'Who do you talk to about your teaching?': networking activities among university teachers

Nino Pataraia[a], **Isobel Falconer**[a], **Anoush Margaryan**[a], **Allison Littlejohn**[a], **Sally Fincher** [b]

[a] Caledonian Academy, Glasgow Caledonian University, Glasgow, Scotland, UK
[b] University of Kent, Kent, England, UK

Nino Pataraia, 58 Port Dundas Road, G4 0HG, Glasgow, UK, nino.pataraia@gcu.ac.uk

Abstract

As the higher education environment changes, there are calls for university teachers to change and enhance their teaching practices to match. Networking practices are known to be deeply implicated in studies of change and diffusion of innovation, yet academics' networking activities in relation to teaching have been little studied. This paper extends the current limited understanding, building on Roxå and Mårtensson's work (2009) and extending it from Sweden to the UK and USA. It is based on two separate studies, one from the Share Project led by the University of Kent, and one from Glasgow Caledonian University, exploring the composition of personal networks, and the characteristics of interactions in order to understand the networking practices which may support change of teaching practice. We conclude that academics' personal teaching networks are mainly discipline-specific and strongly localised. This contrasts with the research networks found by Becher and Trowler (2001) and may reduce innovation, although about half the respondents also had external contacts that might support creativity.

Keywords: Networks; Interactions; Conversational partners; Higher Education; Academics

1 Background

As the higher education environment changes, there are calls for university teachers to change and enhance their teaching practices to match (e.g. European Commission, 2009). If in the past learning, adult education and professional development were largely associated with formal education and training (Kyndt, Dochy, & Nijs, 2009; Tynjälä, 2008), nowadays it is becoming recognised that learning is lifewide and can take place at work or elsewhere (Skule, 2004). Furthermore, education scholars argue that teaching knowledge is frequently experientially acquired, and change in teaching occurs through adoption and adaptation of new practices learnt about informally (Eraut; 1994; 2004; Knight, 2006). Thomson (2013) argues that "academics are able to learn about teaching through informal conversation, and for some issues, and even individuals, it may be a more appropriate means for learning about teaching than formal academic development" (p. 205). Despite the fact that the significance of informal aspects of academics' learning about teaching is becoming recognised, there is still little insight into how and when academics engage in informal learning for enhancing their practice (Thomson, 2013). Given that a network represents a locus for informal interactions, offering a medium for the exchange of resources and experience, capacity building and collaborative development of knowledge (Koper, Rusman, & Sloep, 2005; Powell, Koput, & Smith-Doerr, 1996; Tynjälä & Nikkanen 2009), academics' interactions about teaching are grounded and discussed in the context of networks.

A network comprises a set of actors ("nodes") and a set of relations ("ties" or "edges"), between the nodes (Wasserman & Faust, 1994). Common objectives for interaction bring network participants together (Paavola, Lipponen, & Hakkarainen, 2002). Network members may be connected either directly or indirectly, and their connections can be either informal (trust-based), or formalized through contracts. The ties may comprise flows of various types, such as flows of information, materials, financial resources, services, and social support (Monge & Contractor, 2003). Granovetter (1973) differentiated between strong and weak ties, describing strong ties in terms of the time and emotions invested in the relationship. Examples of strong ties include friendship and familial relationships, which facilitate the transfer of tacit, sensitive and complex knowledge (Burt, 1992; Reagans & McEvily, 2003). Weak ties, by contrast, encompass a more restrained investment of time and intimacy. Granovetter suggested that weak ties serve as bridges between otherwise disconnected social groups and are more important in disseminating new, non-redundant information and resources than strong ties.

