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Bridge building potential in cross-cultural learning

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Bridge building potential in cross-cultural learning; A mixed method study

Abstract

Although many international students experience transitional issues, most research assumes that these issues will disappear over time with increased interaction. Using principles of social network theory, this study addressed why some students become bridge builders between international and host students, while others primarily interact with co-national students. In this innovative mixed method study of 81 students from 28 nationalities using dynamic Social Network Analyses combined with embedded case studies of five (potential) bridge builders, the results indicate that students use a range of complex strategies to cope with mixed group work. After 11 weeks, two students stayed as strong bridge builders across groups, two had some bridge building characteristics, and one focussed more on her friends rather than on her assigned group. These findings indicate that even after three years of study, international and host students carry on using complex and dynamic social network strategies based on their particular characteristics as well as adaptation to their unique experiences.

Introduction

Of the 428,225 international students studying in the UK in 2011, many are from Confucian Asia (43%), in particular China (Higher Education Statistics Agency 2012). While internationalisation in higher education has become increasingly common, research findings continue to suggest that international students face a number of challenges while studying abroad (De Vita 2001; Kondakci et al. 2008; Rienties, Heliot, & Jindal-Snape 2013; Zhou, Jindal-Snape, Topping, & Todman, 2008). Furthermore, several researchers (Hendrickson et al. 2011; Kimmel and Volet 2012; Rienties et al. 2013; Rienties, Hernandez Nanclares, Jindal-Snape, & Alcott, 2013) have found recently that interactions between international and host students are limited. Yet, only a few studies have examined the students' experiences in culturally diverse group settings (Kimmel and Volet (2012).

According to Gabb (2006) mixed cultural groups have different social dynamics as compared to monocultural groups. Hence, putting students together in the same classroom or in a mixed group is only a starting point for students to learn about intercultural interactions (Rienties, Hernandez Nanclares et al. 2013, Rienties et al. 2013; De Vita 2001) and does not necessarily guarantee smooth interactions amongst these different cultures (Kondakci et al. 2008). Diversity is in every sense central to the university experience (Jenkins and Galloway 2009), yet truly international education can only be achieved through understanding, communicating and cooperation among various cultures (Rienties, Alcott, & Jindal-Snape, 2014; Turner 2009; Ward et al. 2009; Zhou, Jindal-Snape, Topping, & Todman, 2008).

Networks of support are of particular importance for international students (Rienties, Hernandez Nanclares et al. 2013, Rienties et al. 2013; De Vita 2001; Montgomery and McDowell 2009; Sawir et al. 2008). Sawir et al. (2008) suggest that networks help students to feel supported and more in control, which explains why students often turn to co-national friends when their family and home friends are far away. Montgomery and McDowell (2009, p. 458) found that "the international students formed a strong social group whose purpose was to replace the social capital they had lost in their transition to a new culture. The students appeared to use their friendships to support their study and learning". When social relationships do not meet students' needs (e.g. students are unable to fully express themselves and feel misunderstood), symptoms such as loneliness, mood disturbance or lower self-esteem may surface (Kondakci et al. 2008; Zhou et al. 2008).

Relationships between host and international students have received increased attention in the intercultural literature (Hendrickson et al. 2011; Leask 2009; Rienties et al. 2013) and this journal in particular (e.g. Jenkins and Galloway 2009; Kondakci et

al. 2008). Limited exposure to host students may not only hamper international students' abilities to learn about the host culture but also make them feel isolated (Montgomery and McDowell 2009). In their study with 60 domestic UK students, Peacock and Harrison (2009) found that host students have varying degrees of contact with international students; international students who are more fluent in English were considered to be more approachable. Interestingly, it is documented that intercultural social relations are typically not initiated by host students (Ward et al. 2009). At the same time, in a study with 1174 (primarily Chinese) international students in Taiwan, Jenkins and Galloway (2009) indicate that adjustment issues were relatively minor, and primarily related to English language skills.

Group learning and intercultural interaction

Several researchers (Rienties, Hernandez Nanclares et al. 2013; Curşeu et al. 2012; Leask 2009) argue that intercultural sensitivity of students could be enhanced through both formal and informal curriculum design. Group work may be an appropriate pedagogical tool to 'force' students to interact with each other within a module (Peacock and Harrison 2009) and build intercultural relations over time (Rienties, Hernandez Nanclares et al. 2013). Chang (2006) documented three main advantages of group work: exposing students to different experiences and values, allowing them to learn as a team in a diverse group, and providing an effective structure for students' learning and social life in a wider university context. Several researchers (Chang 2006; Hendrickson et al. 2011; (Rienties, Hernandez Nanclares et al. 2013, Rienties et al. 2013) argue that group work can help students to build intercultural friendships, which may help to reduce feelings of isolation and intercultural stress.

Nonetheless, Turner (2009) reported ten challenges affecting intercultural group work (in descending order of importance): 1) unequal English language skills; 2) quietness or silence; 3) leadership or role ambiguity; 4) communication issues; 5) conflict; 6) unequal commitment to the group; 7) time keeping or punctuality; 8) free riders or lack of participation; 9) differing expectations of groups; 10) over-talking or interrupting. Furthermore, using a mixed method study with 88 business and 81 science students working in (self-selected) mixed and homogenous group, Kimmel and Volet (2012) found substantial differences in attitudes towards group work, whereby students in culturally non-diverse groups over time developed stronger negative attitudes towards cross-cultural learning. Their follow-up qualitative analyses indicated that international students tended to focus on task completion and work attitudes, while host students tended to focus on socio-emotional aspects, for instance having a good time, feeling relaxed and comfortable.

Although creating a successful mixed group climate is challenging, three recent quantitative studies (Rienties, Alcott, & Jindal-Snape 2014; Rienties, Hernandez Nanclares et al. 2013; Rienties, Johan, & Jindal-Snape 2014) using dynamic Social Network Analysis (SNA) indicated that group work helped students to build intercultural friendships and learning relations. Furthermore, a recent longitudinal study (Rienties & Nolan, 2014), with 485 international and 107 host students in five business modules, indeed indicated that group activities positively encourage the number of intercultural interactions over time, even when students were only working together for a limited duration (11-14 weeks) together in mixed cultural groups.

