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# **International Students' Networks: a case study in a UK university**

## **Abstract**

The great influx of international students into UK universities has led to internationalisation becoming an important issue. Previous studies have focused on the integration of home and international students, illustrating a lack of intercultural interaction. Yet there has been a lack of research investigating international students' networks and how these networks evolve over time. The study reported in the current paper sought to fill this gap. The research findings were interpreted through the lens of Community of Practice (CoP) and Social Networks (SN) theories. Findings confirmed that international students have four distinct types of network. The class did not evolve towards a single cohesive network, rather there were changing clusters of relationship. The findings showed that although co-national factors are important at the beginning of students' learning, they are not always the main influences shaping student networks. The findings are significant for both institutions and teachers.

**Keyword:** Network Evolution; Internationalisation; Social Network Analysis; Mixed Methods; Higher Education; Intercultural Interaction; Community of Practice; Social Networks.

## Introduction

In UK Higher Education Institutions (HEIs), the number of international students has increased dramatically over the last two decades. Over 428,000 international students were in the UK in 2010-11; an increase of 6% compared to 2009-10 (UKCISA 2012).

This influx of students with diverse backgrounds has meant that internationalisation has emerged as an important agenda in pedagogy (Luxon and Peelo 2009; De Vita and Case 2003). In this agenda integration and social interaction in the classroom is one important theme. When internationalisation is seen as about incoming students' adjustment to local academic norms, the focus could be on building support networks and on interactions with home students to acquire increased understanding of local practices. In the model of internationalisation that stresses the transforming power of the novel perspectives brought by international students themselves, equally the interaction within the class is an important resource to generating new understandings.

Studying the ties between students in an internationalised classroom is important, therefore, yet most of the previous studies have examined the multicultural mix among home and international students, where the former were a majority. Often the studies of international students focus on Chinese students, whereas the international student body has become increasingly diverse. The context for studies has been the USA, UK, Canada and Australia, where many aspects of the wider cultural and educational context are different. In some cases, the focus of previous studies was on the work network, in others, it was on the friendship network. There have been few studies to integrate study of multiple types of networks. From these previous studies,

while the factors seen as shaping networks are often the same, there is still a need for more work to understand how such factors operate in different contexts, such as in postgraduate classes or contexts where international students are a majority. The research reported in this paper provides another dimension to understanding the internationalisation process through a study of the social network dynamics of international students.

The paper is set out as follows: in the literature review section key conceptualisations of social learning and findings of previous studies of student networks are summarised. This is followed by the research methodology, in which the approach using social network analysis and qualitative methods is explained. The findings of the study are then laid out. In the discussion section, the significance of the findings in the light of previous studies is considered. The paper ends with a summary section, where also the research limitations and priorities for future research are presented.

## **Literature Review**

### ***The Social Nature of learning***

The importance of student networks is framed by the increasing understanding of learning as a social rather than purely cognitive process. A number of important theories of learning stress its social nature, though they conceive of this in different ways (Vygotsky 1978; Lave and Wenger 1991; Haythornthwaite et al. 2000). Two such perspectives are directly relevant to this research, namely: social network (SN) and community of practice (CoP) theories.

The social network perspective on learning highlights the importance of networks for personal and professional development (Haythornthwaite and De Laat 2010). In social networks, learning is considered to be a “social network relation” and relations among network members are the main element of analysis (Haythornthwaite 2005; Haythornthwaite 2008). Having both strong and weak ties are important to build and sustain a learning network (Haythornthwaite 2002). Haythornthwaite (2008) has identified four distinct types of network in learning, namely friendship (maintaining friendship relations through social interaction and “exchange of more personal confidences” (Haythornthwaite 2001), work (collaboration in class work, exchange of information or advice related to class work), advice (giving or receiving general or personal advice) and support networks (personal and emotional support) (Haythornthwaite 2001). Haythornthwaite’s (2008) studies tend to have been of the social networks of culturally homogeneous classrooms, so understanding of how this translates to an internationalised context is relatively under-developed.

Community of practice theory is another body of theory that takes a social view of learning. Here participation in the community is a key aspect of learning (Wenger 1991; Wenger 1998; Wenger 1999; Wenger 2006; Wenger et al. 2002). In their situated learning theory, Lave and Wenger (1991) describe a key process in learning as of legitimate peripheral participation (LPP), how learning happens in a social context through oldtimers- newcomers relationships. They stress the significance of participation in the community to learning and how experienced individuals have a central position in the community and novice learners move from a peripheral position, through sanctioned, legitimated participation in the activities of the community, to a central position in the group (Lave and Wenger 1991). How such

dynamics might play out in an internationalised classroom has not been much explored.