In order to understand different properties of networks, it is useful to draw on a range of network theories. Homophily and Proximity Theories are particularly important for scrutinising and interpreting the likelihood of establishing and/or dissolving network ties. According to Proximity Theory (Monge & Contractor, 2003, p.303), "people communicate most frequently with those to whom they are physically closest and proximity increases the opportunities for individuals to observe and learn more about one another, thereby creating conditions favourable for the development of communication ties". Rogers (2003) asserted that communication is usually most effective between individuals who are similar, or homophilous, in some respect. Proximity theory implies that those who are physically close and communicate frequently are more likely to become homophilous, thus leading to the development of Rogers's (2003) conditions for effective communication. Nevertheless, recent technological developments have greatly affected the spatial and social structure of groups, communities and other entities, offering easy access to new information/knowledge/resources and sustainment of communication ties (Wellman, 2001). The advent of ubiquitous virtual networking raises the question of whether the concept of proximity is still relevant. While Homophily and Proximity Theories are useful for understanding the formation of network ties, Social Capital Theory helps to evaluate the value of social networks. Social Capital Theory explicates that individuals invest in forming social relationships in order to acquire access to rich resources, namely emotional and professional support, expertise, valuable new connections, and different type of capital (Knowledge, Human, Social and Learning) (Wenger, Trayner, & De Laat, 2011).

Previous research has emphasised the importance of networking, along with other forms of social exchange, for both individual and organisational learning (Katz, Earl, & Jaffar, 2009; Trinkle, 2009; Tynjälä, 2008). Scholars have concluded that networks facilitate dissemination of good teaching practices (Coburn & Russell, 2008). Engagement in networks offers new ways of thinking about educational quality and enhances teachers' knowledge, potentially altering their thinking and classroom practice (Hargreaves, 2003). Furthermore, networks have been recognised as a key instrument for sustained teacher learning and

professional development (Katz et al., 2009). Through networking, individuals form and maintain useful relationships with others who can, potentially, provide work-related support (Forret & Dougherty, 2004). In addition, networks equip teachers with a sense of empowerment, provide emotional support, and encourage engagement in teaching (Baker-Doyle, 2011). Nevertheless, it is worth highlighting that these arguments have been largely derived from research in school teaching contexts. Pioneering investigations of educational networks have primarily focused either on teachers' learning in the context of secondary education (McCormick et al., 2011) or on academics' research and departmental networks (Becher & Trowler, 2001; Pifer, 2010). For example, McCormick et al. (2011) examined the role of networks in school teachers' learning, suggesting that application of network theories would lead to a better understanding of educational networks. Several studies have documented that informal interactions contribute to enhancement of teaching practice (Schuck, Aubusson, & Buchanan, 2008; Thomson, 2013). However, many of these studies have examined centrally-organised, formal networks stressing network coordinators' viewpoints on the overall value of networks for teachers' professional development (Kerr et al., 2003). Therefore, there is still little insight into what role personal networks play in supporting the professional development of teachers (Baker-Doyle, 2011). It is worth emphasising that there is even less understanding of personal networks at HE teacher level. Hence, this paper aims to extend the limited understanding of academics' teaching networks by focusing on personal, egocentric networks where, "the network is perceived by the individual at its centre" (Wellman, 1998, p.19). We explore the composition of academics' personal networks, and also the nature, frequency, venue and characteristics of interactions in order to understand how academics' networks may support learning and change of teaching practice. Furthermore, Coburn & Russell (2008) have emphasised that previous studies have ignored the content of teachers' interactions. This research responds to this call by investigating themes of participating academics' interactions.

A number of previous studies examined academics' self-initiated networks. Most notably, Pifer (2010) explored the networking behaviour of academics in the US universities. She found that academics relied on their departmental colleagues for instruction, mentoring, professional opportunities, support with writing grant application and publications, and general support and friendship. Pifer's study showed that "departmental characteristics, such as proximity, disciplinary influence, and the culture of the department, appeared to influence the interactions of academics" and academics tended to "cultivate relationships and exchange resources with colleagues they perceived to be like them, and less likely to interact with colleagues they perceived to be different from them" (ibid, p. 227–230). However, Pifer's work focused solely on networks within single departments. She identified the need for further research into other types of academic networks. This paper addresses this gap by examining relationships both within and beyond the department.