Social capital and the power of bridge building

Social capital theory has been used by most social network studies to explore how individuals develop and sustain social relations (Putnam 2001; Rienties, Johan et al. 2014), which is defined as "resources embedded in a social structure which are accessed and/or mobilized in purposive action" (Lin, 2001, p. 12). These embedded resources can facilitate information flows between students (e.g. sharing of materials, summaries, or ideas). Furthermore, social ties provide certification of social credentials (Lin 2001), psycho-social support (Lee and Madyun 2008; Montgomery and McDowell 2009; Neri and Ville 2008), a sense of belonging (Daly and Finnigan 2010), and reinforces identity and recognition (Rienties & Nolan, 2014). Putnam (2001) distinguishes between bonding and bridging social capital, whereby bonding social capital provides solidarity, mutual reinforcement and support, which is commonly found amongst 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 (Putnam 2001). In an international classroom, this bridging capital could be developed when students from different cultural backgrounds develop cross-cultural relations (Rienties, Johan et al. 2014).

Recent research (Hendrickson et al. 2011; Lee and Madyun 2008; Rienties et al. 2013; Rienties, Hernandez Nanclares et al. 2013; Rienties & Nolan 2014) indicates that some students act as 'bridge builders' (Otte and Rousseau 2002; Wassermann and Faust 1994) between international and host students. While most students develop strong social network links with co-national students (Rienties et al. 2013; Hendrickson et al. 2011; Neri and Ville 2008; Rienties, Hernandez Nanclares et al. 2013), some students seem more able to build intercultural learning and friendship links. For example, in our (quantitative) study with 81 students from 28 nationalities following a UK hospitality programme (Rienties, Johan et al. 2014), we found that several host-students and

international students developed stronger cross-cultural links after eleven weeks due to working in mixed groups and became bridge builders. Other students focussed more on their own cultural network (Rienties, Johan et al. 2014).

The question-stem of a SNA questionnaire has a substantial influence on the types of social networks a researcher can explore (Wassermann and Faust 1994; Hommes et al. 2012). According to Hommes et al. (2012), friendships explore passive information diffusion between students, while working and learning networks explore with whom students are formally and informally communicating about task-related activities (Rienties & Nolan, 2014). It may be conceptually important to distinguish working from learning networks. For example, students working together in small groups of five could indicate that they have all worked together, but not learned anything from any of the group members. Alternatively, they may have worked primarily with students outside their formal group but also learned from members within their group. Given space limitation, this article will mainly focus on learning relations but additional data analyses indicated similar patterns for across the working and friendship networks (available from first author). Therefore, in this follow-up study we used a mixed, triangulated method combining initial quantitative analyses of potential bridge building characteristics with a fine-grained qualitative perspective to understand and unpack these differences.

Research questions

Most research using SNA methods are quantitative in nature, without explaining why some students become bridge builders across different cultural networks. In line with recent recommendations by Daly and Finnigan (2010), triangulating SNA measurements of potential bridge building with qualitative interviews in the social

network may provide a more nuanced and detailed understanding of how international and host students develop social learning relations over time. Therefore, the following two research questions will be addressed in this article:

1. What are the characteristics of (potential) bridge builders to develop and maintain intercultural/co-national learning relations?
2. Which explicit and implicit strategies are used by bridge builders to work in mixed groups?

Methodology

Setting and context

This study took place in a third year undergraduate module of Hospitality Management at a UK university in 2012. 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 (22%), Vietnam, Japan and Brunei (each 2%), followed by UK (27%), and Eastern Europe (17%). 75% of participants were female, and the average age was 23.26 (SD = 3.74). The students were taught by a female teacher with Indonesian roots.

Students were randomly assigned into ten small groups by the teacher, with an average group size of 8.10 (SD = 0.74). Students worked in the same group during the module. This was with the purpose of sharing knowledge and insights based on group members' background and previous experiences. Students met formally once a week during a three-hour interactive lecture alongside (online/face-to-face) informal meetings with their group members, whereby they worked on weekly tasks. These

group products were not formally assessed but the teacher provided formative feedback for students' further reflections (See also Rienties, Johan et al. 2014).

Measuring learning networks to identify potential bridge building

In order to measure the social dynamics between international and host students over time, Social Network Analyses were undertaken. As students were in their third year of study, most students had already developed informal links with some of their peers before the start of this study. At Day 1 (pre-test) and after 11 weeks (post-test), students answered three social network questions: "I learn from…"; "I am friends with…"; and "I have worked a lot with…". 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. Given that visualising the interaction patterns between 81 students from 28 different countries would be difficult for a reader to interpret (Rienties, Hernandez Nanclares et al. 2013;), we clustered the nationalities according to the GLOBE study. House et al. (2004) identified nine cultural dimensions by investigating the relation between culture and leadership styles, and created ten GLOBE clusters of world cultures transcending national boundaries.

Data analysis

In this mixed method study, an embedded case study is undertaken to examine the characteristics of a single individual unit (recognising its individuality and uniqueness), namely, a student, a group, or an organisation (Jindal-Snape & Topping 2010). Yin (2009) emphasised that a case study investigates a phenomenon in-depth and in its

natural context. Therefore, the purpose of a case study is to get in-depth information of what is happening, why it is happening and what are the effects of what is happening. Using visual inspection of the various SNA graphs (including Figure 2-3) by Netdraw, two authors (one external, one internal but working in a different faculty) selected five students for case studies as they stood out within the social network graph after Day 1 as (potential) bridge builders across different GLOBE cultures (see Figure 2) as well as interesting patterns emerging (e.g., some students strengthened their bridge building power, while others did not) when looking at SNA at 11 weeks (see Figure 3).

In order to triangulate our findings, we used three common SNA metrics to quantitatively highlight how these five students were positioned initially in the social network and how their position changed over time relative to other students. First, we measured the number of links made by each student, and what the cultural background of each connected actor is. Second, three different centrality measures (*in-degree*: having many incoming links, being prominent; *out-degree:* having many outgoing links, being an influential actor; *betweenness*: being positioned between other pairs of actors in the network) were computed, whereby in particular high scores on betweeness may be important for bridge building (Otte and Rousseau 2002). Finally, following Rienties and Nolan (2014), we computed the External-Internal (E-I) index, which ranges from '-1' (all ties are only with own GLOBE cluster) to '+1' (all ties are to students outside the GLOBE cluster). However, having a score close to these extremes would probably limit (cross-cultural) bridge building abilities.

These students were invited to individual interviews one month after the module was completed. Students participated voluntarily in the pre- and post-test of SNA as well as interviews, and were assured that the results would be completely anonymised. Interviews lasted 40-60 minutes, and the SNA graphs were used as reference materials

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during the interviews. Two of the authors (who had no prior involvement with the programme) conducted the interviews, and afterwards analysed the transcribed qualitative data independently from each other, before the analysis results were compared and contrasted arriving at a final result.