### ***Internationalisation***

Studying social networks is important for the UK, because of the influx of students from abroad into UK HEIs (UKCISA 2012). Researchers have looked at internationalisation from two main perspectives. Some studies have seen it through the lens of adjustment to the host context: the challenge of adapting to unfamiliar modes of living (culture shock) and learning, such as group work or critical thinking (Brown 2009a). This has meant studying the friendship network because of its role in minimising students' problems related to adjusting to living in a new country and finding out about how to operate in a very different educational system (Brown 2009a). The other perspective is the diversity perspective, where researchers have made the case for leveraging the cultural diversity in classes to help students acquire multi-cultural skills that are core competencies for working effectively in an increasingly globalised world. In this perspective, the work network is central for understanding the cultural mixing in group work, for example.

Yet there has been a lack of studies that address the character of international students' networks and those there have been have tended to look only at limited aspects. Thus they have either exclusively studied the friendship network (Bochner et al. 1985; Bochner et al. 1977; Brown 2009a; Furnham and Alibhai 1985; Ying 2002; Maundeni 2001) or the work network, through studying multi-cultural group work (Volet and Ang 1998; Peacock and Harrison 2009; Harrison and Peacock 2007; Harrison and Peacock 2009; Harrison and Peacock 2010; Ippolito 2007; Kimmel and

Volet 2010). In fact, researchers looking at the adjustment of international students to western models of education have tended only to focus on friendship networks and what factors have influenced building these networks, whereas, researchers considering the diversity perspective have focused on the work network, more specifically, studying the factors that influenced students working in intercultural groups.

In focusing on one type of network, the friendship network and its importance in international student's adjustment, Bochner and Furnham (1985; 1977) showed that international students tended to form their friendship networks based on co-national relationships. They provide a model of international friendship networks suggesting that an international student's first choice in building friendship is based on co-national factors followed by a preference for friendships with students from the host country and finally with other international students (Bochner et al. 1977). Furnham and Alibhai (1985) confirmed Bochner's (1977) model by stressing that international students tend to build their friendship network based on co-national factors. However, both Bochner and Furnham did not fully explain how the friendship evolves over time or what factors shape this network. Furthermore, their studies have only focused on the friendship network and do not give any attention to the work network.

Other researchers have tended to investigate the work network in an international classroom and the factors impacting on students working in multicultural groups. Previous research findings have shown that intercultural interaction is often limited in a culturally diverse classroom (Volet and Ang 1998). Both international and home students tend to form their work networks based on co-national groups (Volet and

Ang 1998; Harrison and Peacock 2007; Ippolito 2007; Rhamdhani et al. 2009). Harrison and Peacock's (2007) research studying UK students' perceptions of working in a multicultural group shows that they tend to build their work groups with their close friends, who all share the same nationality. This is also confirmed in Dunne's (2009) findings, where he points out that friendship networks that help build the work network among home students are formed earlier in the course, even before international students register. ~~Different~~ Various factors were found to be related to this situation of the failure of cultural mixing in the work network (Dunne 2009). Students preferred to work with their close friends or friends of a friend based on conational factors, age and having the same programme of study.

### ***Factors shaping students' networks***

Table 1 summarises what previous studies have found about key factors in shaping student networks, differentiating the types of network studied and the context within which the study was conducted. It is apparent from the table that most of these studies seem to confirm that international students prefer to build their network based on conational factors (language and culture).



Factors	Researchers	Network Studied	Context
Language	(Volet and Ang, 1998; Ippolito, 2007; Leask, 2009; Tian and Lowe, 2009; Kimmel and Volet, 2010)	Work Network	Multicultural
	(Harrison and Peacock, 2007; Harrison and Peacock, 2009; Peacock and Harrison, 2009; Harrison and Peacock, 2010)		Home Students
	(Yeh and Inose, 2003; Brown, 2009a; Brown, 2009b)	Friendship Network	Multicultural
Culture	(Volet and Ang, 1998; Ippolito, 2007; Leask, 2009)	Work Network	Multicultural
	(Dunne, 2009)(nationality)	Work Network	Home Students
	(Brown, 2009a; Brown, 2009b)	Friendship Network	Multicultural
Religion	(Ippolito, 2007)	Work Network	Multicultural
Context/ Programme	(Montgomery, 2009; Montgomery and McDowell, 2009; Kimmel and Volet, 2010)	Work Network	Multicultural
Time (networks are formed early in the semester)	(Dunne, 2009)	Work Network	Home Students
	(Brown, 2009a; Brown, 2009b)	Friendship Network	Multicultural
Same Experience/ Fear of Discrimination	(Brown, 2009a; Brown, 2009b; Montgomery, 2009)	Friendship Network	Multicultural
Pre-established Networks	(Volet and Ang, 1998; Yeh and Inose, 2003; Kimmel and Volet, 2010)	Work Network	Multicultural
Age	(Harrison and Peacock, 2007; Harrison and Peacock, 2009; Peacock and Harrison, 2009; Harrison and Peacock, 2010)	Work Network	Home Students
Negative stereotype	(Harrison and Peacock, 2007; Harrison and Peacock, 2009; Peacock and Harrison, 2009; Harrison and Peacock, 2010)	Work Network	Home Students
	(Volet and Ang, 1998)		Multicultural