Similarly, Roxå and Mårtensson (2009) investigated academics' networks in a Swedish university. Drawing on a socio-cultural perspective, they explored the conversations that teachers have with their colleagues. They presumed that some of these conversations could have an influence on teachers to develop new understanding of teaching or even significantly alter their conceptions of teaching. To test the reliability of their assumption, they asked 106 faculty members in Sweden from a range of disciplines to reflect on their conversations about teaching. They discovered that "academics relied on a network of a few significant others as they constructed, maintained, or changed their understanding of the teaching and learning reality" (2009, p. 214). On average, participants reported ten conversational partners, which accords with Becher and Trowler's observations of the smaller research network (2001). Furthermore, their research revealed that although the participants found their conversational partners anywhere - in the same or other departments, disciplines, or institutions, or outside academia - the proportion of conversational partners was higher within the department than in other locations.

This study extends the work of Roxå and Mårtensson (2009) by examining a wider range of aspects of conversations about teaching within networks. The research is guided by the following research questions:

Who do academics talk to about their teaching?
What are the main themes (content) of academics' conversations?
With what frequency and where do academics' conversations take place?
What factors motivate academics to network and what value do they perceive in their interactions?

The data presented in this paper were derived from two interrelated studies from the pilot phase: the Share Project Longitudinal Study[1] and the "Academics' Networking Practices" (ANP) project[2] at Glasgow Caledonian University. The Share project, at the University of Kent, comprised a number of separate studies, which broadly aimed to investigate with whom academics discuss their teaching practice. More precisely, the Share Project Longitudinal Study was concerned with the exploration of the setting, nature and value of academics' interactions related to teaching. Examination of these topics informed the ANP project in terms of its methodological approach and research objectives. The overarching aim of the ANP project was to uncover further how social interactions and the structure of personal networks influence academics' learning, affecting their behaviour and supporting change in teaching practice.

2   Methodology

We applied the analytical method of Social Network Analysis (SNA). This method is specifically designed to examine the patterns, causes and consequences of established relationships between different individuals (Scott & Carrington, 2011). However, SNA falls short of revealing the motivation behind individuals' actions within their networks. Since several authors have recommended application of different forms of data collection for breadth and depth of understanding and also for corroboration of network processes (Kilduff & Tsai, 2007; Mehra, Kilduff, & Brass, 1998), this study integrated both quantitative and qualitative approaches.

2.1   Study 1: Share Project Longitudinal Study

As part of a more extensive questionnaire, longitudinal study of 18 academics in computing, mathematics and technology subjects, 14 provided a free-text written response regarding their teaching-related interactions. Study 1 drew on convenience sampling. The response rate was 83%. Two explicit inclusion criteria were used: 1. Potential study participants had to be teaching in Math/Computing/Technology area, and 2. Participants would be eager to participate in two interventions a year over a period of three years. Within the mathematics/computing/technology constraint, they were chosen to represent a variety of institutional contexts, experience and reputation for innovation. The given study examined the composition of academics' teaching networks along with the frequency, nature and content of interactions.

2.2   Study 2: Semi-structured interviews within the ANP project

To probe findings from the Share project further, eleven academics representing three institutions and five disciplines, namely Engineering-2/11; Life Sciences-4/11; Education-2/11; Social Sciences-1/11; Humanities-2/11, were interviewed. Interviewees for Study 2 were drawn using convenience sampling. The response rate was 100%. The main criterion for the selection was that the potential interviewee had to be an innovative/excellent teacher. The interviews lasted one to one and a half hours and were audio recorded and transcribed. Interview protocol and interview questions can be accessed at: https://drive.google.com/file/d/0B2to0roh4IbxXzRSaWZ4ckJ5NUk/edit?usp=sharing.

