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To let students self-select or not: that is the question for teachers of culturally diverse groups

Abstract

When students can self-select their group members, a common assumption is that students prefer to select friends from similar cultural backgrounds. However, when teachers randomise students in groups from different cultural backgrounds, students are "forced" to work together. The prime goal of this study is to understand the impact of two group selection methods on how students from diverse cultural backgrounds build learning and work-relations, using an innovative quantitative method of Social Network Analysis in a pre-post test manner.

In a quasi-experimental study of 2*69 students, in one condition the students were randomly allocated to groups by staff and in the other students were allowed to self-select their group members. The results indicate that students in the self-selected condition primarily selected their friends from a similar cultural background. The learning networks after 14 weeks were primarily predicted by the group allocation and initial friendships. However, students in the random condition developed equally strong internal group relations but more "knowledge spillovers" outside their group, indicating that the random condition led to positive effects beyond the group.

Introduction

A common assumption by many teachers in large international classrooms in higher education is that most students seem to prefer to develop friendship relations and work together with students from similar cultural backgrounds (Hendrickson, Rosen, & Aune, 2011; Montgomery, 2009; Volet & Ang, 1998). Although a large body of literature as well as (and perhaps more importantly) employers indicate that being able to work effectively in groups is a key graduate skill, some students (and teachers) seem to be reluctant to embrace group work due to possible free-riding of group members (Chapman, Meuter, Toy, & Wright, 2006), risk of grade inflation (Chapman et al., 2006; Gašević, Zouaq, & Janzen, 2013), difficult group dynamics (Decuyper, Dochy, & Van den Bossche, 2010), and difficulties with cross-cultural collaboration (Author A, 2013a; Author C, 2008; Harrison & Peacock, 2010; Volet & Ang, 1998).

Most of the internationalisation research focuses on academic integration (Author A, 2012b; Zepke & Leach, 2005), personal-social adjustment (Author A, 2011a, 2012b; Russell, Rosenthal, & Thomson, 2010; Ward, Masgoret, Newton, & Crabbe, 2005), and stress of international students in the host institute (Author C, 2008; Russell et al., 2010; Zepke & Leach, 2005), with only a few focussing on how teachers can create a learning environment for mutual adaptation between students from diverse cultural backgrounds. In a recent meta-study on internationalisation research, Volet and Jones (2012, pp. 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".

According to Chapman et al. (2006), 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 who were assigned either to a random condition (i.e. students allocation into groups at random by a teacher) or a self-selected condition (i.e. students select members of their group), 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. Similarly, in a communication module amongst 126 first-year students Myers (2011) found that students who self-selected their members had higher levels of (perceived) commitment, trust, and relational satisfaction.

Within the limited amount of research on group selection methods that is currently available, there seems to be consensus that self-selection leads to better group dynamics and perceived learning (Chapman et al., 2006; Myers, 2011). 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). As a result, self-selection (rather than randomisation) of group members may actually enhance the cultural divide between students.

When teachers create groups in collaborative learning, students from different cultural backgrounds might be "forced" to work together (Eringa & Huei-Ling, 2009; Montgomery & McDowell, 2009). This might lead to stress and anxiety for some, but at the same time creates

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opportunities to learn from different cultural and individual perspectives (Hendrickson et al., 2011; Kim, 2001). Group work may enhance international students' abilities to adapt their learning style to the host-institute, especially when they are not familiar with group work, and may enhance mutual adaptation of students. Our own research (Author A, 2013a, 2013b) indicates that when students work on "authentic" group products for a substantial period of time and are summatively assessed, international and host students are able to develop strong learning and friendship relations with each other.

The prime goal of this study is to understand whether teachers, by means of an instructional design intervention, can actively encourage and intervene in cross-cultural learning by adjusting the group selection method. In other words, to what extent does a random or self-selected group selection method lead to enhanced group learning, and which group selection method, if any, is more socio-culturally inclusive. In this quasi-experimental study with 138 post-graduate students using an innovative technique called Social Network Analysis (Author A, 2012c, 2013a; Katz, Lazer, Arrow, & Contractor, 2004), we compared how students from different countries and cultural backgrounds, over time, build and develop learning relations with other students.

Group selection, cultural background and learning

When students are allowed to self-select their group members, students may first select their friends, and afterwards select students who are known as "good" group members (Chapman et al., 2006). In particular in culturally diverse classrooms, choosing friends and students from similar cultural backgrounds may be perceived to be an easier solution to work effectively as a group (Author A, 2013a; Harrison & Peacock, 2010). Previous research has shown that establishing friendship relations with host-national students is difficult for international students, due to language issues (Author A, 2012b, 2013a; Montgomery & McDowell, 2009), perceived discrimination (Russell et al., 2010), and the fact that most host-national students already have well-established friendship networks (Author A, 2011a, 2013a; Hendrickson et al., 2011). Furthermore, according to Harrison and Peacock (2010) amongst British students there was a passive xenophobia to work with some groups of (Chinese) international students.

However, as highlighted both in cross-cultural research (Author C, 2008; Kim, 2001) as well as in research in group-dynamics (Decuyper et al., 2010; Michaelsen & Richards, 2005), the "easiest" solution of forming "homogeneous" groups may not always be the best solution when working on authentic and complex group tasks. In fact, when multi-disciplinary groups are able to overcome their initial differences and potential conflicts, which inevitably will require substantial effort from all group members, multi-disciplinary groups are more able to come up with creative solutions and insights (Decuyper et al., 2010; Michaelsen & Richards, 2005). Although there is no guarantee that randomisation of groups by a teacher will lead to perfectly balanced groups in terms of cultural backgrounds and abilities (due to random chance), we expect that in the random condition more cultural diversity will be present. Therefore, the following hypotheses were tested in this study:

H1: Self-selected groups are constructed based upon friendships and (prior) work relations.

H2: Self-selected groups are more homogenous in cultural backgrounds than randomised groups.