**Table 1: Factors Shaping the Network Dynamics of International Students**

## Research Questions

The integration of international students in the classroom is central to their adjustment to local educational practice and to their acquisition of multi-cultural skills.

Consequently, there is a need to understand much better what their social networks

are like and how they are shaped in order to facilitate such integration. Therefore research questions posed in the current study were:

- What types of networks do international students build in the UK HE context?
- What are the characteristics of these networks?
- What are the factors shaping them?
- How do they evolve over time?
- What package of research methods is effective for studying them?

## **Methods**

The research participants in this study were international students, studying a first semester, 15 week long module: Information Systems and Information Society (INF6400), at the Master's level, in the School of Information, University of Sheffield. In the study, a mixed methods approach was adopted by developing a package of data collection tools suitable to the research context. There were two iterations of data collection. The second stage (2009/ 2010) sought to validate the findings of the first stage (2008/2009) and to avoid the danger of having the findings based on one particular cohort and to test the package of methods developed in the first stage in a complete cycle. The iterations differed slightly in that the first class was of 27 individuals, with the largest contingent from the Indian sub-continent, with also China and the Middle East and a small number from other countries. In the second iteration there were 41 students, with the biggest group from the Middle East. Again a large number of different countries were represented in the class, but UK

students were a small minority. In the context of this research International refers to residency not citizenship. International students were those who were unfamiliar with UK culture and English was not their mother tongue.

All the research was conducted in accordance with procedures approved under University of Sheffield ethics policies. The package of data collection methods developed was: SN questionnaires, observations and interviews.

### ***Social Network Analysis***

Social Network Analysis (SNA) was used as a quantitative method to understand students' interaction patterns and to find the changes in the network over time. Social network data was collected using a printed questionnaire, which was distributed four times during the semester, at carefully designed intervals. Both cohesion and centrality measures were applied, in order to investigate the connectedness of the networks and how this changes over time. Based on Haythornthwaite (2008) questions asked about four types of relationships, namely: friendship, work, and advice and support relationships. Observation indicated that students had a problem recognising each other's names in the questionnaire. Hence, participants' photographs were placed with the names on the questionnaire to enhance the accuracy of the data collected. Notwithstanding this strategy, it was recognised that participants were not highly motivated to complete lengthy questionnaires with complete accuracy. They could not necessarily remember all the interactions they have had. Moreover, quantitative data by itself does not tell us why the network is the way it is and why actors interact more with others or how they themselves view the network. Given these inherent limitations, social network analysis was combined with qualitative

methods namely: interviews and observation. This data was collected to fill in gaps and discover “the story” of the factors shaping the international students network dynamics.

### ***Observation***

Observations were conducted throughout the semester. The researcher attended all the classes and laboratory sessions for the module, observing changes in the student network, and recording them as field notes. She was introduced as a researcher, participated in some of the teaching, but was generally a non-participant. Research observation was focused on the relations students had with each other, such as who talked to whom, who attended classes, and who were vocal or quiet in the class. The findings of these observations were used to complete the picture of the network but were not analysed or coded on their own. The results of observations were also compared with what students said in the questionnaires. Questionnaire results were also compared with observations in term of network centrality and frequency of attendance and participation in class activities, which gave a clearer picture of the real network students have in a learning context.

### ***Interviews***

Interviews were also incorporated to uncover “the story” of the factors shaping the network dynamic. Interviews were conducted from week 7 to 11 of the semester (in both stages). Interview questions (appendix 1) explored the main networks students develop through the semester and how these changed over time. They also investigated the factors shaping each of these networks.