2.3   Data analysis

2.3.1   Studies 1 and 2

The same techniques of analysis were applied to the 14 written responses from Study 1 and 11 interview transcripts from Study 2. Descriptive statistics, using SPSS software, focused on describing the characteristics of the sample along with the number of contact types/categories, the frequency and themes of interaction about teaching. Given that variables of interest were categorical (qualitative) by nature, frequencies were utilised to obtain descriptive statistics (Pallant, 2010). The research questions were used to define initial coding classes for written data and further classes were created as themes emerged. Emergent classes were developed by two independent researchers, then compared and contrasted. Checks for consistency and reliability were carried out and the final list of codes was refined. Overall, eight classes were created: 1. Contact category (Table 1); 2. Level of Experience; 3. Disciplinary affiliation; 4. Frequency of

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[1] http://www.sharingpractice.ac.uk/homepage.html
[2] http://www.gcu.ac.uk/networkedinnovation/

interaction; 5. Venue of interaction; 6. Nature of interaction; 7. Preferred method of interaction; 8. Content of interaction. The purpose of these thematic categories was to organise data into meaningful units of analysis. Table 1 shows the different categories of contacts enumerated by academics. Table 2 outlines the categories within the classes frequency, nature and themes of conversations.

Table 1

Contact categories (top row) and types within each category

'Family'	'In department'	'In institution'	'Friends'	'Elsewhere'
Family member, profession not specified	*Departmental colleague, role not specified*	*Academics teaching in other departments, same institution (discipline not specified)*	*Friends, profession not specified*	*Professional relationships outside the institution, role not specified*
Family member teaching	*Colleagues teaching same or companion modules*	*Academics teaching in other, but related disciplines/departments*	*Friends teaching*	*Formal relationships; collaborations (i.e., co-authors)*
Family member non-teaching	*Support Staff* *Students: current*	*Central support staff*	*Friends non-teaching*	*Non-academic relations* *Former colleagues* *Students: Former and prospective*

Table 2

Categories within the frequency, nature of conversation, and theme classes

Frequency of Interactions	The nature of conversations	Themes
NS-not specified=0	*NS-not specified=0*	*Unspecified=0*
Once a term-yearly=1	*Formal=1*	*Learning, curriculum design; projects for students=1*
Fortnightly-several times per term=2	*Informal=2*	*Students experience/progress=2*
2 weekly-fortnightly=3		*Research and developing teaching=3*
Daily=4		*Approach to teaching=4*
		Feedback to students/students' assessment=5
		Tips and ideas for teaching=6 *Problems with students=7*

		Administration/management=8
		Concerns with institutional environment=9
		Other=10

Interview data were classified, summarized and visualized using Nvivo 9. Initially, interview transcripts were read to uncover the key themes; subsequently, data were broken down into discrete parts, closely examined, and compared for similarities and differences. From content analysis, themes, such as contact categories; nature, content, intensity and venue of interactions; motivating factors, and also the value of networking, emerged (Babbie, 2007).

3   Results and discussion

The presentation of results is structured around our four research questions.

3.1   Research question 1: Who do academics talk to about their teaching?

In order to understand the configuration and composition of academics' teaching networks, information about teaching-related interactions was gathered. Each participant was free to name as many contacts as they wished, located across different settings and representing diverse categories of relationships, namely department/institutional/external colleagues, friends and/or family members. It is worth mentioning that each academic could identify more than one contact type under each category (e.g. "Staff directly involved in the course I teach" and "Postgraduates who teach"; These two different types of contact would still appear "In department" category). Since no boundaries were predefined and also no temporal or numerical constraints were introduced for capturing academics' significant teaching-related interactions, we presume that enumerated contacts represent members of participants' personal networks rather than of their tightly-knit communities.

Results revealed that academics discuss their teaching with diverse types of contact. However, when asked "who do you talk to about your teaching", participants tended to name departmental colleagues first before mentioning other types of connection. Interviewee 5, specialising in Life Science, emphasised that "everything I do, I discuss with others, here, in the departmental level". Similarly Interviewee 8, representing Life Sciences, highlighted having close interactions with the departmental programme team while designing new, or amending old, courses. Overall, the majority of teaching-related contact types fell under the category of department. "Elsewhere" and "Institution" represented the second and the third most frequently quoted categories, followed by "Family" and "Friends". Only two out of eleven academics from Study 2 prioritised interactions outside their institution. These two a-typical cases were experienced teachers from the discipline of Education. It has to be noted that some respondents identified individual contacts (eg. "the director of teaching"), while others named only types of contact (eg. "other instructors in my department"), giving no precise idea how many individuals within each contact type they talk to. Therefore, analysis is at the level of contact type, rather than individuals. Findings from this research suggest that common interests, namely joint projects, goals, problems, mutual commitment ("we actually sit on the same committee, we teach on the same course, we are on the same project"), trust and good personal relations played an essential role in cultivating and maintaining connections with others, encouraging open discussions and idea exchange in regards to teaching.

