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## **A dynamic analysis of social capital-building of international and UK students**

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# A dynamic analysis of social capital building of international and UK students

## Abstract

Although many international students experience transitional issues, most research assumes these issues will disappear over time. Using principles of social capital theory, this study addressed whether after three years of study students were able to build multi-national and host social capital links. In this quantitative study of 81 students from 28 nationalities, the results indicate that Confucian Asian students lived in separate social worlds, while English and other international students developed substantial multi-national networks over time. Learning networks after 14 weeks were predicted by group allocation and initial friendships, indicating a positive effect of mixing multi-national groups.

## Introduction

UK remains one of the most desired destination for higher education for many students worldwide; most international students regards the opportunity to study in England as a personal strategy to internationalize and adapt themselves to the global environment (Waters and Brooks 2010). Of the 428,225 international students studying in the UK in 2011, a large percentage of international students are from Confucian Asia (43%), in particular from China (Higher Education Statistics Agency 2012). Most Confucian Asian students follow strategic economic programmes, such as business, computing or engineering (Waters and Brooks 2010).

Due to the global nature of higher education today, the context of learning should neither be overlooked nor simplified; according to Mills and Gale (2011), international institutions should embrace a more holistic understanding of learning. This study attempts to review learning from both social and cultural contexts, which were documented to provide good indicators of students' performance (Mills and Gale 2011). While students' social relationships cannot be directly equated to social capital, they can provide resources for social capital (Lee 2010). Given the globalised labour market, social relationships with others with similar or different cultures may provide graduates with cultural capitals required to be successful in the long term. For example, studies by Heath, Fuller, and Johnston (2010) and Roth and Salikutluk (2012) confirmed that social networks may have an impact on attitude and perceptions towards education.

Several researchers indicate that non-Western students, and Confucian Asian students in particular, may experience stronger transitional issues than international students from Europe due to

the relatively larger language barriers (Skyrme 2007, Zhou et al. 2008), larger differences in educational systems (Ward et al. 1998, Zhou et al. 2008), and learning styles that are seen to be focussed on rote memorisation (Tempelaar et al. 2013). In addition, in a study amongst 207 post-graduate students in the UK, Rienties, Heliot, and Jindal-Snape (2013) found a substantial segregation in friendship and learning networks between Confucian Asian, European and English home students, which persisted even when students were mixed in multi-national groups.

Although a large number of studies indicate that some groups of (international) students may experience transitional issues, most research is focussed on the first-year of the undergraduate program (Skyrme 2007, Ward et al. 1998), with some research in post-graduate education (Rienties, Heliot, and Jindal-Snape 2013, Rienties et al. 2013, Zhou, Topping, and Jindal-Snape 2011). As argued by Kim (2001), with an increased interaction with the local host culture, the expectation is that international students over time are able to develop appropriate adaptation strategies to cope with cross-cultural stress. For example, in a longitudinal 12 months adaptation study of 35 Japanese students, Ward et al. (1998) found that adjustment problems were greatest at the start of their program, and decreased over time. Therefore, one would expect that after three years of studying at a host institute, international students would have developed effective coping strategies, with groups of friends from widely diverse cultural backgrounds.

Using principles of social capital theory, the primary goal of this study is to understand whether, after three years of study at a UK management school, international students have been able to build multi-national and host-friendships, and learning relationships. Secondly, if there is a lack of adaptation evidenced through multi-national networks, whether we can intervene through group work by creating multi-national groups. We conducted dynamic Social Network Analyses (Rienties, Heliot, and Jindal-Snape 2013, Rienties et al. 2013) to understand how 59 international students from 27 different nationalities and 22 English students built and developed learning relations with other students over time.

# **Social capital theory, friendships and cultural differences**

## *Social capital theory*

The degree to which students develop social relations with other students has an impact on how students cope with the complex demands of higher education (Hendrickson, Rosen, and Aune 2011, Hernandez Nanclares, Rienties, and Van den Bossche 2012, Rienties, Heliot, and Jindal-Snape 2013, Rienties et al. 2013, Rienties, Alcott, and Jindal-Snape 2014). Several social network studies in sociology and education use social capital theory to explain how people develop and maintain formal and informal relations (e.g. Daly et al. 2010, Heath, Fuller, and Johnston 2010, Lee 2010). Social Capital is a concept with probably the most application in the area of organizational network research (Borgatti and Foster 2003, Coleman 1991, Ibarra, Kilduff, and Wenpin 2005, Putnam 2001, Reagans and McEvily 2003, Rienties et al. 2010), which is concerned with the value of the resources that social network ties hold. Social capital can be defined as “resources embedded in a social structure which are accessed and/or mobilized in purposive action” (Lin 2001, 12). The resources could come from students’ parents and siblings (Heath, Fuller, and Johnston 2010), but also from peer-students on their programmes (Brooks 2005). A recent review of the conceptualisation of social capital by Lee (2010) highlighted three conceptual issues: the use and accessibility of potential resources, the social capital formation processes and the network orientations.

Generally there are four explanations why resources embedded in social networks will enhance the returns on an individual’s actions (Lin 2001). First, embedded resources facilitate information flows between people, which consequently reduce the transaction costs, such as sharing of ideas, tasks or lessons learned. Second, social ties have a substantial influence upon how students deal with academic life and change in particular (Heath, Fuller, and Johnston 2010, Hommes et al. 2012, Lee 2010). Third, social ties may be conceived as certification of social credentials, as it reflects a student’s ability to access resources through social networks and relations. If a student is successful in building new relations and solving various educational tasks, his/her direct student colleagues may provide (in)formal recognition, which may also strengthen the credentials amongst students to whom he/she is indirectly connected to. Finally, social networks provide substantial psycho-social support

(Brooks 2005, Rienties et al. 2012), a sense of belonging (Heath, Fuller, and Johnston 2010), and reinforce identity and recognition (Lin 2001).