Thematic analysis of qualitative data identified eleven key themes that reflected the meanings attributed to the data, in internationalisation (Kimmel and Volet 2012; Turner 2009) and social network literature (Curşeu et al. 2012; Daly and Finnigan 2010; Lee and Madyun 2008): 1) cultural sensitivity; 2) motivation; 3) attitude towards sharing; 4) practical vs. theoretical experience; 5) learning styles; 6) conflict resolution strategies; 7) leadership skills; 8) adaptability; 9) respecting people's choices; 10) communication skills; and 11) academic ability. Afterwards, the coding and notes were compared, and when the coders disagreed consensus was reached. We replaced the names of the respondents by pseudonyms.

➔ Insert Figure 1 about here

Results

As illustrated in Figure 2, most Confucian Asian students (diamond) were positioned on the left at the start of the module, most host students (circle) were positioned on the right, while "other" international students provided a bridge between these two groups of students. Netdraw positions nodes at random across the X- and Y-axis based upon the (perceived) learning interactions between students, whereby students who share similar connections are positioned more closely together. Being on the left of the graph is not necessarily better or worse than being on the right, top or bottom, but students with similar connections are positioned closer together. Host students had on average

5.18 (SD = 3.30) host learning relations and 5.00 (SD = 3.57) host-international learning relations at the start of the module, and over time developed 3.09 (SD = 2.16) host and 4.59 (SD = 3.42) international learning relations. International students had on average 1.86 (SD = 2.38) host national learning relations and 5.36 (SD = 3.08) international learning relations at the start of the module, and over time developed 1.71 (SD = 2.10) host and 4.07 (SD = 3.23) international learning relations.

➔ Insert Figure 2-3 about here

At the beginning of the module, CS1, CS2 and CS3 were positioned more towards the international and host-students network on the right of Figure 2. In contrast, CS4 and CS5 were more closely positioned in the middle, and were more connected to the large Confucian Asian cohort on the left of Figure 2. After eleven weeks the five case study students were closer together in Figure 3, but CS3 and CS4 were positioned more on the outer fringe, while CS5 was positioned closer to the Confucian network.

➔ Insert Figure 4 & 5 and Table 1 about here

As illustrated in Figure 4, four out of five case study students were positioned on the top left in the betweenness (i.e., proxy for bridge building potential) scatterplot, indicating that these students were in the top 5 of bridge builders at the end of the module. In Figure 5, all case studies except CS3 had more cross-cultural learning links at the pre-post measurement than same cultural learning links. Follow-up ANOVA analyses indicated the five case study students in comparison to the other 76 students had on average significantly more cross-cultural connections at the start of the module (see Table 1). Furthermore, these students had a significantly higher outdegree

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centrality, indicating potential influence. After eleven weeks, the five students had significantly higher scores on six out of seven SNA indicators (except E-I index). In particular the betweenness scores substantially increased for four out of five students, although CS3 seemed not to have reached her potential as a potential bridge builder. Data from the five students' interviews were used as narratives to make sense of the different quantitative patterns between these case studies.

Case Study 1: Example of a host-national bridge

Jennifer (CS1) was a host student from a multi-ethnic British Caribbean background, 22 years old and an average performing student (Grade Point Average during undergraduate programme = 60). Jennifer was in a group where she did not know most of the students prior to starting the module, and according to Jennifer she found participation in the group tasks problematic due to time constraints and deadlines of other modules. This led to the group choosing to work remotely on the group tasks. She found working with her group members to be useful as they were willing to learn from each other's experiences, but the lack of grading led to group members to focus more on the (individual) graded assignments. Montgomery and McDowell (2009) proposition that students' approaches could be functional and strategic when grades are involved in group work holds some truth in this study, as Jennifer indicated:

> *I had a group of friends that I'd worked with in other modules where I had chosen my groups and we tended to sit together so if there was an in class smaller discussion, I'd be working with them on that, or kind of, you know we would finish the lecture and we'd said 'Oh I like that bit or I'd like to research that'.*

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Jennifer was working with some friends from previous modules in the classroom and interacting with her group members remotely. This is a vital reason for her appearing as a bridge between her and other groups in Figure 2. It was clear that Jennifer had a positive attitude towards diversity and differences:

I would have to say yeah we were very diverse [group] *in the sense there was one guy who was eastern European, 2 of us were British, one was Italian and say about 3 Asian student members; and I enjoyed it because of that. I enjoyed it because I didn't get to chose class mates and I enjoyed it because we were all kind of...right I have never worked with you before so I'm going to be on my best behaviour and I think it was very interesting in that sense.*

Jennifer, however, was quick to point out that although she worked well with her group members, they did not gel socially due to their decision to work on the tasks remotely. She discussed ways in which she resolved conflict within her group.

I don't think that [nationality of the student] *would matter to me. I kind of would address it in the same way and also for me it would depend on my background or history with the person. So for instance if I was irritated with someone who didn't really turn up, and ... their English language skills weren't that great I would probably send an email. Whereas if it was like I had one other group member that was from* [UK], *I'd just come up at the end of class and say 'Look, that was really annoying'... and kind of in a way that was me kind of doing a different* [style based] *on the cultures.*

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As illustrated in Figure 4, as she continued to work outside her group with many students she substantially increased her bridge building power towards the end of the module, whereby her betweenness scores were third highest in her class,

Case Study 2: Example of a 'Globe' bridge

Misaki (CS2) is an average performing international student originally from Japan (GPA = 62), and 22 years old. She had lived in several other countries since she was 11 years old. She identified herself as Japanese who was *'not 100% Japanese mentally'*, implying that her international experience had an impact on her identity, especially her way of thinking. Her group comprised of mainly Asian and one American student. Similar to Jennifer, Misaki found the aspect of sharing experiences to be the most important outcome of the group work and indicated that some students were not motivated to play their part in the group work as the tasks were not graded.

> *When they go into the real world and work with other people they not only see it from their perspective, they can also see it from other people's perspective or at least they can try to look at it from different perspective. And if I share, then of course, other people will share their story as well.*

She reported that she saw sharing of stories and experiences to also be important to ensure there was no miscommunication or conflict.