Since network studies normally rely on a simple name generator question, such as "Who do you talk to about specific topic", data derived from these two studies were sufficient to capture participants' contacts distributed across diverse settings, determining the configuration and the basic size of academics' teaching network. In sum, findings suggest that academics' interactions are concentrated in, but not confined to, departments, spreading more weakly across and outside academia. This observation is in line with Roxå and Mårtensson's finding in Sweden that, "academics' conversational partners could be found anywhere: within their discipline, in other universities or outside academia" and with their diagram showing a higher proportion of contacts within the department (2009, p. 551, diagram on page 552). As mentioned above, there were only two interviewees who had teaching networks that focused strongly outside their department and institution. It seems likely that their teaching and research networks were inseparable and shared the

characteristics of research networks comprised of dispersed contacts (Becher & Trowler, 2001). Given that respondents tended to list informal interactions first and in greater numbers than formal, it can be presumed that they attach greater significance to the informal. This concurs with Roxå and Mårtensson's (2009) finding for teaching networks in Sweden, and bears out Knight (2006), Thomson (2013) and Eraut's (1994; 2004) claims that teachers' learning is informal. The small significant research networks observed by Becher and Trowler (2001) were also informal. Although our data did not measure the absolute size of respondents' teaching networks, the indications are that they were small, sparse and simultaneously informal.

3.2   Research question 2: What are the main themes of academics' conversations about teaching?

This research sheds light on the content of academics' interactions, examining the flow of different types of resources, advice, information and support within personal networks. Data revealed that conversations about teaching varied in terms of their content across diverse types of contact. Table 3 illustrates the themes discussed across the five contact categories:

Table 3

Distribution of themes discussed across five categories of contacts

Themes discussed with different categories of contacts	'Family'	'In department'	'In institution'	'Friends'	'Elsewhere'
Learning, curriculum design; projects for students	1	11	3	0	6
Students experience/progress	2	6	3	0	3
Research and developing teaching	0	1	1	0	1
Approach to teaching	1	4	3	1	1
Feedback to students/students' assessment	0	7	0	1	4
Tips and ideas for teaching	1	2	2	0	1
Problems with students	2	5	2	1	1
Administration/management	1	9	2	0	3
Concerns with institutional environment	2	2	0	0	0
Other	3	5	4	1	3

Student-related issues and concerns with the institutional environment formed a high proportion of conversations with family "... content of modules, how things are going, irritating admin regulations, marking woes, and odd events". In addition, family members offered emotional support: "[my wife] provides a valuable balance that helps me to deal with tough situations. It's not really directly to do with teaching, but it is certainly a huge help with part of my job".

Inside their departments, respondents discussed a wider variety of themes, as detailed in Table 3. Problems, concerns about students and administrative issues were discussed with administrative staff (five respondents) and people who provided teaching support (two respondents). Whereas, curriculum design, projects for students and approaches to teaching were discussed with people whose teaching participants supervised (seven respondents). Students' experience, progress, feedback, assessment and problems, were discussed with current students, mainly during tutorials and classes (seven respondents). One participant indicated that students' opinion was "invariably good source of feedback, insight into teaching practices".