Typically, in social capital theory a distinction is made between the strength of a tie and the structure of the social network (Lee 2010). Strong social ties support the transfer of tacit, complex knowledge, and joint problem solving (Daly et al. 2010, Reagans and McEvily 2003). For example, Hommes et al. (2012) found that medical students developed strong learning and friendship ties with a range of students to share knowledge and expertise, which substantially improved their coping mechanisms in solving complex authentic medical tasks and academic performance. A common finding in internationalisation literature is that most students initially prefer to “stick” together with students from the same cultural background (Harrison and Peacock 2010, Hendrickson, Rosen, and Aune 2011, Kim 2001, Rienties et al. 2013, Ward et al. 1998), as it provides common ground, support, and trust. At the same time, limited new information is passed through strong (but sometimes redundant) ties. According to Daly et al. (2010), weak ties are better suited to transfer simple, routine information, but research by Granovetter (1973) and our own research (Rienties et al. 2010) indicates that weak ties can allow new brokerage information within the strong dense network. In line with Borgatti and Foster (2003), a combination of strong ties with a substantial number of weak ties in different social networks (i.e. non-redundant ties) may allow international and host students to benefit from the diversity of social capital connections, while maintaining sufficient close and strong links with network connections who can be trusted.

In line with theories of strong versus weak ties, Putnam (2001) distinguishes between bonding and bridging social capital, whereby bonding social capital provides solidarity, mutual reinforcement and support, as commonly found amongst international students from the same cultural background. In contrast, bridging social capital may provide linkages with different (non-redundant) parts of the social network, thereby facilitating social mobility and potentially social inclusion (Heath, Fuller, and Johnston 2010, Putnam 2001). In an international classroom, this bridging capital could be developed when students from different cultural backgrounds develop cross-cultural learning and friendship relations.

### *Friendships between international and host students*

Most studies on friendships of international students have focussed on co-national friendship networks (i.e. friends from the same country). Although co-national friendship networks provide (short-term) support through social interaction with students who are experiencing similar emotions, Kim (2001) argues that it will hinder adaptation processes in the long-run. In fact, Hendrickson, Rosen, and Aune (2011) found that students with relatively more co-national friends were less satisfied with their lives. Having more relations with host-national students in contrast was positively correlated with satisfaction and connectivity.

Multi-national friendships are often built because international students share a similar experience and are open to learning from other cultures (Hendrickson, Rosen, and Aune 2011). However, host-national friendships are difficult to establish for international students, due to language issues (Rienties et al. 2012, Zhou, Topping, and Jindal-Snape 2011), perceived discrimination (Russell, Rosenthal, and Thomson 2010), and the fact that most host-national students already have well-established friendship networks (Hendrickson, Rosen, and Aune 2011, Rienties et al. 2012).

In line with adaptation literature (Kim 2001, Rienties, Heliot, and Jindal-Snape 2013, Ward et al. 1998) and social capital theory (Lee 2010, Lin 2001, Putnam 2001), after three years of study one would expect that most international students would have been able to establish not only co-national friendships (i.e. bonding social capital) but also many multi-national and host-national friendships (i.e. bridging social capital). At the same time, given the strong preference of host- and international students to work together with co-national students (Harrison and Peacock 2010, Volet and Jones 2012), one could also expect that friendships after three years are still influenced by cultural backgrounds. The following (alternative) hypothesis is tested:

H1 Friendships after three years of study are not related to cultural backgrounds.

H1A Even after three years friendships of host students are different from those of international students.

### *Group selection methods to the rescue?*

According to Naidoo (2003), if higher education institutions are to provide competitive global advantage, they need to ensure a learning environment that allows trust building activities amongst students and their facilitator. Although substantial progress has been made in internationalisation literature, in a recent meta-review Volet and Jones (2012, 255-256) argue that “[c]hange in international and local students’ engagement in intercultural interactions over a period of time has attracted limited empirical attention... Intervention studies aimed at enhancing intercultural engagement among local and international students tend to be small scale, descriptive, and lacking methodological rigor”. The way teachers manage group enrolments (e.g. self-selection, randomisation) has an important impact whether students from different cultures are encouraged (or not) to work and learn together. Chapman et al. (2006) argued that teachers can improve group dynamics and learning experiences by allowing students to self-select members of their group. That is, in an experimental study amongst 583 first-year business students, Chapman et al. (2006) found that students in the self-selected condition had better (perceived) communication, were more enthusiastic about working together, and were more positive about their (perceived) group outcomes.

However, an obvious risk of allowing students to self-select their group members is cronyism, whereby students primarily select their members based upon friendships and previous working relations (Chapman et al. 2006, Rienties, Alcott, and Jindal-Snape 2014). Furthermore, in our opinion another crucial element beyond cronyism is that in UK universities students from many different cultural and international backgrounds are present (Peacock and Harrison 2009, Zhou et al. 2008). For example, in a post-graduate module with 207 students Rienties, Heliot, and Jindal-Snape (2013) found strong segregations across cultural lines even after fourteen weeks of study, despite that students were put into (small) multi-national groups. However, in a different context of 2\*69 post-graduate hospitality students, using a quasi-experimental design Rienties, Alcott, and Jindal-Snape (2014) found students in a randomised condition were able to cross cultural differences in groups over time. Furthermore, in comparison to the self-selection condition, students in the randomised condition developed significantly more learning links to other students outside their group.

Rienties, Alcott, and Jindal-Snape (2014) conclude that teachers can actively encourage students to learn with students from different cultural backgrounds if students are “forced” to work in multi-national groups for a sustained period of time on authentic and complex group products. At the same time, in line with Krackhardt and Stern (1988), Hernandez Nanclares, Rienties, and Van den Bossche (2012) also found that when students are put into groups where they at least know one or two students already, groups are more likely to develop trust in an earlier stage of development. Based upon the findings of Rienties and colleagues (2013, 2014), in this context we actively merged international and host students from different parts of their initial friendships, which we refer to as “balanced multinational groups”.