The number of interviews was 16 in the first stage and 17 in the second one. The length of the interviews varied between 30 minutes to an hour. Most of these interviews were transcribed the day of conducting the interview, which increased the accuracy of the data. The lead author, herself, transcribed all the interviews to enable her to be more immersed in the research context, hence provide better interpretation of participant's views. This also helped preparation for the next interview (Rubin and Rubin 2005: 204). The transcription process was conducted in a systematic way, so that a table was created in which interview questions and answers were separated into rows. Being systematic in the interviews' transcription was important for "valid analysis and interpretation of interview data" (Mishler 1986: 50). The interview and observational material were analysed thematically. Thematic analysis aims at finding patterns or themes in qualitative data. The study follows Braun and Clarke's (2006) method. They suggest six steps to follow in using thematic analysis; namely: data familiarisation stage, code generation stage, themes identifying, reviewing and refining stages and findings reporting stage.

## **Findings**

By employing a mixed methods approach, this study confirmed that the multiple networks proposed by Haythornthwaite were identifiable. One interviewee commented:

My relation is formal with the majority of them, informal and formal with TA, AS and RA (class members)... *we share stuff, but we did not go* as far as advice or something! I have discussions with them beyond the class context, but there are still limitations. You know them for one month, two months and that is it. And I already have my friends from my country or

from here, they are not studying in this module, but there are studying different courses in Sheffield.

Thus class mates offered support to immediate aspects of course work, but the support and advice network was typically made up of family and close friends and flat mates – generally from the same country, usually people who also had had the experience of living and studying in the UK.

For personal advice I think of my family first, my sister and my other brothers around here[...] like my sister, and her family, most of the time talk to her and get her view and things, anything in Sheffield because she has been here for quite a while now, I can ask her advice about that. And since she is older than me, I can get big sister advice from her.

Sharing the same language was important as a factor in building different types of network. Furthermore, age and having experience of living in the UK were also important factors to build the information and advice networks as one participant commented:

For information [...] I have many friends who all are older than me, two are from my country and one from another country, but we have the same language [...] they all are here for four years, I think basically they are a good source for me because if I have some problem [...] I go to them

SNA provided a picture of how the networks evolve over time and the different factors shaping them. Cohesion measures for work and friendship showed differing patterns over time. Not all of these networks were built through class relationships. Rather, while work and friendship networks were developed through classroom interaction, advice and support networks showed marked continuity with what had existed before the class started. Thus understanding the different relationships in the

classroom requires awareness of previous histories of interaction and patterns of relationships. Furthermore, the different networks were each shaped by rather different factors; they were not always simply based on co-nationality, as suggested by previous studies. The main factors at work included ones based on co-nationality, such as language, and culture; but also other factors, such as programme of study and learning motives and time. The following sections explain each of the key factors in the character and evolution of students' ties.

### ***Co-nationality***

Co-nationality implies a common language and cultural similarities. Sharing the same language was found to be important in building the different types of students' networks. Initially, the friendship network was formed on the basis of language, and then was likely to evolve into a work network over time. Language was an important factor mainly because sharing the same language made students feel more comfortable and enabled them to communicate more easily. Common language allowed students to express themselves better and feel closer and less formal, hence it was easier to build a bond and to foster the ties. Moreover, language gave a sense of similarity and having common things to share about their home countries.

Students preferred to work with co-nationals; their second choice was to work with English native speakers, through a desire to improve their English language.

International students also found native speakers easier to understand.

Sharing a similar lifestyle, way of thinking, values and attitudes created a sense of similarity, hence increasing the chances of building friendship and work networks.

Equally, having a different culture created barriers because the way of thinking and understanding were different.

These cultural differences create conflicts sometimes. So that is why we (~~people from~~ the same culture) like to work with each other, because we do understand our culture and how to respect each other, where *some people from different countries don't realise* such cultural things. Maybe they see us as different! And they might not like this.

That cohesive cliques were formed based on sharing similar language and culture was clearly observed inside the classroom through where people chose to sit. Such co-national groups were based on strong relationships that inhibited people from a different language and culture from joining them. The existence of these clusters then had an impact on the whole class network by forcing other people from different countries to be together or to be isolated in the class network.

*I'm finding* in most of these classes, only one, two to three people from my country, so for me, going to a group of people of same nationality it is difficult to integrate [...] Normally, because if there is one or two people of different countries, then it is easier to talk to them, because they are on their own too, but I know, there seems to be a lot of Chinese people in the *classes that I'm in, and they know each other or get to know each other, and they go around together all the time, it is difficult to get in there.*

The SN data collected in the study were not sufficient to offer statistically significant results, but are suggestive of some interesting features in the network. Cohesion is a SNA measure that indicates the strength of relationships among members in a network, a cohesive network means the members of the network are all connected (directly or indirectly). The SNA results showed that in this class cohesion was low. Rather there were a number of fragmented groups. Work and friendship networks



were rather different in shape in terms of cohesion. The work network was never dense, and the number of isolates varied during the semester, whereas the cohesion of the friendship network increased over time and the number of isolates falls to zero after the second week of the term. In the second stage of the study, using some educational interventions' such as mixing nationalities in group work had a clear impact on network cohesion by minimising the number of isolates and creating [a](#) more cohesive network.