Beyond the department, but within the institution, conversations were not discipline-specific. General pedagogical approaches, assessment tools, curriculum design and problems associated with students were discussed with academics from other departments. The conversations with institutional colleagues occurred in a formal setting, normally during seminars and training events. Interactions with people from support departments addressed educational research and development of teaching, students' experience, administration/management and use of technology (five respondents). Three respondents discussed approaches to teaching, students' issues, assessment and feedback with their friends. While some stated sharing and testing new teaching ideas or seeking advice for teaching-related challenges from friends, others

specified that their conversations with friends were general and entailed sharing funny stories. With colleagues from other institutions, academics compared and contrasted their professional and teaching environments and discussed prospects for collaborations. The external colleagues tended to be either from the same discipline or at least share similar research interests. Course content, teaching approaches, learning process and students, in particular their changing expectations, progress, and issues, were the main themes of conversations. Overall, the depth of conversations varied across different contacts, yet appearing more comprehensive with departmental colleagues in comparison with peers from other departments or institutions.

3.3 Research question 3: With what frequency and where do academics' conversations take place?

Results indicated variations between participants in terms of the regularity of their interactions about teaching. Some engaged in task specific interactions, such as struggling with a particular aspect of teaching or designing a new course, while others took part in regular, informal talks around various aspects of their practice. For Interviewee 4, specialising in Social Sciences, networking is a natural way of working and an integral part of her everyday professional life: "My whole practice is based on this idea of collaboration and networking, because it is how I work; you know, it's a personal preference, I am not a lone scholar".

In written responses, respondents specified the frequency of their conversations either in quantitative or qualitative terms for 72 out of 105 interactions. Table 4 illustrates the distribution of frequencies across different contact categories where this was specified quantitatively, and Table 5 shows the distribution where frequency was specified qualitatively.

Table 4

Distribution of quantitatively specified frequencies (n=14)

Frequencies reported in quantitative terms	Contact types					
	'Family'	'In department'	'In institution'	'Friends'	'Elsewhere'	Total
Once a term-yearly	0	6	1	1	3	11
Fortnightly-several times per term	2	7	1	1	2	13
1/2 weekly-fortnightly	0	10	0	0	1	11
Daily	0	1	0	0	0	1

Table 5

Distribution of qualitatively specified frequencies (n=14)

Frequencies specified in a qualitative way	Contact types					
	'Family'	'In department'	'In institution'	'Friends'	'Elsewhere'	Total
Very occasionally	0	2	1	0	1	4
Sometimes	3	9	3	2	4	21
Frequently	3	2	0	0	0	5
When change is required	0	1	0	0	0	1

Table 4 and 5 suggest that participants talk about their teaching with colleagues in the department regularly, half-weekly or several times per term. The content analysis of written responses and interview transcripts revealed that interactions about teaching were ad hoc, taking place during lunch and coffee breaks, and more frequently during the teaching term (verified by five respondents). A detailed analysis of written data revealed that within the department, participants talked most frequently with colleagues teaching the same or a companion module, or whose teaching they supervised, namely teaching assistants. Interactions with colleagues teaching the same or a companion module were mainly face-to-face, spontaneous, casual in nature, and took place in common rooms or corridors. Some selectivity was evident in Interviewee 2's (Humanities) statement that, "I've got a couple of colleagues here I often talk to about teaching... So yes, a fair amount of, probably two or three people out of 40, ... they tend to be people you can

talk to or you feel are on a same sort of wave length as you are,". Similarly, Interviewee 10, specialising in Engineering, mentioned talking with some colleagues far more frequently than with others. Overall, participants emphasized talking more with those with whom they were on friendly terms. Despite the fact that interactions with colleagues from other departments, from subject networks, other HE institutions, industry or employers, were mentioned, the majority of interviewees indicated a lower frequency of such interactions, occurring occasionally, once a term-yearly basis: "maybe a couple of times a year, depending on if there's an event" (8/11). Interactions with institutional colleagues occurred at university-wide events, mainly face-to-face, but email, phone, chat and online platforms, were used with physically distant colleagues.