H2 Learning after 14 weeks of working in multi-national groups is related to group division

H3 Learning after 14 weeks of working in multi-national groups is related to initial friendships

H4 Group division has a stronger influence on learning after 14 weeks than initial friendships

## **Methods**

### *Participants and setting*

This study took place using a convenience sample in a compulsory third year undergraduate module of Hospitality Management at a research-intensive university in the UK during the second semester. A truly international classroom was present, as there were 28 different nationalities amongst 81 participants. The three largest groups were from Confucian Asian countries (38%), primarily China, followed by UK (27%), and Eastern Europe (17%), see Table 1 for the composition of the sample per country. 75% of participants were female, and the average age was 23.26 (SD = 3.74). 41 (51%) of the participants followed a year-long placement after their second year of study, while 40 (49%) participants directly followed their third year after the second year of study. This module included students from two different programmes: BSc in International Hospitality and Tourism Management (49%) and International Hospitality Management (51%)

➔ Insert Table 1 about here

After the first measurement of social friendship network (see next section), students were put into “balanced” groups based upon their social network position (irrespective of cultural backgrounds). That is, the authors of this paper tried to ensure that for each group a couple of students were already friends, while at the same time bringing in one or two students from different parts of the network in order to create a sufficiently diverse group with limited redundant links. As a result, 10 small working teams were formed in Week 2, with an average group size of 8.10 (SD = 0.74). During the course, students met formally once a week during a three-hour interactive lecture alongside (online/face-to-face) informal meetings with the peers of their group, whereby they worked on weekly tasks. These group products were not formally assessed but the teacher provided formative feedback.

### *Measuring friendship, work and learning networks*

For ascertaining how international and host students from different cultural backgrounds learned together over time, we employed a method developed within the field of Social Network Analyses. Numerous researchers have found that SNA networks provide robust and accurate depictions of actual learning processes and social networks (Curşeu, Janssen, and Raab 2012, Hernandez Nanclares, Rienties, and Van den Bossche 2012, Hommes et al. 2012, Katz et al. 2004, Rienties, Heliot, and Jindal-Snape 2013), and recent research highlights that social networks are the key predictor for learning (Hommes et al. 2012).

First, the pre-existing friendship and work relations were measured by “closed-network” analysis (Hernandez Nanclares, Rienties, and Van den Bossche 2012, Krackhardt and Stern 1988). During the first session, a list with all respective names of the students was provided and the 81 students answered three Social Network questions in English, namely: “I am a friend with...”; “I learn from...”; and “I work a lot with ...”. Given that we were primarily interested in how networks developed over time and students had to fill in the questionnaire twice, a check-box manner was adopted rather than a rating for each student, which requires more time from students and might lead to socially desired answering. Second, we (again) measured the social learning networks at the end of the module at Week 14 in order to analyse whether the dynamics of learning of international and host students had changed. The friendship question was phrased identically, but the learning and work-question were phrased in past tense (i.e. I learned a lot from ...). For the two measurements a response rate of 83% and 67% was established. A possible reason for the lower response rate during the post-test was that not all participants were present during the final lecture. Although non-respondents were reminded via personalised mail, most students already completed their degree and left for internships, or went abroad.

Separate Chi-Square analyses indicated no difference between respondents and non-respondents in terms of age, teams, nationality, GLOBE, specialisation, marks in the module and GPA.

### *Data analysis*

As a first step, a graphical analysis of the friendship and learning networks was conducted in order to identify the overall social network structure and identify possible patterns of sub-group development, as recommended by Wassermann and Faust (1994). Given that there were 28 nationalities present, and visualising the interaction patterns amongst 81 students from 28 different countries would lead to an extremely difficult to interpret social network graph, we clustered the nationalities according to the GLOBE study, as illustrated in Table 1. The GLOBE project (House et al. 2004) identified nine cultural dimensions by investigating the relation between culture and leadership styles, and created ten clusters of world cultures transcending national boundaries, of which eight were present in our dataset. Afterwards, a quantitative analysis was conducted in order to determine the dynamics of social friendship and learning networks in a pre-post manner. First, a group division matrix was constructed in order to measure the influence of the group division on the social learning network, a procedure similar to creating a dummy-variable for each group in “classical” statistical analyses. Second, given that students followed different specialisations and half of the participants went on year-long placements before their third undergraduate year, a specialisation matrix and placement matrix was constructed. Third, four cultural backgrounds matrixes (i.e. co-nationality, Chinese, English, GLOBE) were constructed.

Subsequently, we determined the position of each student within similar cultural backgrounds relative to students from other cultural backgrounds in the (dichotomised) social learning network using the External – Internal index (Krackhardt and Stern 1988). As there were a large number of nationalities present, in particular amongst Eastern European and Confucian students, we clustered students based upon their GLOBE classification. The resulting index ranges from -1 (all ties are only with “co-GLOBE” students) to +1 (all ties are with students from a different GLOBE cultural background). Follow-up sample t-tests were conducted in order to determine whether the E-I indexes per GLOBE region were significantly different from 0, or whether there was a cultural bias in the friendship network.

Follow-up quadratic assignment procedure Pearson correlations and multiple regression quadratic assignment procedures (MRQAP) were conducted in order to compare similarity measures between the friendship and learning networks. Basically, MRQAP tests are permutation tests (2000x) for multiple linear regression model coefficients for data organised in square matrices of relatedness of friendship and learning, and

the interpretation of the standardised betas is similar to OLS regression analyses (Rienties, Heliot, and Jindal-Snape 2013). Data were analysed on a network level using UCINET version 6.414. Although SNA data can be transformed and exported to “classical” statistical programs, such as Stata or SPSS as done by Hendrickson, Rosen, and Aune (2011), analysis in UCINET is superior given that the specific learning relations between international and host students (i.e. our primary research interest) remain intact (Rienties, Heliot, and Jindal-Snape 2013).

All students participated voluntarily in the pre- and post-test of SNA. The participants were assured that the SNA results would be completely anonymised and none of the detailed results would be shared with the teacher or the university.

## Results

### *Social network visualisations: a first step to understanding complexities of cross-cultural learning in groups*

#### *Initial friendship and work networks at Week 1*

In order to illustrate the power of SNA in understanding the initial friendship and work networks of international and host students at day 1 Figure 1 and Figure 2 are presented. Five aspects can be distinguished from these figures. For example, in the top-right of Figure 1 (see grey arrow), an Eastern European female student (box, 10) had links with four other Eastern European students (from Group 2, 5, 6, 9), one Confucian Asian student (black, diamond, 5), and one Latin European student indicated to be friends with her (square, 8), however this relation was not reciprocal as the arrow only goes towards the Eastern European student. Note that the colour and shape in brackets represents the respective GLOBE cluster of each of her friends (see also Table 1), as well as the respective group number the students were put into.