Another key SNA measure is centrality. Centrality shows the position of an actor in a network .It measures how important an actor is in a network. Central actors are those who have many ties with other actors in the network. Their central position gives them the advantage of receiving and passing knowledge from and to other actors in the network (Wasserman and Faust 1994). Again, however, and rather surprisingly, the centrality of the class showed no particular student in the central position of the network: this varied over time. This means that network connections were distributed among people in the network and there was no particular individual at the centre of the network or holding the majority of connections.

### ***Work Orientation and Learning motives***

Work orientation and learning motives were found to be crucial in building students' networks, particularly over time. In the early stages of the class, co-national factors were found to be a key to the building of the friendship network and this in turn led to the formation of the work network. However, students who were found to share the same attitude towards their work, those were found to form work network, regardless of their nationality. Participants were found to prefer working in mono-cultural groups

that shared the same learning motives, which were more focused on having “better” results.

In the first semester, okay this person is from my country, I will work with him, I will interact with him more. But now I know both of them, I will take a call not on a basis of the country, but on the basis of how good a person is in terms of how he works and whether it would be fun to be with.

In the class there were students from two different programmes of study. Students from the same programme of study tended to form work networks because they spent more time together and could easily work together since they share the same schedule. Following the same programme was also important in building friendship networks through strengthening the work relationship, which happens over time.

Because we are in the same programme of study, so we know each other very well, we are familiar with each other, I think we are all the same schedule, so it was easier for us to find common time for us to get together, I will spend more time with WS, BK and UJ, but most for the course work

### ***Time***

Time was a key aspect of the networks. Over time relations strengthened or one type of network evolved into another type of network. In addition, international students’ work and friendship networks were found to be strongly shaped by meeting early in the course. Such connections were made through a friend of a friend, meeting in the orientation week, meeting in the English summer school or meeting through social networking sites.

I got to know him specifically in April 2008 [...] and from that time till the beginning of the course, he was almost free, he did not have work stress, so we were meeting a lot, and going out a lot, had the chance to see each other more

The following section presents another aspect of the research findings; the visibility of networks.

### ***Visibility of the network***

Important aspects of students' networks were found to be invisible, in the sense that visible classroom dynamics were different from the network reported in SN questionnaires and identified through observation and interview. Conational clustering was quite visible. However, one might expect that students who attend every class and are vocal in discussion to occupy a central position in the network, and those who do not attend classes to be "isolates", having few or no connections. However, in this research the findings suggested that students who were at the centre of the network seemed not to be central in terms of attendance and participation in the class discussions. In addition, in terms of academic performance, the findings revealed that those who were central in the network (based on the SNA findings) did not do best in the class.

### **Summary of the findings**

In conclusion, this study showed the usefulness of the conceptualisation of multiple networks in studying ties in a multicultural classroom. International students were found to build work, friendship, advice, support networks. The study has differentiated the work (study related) and friendship networks and showed how these networks evolve differently over time. Only work and friendship networks were based

on others in the classroom. Personal support and advice networks, showed continuity with pre-existing networks.

The study identified that some of the factors shaping international students' networks were similar to those found in previous studies, such as co-nationality. However, it also identified other important factors, such as work orientation. It was also found that these factors operate in a complex way over time, with factors like work orientation emerging as important at later stages of development in the class. International students' networks were found to be in the shape of small pockets that were forming and dissolving throughout the semester based on multiple factors – rather than evolving towards one coherent network.

Some aspects of international students' networks were “invisible”. The network visible in the classroom was different from the network reported in SN questionnaires and identified through observation and interviews. Other indicators than performance or being vocal showed whether a student was in a central position of the network. However, students' segregation based on common culture was noticeable in the classroom.

## **Discussion**

Many previous studies have been preoccupied with the issues around interaction among home and international students, where the former are a majority. This was not the case in the context studied here: the majority of students in the classes studied were international. Students were also PGTs, whereas most previous studies have been of undergraduates. Furthermore, previous studies have tended to examine one type of network. The argument here is that all the networks should be investigated

(Bochner et al. 1985; Bochner et al. 1977; Brown 2009a; Furnham and Alibhai 1985; Ying 2002; Maundeni 2001). These differences complicate comparison; nevertheless, there are still many conceptual and empirical comparisons to draw out and to show the importance of the current research's findings. The multiple networks concept is first discussed.