> *I think sharing a story is very important in terms of communication as well because if we don't tell each other ... what we are thinking of or how things*

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work and how you are satisfied or dissatisfied about something that you are
doing, then obviously there is a miscommunication and there could be a
potential conflict so I think sharing information is very important.

Misaki said that her group had a tendency to share and learn from each other. Like Jennifer, Misaki had set up a system of reminding others to submit assignments and tasks on time, and showed positive strategies for dealing with potential conflict as well as demonstrating leadership skills. She gave another example of her understanding of different perspectives and cultural sensitivity.

The exchange student from America, I don't think she has been out of America
too much … she was still surprised at how some people are unfriendly compared
to the people from America. I think in Chinese people and Japanese people's
perspective I think that is relatively familiar … if you are walking down the
street and you stop at the signals and if it is raining you don't talk to the next
person saying 'horrible weather today' but in America I think you probably do
that.

She was insightful about the SNA graphs, whereby her role as the strongest bridge builder in the classroom (see Figure 4) was due to her having prior friendships with people from other groups. She also highlighted her adaptability due to having lived in different countries as another reason.

I have lived in various countries with various culture and religion so I had a
deeper understanding as to why there is a conflict between different people and

I really don't like conflict and shouting and angry. I like to be in a neutral position ... on both sides.

She felt sorry for students who were unable to make friends and benefit from the international environment of the university. However, she was again quick to point out that it was an individual's choice; hence demonstrating her ability to respect others' choices. Her view was that international students, due to their experience of at least two countries and cultures had more cultural awareness compared to most host students. Her shared view is in agreement with Zhou et al. (2008) who believe that international students' previous experience could serve as a major contribution to the learning community.

Case Study 3: A potential bridge who became more insular

Fatima (CS3) was born in the UK but her parents were from the Middle East. She performed above average (GPA = 73) and is 22 years old. She valued the tasks and believed she learned from others' experiences, inside and outside her own group. However, she indicated that there was a lack of communication with some group members, which was stressful and annoying.

It depends on people commitments; I am more academic so I would commit to my work more than societies and friends. I am the sort of person that is happy to work with anyone as long as the work gets done and people commit. But if they don't, I will still do their work for them ... for me, my grades are more important than fussing and fighting over who does what. Yes, it does frustrate

me, it just means an extra workload for me, but I guess it depends on the people

you work with.

Although she used a conscious strategy, it seemed that her way of resolving conflict was to do the task that others did not undertake. This quote (and other data) also suggests that she was open to working with different students, but was conscious who to work with.

I often like to mix with different people and not only work with one group of

people, because then I don't learn anything from them. If you stick with one

group of people when you go in the outside world you are going to struggle. For

the four years, I have always worked with different groups, hardly working with

the same person again.

In contrast to Jennifer and Misaki, Fatima became more internally focussed and her bridging function substantially decreased over time (as also indicated in Table 1 and Figure 4). A potential reason for her decreased bridging function could be related to her focus on obtaining a good average GPA, as she was preparing for future employment (i.e., the module design and marking only individual performance, not group performance).

Case Study 4: A potential bridge builder turned into a relatively "isolated" student
Magdalena (CS4) was a 23 year old Polish student with an above average performance (GPA = 76). Although she was studying hospitality management, one year into the programme she decided that she would like to study medicine. As her parents were

paying her fee, she decided to complete the three year programme. According to Magdalena, most of her group members did not have a chance to get to know each other, as they did not have time and opted to complete the tasks online.

> *It is just a module, one of the 4 modules which we are having in our final year, it was quite intense, so many people couldn't participate in VLE discussion. Afterwards our teachers were not happy but on the other side it was not graded as well.*

According to Magdalena, others who wrote on the discussion forum were high-achieving students. She had experience of group work before this module and believed that in principle the approach was good. Although Magdalena seemed to be a high achiever and persevered despite her lack of interest in the discipline, she repeatedly focussed on the lack of grading of the tasks and did not seem to see any other benefits of sharing views and discussing ideas with others.

She had more friends outside this particular module (perhaps as no other Polish students were in her programme). Her experience suggests that while that it was easy to work with people in the UK, it is more difficult to make friends with them. She felt that in the case of British students it might be due to them not feeling a need to make other friends (See also Peacock and Harrison 2009). Furthermore, Magdalena said that she had made several friends from different nationalities in the first year but now tended to spend more time with other Polish students, as it was easier and more comfortable.

> *At first it was like a mix of people but afterwards you more or least rationally like, go toward like people of your country I mean that is how it happens with*

many nationalities. I was trying not to in the beginning but after I met so many

Polish people it is just the same pattern, it is just a bit easier.

Case Study 5: A bridge builder with "negative" group experience

Eyah (CS5) was an international average performing student (GPA = 66) from Brunei, 22 years old. The friends she made outside the module were from different nationalities but mainly Bruneian. For the current module, she was in a group with only host students, which she found intimidating and reported feeling awkward. She felt that others had more local experience in their field and therefore she was quiet during the first meeting. Three to four meetings later, she apologised to the group for not expressing her views but said she was still carrying on with her work. The group members reassured her and she became close to one of the host students. She mentioned that problems emerged when the others decided that due to lack of grading, they would not meet as a group. She said that they felt they were wasting their time meeting with her in a group context. Later on she was unable to complete her share of the work due to personal problems and finished it later than the others. The group read her work and told her that they were not satisfied with the quality of her work. She reported being devastated by this:

> *I tried this and my part they, they correct … I assume that they don't really like my part, they should just say it in the meeting. …during the meeting I did feel that they … make fun of me or something but I kept quiet so.*

She explained that she did not have anybody in her group she was familiar with and did not like her group. She felt that their ideas and thinking did not match. Nevertheless, she felt that this was good preparation for work life as she now could work with anyone:

> *It's a test for me, because having this experience I could cope with anyone in the real world. You know you can work with these people and how to deal with it. It's a positive thing I think.*

She said that English and Chinese students did not mingle with other students due to language barriers, and found it easier to work with other international students. Nevertheless, she felt positive about the benefits of reading other students' contributions. Eyah's isolation in her assigned group resulted in her feelings of loneliness for not being understood as part of learning community (See also Sawir et al. 2008). Such intercultural communication apprehension and social isolation need to be monitored as they may cause acute loneliness, mood disturbance and low self-esteem. Nonetheless, in the classroom she continued to act as a bridge builder between Confucian Asian and other students.