HEIs have a key role and responsibility in creating a powerful learning experience for students from diverse cultural backgrounds (Author A, 2013a; Russell et al., 2010; Volet & Jones, 2012). In particular, how teachers design their module and how students are encouraged to work together in small-groups has been found to have a strong influence on academic and social integration (Author A, 2012b; Eringa & Huei-Ling, 2009). Author A (2012c) found that students over time primarily developed strong learning relations with students within their group, but at the same time maintained strong links with students outside their formal group. Given that students in a random condition are forced to work together with students that they (perhaps) have not worked with before (Chapman et al., 2006), this gives them an opportunity to establish new learning relations that may challenge their perspectives and ways of thinking.

Furthermore, both Hommes et al. (2012) and Author A (2013a) found students will continue to share experiences with their friends even when they were allocated in different groups. As argued by Author A (2012c), students may develop so-called "knowledge spillovers", whereby students from different groups formally and informally share ideas and constructs developed with their respective group, thereby potentially increasing the knowledge and expertise across groups. These learning activities resemble the sharing model of cross-boundary spanning (Akkerman & Bakker, 2011). The main premise of this understanding of boundary spanning activity is that knowledge is transferred, translated and transformed between (groups of) people working in different spheres of activities (Author A, 2012c; Hsiao, Tsai, & Lee, 2011). In management literature, research indicates that boundary crossing increases knowledge transfer and team learning (Argote, McEvily, & Reagans, 2003), as well as efficiency and innovation of firms (Sundstrom, McIntyre, Halfhill, & Richards, 2000). Preliminary research in a Dutch medical programme using Problem-Based Learning indicates that 80% of students learned more from students outside their formal group than from students inside their formal group (Author A, 2014). As argued by Hommes et al. (2012) and Author A (2012c, 2013a), these external learning links cannot be easily measured by traditional educational psychology instruments. However, methods like Social Network Analyses can allow researchers to make these informal relations amongst learners and groups visible. Therefore, in this study we investigated whether randomising students in groups by the teacher rather than self-selection may (actually) lead to positive knowledge spillovers beyond their own group. Finally, in line with Myers (2011) we expected that students in the self-selected group condition at the end of the module would be more satisfied about team performance, cohesion and potential, as they selected group members with whom they liked to work with. Thus, the final hypotheses are:

H3: In the random condition, the development of social learning networks over time is not related to the similarity of cultural backgrounds.

H4: In the self-selected condition, the development of social learning networks over time is related to the similarity of cultural backgrounds.

H5: The development of social learning networks over time is related to the group allocation for both random and self-selected condition.

H6: In the random condition, students maintain more learning relations outside their group.

H7: In the self-selected condition, there is a higher (perceived) team performance at the end of the module.

Methods

Procedure

This study took place in a post-graduate program of Event management at a British university in the spring semesters of 2011 and 2012. In this quasi-experimental study, the implementation of 2011 is referred to as "random condition", while the implementation of 2012 is referred to as the "self-selection condition". In 2011, the teacher balanced the groups in terms of gender and Chinese students (see next section). That is, the 10 males and at least two Chinese students per group were randomly allocated to one of nine groups. Afterwards, the remaining students were randomised across nine groups. In 2012, students were able to self-select their members of the group on the first day of the module.

Setting

In both conditions, students had worked together before in (different) small groups in Semester 1 and had known each other for four months before starting with this event management module. During the 14 week course period, students met formally once a week during a three-hour interactive class session. At the same time, students were expected to meet with the peers of their group throughout the module in order to work on three group processes/products, all of which were assessed on a group level by the teacher. The first group product was an event feasibility plan, whereby students had to

conduct research and gather evidence regarding whether their proposed event was financially and organisationally feasible to implement. The second group product was the actual planning, organizing and running of a profitable event. The third and final group product was a (reflective) written report about the planning, organising and running of the event. A detailed description of the design principles of the module has been published elsewhere (Author A, 2013c). Except for the group selection method (i.e. random selection vs. self-selection), the assessments, module materials and the teacher were the same in both conditions.

Participants

For both implementations, 69 students registered for the module and all 138 students were included in our analyses. The division of participants for each group/condition based upon the GLOBE categorisation is illustrated in Table 1. In the random condition, 50 students were from Confucian Asian and Southern Asian countries, primarily China, Thailand and India. The third largest group of international students came from Europe. 58 (84%) participants were female, and the average age was 22.99 (SD = 2.12). In self-selected condition, 49 students were from Confucian Asian and Southern Asian countries, followed by participants from Europe. 60 (87%) participants were female and the average age was 24.31 (SD = 2.23). In both conditions, only three UK students each were present and the vast majority of students were international, so these settings could be characterised as international classrooms.

Measuring friendship, work and learning networks

For ascertaining how students from different cultural backgrounds learned together over time during the two conditions and addressing H1-H6, 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 (Author A, 2012c, 2013a; Hommes et al., 2012; Katz et al., 2004), and recent research highlights that social networks are the key predictor for learning (Gašević et al., 2013; Hommes et al., 2012).

First, the (possible) influence of pre-existing friendship and work relations was taken into consideration by using so-called "closed-network" analyses (Author A, 2012c, 2013a). During the first session, a list with all respective names of the students was provided and the 2*69 students answered two Social Network questions, namely "I am a friend of ..." and "I have worked a lot with …" in English. At the end of the module at Week 14, we again measured the social networks in order to analyse whether the dynamics of inter- and intra-group learning of the students had changed. In addition to the friendship and work-network, we also asked the question stem "I have learned a lot from …" in order to measure the learning network after 14 weeks. For the two measurements a response rate of 71% and 84% was established for the random condition, and 77% and 73% for the self-selected condition respectively.

Team performance

For addressing H7, we used two measurements. First, team cohesion (3 items, α = 0.84) and team potential (4 items, α = 0.83) were measured by Team Learning Behaviour instrument of Van de Bossche et al. (2011). Second, all students participated in a summative peer-assessment (Author A, 2013c; Boud & Falchikov, 2007) at the end of the module, whereby students' peer-evaluated the performance of each member of the team on a scale of 0-100.