### ***Multiple Networks***

This study provides an explanation of the types of networks in a multicultural classroom through differentiating the work and friendship ties and how these networks evolve in a fairly complex way over time. The findings confirm Haythornthwaite's (2008) research, in terms of emphasising a focus on the multiple networks in the classroom. Ties between students reflected the existence of multiple networks that also evolved shaped by differing factors. Classroom networks are therefore more complex than might be thought. International students were found to build their advice and support networks based on pre-existing networks, hence, these two networks were not much reshaped in the classroom.

### ***Factors shaping international students' networks***

This study confirmed previous studies' findings (Table 1 above) of the importance of the language, culture and co-national clusters as significant factors in shaping international students' networks, particularly the friendship network. However, what this study adds is that the influence of these factors was found to change over elapsed time. There is a gap in internationalisation research investigating social network dynamics and how the student network changes over time. Meeting early in the course through meeting by a social network site, in the orientation week or through a friend

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of a friend was very important in shaping international students' networks. The learning motives factor was also identified as a key factor; students were found to prefer to build their networks based on sharing same learning motives rather than co-national factors.

### ***The Evolution of International Students' Networks***

Theoretically, both social network theory and community of practice theory describe the network/community dynamics from a whole network perspective. Learning is seen to occur either ~~throughby~~ being central by having more relations (as in SN theory), or being more experienced and moving to the central position (as in community of practice theory). The findings of this study showed that the dynamics of international students' networks evolve in the form of small pockets that were constantly changing over time. Each of these pockets (clusters) comprises small groups of individuals who were connected through sharing a few common factors, such as language, programme of study or learning motive. These clusters were formed and/ or dissolved over time based on sharing one factor, which had a different role each time (see Figure 1). ~~The figure identifies six patterns of evolution of learning networks. For example, pattern 1 represents students who share the met in the English summer school, the first connection among them was sharing the same language (S.language). They had a weak tie at the beginning, but sharing the same programme of study was important to strengthen the relation which led to working together in group work. For example, in~~ ~~On the other hand, Pattern 2 shows how sharing the same programme of study helped in forming thea weak tie relationship, which evolved later because of sharing same language factor. , and same for p~~ ~~Patterns 3 and 5 are variations on this. In patternsn 4 and 6 the relationship working in the same working-group was not good factora strong factor in creating a network even-in-where sharing the same language and same programme of study were shared because of having a connection between one member of the group with people from outside the network. Based on these patterns, it iswas identified -noticed that in~~ one cluster, sharing the same language ~~was iswas~~ the main connecting factor, while in another cluster the same language was not important, rather learning motives ~~wereas~~ the main force at work. In each case networks were found to be transformed from one type into another, with the work ~~ties-network becoming-leading to friendship ties networknetworks~~ and vice versa.

In the first stage of this research, the findings demonstrated the work network was formed based on co-national relations. This, however, changed over time, ~~where-as~~ students were found to form their work network based on sharing the same learning motives, rather than on sharing the same language. The creation of preliminar~~ly~~ co-

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national networks was the base ~~that was used helpful into~~ creating the work network, which evolved into a friendship network over time. In the second set of findings, the ~~group make-up~~ tutor's decision to pick the groups based on mixing nationalities ~~has~~ impacted on forming a multicultural work network. However, a co-national work network was already formed ~~for~~ in other modules. The work network that was based on sharing the same language was found to often evolve into a friendship network. However, ~~the a~~ work network that was based on ~~the a~~ multicultural ~~network group~~ was found not to evolve into a friendship network over time, because of other factors (as discussed earlier). Meanwhile, some multicultural work networks were found to evolve into friendship networks because of sharing common factors.

Conducting the second stage of study was important to exploring how the factors operate over time.