Discussion

In this triangulated study of dynamic social network analyses with follow-up in-depth interviews of five potential bridge builders we found that students developed complex and dynamic strategies to work in mixed groups, in line with recent research (Gabb 2006; Montgomery and McDowell 2009; Rienties et al. 2013; Turner 2009; Zhou et al. 2008). In Table 2, the key characteristics of how these five students coped with the module and learned together with different students are illustrated. While all five

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students were academically average-to-able students, how they coped with the challenging mixed group environment differed substantially. Host student Jennifer and international student Misaki met nine out of eleven bridge building concepts (Lee and Madyun 2008; Rienties, Johan et al. 2014) in an international classroom. Both students remained strong bridge builders between the Confucian Asian, international students and host students over time (see also Figure 3 and Figure 4).

→ Insert Table 2 about here

In contrast, the other three potential bridge builders had varying degrees of cultural sensitivity, and were less likely to take leadership roles and show adaptability towards the group and the wider international classroom (see Table 2). Over time, they became relatively more isolated from their assigned group and positioned more closely to peers with similar cultural backgrounds. For Fatima and Magdalena this move away from the centre was a conscious choice, despite that Magdalena remained a bridge builder between Eastern European and other students. For Eyah the focus toward Confucian Asian students was a result of her extremely negative (perceived) experiences when working in a group with only host students. As Kimmel and Volet (2012) cautioned, such early negative encounters for international students may have an impact on their outlook to subsequent work with host students.

While many researchers argue that there are substantial benefits of working in groups (Chang 2006; Rienties et al. 2014; Rienties, Hernandez Nanclares et al. 2013; Turner 2009), this study indicated that the learning benefits itself do not necessarily warrant motivations and participations, hence teachers may consider grading group activities (Leask 2009). While all five students were willing to share knowledge

together with their group members (and average density within the groups increased over time), due to the lack of group grading most students developed more informal learning relations with co-national peers and friends rather than with their assigned group members (see Table 1). Furthermore, if students were assigned for a longer time period together in the same mixed group, such as in parallel or subsequent modules, perhaps more cross-cultural links might have been established, as cross-cultural network development takes time and conscious effort.

In line with social network theory, these students, albeit in different ways, used the social network to their advantage to share materials, and ideas, and to provide them with psycho-social support, reinforced identity and recognition.

Furthermore, this study shows some agreements (Magdalena, Eyah) and disagreements (e.g. Jennifer, Misaki, Fatima) to findings by Kimmel and Volet (2012) that students prefer to work with those who come from similar cultural backgrounds, even when language is not an issue. Similarly, the large differences in social network positions and the variations in host and international learning relations amongst students from different cultural backgrounds (Figure 2-5) indicate a complex, non-linear relation between culture and social network development. It also confirms that psychological stress for international students may be high and varied (e.g. Eyah) in attempts to adjust within the classroom, even after three years of studying.

Limitations

A limitation of this triangulated study is its self-reporting nature, whereby perceived socially desirable behaviour might influence the results. Furthermore, the relatively low response of the post-test (67%) might be troublesome (as several studies indicate a benchmark of 80%). The lower response rate during the post-test was due to the fact

that not all participants were present during the final lecture, although previous analyses indicated no response bias between students who responded and those who did not (Rienties, Johan et al. 2014). As we triangulated the social network graphs and quantitative analyses with in-depth interviews of five (potential) bridge builders, we were able to provide a more nuanced picture of how host and international students develop a range of strategies to cope with working in small groups in an international classroom, and in doing so might continue to be bridge builders or move away due to their experiences in a particular context. Studies using a "single measurement in time approach" may fundamentally under/overestimate the complex dynamics inside and outside the international classroom. Therefore, our longitudinal SNA study with interviews capturing the experiences of students over that period provides unique insight into how international and host students use a range of complex and dynamic strategies to build, construct and decompose social networks.

Future research and practical implications

Although methodologically challenging, teachers may use several advanced SNA metrics to objectively determine which students are (potential) cross-cultural bridge builders at the start of a module in addition to the current approach used in this study. Furthermore, future research could design metrics to automatically determine whether group allocations are culturally balanced using learning analytics approaches. Other factors need to be taken into consideration, such as the formal and informal curriculum (Leask 2009), assessment and task structure. As Kimmel and Volet (2012) argued, enrolment status (i.e. students being local or international) is insufficient to explain the nature of students' intercultural experience.

The practical applications of our study are that teachers can use our "characteristics list of bridge builders" for identifying potential bridge builders in their classroom practices. By mixing bridge builders together with students who (initially) are less inclined to build cross-cultural relations, group dynamics may be substantially improved over time, which hopefully will lead to a truly international learning experience.

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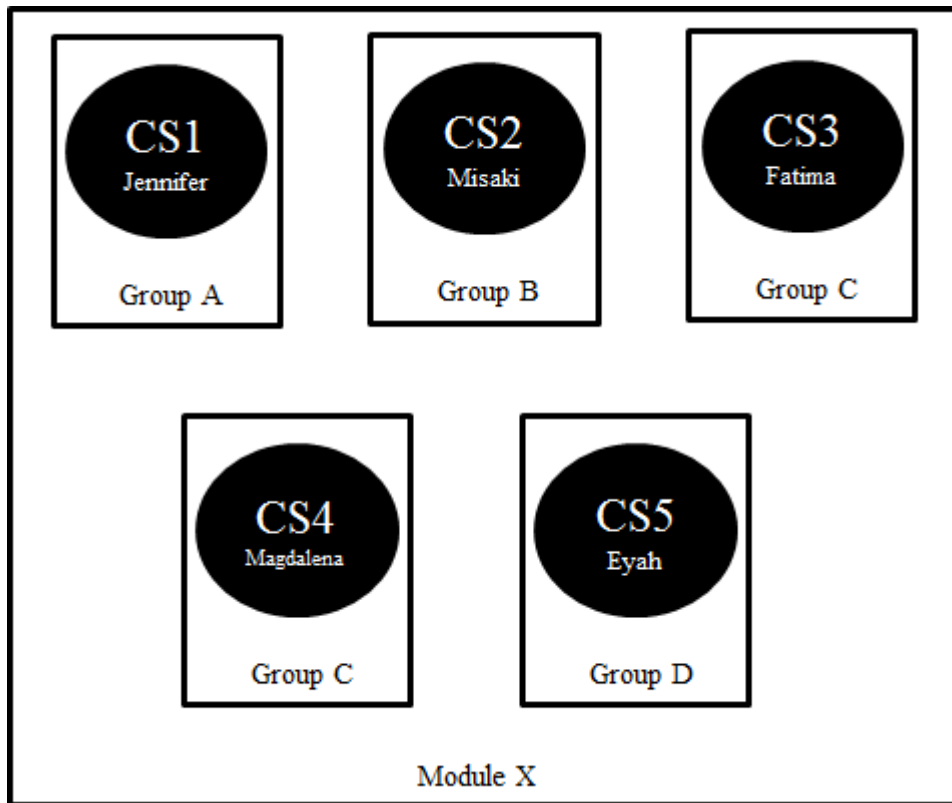Figure 1: A multiple embedded case study design ([Based upon Yin 2009](#))