Data analysis

As a first step, a graphical analysis of the social networks was conducted in order to identify the overall social network structure and to identify possible patterns of sub-group development, as recommended by Wassermann and Faust (1994). In line with Author A (2013a), for both cohorts a co-nationality matrix was constructed, a procedure similar to creating a dummy-variable for each person with the same nationality in "classical" statistical analyses. Furthermore, given that there were 37 and 43 Chinese students present in the two respective implementations, and Montgomery (2009) found that some students had a prejudice against working with Chinese students, we constructed a Chinese vs. non-Chinese matrix. In addition, we constructed a GLOBE matrix, whereby we clustered students

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based upon their geocultural region classification by House et al. (2004), namely Anglo-Saxon, Latin Europe, Germanic Europe, Eastern Europe, Middle East, Confucian Asia, and Southern Asia. Finally, a group allocation matrix was constructed in order to control the influence of the group allocation on the social learning network.

As a second step, we determined the position of each student within their group (intra) relative to other students (inter) in the social learning network using the External – Internal index (Krackhardt & Stern, 1988). Basically, the E-I index takes the number of ties of members of the group to students outside the group, subtracts the number of ties to members within the group, and divides this by the total number of ties (Author A, 2012c). The resulting index ranges from '-1' (all ties are only with own group members) to '+1' (all ties are to students outside the group). Afterwards, quantitative method multiple regression quadratic assignment procedures (MRQAP) were used to test whether pre-existing friendship and work relations amongst students and group allocation predicted social learning networks after 14 weeks. 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 (Author A, 2013a). Data were analysed on a network level using UCINET version 6.445. For H7, ANOVAs on individual and group levels were conducted in SPSS 19.

Results

Comparability of cohorts in two conditions

As a first step to ensure that the two cohorts were comparable at the pre-test, we analysed the division of nationalities present, gender, academic performance during the year, and age, whereby we used Chi-Squares for categorical values and ANOVAs for binominal values. No significant differences were found between the two conditions except for age, whereby participants in the self-selected condition were 1.33 years older (F = 12.873, p < .01)[i]. Given that we measured (perceived) social network relations between 69 students (per condition), when a participant did not respond to a SNA questionnaire, there were still on average 54 (i.e. 78% * 69 participants) other participants who

indicated whether (or not) they had a friendship, learning or work-relationship with this (non-responding) participant. In other words, SNA measures the (perceived) network interactions amongst all 2*69 participants simultaneously, which verifies and/or provides counter perceptions from all participants (Author A, 2013a).

Social Network Visualisations

In Figure 1, the initial friendships at the beginning of the random condition are illustrated, whereby four aspects are visually present. First, a large group of Confucian Asian students (blue, diamond) formed a highly linked subgroup on the top right of Figure 1. Second, as students were randomised in groups, students from various friendship networks were "forced" to work together, whereby most students were situated closely together with friends, but most of their friends were enrolled into different groups (i.e. labels of the nodes have different group numbers). For example, Group 4 had four students relatively closely clustered (right from middle of Figure 1), while two Confucian Asian students and one Eastern European (light green, box) student were relatively far away from the other members at the beginning of this module.

Third, although three Anglo-Saxon students (black, circle) from the U.S. were situated in the centre of a highly culturally diverse group of international students, the three British host students were situated on the bottom right of Figure 1 and were not well-connected to the majority of students. Finally, Groups 8-9 formed different sub-groups on the left side of Figure 1, which was due to their specialisation in food management.

➔ Insert Figure 1 about here
➔ Insert Figure 2 about here

As expected, in the self-selected condition students primarily selected group members with whom they had already developed a friendship relation, as most of the nodes in any particular area in Figure 2 had a similar group number. For example, Group 3 was situated in the bottom left of Figure 2, with seven Confucian Asian students and one Southern Asian student (red circle in black box), while Group 7 on the bottom right consisted of students from Anglo-Saxon (3), Confucian Asia (3) and Eastern Europe

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(2). As was previously visualised in Figure 1, most non-Confucian students and Anglo-Saxon students were situated on the outer fringe of the network, while Confucian Asian (i.e. primarily Chinese) students were situated in the centre of the network.

After fourteen weeks, students in the random condition developed substantial learning links with their respective group members, as illustrated in Figure 3. For most groups, a relatively clear "group structure" could be visually identified in Figure 3 (e.g. Group 1 or 7), in that students from the same group were closely located. Although almost all students developed learning relationships with group members irrespective of their cultural backgrounds, a central group of Confucian students remained visible in the middle of Figure 3, while the other international and English students were more situated on the right side and outer fringe of the network. In other words, in the random condition students were able to develop strong (multi-national) learning links with their group members over time, even though most of them initially were not friends with each other.

➔   Insert Figure 3 about here
➔   Insert Figure 4 about here

In contrasts, group structures were more clearly visible in the self-selected condition, such as Group 6 and Group 8 on the left, or Group 1 and Group 2 on the right of Figure 4. At the same time, in contrast to Figure 3 no central group of Confucian Asian students was present, as a culturally diverse Group 2 was at the centre of the social learning network. Furthermore, in comparison to the random condition less learning relations were maintained with students outside the group.

Comparison of internal and external group friendships, culture and learning

➔ Insert Table 2 about here

As expected, students in the self-selected condition indicated that significantly more friends were present in their group than in the random condition at the pre-test. As a result, the number of friends outside their own group was significantly lower than in the random condition, as illustrated in Table 2, providing support for H1. Furthermore, the E-I index for the random condition was positive (0.53), indicating that the majority of friendship relations were outside their group, while for the self-selected

group (0.13) this was significantly less, with effect sizes that were strong in size. Similar effects were found with respect to initial work relations (not illustrated), whereby students in the random condition had relatively more initial working relations outside their own group as indicated by a significantly more positive E-I index (M_{Random} = 0.43, M_{Self} = 0.18 t = 3.849, p <.01), supporting H1.