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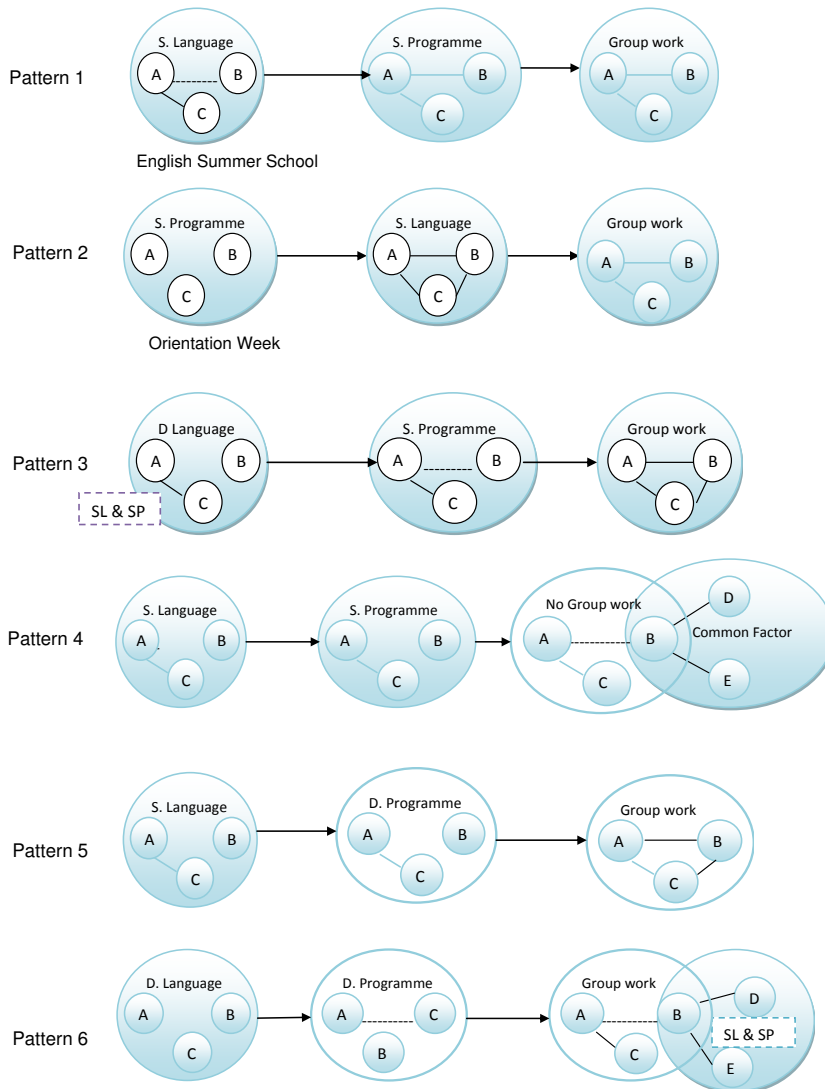


Figure 1: Network Evolution patterns

***LPP in the Multicultural Classroom***

The study found that rather than evolving towards a cohesive network, the interplay of complex factors over time within networks produced a pattern of fragmented groups,



which themselves evolved quite quickly and with some students remaining isolates. This for example, means that the model of a single, strongly cohesive network, as proposed in communities of practice theory is not realised.

In the theory of LPP, much of the learning is said to happen through peripheral participant interactions with old hands at the centre of the network. From this one would expect an important role for the tutor, if one assumed them to be central in the network, as they were indeed central in visible classroom interactions. However, the network reported in the SNA placed others as more central actors and suggested that the true learning network was relatively invisible in the classroom. This is not expected in LPP., ~~so one would expect an important role for the teacher, as an old hand, to be central in particular networks. The findings of this research showed that visible classroom dynamics were different from the reported network, which suggests that learning network was relatively invisible in the classroom, which is not expected in LPP.~~

On the other hand, some types of international students' networks; namely: advice and support networks showed some features of LPP. Experienced individuals were represented by the ones who were experienced in living in the UK. While it might seem at first that the processes of LPP were not at work, through examining the smaller groups within the whole networks, it was found to be working. This suggests that LPP theory can be extended to examine the dynamic of learning that happens in smaller groups within the whole network, rather than just simply examining its applicability to the entire network.

## Conclusion

### *Theoretical contribution*

This study adds to previous knowledge by being one of the few recent studies to apply SN theory in a face to face classroom context, particularly a multicultural classroom.

The current study has reinforced the importance of recognising the multiple networks that exist in a classroom as proposed by Haythornthwaite (2008). It has extended previous knowledge by stressing the importance of context in investigating the different types of networks, because in different contexts networks evolve differently.

A classroom where there is great diversity of nationalities operates differently from where the majority are home students. This study has also contributed to existing knowledge by providing a fuller picture of international students' networks,

particularly what factors shape their formation and evolution. Previous studies have focussed on dichotomies between home and international students: be that where internationalisation is seen as about international student adjustment to the host culture or where home students interact or fail to interact with international students. However, in the context where home students are a tiny minority, as here, network evolution was more complex and fluid. Even though there was a majority of students from one country, because it did not have all the cultural and linguistic capital of being from the host country, its influence was less profound – though network structures did push smaller minority groups into clusters together. It seems plausible to argue that the same processes observed here do also operate where home students are the majority, but are masked by the over-powering influence of the home-international dualism.

