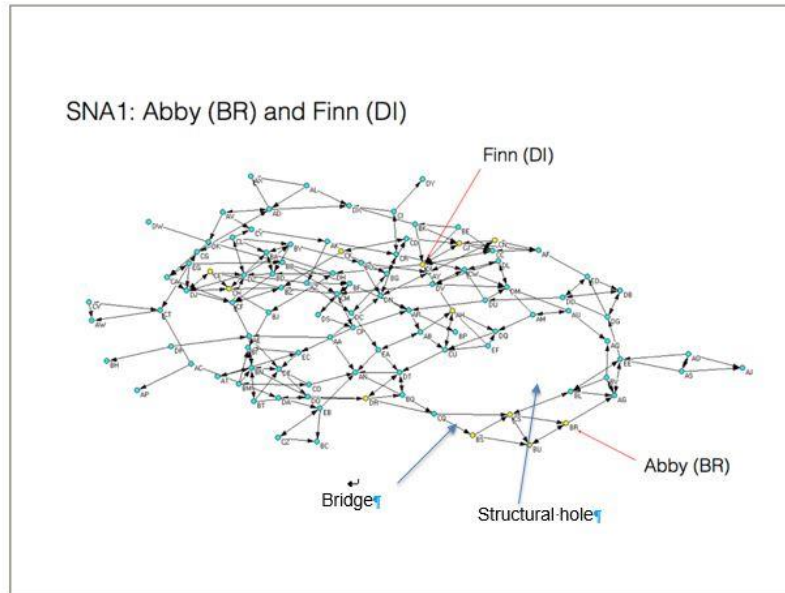

Figure 2. Abby and Finn's positions in relation to the 'structural hole' in SNA1.

By the end of the second year of study, connections between the students appeared much looser, with some forming a chain in relation to a more fragmented central hub. However, the potential influence of a few individuals became more apparent. These actors demonstrated high levels of 'authority' as their positions within the network, in addition to their in-degree measures and connections with others with high in-degree measures, meant that their informal feedback had the potential to influence many students within the cohort. By this point, two of the 12 students, CJ and Finn (DI), who shared a mutual tie, demonstrated high SNA centrality measures of authority (0.45 and 0.35 respectively) within the cohort; their feedback was sought by others and had the potential to flow widely across the connected elements of the network.

By the end of the third year of study, the cohort demonstrated far higher levels of 'closeness' with respect to informal peer feedback. This was particularly well evidenced by Abby and Finn. Their SNA measures of closeness centrality contrasted at SNA1 (0.16 and 0.25 respectively) but showed similarity at SNA3 (0.27 and 0.29 respectively). At SNA3, the structural hole of SNA1 and chain of SNA2 had vanished and the majority of the cohort had more direct access to the flow of information across the whole network in which CJ and Finn (DI) maintained high levels of authority (0.49 and 0.32 respectively). This suggested that the cohort had become more collegial in respect of its informal peer feedback. The students appeared to be drawing upon the culmination of their experiences to aid all members, rather than working in isolation or in competition against each other. The veracity of this interpretation was tested through the analysis of the diary-interview data which also served to explore students' 'ego networks'.