We took GLOBE indicators as a proxy for similarities and differences in cultural backgrounds and compared the E-I index within groups. As illustrated in Table 2, the number of students within the group with the same cultural background was significantly higher in the self-selected condition, with a moderately strong effect size. Furthermore, the E-I index of the self-selected condition was significantly more internally focussed in comparison to the random condition, thereby providing support for H2 that students selected relatively more students with similar cultural backgrounds and therefore groups were relatively more homogenous in the self-selected condition.

With respect to learning relations after fourteen weeks, no significant differences were found between the two conditions when comparing the number of links within their group. However, almost three times more external learning relations (with a strong effect size) outside the group were created and maintained in the random condition, while only 1.83 learning relations outside the group in the self-selected condition were maintained. Finally, the E-I index was significantly more negative for the self-selected condition, indicating that most learning occurred within groups, while in the random condition learning occurred both within and outside the group, with a moderate to strong effect size, thereby providing support for H6. Similar effects were found with respect to friendship and working relations after fourteen weeks, whereby the number of friendships and working within groups were almost identical, but in the random condition significantly more relations outside the group were maintained ($M_{RandomF}$ = 16.99, M_{SelfF} = 10.75, t_{Friend} = 4.084, p <.01; $M_{RandomW}$ = 7.57, M_{SelfW} = 1.91, t_{Work} = 6.953, p <.01), with a significantly more positive E-I index ($M_{RandomF}$ = .42, M_{SelfF} = .24, t_{Friend} = 3.726, p <.01; $M_{RandomW}$ = -.15, M_{SelfW} = -.49, t_{Work} = 6.558, p <.01). In sum, over time students in the random condition developed and maintained almost 2 ½ times more learning relations in comparison to the self-selected condition.

MRQAP Regressions

Although students in the random condition developed more learning, work and friendship links over time with students outside their group, the E-I index method does not allow us to assess the relative impact of cultural backgrounds and social network relations. Therefore, in Table 3 the multiple regression quadratic assignment procedures of learning ties after fourteen weeks for the random and self-selected condition are illustrated. Learning ties in the random condition were not significantly predicted by cultural backgrounds in Model 1, providing support for H3. Adding group allocation significantly improved the fit of Model 2, and 20% of variance was explained by the (random) group allocation, providing support for H5. Finally, adding initial friendships and initial work relations to Model 3 added 6% additional explained variance. Subsequent MRQAPs indicated that work relations after fourteen weeks (not illustrated) were primarily predicted by the group allocation ($\beta = .51$; $p < .01$), followed by initial friendship ties ($\beta = .17$; $p < .01$), and initial work ties ($\beta = .11$; $p < .01$), with an adjusted R-square of 0.37. Friendship relations after fourteen weeks were primarily predicted by initial friendship ties ($\beta = .35$; $p < .01$), followed by the group allocation ($\beta = .25$; $p < .01$) and initial work ($\beta = .10$; $p < .05$), with an adjusted R-square of 0.29.

→ Insert Table 3 about here

For the self-selected condition, learning ties were significantly predicted by the Chinese vs. non-Chinese matrix, although the variance explained was less than 1%, providing (partial) support for H4. Adding the group allocation in Model 5 improves the fit and 34% of the variance was explained (H5), whereby cultural backgrounds no longer significantly predicted learning networks. Finally, adding initial friendships and work relations to Model 6 added 2% additional variance. Subsequent MRQAPs indicated that work relations after fourteen weeks (not illustrated) again were primarily predicted by the group allocation ($\beta = .68$; $p < .01$), followed by initial work ties ($\beta = .06$; $p < .01$), initial friendship ties ($\beta = .06$; $p < .01$), and the Chinese matrix ($\beta = .05$; $p < .05$), with an adjusted R-square of 0.55. Friendship relations after fourteen weeks were primarily predicted by initial friendship ties ($\beta = .42$; $p < .01$), followed by the group allocation ($\beta = .18$; $p < .01$) and the Chinese matrix ($\beta = .17$; $p < .05$), with an adjusted R-square of 0.32.

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As illustrated in Table 4, in contrast to our expectations (perceived) team performance and team cohesiveness was not higher in the self-selected condition. Although participants were significantly more positive about the team potential of their team members, both individual and group-level analyses (not illustrated here) indicated no support for H7 that the self-selected condition led to better team performance. This was also highlighted by the peer evaluation grades that students provided to their peer members in the group, whereby no significant difference between the two conditions were found. In other words, for both conditions towards the end of the module the perceived team cohesion and the grades given to performance of their peers were similar, indicating that groups in both conditions were able to effectively work together.

Discussion and Conclusion

In this quasi-experimental study amongst 2*69 students in a diverse international classroom setting, our study indicates that instructional design can have a substantially strong impact on how students develop cross-cultural learning relations. In contrast to the random condition, in the self-selected condition cultural backgrounds remained a significant predictor for learning, work and friendships after 14 weeks. That is, when "forced" to work together in (multi-national) groups for a substantial period of fourteen weeks on several authentic and complex group products, only students in the random condition seemed able to overcome some of the initial cultural barriers that prevented students to learn together in multi-national groups.

Nonetheless, in both conditions group work was effective in crossing (some) cultural boundaries, in line with expectations raised by Hendrickson et al. (2011) and findings by Author A (2013a). For both conditions the best predictor for explaining the extent to which learning ties after fourteen weeks were constructed was the initial group allocation, which had eight to ten times larger standardised beta sizes than our proxies for cultural background. This is an encouraging finding, which (in particular for the random condition) seems to provide a (slightly) different perspective to the

findings of Volet and Ang (1998) and Harrison and Peacock (2010) that most students prefer to work with co-national students.

A second main benefit of the random-condition (that is not easily measurable with traditional statistical methods) is that significantly more knowledge spillovers were generated and maintained outside the formal group. As reflected by the teacher (one of the co-authors), he was unaware that students in the random condition in comparison to the self-selected condition were using their social network outside the formal group structure to such a degree, as he only met the students in their formal group structure. In the random condition, students maintained 10.15 learning relations after fourteen weeks, while in the self-selected condition only 6.58 learning links were maintained, and primarily within groups rather than across groups. Research by Hommes et al. (2012) and our own research highlights that many students learn both within and outside their formal group. However, in most educational studies the focus of study is either on the individual learner (Author A, 2011a; Eringa & Huei-Ling, 2009), the group (Chapman et al., 2006; Decuyper et al., 2010; Volet & Ang, 1998) or the programme as a whole (Neri & Ville, 2008; Russell et al., 2010), thereby potentially missing vital informal and formal interactions between students from diverse cultural backgrounds.