Figure 2 Learning network at the beginning of the module
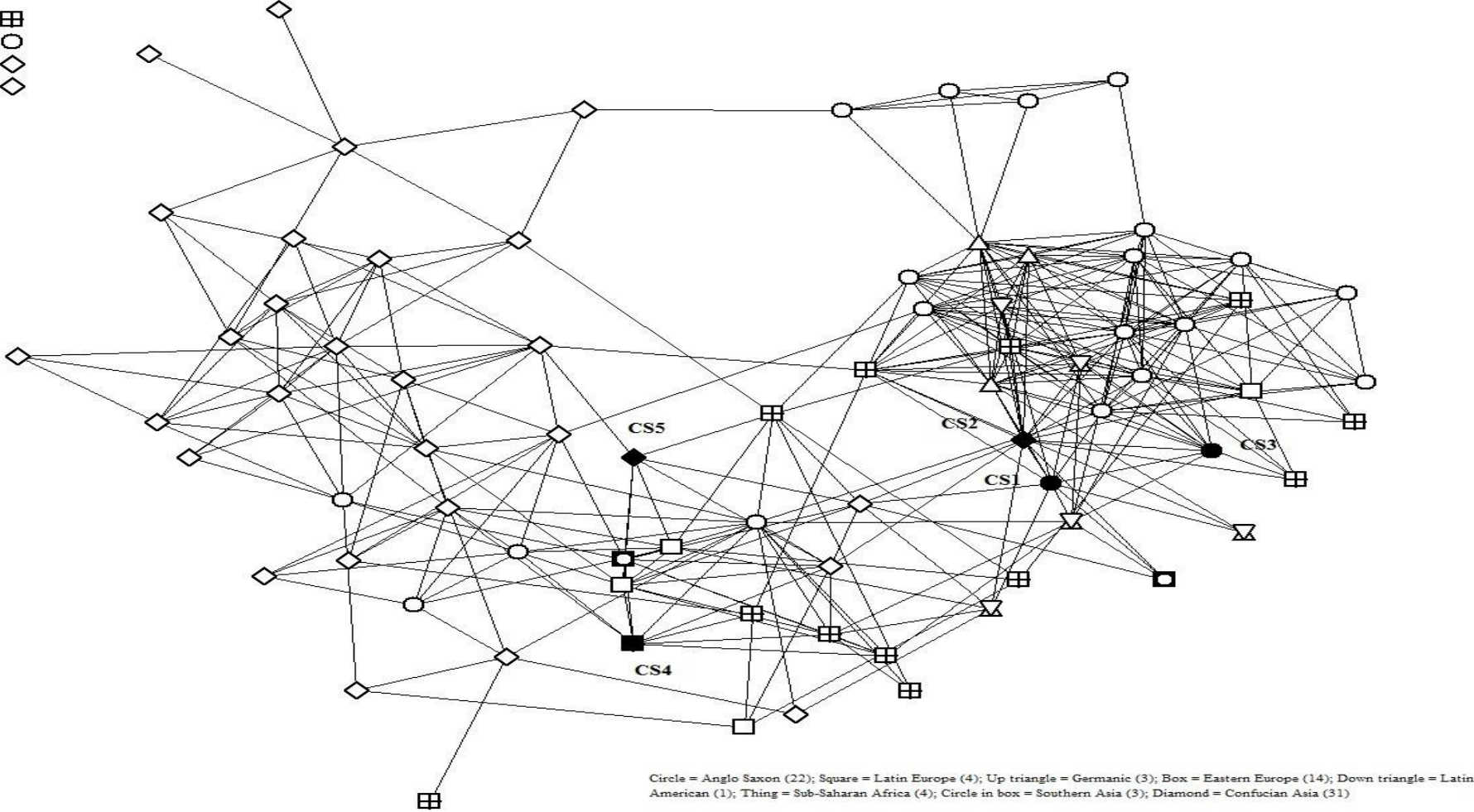

Circle = Anglo Saxon (22); Square = Latin Europe (4); Up triangle = Germanic (3); Box = Eastern Europe (14); Down triangle = Latin American (1); Thing = Sub-Saharan Africa (4); Circle in box = Southern Asia (3); Diamond = Confucian Asia (31)

Figure 3 Learning after 11 weeks.