Ego networks

Ego networks highlight an individual's experiences within the whole network. These personal networks are based on the ties between an individual actor and those who have direct ties with this actor. Such micro-analysis of the three sociograms exposed Abby and Finn's diverse experiences of informal peer feedback networks at an ego level (Figure 3). These were explored further through the diary-interview data.
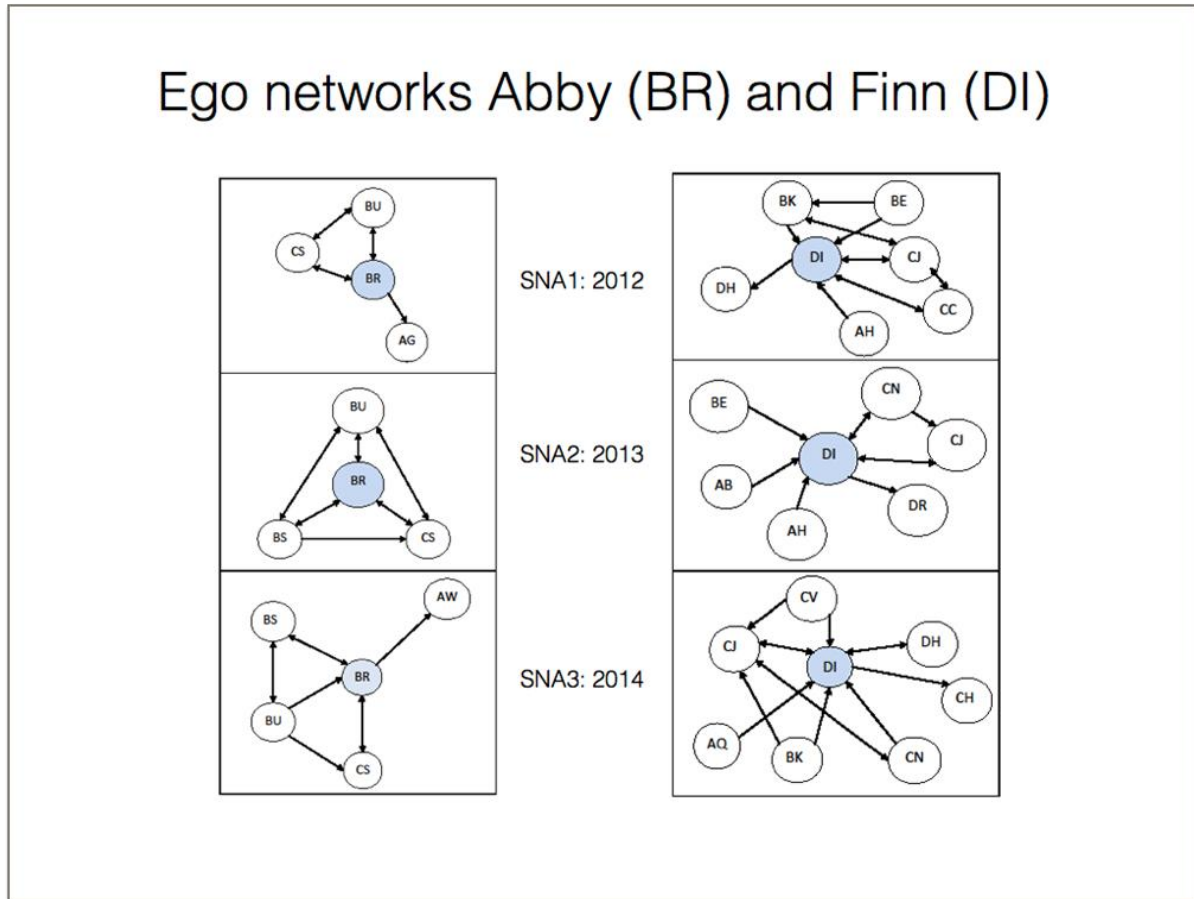

Figure 3. Abby and Finn's informal peer feedback networks at the 'ego' level.

Abby's direct ties were restricted to a small number of peers. Two students, BU and CS, maintained a strong feedback relationship with Abby (BR) across the three years of the degree; initially forming a triadic clique with her at SNA1. The three were joined at SNA2 by BS, with Abby centrally placed in two triadic feedback cliques. Their relationships continued into the third year, but with the dissolution of the cliques and the inclusion, by Abby, of AW.

Diary-interview data revealed the strong bond of trust that existed through the continuity of Abby's ego network. This was based upon their similarities of backgrounds and experiences: the students had all come to university directly from A-level experiences, remained living in their family homes and travelled in to campus. They were, in McPherson *et al.'s* (2001) terms 'birds of a feather' who stuck together. Similarities in status had drawn them together and seminar discussions had revealed similarities in their values. This was further developed through informal meetings on and off campus and the use of communication technology (i.e. email, text, video calls, phone) to maintain contact, increasing the students' proximity (Chua *et al.*, 2011) and providing them with opportunities to share and discuss their feedback experiences in an informal manner. As trust grew, the students asked each other for feedback on draft assignments prior to submission; initially seeking the identification and correction of minor errors at a production level. Gradually, their reciprocal feedback moved towards

the interpretation of assignment briefs, assessment criteria and rubrics prior to submission and, later still to sharing and discussing the feedback provided by tutors on their returned assignments.