Finally, despite that students were forced to work together with students from different cultural backgrounds in the randomised condition, at the end of the module, participants in both conditions were positive about their teams' cohesion and performance, thereby contrasting findings in group division literature (Chapman et al., 2006; Myers, 2011) of potentially difficult group dynamics and grade inflation. When students have to work together in teams for a substantial period on authentic but complex group products, students seem to be able to develop sufficient coping strategies to overcome initial cultural differences and develop a strong team identity.

Constraints and Limitations

Although this study was developed and designed with the highest care, there are several limitations. A first limitation of this research is that the social network analyses and Team Learning Behaviour questionnaire were self-survey instruments. However, a large body of research (Hommes et al., 2012;

Katz et al., 2004) has found that SNA techniques provide a robust predictor for actual social networks and learning outcomes, in particular given the high response rates in both conditions, and the longitudinal research design. A second limitation is that we did not conduct a fine-grained analysis of the actual learning interactions between students, such as done by Montgomery and McDowell (2009). However, given that the two conditions were similar at the start of the module and for most hypotheses a moderate to strong effect sizes were found, our findings seem to suggest that group selection methods have a substantial influence on how students develop learning networks over time. A third limitation of this study is that we did not explicitly address or measure the role of the teacher in the daily teaching activities, and how he encouraged cross-cultural learning beyond the instructional design intervention. Given that students had to work in groups on three group products throughout the module and had to organise a "high-stake" event, the teacher spent considerable time at the beginning to create a constructive group climate in both conditions. Furthermore, he stressed that diversity in teams (i.e. expertise, cultural backgrounds) is a positive asset in successfully completing such complex, authentic projects (Decuyper et al., 2010). Finally, the teacher discussed the progress made within each group on a weekly basis, thereby providing a platform to discuss any troublesome group dynamics or cross-cultural adjustment issues.

Future research

The dynamic use of SNA by measuring social learning and friendship interactions over time allows internationalisation researchers many new angles in understanding social interaction processes amongst students from diverse cultural backgrounds. For example, experimenting with different compositions of groups based upon cultural backgrounds and friendships, different task-structures, group sizes, abilities, motivational styles, or different assessment methods would allow a deeper insight into how teachers can actively encourage learning across learners and groups. Furthermore, triangulation with qualitative research methods would further strengthen our understanding of the underlying mechanisms of why some students develop strong links with other students, while others develop remain relatively isolated. For example, similar to Montgomery and McDowell (2009), following one or two groups of students (e.g. based upon their unique position in the first social

network) for a period of time and quantitatively and qualitatively measure their interactions within and outside their group would provide a fine-grained and enriched understanding how students from different cultural backgrounds develop, maintain and nurture friendship and learning links. Finally, despite the relatively small intervention in the instructional design of the module, the impact on cross-cultural learning and cross-boundary learning seems to be substantial. As a first step to create an international classroom, by using random selection teachers seem to be able to effectively intervene in the classroom. Future research should also focus on the multiple roles of the teacher to create an international classroom climate, as Volet & Jones (2012, p. 245) indicate that research addressing teachers' mutual adjustments have rather "binary, functionalist conceptualisations of adaptation".

Author A 2011a (Rienties, Grohnert, Kommers, Niemantsverdriet, & Nijhuis, 2011)

Author A 2012b: (Rienties, Beausaert, Grohnert, Niemantsverdriet, & Kommers, 2012)

Author A 2012c: (Hernandez Nanclares, Rienties, & Van den Bossche, 2012)

Author A 2013a: (Rienties, Hernandez Nanclares, Jindal-Snape, & Alcott, 2013)

Author A 2013b: (Rienties, Heliot, & Jindal-Snape, 2013)

Author A 2013c: (Rienties, Willis, Alcott, & Medland, 2013)

Author A 2014: (Rienties, Hernandez Nanclares, Hommes, & Veermans, 2014)

Author C 2008: (Zhou, Jindal-Snape, Topping, & Todman, 2008)

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Table 1 Division of groups based upon cultural background (GLOBE)

Random Selection	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Total
Anglo-Saxon	0	2	1	0	2	0	1	0	0	6
Latin Europe	0	2	0	0	0	0	0	0	0	2
Germanic Europe	0	0	1	0	0	0	0	0	0	1
Eastern Europe	1	1	2	2	1	0	0	0	1	8
Middle East	0	1	0	0	1	0	0	0	0	2
Southern Asia	3	0	0	1	0	0	2	3	3	12
Confucian Asia	4	2	3	5	4	8	4	5	3	38

Self-selection	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Total
Anglo-Saxon	0	2	0	0	1	0	3	1	7
Latin Europe	3	1	0	0	0	0	0	0	4
Germanic Europe	0	0	0	0	1	0	0	0	1
Eastern Europe	1	2	0	0	0	0	2	1	6
Middle East	0	2	0	0	0	0	0	0	2
Southern Asia	0	0	1	0	1	2	0	0	4
Confucian Asia	5	3	7	8	6	7	3	6	45

Table 2 Friendship, GLOBE and learning links within and outside groups (random vs. self-selected condition)

	Random		Self-selected			Cohen d-value
	M	SD	M	SD	t-test	
During the first week						
Friendship relations within group	3.68	2.10	5.86	1.90	-6.387**	-1.09
Friendship relations outside group	15.80	10.87	9.28	6.59	4.262**	.73
E-I friendship relations	0.53	0.38	0.13	0.35	6.471**	1.10
Same GLOBE relations within group	2.58	2.02	3.68	2.42	-2.902**	.49
Different GLOBE relations within group	4.16	1.95	4.00	2.80	.389	
E-I GLOBE relations within group	.24	.58	.01	.68	2.140*	.37
After 14 weeks						
Learning relations within group	4.93	1.80	4.75	2.53	.465	
Learning relations outside group	5.22	5.12	1.83	1.92	5.151**	.88
E-I index learning relations	-0.15	0.46	-0.49	0.45	4.281**	.73

Independent sample T-test (2-sided) and Cohen d-value of Random (n= 69) vs. self-selected condition (n= 69). ** p < .01, *p < .05.