Circle = Anglo Saxon (22); Square = Latin Europe (4); Up triangle = Germanic (3); Box = Eastern Europe (14); Down triangle = Latin American (1); Thing = Sub-Saharan Africa (4); Circle in box = Southern Asia (3); Diamond = Confucian Asia (31)
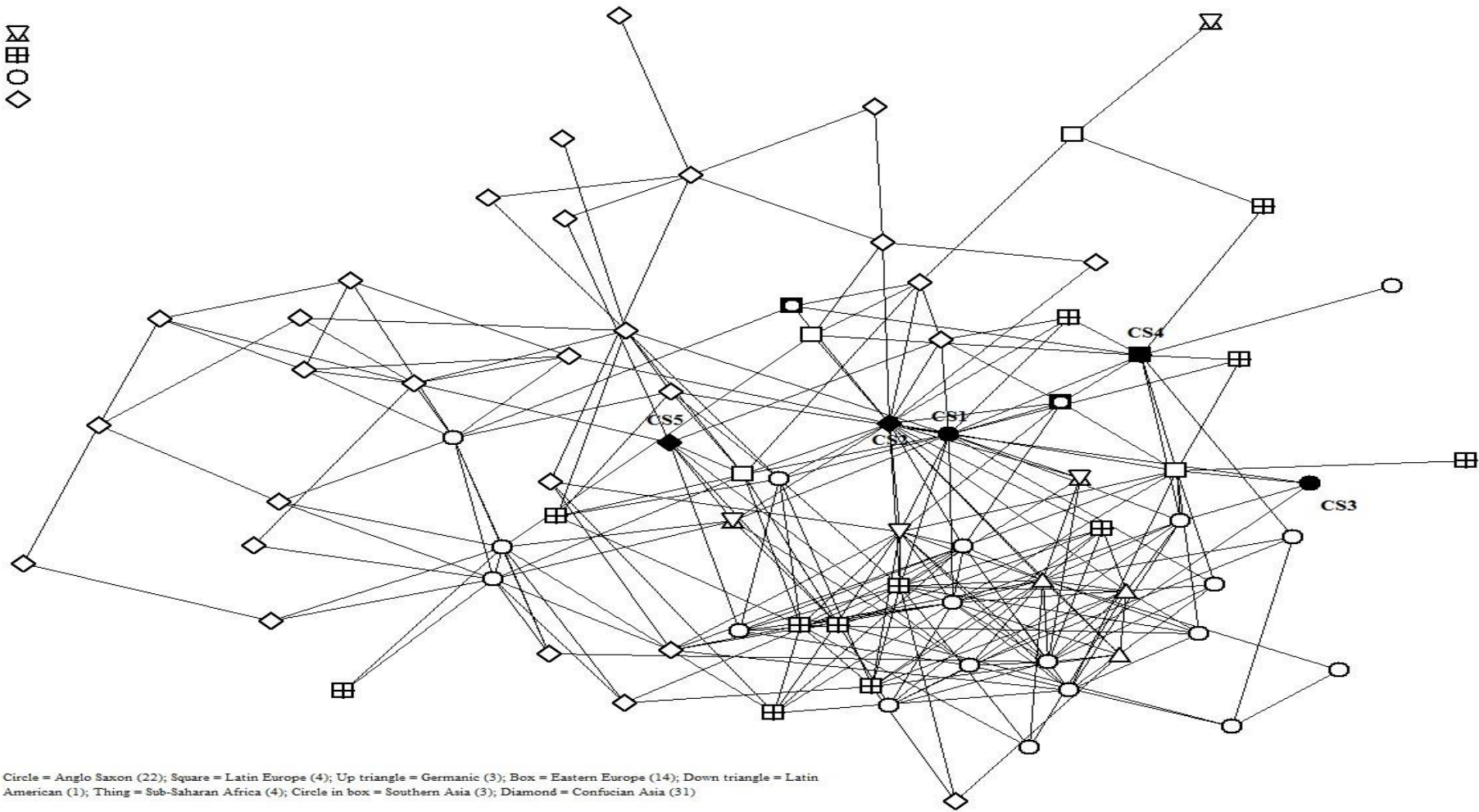
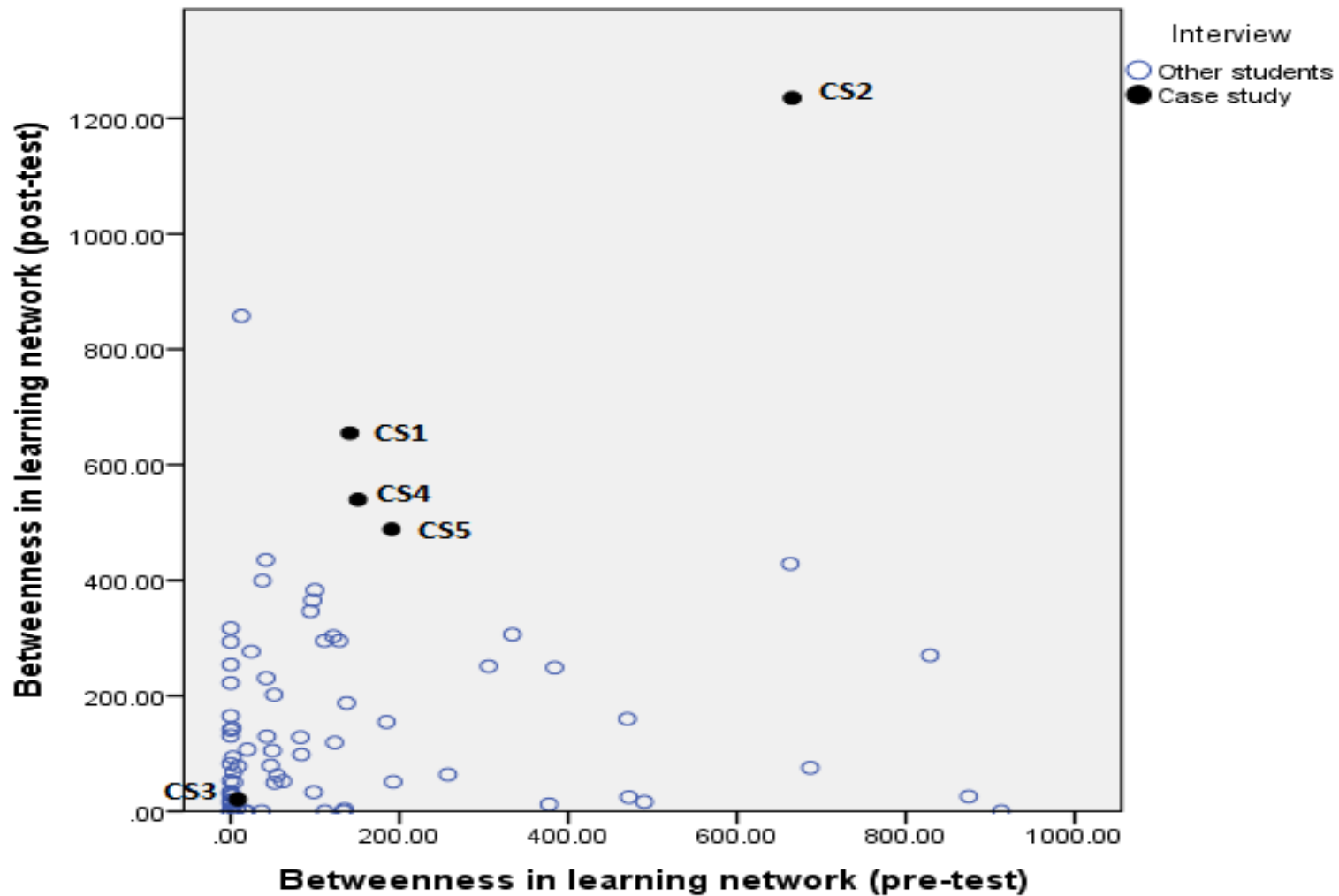**Figure 4 Scatterplot of betweenness of learning networks (pre vs. post test)**