Since the most frequent interactions were with departmental colleagues - these are likely to be discipline-specific. Proximity Theory appears useful for interpreting the greater frequency of interactions about teaching, while the emphasis on discipline points to the evidence of homophily. This observation highlights that physical proximity still plays an influential role in activating and sustaining network ties, and also for developing trust and rapport with peers despite the widespread popularisation of technologies. If, following Granovetter (1973), frequency of interaction is taken as a measure of strength of tie, then the study suggests that academics tend to have strong teaching ties with people within the department, and far weaker ties with people outside their institution. It appears that respondents rely mainly on close, localised connections when dealing with teaching matters. However, since some academics maintained weak ties, such contacts could represent a source of radically novel teaching ideas, bringing complementary knowledge to personal teaching networks (Granovetter, 1973). Finally, results point to the fact that not only the temporal component of interactions determines the strength of ties, but also the significance of a conversational partner (i.e., friendship).

3.4 Research question 4: What factors motivate academics to network and what value do they perceive in their personal networks?

In addition to exploring the composition and the basic size of networks along with the content, frequency, venue and nature of academics' interactions, this study expands understanding of the incentives for networking and the benefits obtained through personal teaching networks. Table 6 summarises results across all of the interviewees:

Table 6

Motivation for networking and the benefits obtained through personal networks

Motivation for networking	Benefits obtained through networks
Access to new teaching ideas	Good personal relationships
Access to disciplinary knowledge	Professional guidance
Access to new learning opportunities	Prompt feedback
Access to diverse resources	Solidarity and the sense of community
Access to professional and emotional support	Confidence

Findings suggest that personal networks provide not only access to new teaching ideas, learning opportunities and diverse resources, but also the exposure to diverse viewpoints and a wide pool of expertise within networks enriches academics' knowledge base and challenges their conceptions of teaching. Through interactions, participants keep track of others' work, sometimes triggering their motivation to adopt or experiment with new things: "I find out what other people are doing; looking at what someone else is doing and then changing my teaching is one of the things that I would do" (Interviewee 9). Sometimes, interviewees adopted ideas without much alteration; at others they adapted new concepts to their own context, "you can take something that someone is using to teach in a particular context and you maybe like

the idea, but it doesn't fit with your students or with what you teach. So what you could do is take that idea and you can change it until it does fit with your students."

Furthermore, interviewees indicated that the network offered a sense of security, comfort and reliability. Participants particularly valued availability of prompt feedback, especially when facing a specific teaching-related issue. By discussing problems with peers, academics could easily develop useful solutions. In addition, personal networks represented a locus for testing new ideas: "If you are planning some changes to your course, you'll often try it out on them first, before you go to the larger group, just to make sure you don't make a complete fool of yourself" (Interviewee 2).

In sum, findings showed that through personal networks academics acquire various kinds of resources (new ideas and teaching materials), share knowledge and experience with one another as speculated by Social Capital Theory (Wenger, Trayner, & De Laat, 2011). The interviewees appreciated these as benefits that provided incentives for networking. Overall, respondents used their personal networks for exchanging ideas, discussing teaching-related problems and obtaining professional advice. Academics' teaching networks thus conform with the network functions proposed by Tynjälä and Nikkanen (2009), Koper et al. (2005) and Paavola et al. (2002), as discussed in the introduction.

4   Conclusion

Understanding academics' learning is important as in today's society lifelong learning is becoming the benchmark of all professional fields. Given that academics are the key agents in transforming educational practices, scientific knowledge about from whom or how they learn and also in what ways their professional development can be supported is of key importance. This research specifically unpacks the interactions that influence and enhance academics' teaching practices, examining their networking in terms of its nature, processes and outcomes. This study can be of interest not only to the academics themselves, but also to the wider university staff, especially those who are responsible for professional development, and national bodies interested in teaching and learning (for instance, Higher Education Academy and SEDA). The small size and variation of the sample limit the generalisability of the findings. Nevertheless, some tentative conclusions are drawn below. These have implications for understanding the ways in which academics develop understanding of teaching, acquire new knowledge, skills and dispositions in regards to teaching, and also how change in instruction might be supported. Nevertheless, further testing and verification of the results through additional empirical research are highly recommended.