Table 3 Multiple regression quadratic assignment procedures of learning after fourteen weeks.

	Random condition			Self-selected condition		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Co-nationality	.017	.031	.058	-.028	-.034	-.022
Chinese vs. non-Chinese	.032	.030	-.012	.077*	.031	.009
GLOBE	.047	.023	.020	.001	.033	.027
Group allocation		.450***	.412***		.579***	.490***
Initial Friendship			.112***			.116***
Initial Work			.129***			.075***
R^2 adj.	1%	21%	27%	0%	34%	36%

*$p < .05$, ***$p < .001$

Table 4 Team performance, cohesion and potential

	Random		Self-selected			Cohen d-value
	M	SD	M	SD	t-test	
Team cohesion	4.00	0.80	4.05	0.72	-0.364	.07
Team potential	4.00	0.87	4.29	0.61	-2.353*	.46
Peer evaluation grade	85.68	9.34	85.00	3.79	.557	.10

Independent sample T-test (2-sided) and Cohen d-value of Random (n= 57 for TBL, n = 69 for peer evaluation) vs. self-selected condition (n= 49 for TBL, n = 69 for peer evaluation). *p < .05.

Figure 1 Social friendship network at the start of random condition
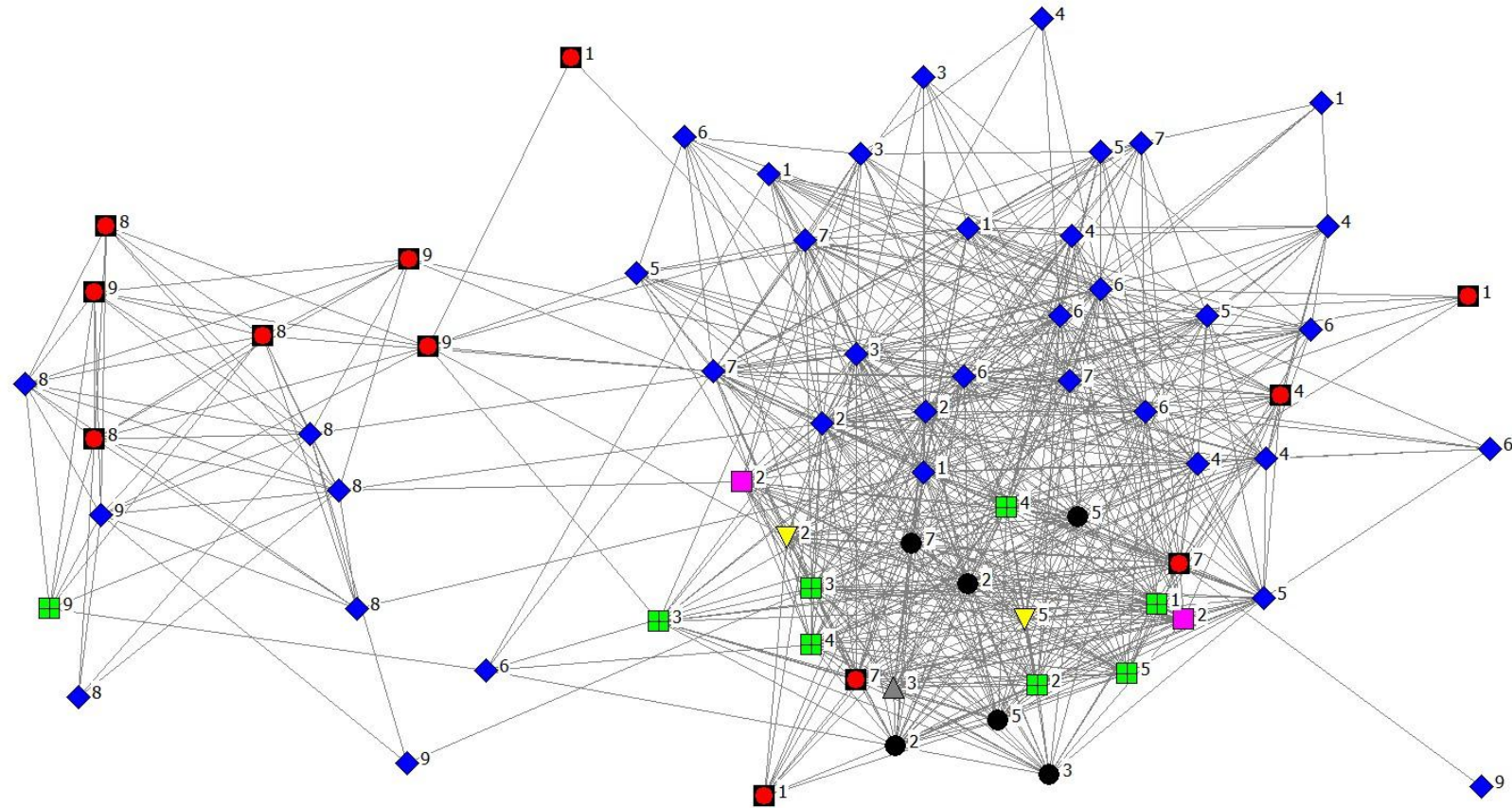
Note Group numbers are illustrated above each node. Furthermore, the shape and colour of each node is based upon GLOBE: Anglo-Saxon (black, circle); Latin Europe (pink, square); Germanic Europe (grey, up triangle); Eastern Europe (light green, box); Middle East (yellow, down triangle); Southern Asia (red circle in black box); Confucian Asia (blue, diamond).