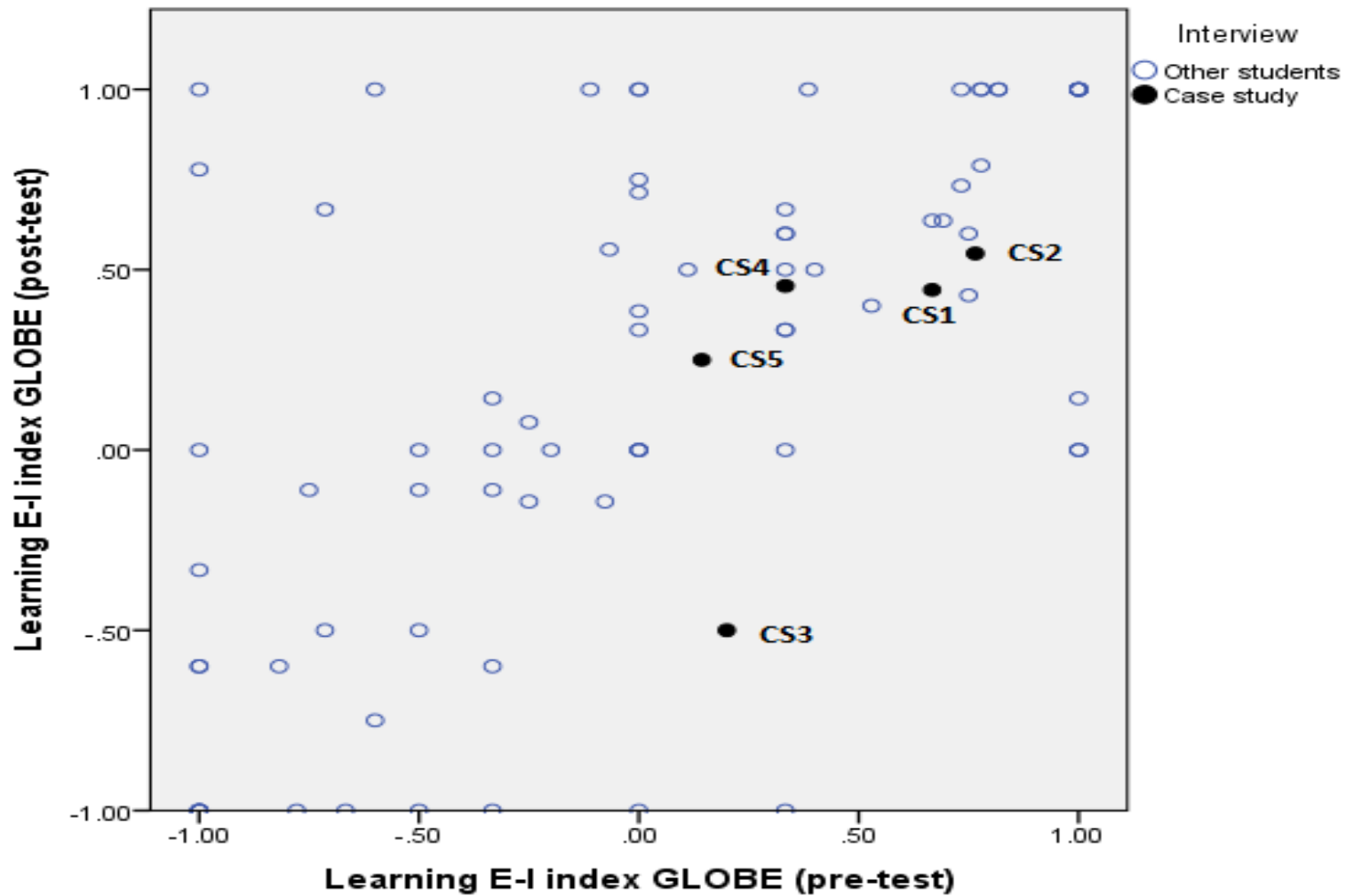**Figure 5 Scatterplot of E-I index of Globe culture (pre vs. post test)**

Table 1 Descriptive SNA statistics of five case study participants vs. others.

	At day 1 (pre-test)								After eleven weeks (post-test)							
	# Ties	Same culture	Different culture	OutDeg	Indegree	Betweenness	E-I Index	Density (group)	# Ties	Same culture	Different culture	OutDeg	Indegree	Betweenness	E-I Index	Density (group)
CS1 Jennifer	12	2	10	10	6	141.10	0.67	.018	18	5	13	16	14	654.89	0.44	.464
CS2 Misaki	17	2	15	11	12	665.30	0.77	.161	22	5	17	16	17	1235.31	0.55	.214
CS3 Fatima	10	4	6	9	3	8.46	0.20	.107	4	3	1	4	4	20.47	-0.50	.321
CS4 Magdalena	9	3	6	7	6	150.88	0.33	.107	11	3	8	8	9	539.79	0.46	.321
CS5 Eyah	7	3	4	7	1	190.58	0.14	.196	8	3	5	7	4	488.40	0.25	.304
Mean others	7.81	3.45	4.36	4.93	5.27	128.53	0.02	.131	5.93	1.99	3.95	4.71	4.75	132.08	0.20	.287
SD others	4.84	3.05	4.25	3.65	4.43	216.80	0.66	.078	4.14	1.93	3.83	3.60	3.64	151.70	0.68	.200
F-value	2.076	0.272	3.934*	5.305*	0.039	1.087	1.932	.051	11.174**	4.365*	7.078**	10.425*	7.875**	31.295**	0.035	.122

F-values (ANOVA), * $p < .05$, ** $p < .01$. Note that density is calculated on a group level.

Table 2 Characteristics list of bridge builders: **summary of five case study participants**

Characteristics	CS1 Jennifer	CS2 Misaki	CS3 Fatima	CS4 Magdalena	CS5 Eyah
Cultural sensitivity	√	√	√		
Motivation to do well	√	√	√	√	
Positive about sharing and learning from others	√	√	√		√
Positive about differences in practical and theoretical experience	√				
Positive about different styles of learning	√		√		√
Conscious strategies for conflict resolution	√	√	√		
Leadership skills		√			
Adaptability		√			√
Respecting other people's choices	√	√	√	√	
Good communication skills and willingness to communicate	√	√	√		
Academically able	√	√	√	√	√

Note that if response is not ticked, this does not imply that a student does not have this characteristic, but that during the interview this characteristic was not made explicit.