Abby valued the 'objectivity' of her informal ego network and placed this in contrast to her formalised experiences of tutor-initiated peer feedback scenarios, where she had encountered students who she felt were too emotionally involved and 'too picky'. BU described their shared approach to informal peer feedback as honest and supportive and BS pointed to its non-competitive and supportive nature, saying:

> …At the end of the day, it's not competition to get the degree, so that's why we kind of…we've looked at each other's feedback and things and just tried to help each other with it really. 'Cause it is hard, especially when you've got a life and job as well, you know
>
> (BS Interview 1:7).

Similarly, CS considered that a collegial approach to improvement was the main purpose of their informal peer feedback:

> …I read and shared this feedback with Abby. She was there when I collected it and she also collected hers so we discussed what each other had done to get better marks, what we could both do next time to improve
>
> (CS Diary 5:2).

Beyond objectivity, and in contrast to delays with tutors' formal feedback, their informal approaches offered the students prompt, immediate and dialogic feedback. Abby likened this to formative oral feedback within the professional placement contexts where she 'kept asking questions' to provoke feedback responses (BR Interview 2:1). She appeared proactive in seeking opportunities to engage in formative feedback with trusted peers and tutors to aid her learning, suggesting that:

> …you have to be flexible and be willing to learn - so the feedback that you were given or […] initiated was so important and it's the only way you managed to learn
>
> (BR Diary, 4a: 4).

However, while this led to Abby's ego network developing strong and trusting relationships that enabled 'super strong and sticky ties' (Krackhardt 1998), the nature of their 'clique' may have hindered the flow of information from other peers in the cohort. In Krackhardt's (1999) terms, cliques can also become 'ties that bind' that stultify growth by being inward looking. This may have provoked change by SNA3, where fewer reciprocal ties existed between BS, BU and CS and Abby sought feedback from AW

In contrast, Finn's ego network demonstrated his position as a 'star' with 'authority' and exposed the fluidity of his relationships with peers. His reciprocal relationship with CJ was the only one that he maintained across the three years. During interviews, Finn identified 'strength of weak ties' (Granovetter, 1973) as his flexible ego network altered according to his and their changing needs.

As a mature student, Finn was more confident in seeking feedback from tutors although he recognised that opportunities for discussions with them were necessarily limited. He was ready to critique tutor feedback and, became frustrated when directness or clarity was lacking in written assignment briefs, assessment criteria and feedback, saying:

…it would be easier to identify targets if they were short and sharp...[of feedback] you want it there and then, out in front of you, so you can clearly see it in your assignment - so you can use it the next time you write an assignment

(DI Diary 2: 1).

Finn valued prompt feedback and, if this was not available from tutors, he sought it through informal interactions with his peers. During the first year, he responded positively to peers who asked him for feedback on draft assignments in respect of grammar, punctuation and referencing. He referred to this as both 'feedback' and 'proof-reading'. Finn recognised that being a provider of feedback, as well as a recipient, had the potential to improve his assignment writing. However, the support he offered others came with personal costs. Finn found their constant demands 'a bit tiresome, because it was expected a bit too much...and it didn't seem to be appreciated' (DI Interview 2:1). He noticed that asymmetrical relationships were forming: others were more willing to receive feedback than to reciprocate by providing him with feedback. By the second year, rather than turning away peers who requested informal feedback, he made a conscious decision to reduce the time he gave to them, saying:

 …if I'm reading someone's essay and proof-reading it, last year I would've spent like a couple of hours on it and then sit down and talk them through everything and, you know, I was spending more time doing that than I was proof-reading my own work

DI Interview 2:1).

Reciprocity was essential and Finn achieved this through his informal feedback relationship with CJ; they proof-read each other's work before submission and worked together to determine how to tackle forthcoming assignments. In common with Finn, CJ had been frustrated with some aspects of tutor feedback saying that it appeared only to provide '…generic areas to improve [that] were quite vague and [gave] no real clear targets (Diary 1:4). Unlike members of Abby's ego network, Finn and CJ did not share a similar status. Finn lived with his girlfriend and had encountered a range of work experiences before entering university in his late 20s, while CJ lived in the parental home and had entered university directly from A-levels at secondary school. However, geographical proximity led them to share lifts to university and they used these journeys as opportunities discuss shared issues; gradually building an enduring trusting feedback relationship.