Despite the fact that personal networks relating to teaching are valued by academics, in most cases these are strongly localised. There is little evidence of personal networks extending beyond immediate (face-to-face) contacts. Even if other means were utilized to contact external colleagues, the ties were weaker, the intensity of interactions less frequent, the content of conversations less comprehensive, and generally considered less significant. Two interpretations are possible for these observations. First, that teaching practice is a highly contextualised activity (in contrast to research), so meaningful interactions are likely to be with those who understand the local context, namely institutional regulations/politics, departmental culture, students – such people often share the same building, have mutual commitments and/or similar interests, and face to face contact is easy. Second, that face to face contact could be the most effective way for sharing teaching practice and also for acquiring prompt feedback, hence significant interactions are likely to be with those who are geographically close. The data, though, may show some research bias: the prompt "who do you talk to about your teaching?" could have predisposed respondents to think in terms of face-to-face interactions. Investigation of the ways in which academics network about teaching through other media, could establish the circumstances under which face to face contact is significant in supporting changes in practice.

The local focus implies densely connected networks where the majority of members know each other considerably well. Tushman and Anderson (1986) suggest that members of such networks are less exposed to radically new ideas and also less likely to absorb knowledge created elsewhere. Nonaka and Takeuchi (1995) agree, advocating being open to external resources and diverse sources of information to avert pressures for social conformity, and 'not invented here' syndrome. However, Ruef (2002) suggests that a diverse network may support creativity, through flow of information via weak ties, and adoption of the resultant innovation through strong ties. About half of respondents in this research had the diverse networks that might support effective innovation in teaching according to Ruef's model.

The majority of significant ties, for most respondents, appear to be with others from the same discipline, whether within the department or external to the institution. This implies that disciplinary networks may be more effective in supporting change than generalised intra-institutional networks. However, the Share Project respondents all came from computing, mathematics or technology, and this has heavily weighted the sample. Further research should test whether this conclusion applies to disciplines with less technical content where teaching approaches may transfer more easily across disciplinary boundaries. That the teaching networking practices of those whose research discipline is education may be a-typical requires further investigation as it has implications for the applicability of any conclusions drawn from the study of such networks.

Academics' connections did not appear time or context specific, since respondents maintained contact both with current colleagues and with those from previous institutions. This implies a historical or temporal component of networks which are thus not entirely explained by proximity or discipline. Moreover, there was a wide diversity in intensity of networking relations, but only within the department interactions appeared to be regular in nature. The dynamics of teaching network formation and maintenance, and the impact this has on the types of flow warrant further investigation.

Given that personal networks offered new teaching ideas, learning opportunities, diverse resources, and also shaped academics' perceptions about teaching, it can be presumed that personal networks play an influential role in academics' professional development. Furthermore, since previous network literature has been dominated largely by quantitative research (Filliettaz, 2011; Rijt, Bossche, & Segers, 2012), this research project addresses the methodological gap by adding a much-needed qualitative perspective on academics' teaching-related interactions and network processes within their personal networks. By examining the depth of academics' interactions about teaching, this study addresses yet another gap concerning the content of interactions (Coburn & Russell, 2008).

The current studies examined the static snapshot of participants' teaching networks. Therefore, future studies should consider scrutinising how academics' network composition changes over time and what factors cause changes in their network structure. Furthermore, the current research did not explore in what ways personal characteristics, namely age, gender, experience level, disciplinary domain or institutional culture influence academics' networking behaviours. Hence, future research should consider investigating the influence of these characteristics on the patterns of networking. Finally, this paper made partial use of Social Network Analysis by elaborating on the basic structure of academics' networks, along with the frequency, content and the value of teaching-specific interactions. Nevertheless, another research paper reports the detailed SNA analysis on the project data, outlining the impact of ego, ego-alter and alter-alter characteristics on the patterns and nature of relationships formed by academics (Pataraia et al., 2014).

Keypoints

- Academics' teaching networks are localised, marked with strong ties.
- Personal networks offer a wide range of benefits, namely new information, ideas and support.
- Academics' personal connections do not appear time-bound.

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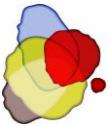
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