This study also contributes to the body of theory by suggesting a new angle on how to apply LPP in a learning context. The research showed that applying LPP, particularly as a theoretical framework, was not very useful in a multi-cultural context if it looked at just the expert and novice relationship, where there are always experts in every network. However, it did show that LPP can be useful concept by looking at the learning process if interpreted in a slightly different way. LPP is applicable within the smaller process that happened in many subgroups even if it is not happening in the main group.

This study contributed to previous knowledge by using mixed methods in studying the social network dynamics, where most previous SNA studies have been purely quantitative (Snijders 2001). Combining SNA with qualitative methods was successful in providing a more holistic picture of the network dynamics. In highly dynamic contexts, such as the early stages of a class, photos of those whose relations are being studied may increase recognition, compared to the usual practice of listing just the names.

### ***Practical Implications***

Understanding the factors shaping the network dynamics of international students is beneficial for informing HEIs' actions, particularly for those who have large numbers of international students. The study ~~was found~~ that international students build their networks based on sharing the same language, culture, commitment to study and/ or programme of study. In order for these networks to be strengthened, students need more time to ~~have chance~~get to know each other after their arrival in the UK. Time was also found to be important factor in network evolution, which suggests giving

international students enough time to mix with UK students early in the orientation week, then in accommodation is important. Furthermore, Organizing social events before the start of the semester would be beneficial in helping international students mix with other international and home students in the university. Continuing to make interventions, such as organising events through the academic year could also be beneficial, because this study showed how networks continued to evolve throughout the academic year.

Tutors of international students can also benefit from the research findings by adopting ~~a~~ changes in ~~the~~ curriculum design, in ~~a~~ ways that supports intercultural learning. These do not necessarily need to be complex One of these changes ~~could be~~ is quite simple: mixing students in group work. ~~Moreover,~~ Another approach would be using ~~other~~ novel teaching and learning methods, such as complex group work tasks, ~~such as~~ for example, video making (~~Cox and Taha 2010~~ Reference hidden Cox and Taha 2010), which to some degree ameliorates issues around language and encourages students from different nationalities to engage with other students.

~~Furthermore,~~ Above all, understanding the importance of monitoring ~~the~~ integration in the class ~~would be another way that is the main way that~~ tutors could ~~use~~ respond to the research findings. Because networks have been shown to be complex and partly invisible, tutors need to ~~explore much~~ be more attentive ~~more deeply~~ to how students draw on different types of support in order to support them. This suggests the need for greater continuity in teaching staff across a modularised curriculum and greater communication between class tutors and personal tutors. It may also be that tutors need a different mental model of what the network should be like. It is unlikely to

achieve a simple cohesive pattern. Exploring these relations and reflecting on them becomes a central task for tutors.

The inevitable limits of time and resource in this study and the limited research context were the main limitations of this research. This research only investigated the perspective of one classroom, in one level, discipline and one country (UK HEI),

where international students were the majority. Nevertheless, it is hoped that conceptual developments presented in the findings contribute to understanding.

Future research could build on the findings here by applying concepts such as multiple networks to other contexts. Future research should be carried out on the networks of international students at the undergraduate level, which would be a good point of comparison. The perceptions of learning networks among academic staff and the part in plays in pedagogy would be an important focus of investigation in future research.

## **Appendix 1: Interview Schedule:**

What are your name/ country of origin/ first language/ programme of study?

Please name the people you know in this class (using a class photo)? Did you get to know them before the class? What are their countries and first language? (Do you know any one just by sight, what do you think of using photos in the questionnaire?)

What kind of relation do you have with them? (Prompt: Ask Information; Advice; Work; Social support) (Why do you communicate with them)?

Do you communicate outside the class?

Do you think that **being in a group** had an effect on your learning in the class and outside the class?

Do you think the **type of assignment** has affected your relation with others outside the classroom? (How did the video creation exercise affect your relations with others? Positively?)

Is there any change in your relation since you got to know each other?

What are your main resources of information, advice and social support rather than the people in this class?

Can you describe how your relations with those people have changed after coming to Sheffield University?

Who are the people you are working with and are not from this class?

What communication tools do you use to communicate with them (both your current social network and previous one)? (give examples)

Do you have any further suggestions or comments?

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