The goal of Finn's SNA1 ego network was direct and honest informal feedback. As CJ (Interview 1:6) stated, '…we've all agreed to be ruthless and there haven't been any arguments yet'. Peers were expected to take the roles of providers and recipients of feedback. When Finn reflected upon this decision to disengage from those who did not adhere to the 'rule' of reciprocity, he recognised that, although his grades had not been affected, there had been some loss of potential professional collegiality:

…I probably would've benefited more if I did go to [my peers]. That's sort of how I've changed: mostly by doing things more independently but maybe I shouldn't have really 'cause the teaching profession isn't about independence as such

(DI Interview 2:1).

While frustrating in some regards, receiving and providing informal feedback through peers paralleled with Finn's professional experiences in primary schools and was worth pursuing.

Informal peer feedback
By the end of their second year of study, these twelve student teachers demonstrated a high level of feedback literacy. They all identified feedback as a means of improving the quality of their learning,

with Abby's succinct definition encapsulating this:

> [Feedback is]…another person's reaction to an action taken by the individual, coupled with recommendations for its improvement
>
> (BR Interview 3: 13).

Throughout the diary-interview data, the students referred to their on-going experiences of informal peer feedback networks in both academic and professional contexts. Indeed, Abby noted that shared personal experiences with AG in the professional context, aided a continuing feedback relationship within the academic setting. From initial proof-reading groups, the students appeared to use their informal peer networks as a readily accessible means of supplementing tutor feedback and helping them to unpick tacit meanings within tutor feedback. While accepting that assignment briefs and assessment criteria were subject to interpretation by both tutors and students, Finn gave examples of tutors' feedback that showed a lack of consistent interpretation at *inter-rater* and *intra-rater* levels. In some cases he was willing to challenge the feedback he was given, but at other times he showed a sense of resignation and seemed to gain little from the tutor feedback that was provided. Such experiences conflicted with his understanding of feedback as purposeful and developmental.

Students used informal peer feedback to aid self-regulation as they alternated between the roles of recipients and producers of feedback; taking action and making recommendations for improvement. The emotional implications of feedback were identified by all twelve students. They indicated that, in contrast with some of their experiences of tutor feedback, informal peer feedback was contextualized, prompt and enabled understanding to be negotiated through dialogue. The language used between peers was at an appropriate level and could be modified in the light of each others' emotional responses, offering greater sensitivity within the feedback process. Empathy with each others' feedback needs was evident: it was based upon students' shared experiences and shared goals. Students were aware of, and valued, the varied skills and experiences of their peers which provided contrasting viewpoints and, aided by proximity, these necessarily offered a level of nuanced interpretation that was not available through tutor feedback alone. As trust developed, students became more willing to expose their ideas to increasing levels of peer scrutiny as recipients and producers of feedback. Informal feedback moved from a 'production-level', based upon finishing a single piece of work to a higher standard, to a 'content-level', where ideas and meanings were discussed to aid all future actions (Figure 4).
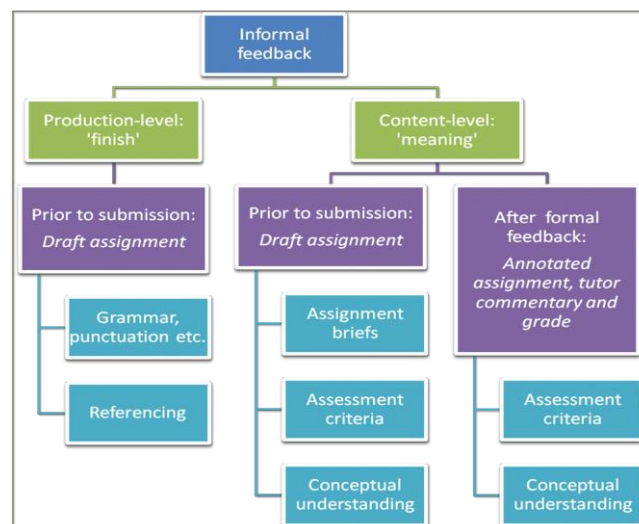

Figure 4. Informal peer feedback model.