➔ Insert Figure 1 about here

Second, when looking at the entire network shape of Figure 1, a n-shaped form seems to be visible. That is, on the left side of Figure 1 almost exclusively Confucian Asian (primarily Chinese) students were present, while on the right bottom side primarily UK and German students were present. There were three links between English and Confucian Asian students, but these relations seemed to

originate primarily from Confucian Asian students. Finally, a mix of international and some English students were present in the top of Figure 1. Where UCINET positions a node in the social network is essentially arbitrary, however the position is dependent upon the list of nodes and the relations amongst the nodes. In other words, the shape of Figure 1 does not imply that it is better or worse to be on the left or right side, rather that some groups of students formed stronger subgroups than others and were therefore positioned in distinct areas..

Third, some students (like the Eastern European female from Group 10) were on the outer fringe of the friendship network and were not well-connected to other students, while other students were more positioned in the centre of the network and had lots of connections. Fourth, similar patterns emerged in the initial working network, where most Confucian Asian students were situated closely together on the top right, while most English students were positioned on the bottom of Figure 2. Quite interestingly, a group of four English students who were put subsequently put into Group 1 (with four international students) indicated that they worked only amongst themselves, as illustrated by the separate sub-group in Figure 2.

Finally, as we tried to balance groups with at least some friends in each group but at the same time ensuring some diversity, most group members were located in the same geographical space, while some group members were from different geographical spaces in the friendship network. For example, Group 9 (black box around nodes) consisted of a mix of students from the left and top of Figure 1, while Group 6 (grey circle around nodes) consisted of a mix of students from the right and left of Figure 1<sup>i</sup>.

➔ Insert Figure 2 about here

#### *Learning network after fourteen weeks*

In Figure 3, the social learning network after fourteen weeks is illustrated. Three aspects can be distinguished. First, similar to Figure 1 and 2 the majority of Confucian Asian students seemed to be positioned in a separate geographical space on the left. At the same time, in comparison to the first two

SNAs, more students seemed to be closely located to their respective group members. For example, most of Group 9 students were located in the same space in the middle of Figure 3, although two Confucian Asian students (black box around node) on the top left were not well connected. Similarly, most of Group 6 students were situated on the bottom of Figure 3, but two Confucian Asian students (grey circle around node) were not connected and were positioned on to the top of the learning network. Third, the relatively clear separation of sub-groups based upon GLOBE geocultural regions at the start of the module was not as visible towards the end of the module. However, separate visual analyses (not illustrated) of the friendship and work networks did again illustrate a separation along cultural lines.

→Insert Figure 3 about here

### *Quantification of friendship relations*

Although network visualisations give important first impressions of the social network patterns, follow-up quantitative analyses are needed to determine whether these patterns were statistically significant. In Table 2, the friendships at day 1 (M1) and after fourteen weeks (M2) between “co-GLOBE” students and students from different GLOBE geocultural regions are illustrated. Confucian Asian students had on average 7.42 friends with the same cultural background, and 2.23 friends from a different GLOBE culture. As a result, their E-I index was significantly negative (-0.61), indicating an internal inward friendship focus. Of the 31 Confucian Asian students, 11 students had only Confucian Asian friends, and only three Confucian Asian students had more international friends than Confucian Asian friends. This seemed to confirm our expectations that Confucian Asian students remained relatively isolated from other international students, even after three years of study in the UK.

English students had more or less an equal number of co-national and international friends at the beginning of the module, which seems to contradict findings by Peacock and Harrison (2009) that most English students develop only co-national friendships. Eastern European students had slightly more friends from a different GLOBE culture, although not significantly different from zero using sample t-testing. Finally, the other international students, who had a lower number of co-nationals

students, were interacting significantly more with international students from a different GLOBE cultural background, as illustrated by the significant E-I scores. In other words, we found no support for H1 that friendships after three years were not related to cultural backgrounds. In contrast, amongst Confucian students there was a significant internal focus even after three years of study, while other international and host students had developed more multi-national and host-national friendships.

Friendship relations after fourteen weeks (M2) became significantly more focussed towards other GLOBE clusters ( $M_{E-I1} = -.09$   $SD_{E-I1} = .65$ ;  $M_{E-I2} = .15$   $SD_{E-I2} = .65$ ;  $T = 4.009$ ,  $p < .01$ ). Confucian Asian students indicated to have significantly less friendships with co-GLOBE students, and the E-I index was significantly less internally focussed. English students followed a similar pattern, whereby relatively more friendship relations with international students were developed; although from a statistical perspective the positive E-I index (0.14) was not significantly different from 0. Students from the other GLOBE groups retained a similar significant external focus. Finally, as one would expect based upon the strong differences across the GLOBE clusters, the ANOVAs indicated significant differences across the GLOBE regions, how students developed friendships within and outside their own cultural background, with moderate to large effect sizes. In other words, although the intervention of group work across GLOBE clusters alleviated some of the cultural barriers between international and home students, substantial cultural differences remained present.

### *Correlation analysis*

In order to better understand how the various variables influenced friendship and learning relations, in Table 3 specialisation, placement, indicators for cultural backgrounds, group division, and social networks measurements are illustrated using QAP correlations. The specialisation that students followed as well as whether students went on placement (or not) were positively related to the social networks of friendship, learning and working. In addition, the proxies for cultural backgrounds (i.e. co-nationality, GLOBE, Chinese, English) were all positively related to the social networks, indicating that students from similar cultural backgrounds preferred to work and learn together, with the exception of the English matrix, which was only related to initial friendships.

→ Insert Table 3 about here

As one would expect, the group division was related to cultural background proxies, initial friendship, work and learning networks, as we tried to balance students who were relatively close with students from other subgroups. However, more importantly the rho's of group division substantially increased when looking at the social networks at the end of the module, indicating that students over time were developing stronger links with their assigned group members.

→ Insert Table 4 about here

### *Multiple regression quadratic assignment procedures*

Finally, in order to identify the magnitude of cultural backgrounds, specialisation, placement and the (forced) group division on friendship and learning networks, we used multiple regression quadratic assignment procedures, as illustrated in Table 4. In Model 1, friendship ties at day 1 were positively predicted by co-nationality ( $\beta = .14$ ;  $p < .01$ ) and Chinese network ( $\beta = .13$ ;  $p < .01$ ), whereby  $\beta$  represent standardised betas. In Model 2, specialisation and placement were added, whereby again the cultural backgrounds, specialisation and placements predicted initial friendship relations. Therefore, even after living and working in the UK for at least 2 ½ years, our results indicate that students developed strong friendship relations based upon co-nationality. Given that the separate dummy-matrix for Chinese students remained significant when the co-nationality matrix was already included, this indicated that this effect was even stronger amongst Chinese students.