Figure 2 Social friendship network at the start of self-selected condition
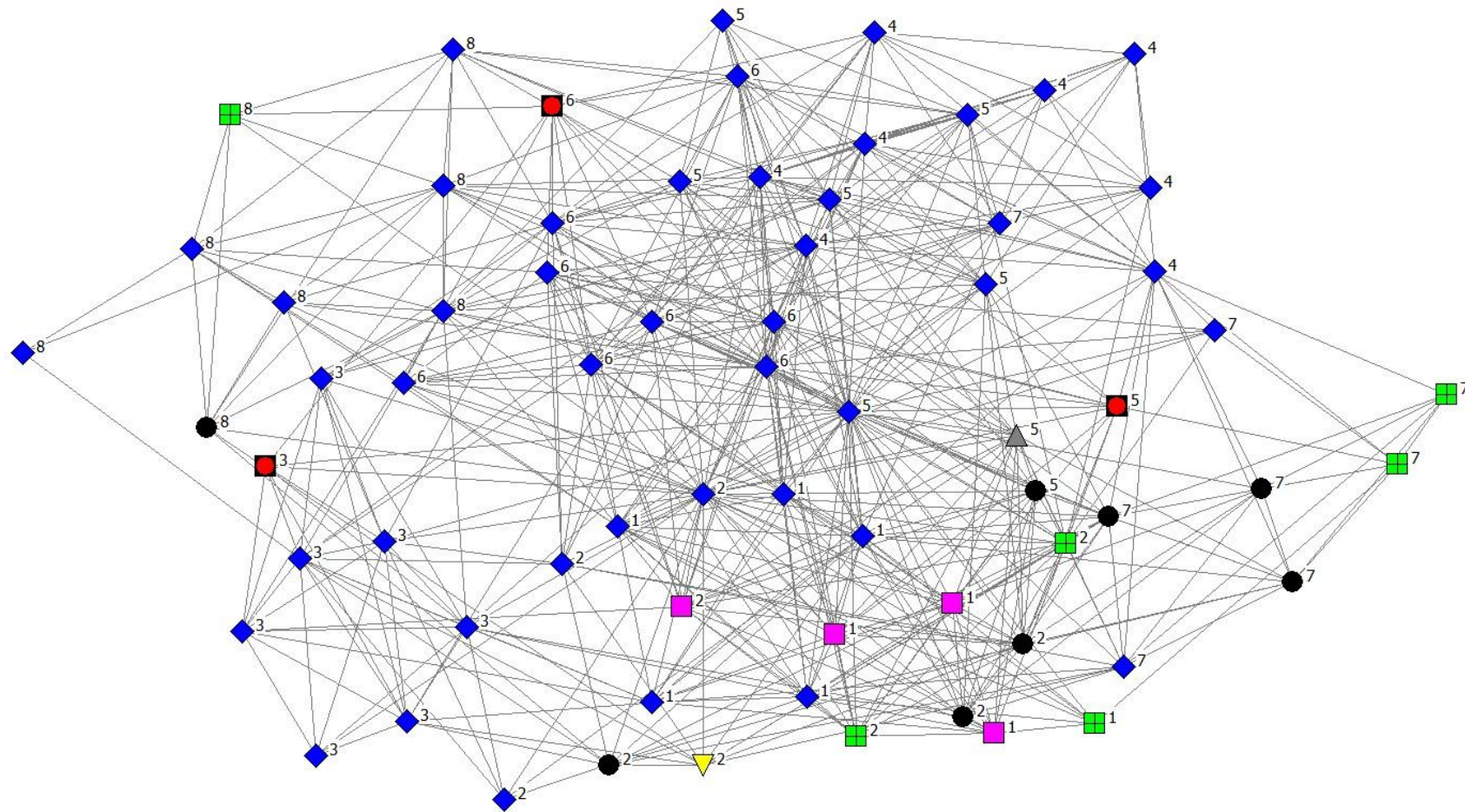
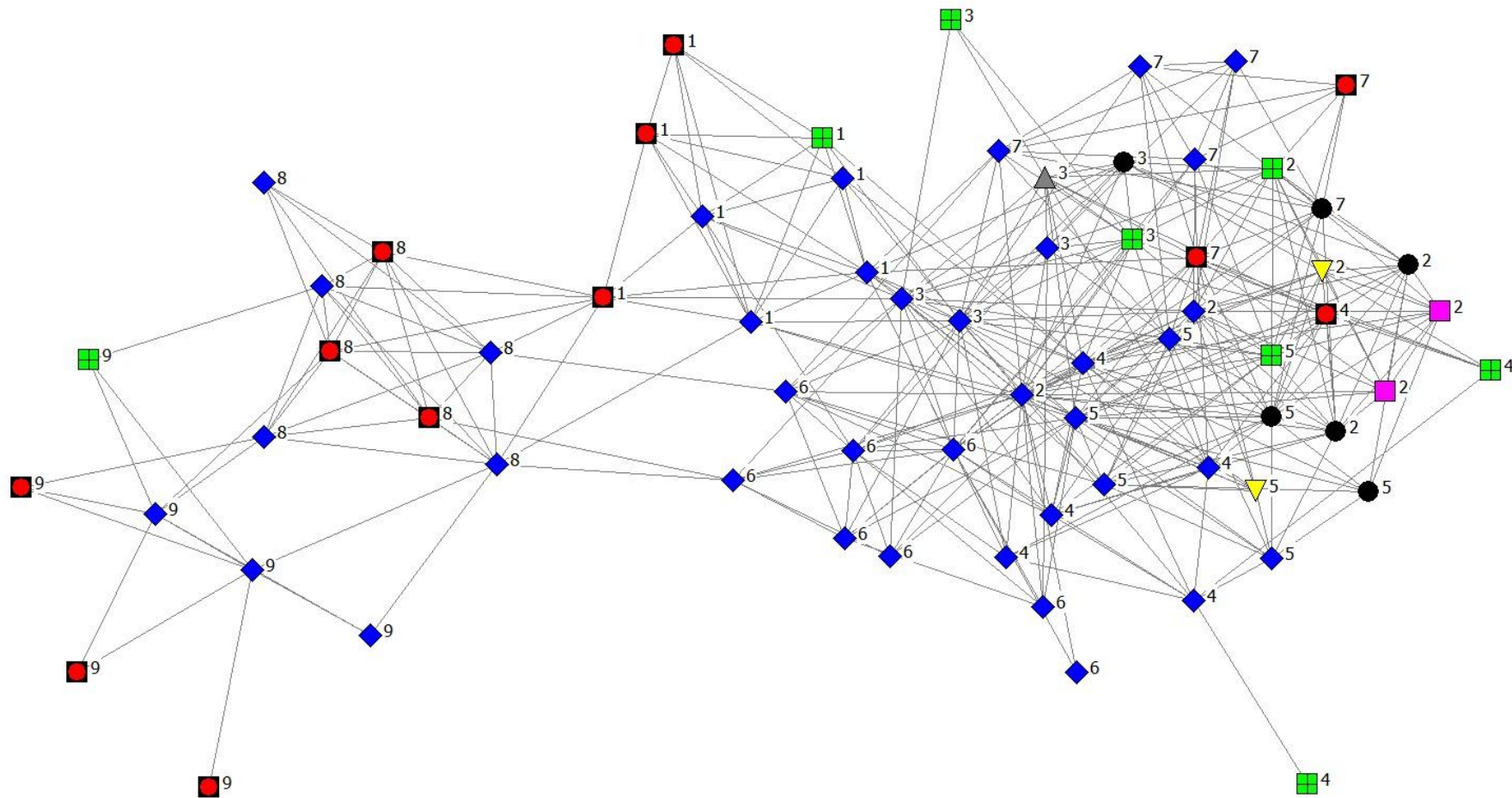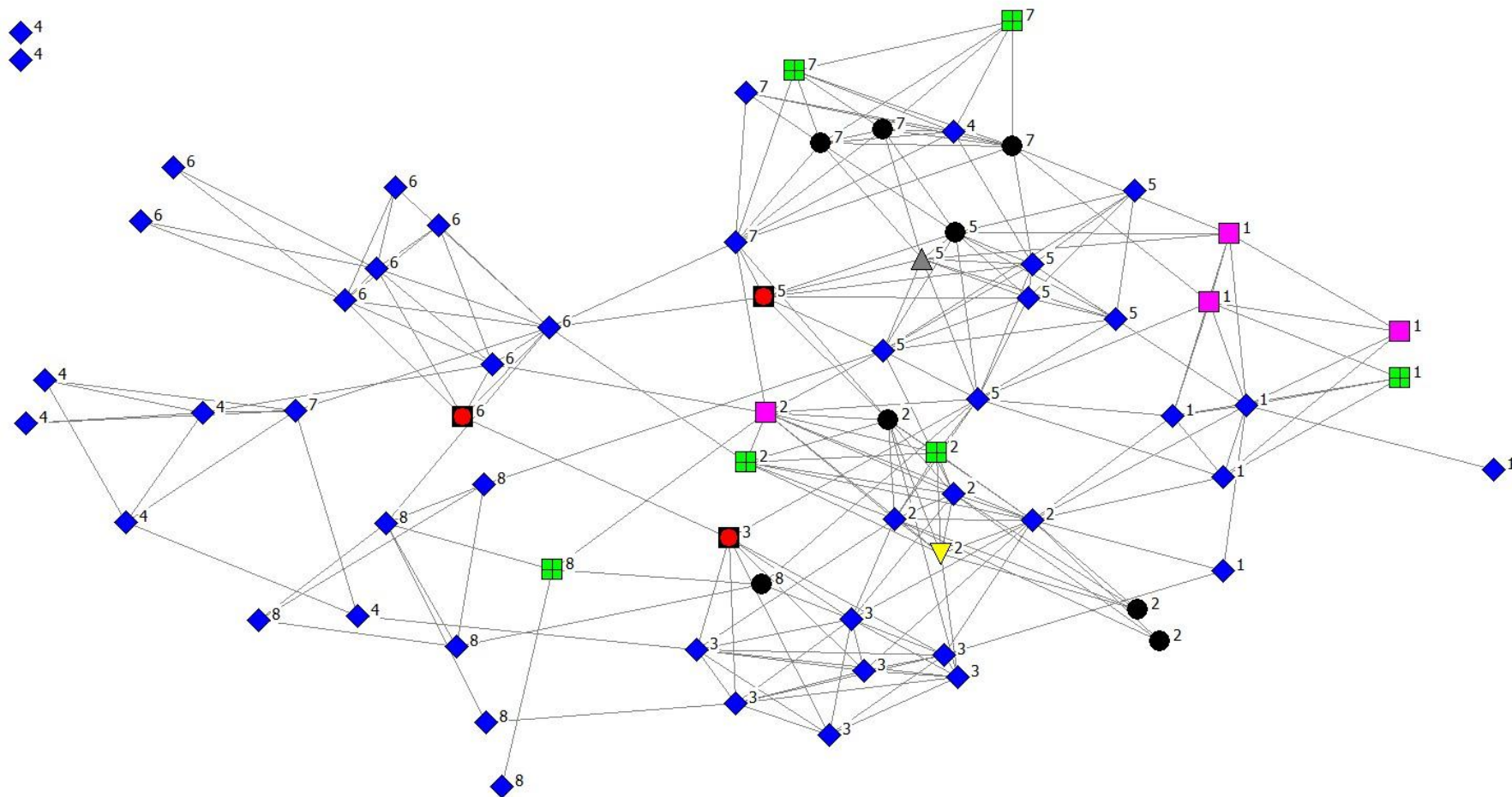Figure 3 Social learning network of random condition after fourteen weeks

Figure 4 Social learning network of self-selection condition after fourteen weeks

i A possible explanation of the age difference between the two conditions may be related to the poor labour market in the UK, whereby relatively older students returned to university to complement their bachelor with a post-graduate degree before the increased tuition fees of 2012-2013.