Production-level feedback centred upon the proof-reading of completed draft assignments prior to their submission. It focused mainly on issues such as grammar, punctuation and referencing and offered 'a fresh pair of eyes' (Dawn, CS Interview 3: 24). Discussion was advantageous but not always necessary as some of this feedback could be undertaken by email. Successful experiences of reciprocal feedback at this level led to dialogical, content-level feedback. This involved students discussing meaning; specifically, their interpretations of assignment briefs, assessment criteria and their conceptual understandings of content. This level of feedback relied on a higher level of trust, coupled with assurances that fellow students would both reciprocate and not seek to plagiarize work that was yet to be submitted. Yet, it still relied on the students' interpretations of tutors' expectations. As Abby commented:

> …there's always a self-doubt …you never know what the marker truly evidently wants until you hand it in and [you've] had that reassurance

(BR Interview 3: 2).

However, the highest step taken in students' informal peer feedback relationships appeared to be when sufficient trust existed between close network members to expose their tutor annotated assignments, commentaries and grades to peer analysis and discussion. This 'content-level' step was necessarily completed face to face and only occurred when the students had accumulated a number of marked assignments and had identified these as potential feedback resources. By sharing their completed, marked work, students had access to a greater range of contexts and tutor feedback than would have been available to them as individuals. This helped them to explore tutors' interpretations and tacit meanings. Although a time consuming process, it viewed as an investment towards the completion of future assignments. The diary-interview data revealed that Abby and Finn were both engaged in these in-depth discussions with their peers, but that Finn had done so from an earlier stage of the programme. As an authority within the whole network, this personal investment may have, serendipitously, offered benefits to the wider, connected community.

Summary and conclusion
This longitudinal study identified the prevalence of informal peer feedback networks across a cohort of student teachers who, during their degree, developed feedback literacy through their exposure as recipients and providers of feedback. Through the use of social network analysis, and diary-interview research, the study revealed how students formed reciprocal feedback relationships which developed through proximity, trust and adherence to self-determined rules. Connections made between individual students enabled the flow of feedback information across the cohort which supplemented their interactions with tutors. Feedback relationships were formed initially at a production level to support the finish of draft assignments prior to their submission. As relationships grew, informal peer feedback focused upon the meaning of assignment briefs, criteria and the conceptual understanding of content prior to submission. Greater trust was shown when, after formal tutor feedback, students shared and analysed their annotated assignments, commentaries and grades. This approach did not simply support the production of one assignment, but enabled students to gain levels of understanding from a range of contexts that would support many future scenarios.

While the students interviewed painted a positive picture of informal peer feedback through the diary-interview data, this had emerged only through a filtering process which accepted only those who were willing to play by the rules they had created, such as agreeing to reciprocity and ruthlessness. High quality discussion, based upon insightful interpretations of academic and professional tutor feedback had the potential, through the students' ego and whole network connections, to enhance the experiences of many others in the cohort. However, alternative scenarios appeared possible. The students who participated in the diary-interview stage were all part of cliques: they were connected to others. Different experiences may have emerged from individuals who were less connected, even

isolated, from others in the cohort. These were also student teachers with a two level experience of assessment and feedback that aided their feedback literacy. Where the students' feedback networks operated beneficially for this cohort, the same might not be evident in other student teacher cohorts or within other, less collegial disciplines. Similarly, the networks might offer opportunities for the flow of misinformation or dissatisfaction amongst cohort members. Such alternative scenarios merit further investigation.

The study's focus on student teachers exposed how those with greater insight into the feedback process used dynamic, informal, collegial and non-competitive approaches based upon trust. Rather than being placed in peer feedback contexts, the students supplemented tutor feedback by identifying opportunities that suited their own needs, were built upon proximity and, through discussion, exposed their commonalities in status and value. While this might not translate directly to other disciplines, the study provides insight into the benefits that providing, as well as receiving, feedback might bring. The students took elements they had experienced *within* tutor-led peer feedback and used them to advantage *beyond* the academic learning environment.

Acknowledgements

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