As the initial work network showed a relatively strong separation across cultural backgrounds, we also modelled initial work. That is, initial work was significantly predicted by co-nationality and Chinese network as well as placement and specialisation in Model 3. When adding initial friendship networks in Model 4, the results indicate that work relations at the beginning of the module were primarily predicted by initial friendship relations ( $\beta = .62$ ;  $p < .00$ ).

As a last step, in Model 5 learning ties after fourteen weeks were significantly predicted by placement ( $\beta = .13$ ;  $p < .01$ ), Chinese network ( $\beta = .10$ ;  $p < .01$ ) and specialisation ( $\beta = .07$ ;  $p < .01$ ), but not for co-nationality. When adding initial friendships and group division, the fit of the model

improved significantly. That is, learning after fourteen weeks was primarily predicted by the group division ( $\beta = .29$ ;  $p < .01$ ) and initial friendships ( $\beta = .26$ ;  $p < .01$ ), followed by the Chinese network ( $\beta = .07$ ;  $p < .01$ ), placement ( $\beta = .06$ ;  $p < .01$ ), and specialisation ( $\beta = .03$ ;  $p < .05$ ), thus supporting H2-H4.

In sum, although both co-national and Chinese networks were significant predictors for friendship relations, no significant relation of co-nationality was found for the learning network after fourteen weeks, with the exception of Chinese network. Students developed learning relations not only based upon initial friendships but also with students with whom they were “forced” to work within their group. As already indicated in Figure 3, not all students were able to develop strong learning links with their group members, even though these results indicate that pro-active sampling of groups can influence learning networks after fourteen weeks.

## **Discussion and Conclusion**

With an increasing number of international students following higher educational programmes in the UK, this study is to the best of our knowledge the first to quantitatively analyse whether students after three years of study actually developed multi-national and host-national friendship, work and learning relations. Most internationalisation research (Kim 2001, Volet and Jones 2012, Ward et al. 1998, Zhou et al. 2008) assumes that with an increased interaction with the local host culture, international students over time will be able to develop appropriate social friendship and learning relations. Using dynamic Social Network Analyses (Hernandez Nanclares, Rienties, and Van den Bossche 2012, Rienties et al. 2013) with 81 students from 28 different nationalities, we found a relatively strong segregation along cultural lines when we measured friendships at the start of the module. A large group of Confucian Asian students were mostly indirectly connected with a group of international students from the rest of Europe to host-national English students. Follow-up quantitative analyses indicate a strong internal focus amongst Confucian Asian students, whereby 77% of their friends were from a Confucian Asian background, in line with bonding social capital notions of Putnam (2001).

In contrast to findings by Peacock and Harrison (2009), all English students developed friendships with international students to some degree, and most English students had more or less an

equal number of co-national and international friends. The “other” groups of international students developed relatively stronger external friendship relations, or bridging relations, with non-co-national students. A likely explanation is that in our context most of the other international students came in relatively small numbers to this program. As argued by Kim (2001) and Zhou, Topping, and Jindal-Snape (2011), when students from a non-dominant group are entering a new culture, in addition to developing strong relations with co-nationals most individuals strategically develop relations with multi-national and host-national students over time. Perhaps the pressures for Confucian Asian students to develop multi-national and host-national friendship relations were less as there were sufficient co-national students to develop a social network.

A second important finding that seemed to counterbalance part of the above findings is that due to the multi-national group allocation friendship and learning relations after fourteen weeks became significantly more focussed towards other GLOBE clusters. In other words, by connecting and bridging together different parts of the social network, students were “forced” to build new (non-redundant) relationships, thereby increasing the diversity of their social capital. In particular Confucian Asian students became less internally focussed after 14 weeks. Finally, MRQAP indicated that learning networks after fourteen weeks were significantly predicated by group division and initial friendships, followed by the Chinese network, whether students joined a placement or not, and their respective specialisation. In other words, although initial friendships significantly predicted learning after fourteen weeks, the standardised beta for group division was slightly larger, indicating that group divisions did substantially influence how students learned over time, and developed social capital relations.

To conclude, group work activities in this module appeared to have influenced the students’ social and cultural networks to some extent. The (forced) bridging of social capital by the “balanced” group approach may vary largely between international and UK students. Yet the application of group work activities seemed to support students in learning within the module, allowed them to create new social links and to strengthen “established” links with their classmates. Through both formal and

informal learning inside and outside the classroom, these students have practised their ability to expand their social and cultural capabilities.

In this study, the Confucian Asian students tended to stay within their cultural circle; while it may be true that they may not benefit from a wider network, there may also reap potential benefits from building social capital among those within the same culture. For instance, building interpersonal relationship within Chinese culture is often noted to be particularly important in one's personal and professional success (Chang and Holt 1991). Thus, it could be argued that social capital is also enhanced through this practice of social networking within the same culture, which may benefit the students in the present and in the future.

### *Constraints and Limitations*

A limitation of this study is its self-reporting nature, whereby perceived socially desirable behaviour might influence the results. However, a large body of research (Borgatti and Foster 2003, Katz et al. 2004, Rienties, Heliot, and Jindal-Snape 2013) has found that SNA techniques provide a robust predictor for actual social networks and learning outcomes, in particular given our high response rates. As we used MRQAP to predict the social learning networks after fourteen weeks, which is a conservative technique given that 2000 random permutations of alternative models were conducted, we found strong and robust indications that specialisation, placements, initial friendships, and Chinese networks were predicting learning.

A second limitation is that our study focussed only on a single setting at one business school. Although this international classroom setting is fairly common amongst business programmes (Higher Education Statistics Agency 2012, Waters and Brooks 2010), one has to be careful to generalise these findings beyond our context. Preliminary research findings in a post-graduate programme at the same institute (Rienties, Alcott, and Jindal-Snape 2014) and an economics programme in Spain (Rienties et al. 2013) do seem to indicate a similar trend in how group work can allow students to build bonding and bridging social capital.

A third limitation was that approximately half of the students followed a year-long placement, while the others did not. As a result, potential learning links that were established in previous years with their respective year-cohort were not explicitly taken into consideration. In addition, social relations maintained by students outside the module (e.g. roommates, friends from sports club, students following different modules in same degree programme) were not taken into consideration in our closed-network approach. Although methodologically challenging, future research could add an open-network or qualitative element to our dynamic social network approach, whereby for example students could also add five people outside the classroom who they consider to be friends and indicate their type of relation. Furthermore, triangulation of the quantitative results with in-depth qualitative results would allow researchers to understand why some Confucian Asian students were able to make successful reciprocal links with host- and international students, and why some host-students were primarily inward focussed.

Jonasson (2012, 738) reminds us that “the social dynamics of student engagement is not solely referring to individual patterns and traits”. Taking this advice, universities need to rethink their policies towards encouraging intercultural interaction (Russell, Rosenthal, and Thomson 2010). In line with recommendations by Volet and Jones (2012), teachers may need to review the instructional design of their module, as our results indicate that active intervention in group formations can influence how students from different cultural backgrounds develop bonding and bridging social capital. In addition to putting students into mixed groups, having complex group tasks that require diverse perspectives will increase the necessity for students to work in mixed groups. Finally, we encourage teachers to articulate the merits of diversity (i.e. bridging social capital) from day 1, and to provide support and trust to students to move beyond their own comfort zone.

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Table 1 Descriptive statistics of cultural backgrounds and labelling in SNA

Cluster	# of students	of Countries (samples, and ordered by relevancy)	Shape/colour in Social Network figures
<i>Anglo</i>	22	UK (22)	Circle
<i>Latin Europe</i>	4	Italy (2), France, Spain	Square
<i>Germanic Europe</i>	3	Germany (3)	Up triangle
<i>Eastern Europe</i>	14	Russia (5), Greece (2), Bulgaria, Cyprus, Czech Republic, Kazakhstan, Latvia, Polish, Romania	Box
<i>Latin America</i>	1	Trinidad & Tobago	Grey Down Triangle
<i>Sub-Saharan Africa</i>	4	Nigeria (2), Zambia, Zimbabwe,	Grey Circle
<i>Southern Asia</i>	3	India (2), Malaysia	Grey Circle in Box
<i>Confucian Asia</i>	31	China (22), Vietnam, Japan & Brunei (all 2), Nepal, Singapore, South-Korea.	Black diamond

Table 2 Friendships across GLOBE geocultural regions over time (ordered by initial E-I index)

	Friendship with same culture M1	Friendship with different culture M1	E_I Index GLOBE Culture M1	Friendship with same culture M2	Friendship with different culture M2	E_I Index GLOBE Culture M2
Confucian Asia	7.42	2.23	-0.61 <sup>.00</sup>	3.94**	2.74	-0.25 <sup>.05**</sup>
UK	5.73	5.00	-0.06	4.09*	5.55	0.14*
Eastern Europe	3.71	5.43	0.18	2.71	6.36	0.31 <sup>.05</sup>
Germanic Europe	2.00	10.00	0.63 <sup>.05</sup>	2.00	9.33	0.64 <sup>.00</sup>
Sub-Saharan Africa	1.00	4.00	0.64 <sup>.05</sup>	0.00	3.50	1.00 <sup>.00</sup>
Latin Europe	2.00	16.00	0.70 <sup>.05</sup>	1.50	16.25	0.76 <sup>.00</sup>
Southern Asia	0.00	10.50	1.00 <sup>.00</sup>	0.00	7.50	1.00 <sup>.00</sup>
Anova	5.566***	8.776***	13.312***	2.993*	4.393***	6.179***
$\eta^2$	0.348	0.457	0.561	0.223	0.296	0.372

Note: The sole Latin American student was excluded as all her connections were external by default. Paired sample t-testing illustrated in rows between pre- and post test per GLOBE cluster, whereby \*\*p<.00, \* p<.05. For E-I, sample T-tests were conducted whether E-I = 0, whereby <sup>.00</sup>p<.00, <sup>.05</sup>p<.05, ANOVA tested illustrated in columns across GLOBE clusters, whereby \*\*p<.00, \* p<.05.

Table 3 Descriptive statistics of specialisation, nationality, group division, friendship, work, and learning networks and correlations.

	M	SD	Density (%)	1	2	3	4	5	6	7	8	9	10	11	12
1. Specialisation	54.32	5.13	51												
2. Placement	39.51	0.50	51	-.01											
3. Co-nationality matrix	11.90	10.10	16	.04*	.13**										
4. GLOBE network	19.36	10.25	25	.02	.14**	.73**									
5. Chinese network	28.40	45.37	60	.03	.12**	.34**	.18**								
6. English Network	25.93	44.10	62	.01	.07**	.34**	.47**	-.05**							
7. Group division	8.10	0.74	10	.06**	.09**	.06**	.06**	.05*	.04						
8. Initial Friendship	10.16	5.54	9	.09**	.18**	.20**	.19**	.17**	.08**	.08**					
9. Initial Learning	8.01	4.77	7	.07**	.18**	.15**	.11**	.16**	.03	.09**	.59**				
10. Initial Work	5.45	3.13	5	.08**	.15**	.14**	.13**	.13**	.03	.09**	.63**	.68**			
11. Friendship after 14 weeks	8.55	6.51	9	.08**	.16**	.11**	.10**	.16**	.04	.27**	.44**	.34**	.34**		
12. Learning after 14 weeks	7.41	3.87	6	.07**	.14**	.08**	.05**	.13**	.01	.32**	.31**	.36**	.32**	.65**	
13. Work after 11 weeks	6.30	4.62	8	.09**	.13**	.12**	.09**	.09**	.01	.46**	.28**	.31**	.34**	.58**	.64**

\* $p < .01$ . \*\* $p < .001$ .

Table 4. Regression analyses of social friendship and social learning networks and cultural differences (standardised beta coefficients)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Initial Friendship	Initial Friendship	Initial Work	Initial work	Learning after 14 weeks	Learning after 14 weeks
1. Co-nationality	.142***	.127***	.093***	.014	.021	-.020
2. English	.031	.025	-.006	-.022	-.004	-.018
3. Chinese	.125***	.109***	.082***	.015	.103***	.067***
4. Specialisation		.081***	.073***	.023*	.069***	.031*
5. Placement		.147***	.126***	.035**	.125***	.064***
6. Initial Friendship				.619***		.261***
7. Group division						.286***
R-Squared adjusted	.051	.079	.048	.401	.037	.188

\*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Figure 1 Social friendship network at day 1

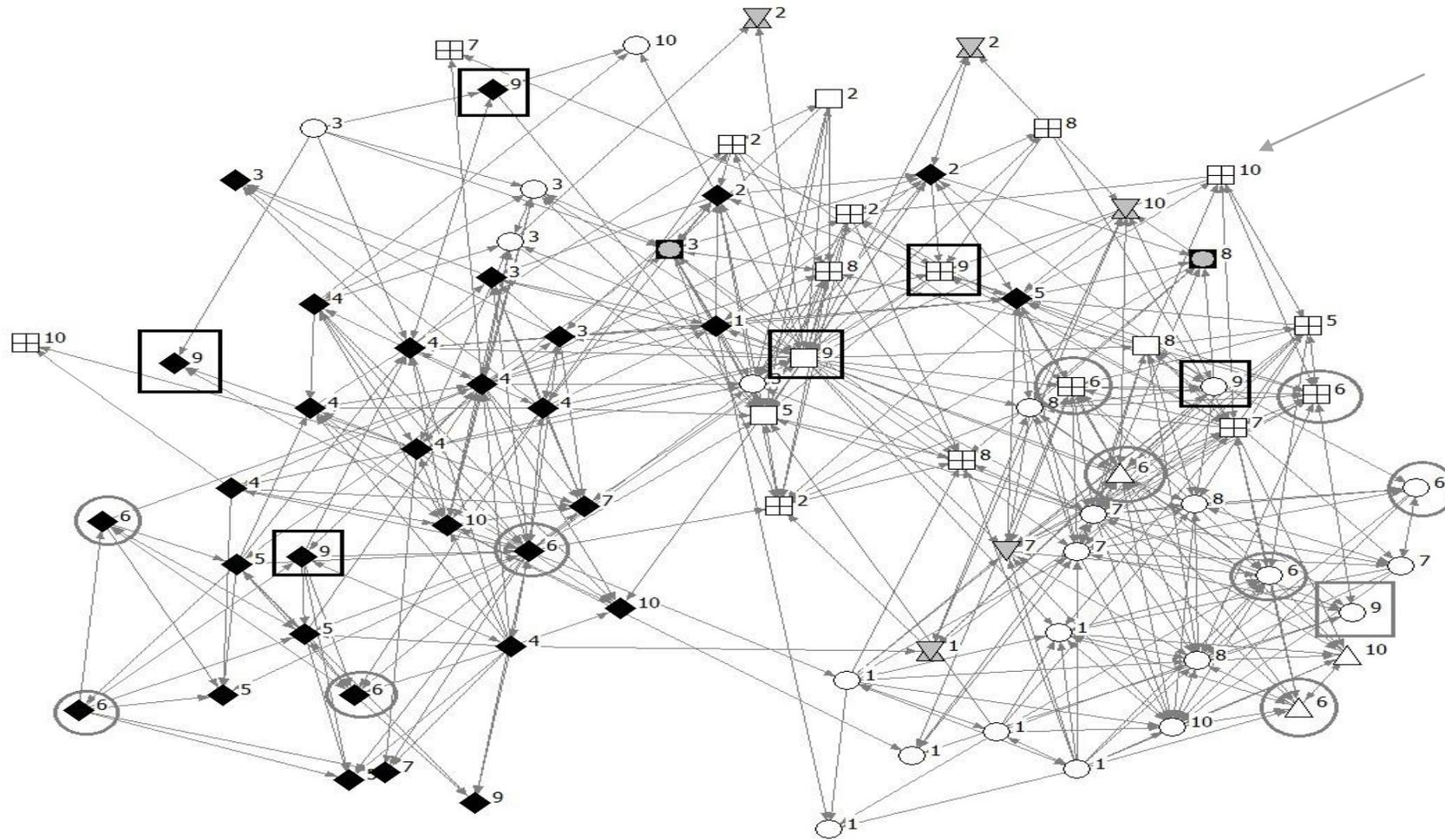


Figure 2 Social work network at day 1

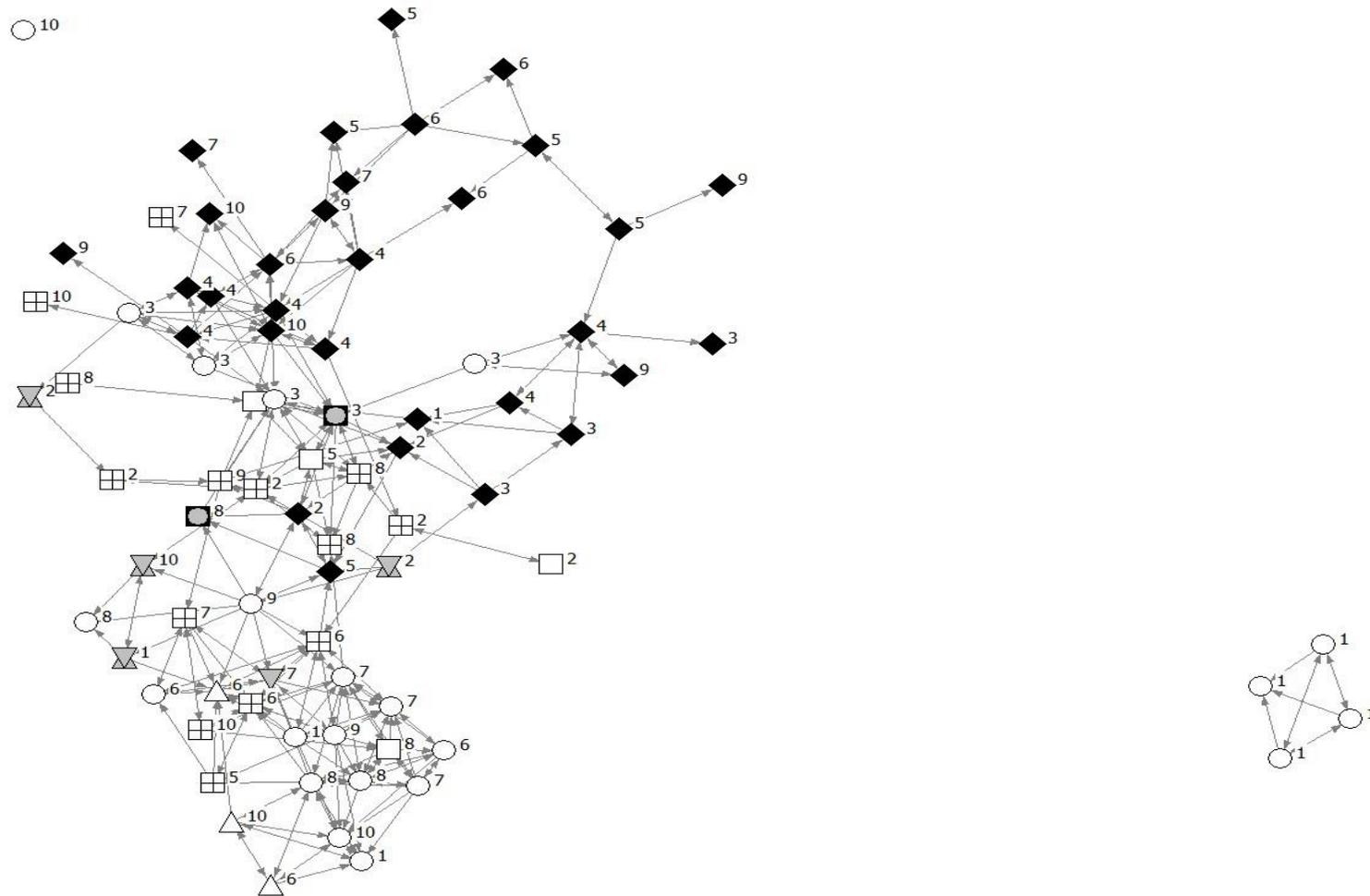
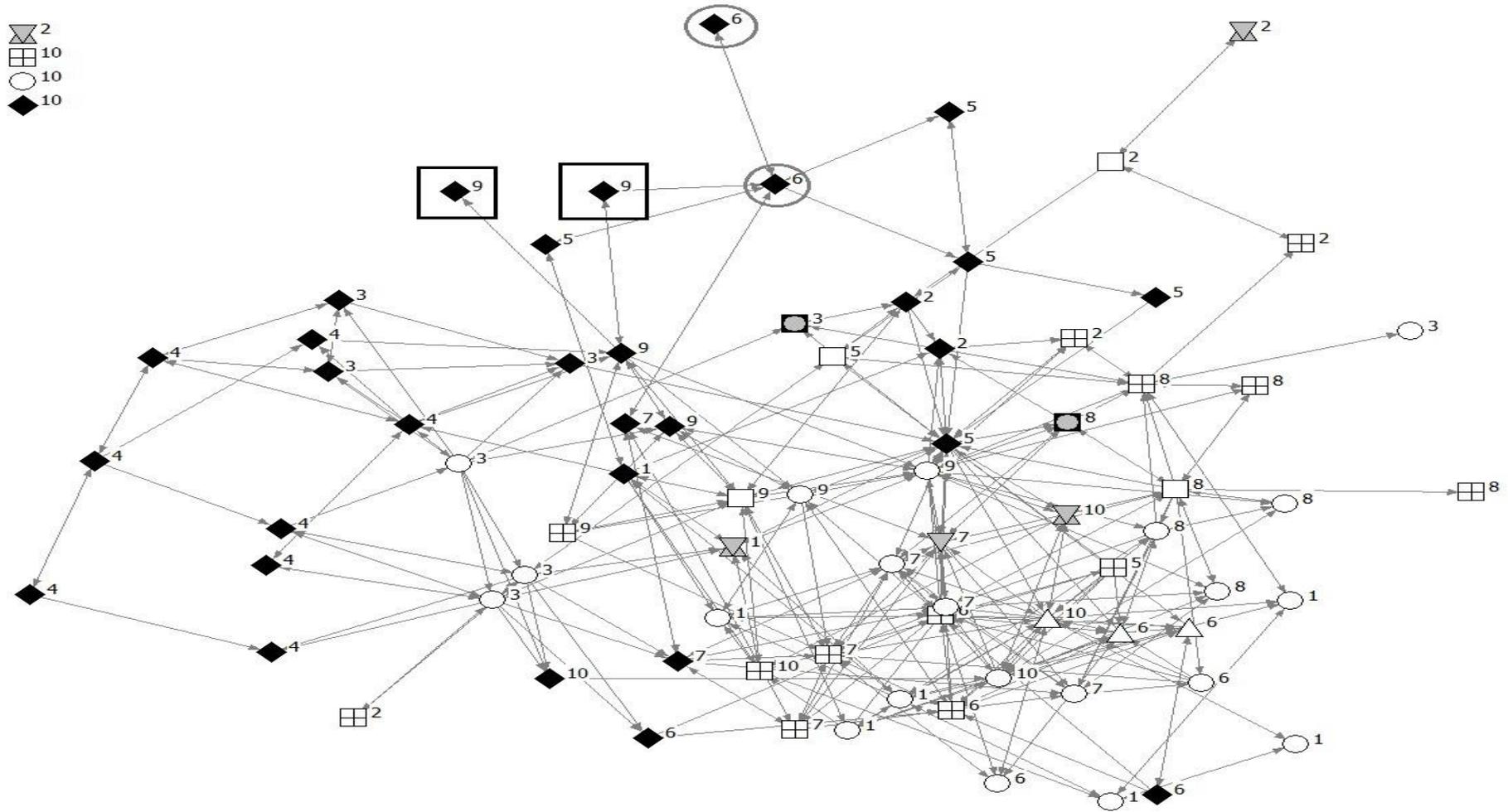


Figure 3 Social Learning network after 14 weeks



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<sup>i</sup> Please note that these groups did not exist till after our analysis of the existing networks. However, we have labelled students by group numbers so that the change from the first and fourteen week is clearly visible.