KNOWLEDGE SHARING, CULTURE AND MEDIA USAGE IN AN ACADEMIC NETWORK: A NETWORK ANALYSES OF THE EBEREA-IRSES CASE

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Jaap Albers, Accenture, The Netherlands

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Abstract

Collaboration between scientist in Europe and China is becoming more and more relevant in order to exchange know-how, and stimulate academic exchange in order to realize market entrance as well as innovation in both European and Chinese markets. This paper explores how collaboration merges and what the cultural impediments or challenges are. To do so we analysed how a network in the field of eBusiness research developed over time in the context of a specific EU-funded project and how cultural attributes and preferences for information exchange and media-preferences affect the networks. Based on Social Network Analysis making use of data collected on two moments in time, at the start of the project and after two years, we will not only give a description of the network but also explore how this network is affected by cultural and media preferences of members of the network. The results indicate that the network has expanded and became denser. Moreover, whereas European universities were the most central ones at the beginning of the project, the Chinese universities are now involving more participants, developing more contact ties and thus getting more central positions in the network. With regard to cultural aspects we found evidence contrary to Hofstede’s assumptions and we could not relate the cultural aspects to the network characteristics in a significant way. In a similar way, with regard to preferences for channels or the formal and informal ways of communication the results are rather homogeneous between the sub samples, except that the Chinese participants have a significantly higher tendency to use and speak within informal settings.

Keywords: Network analyses, knowledge sharing, collaboration, culture, media richness.
INTRODUCTION

Research networks often consist of scholars from several countries, working in different universities and maybe in different continents. Core objective of these networks is to exchange knowledge, discuss research agenda’s, and explore opportunities for research collaboration. For instance, the European Union has a deliberate policy to stimulate academic collaboration within Europe, but also between Europe and other parts of the world such as the USA or China. There is an increased policy interest in scientific mobility as a way to building research capacity and creating knowledge (Jacob & Meek, 2013). Policies that explicitly promote mobility, such as EU Marie Curie programmes funding staff exchanges and other visiting fellowships at universities are considered to be at the centre of the knowledge system excellence. Still, relatively little is known about how these networks of researchers actually work, especially across culture and national boundaries (Hoekman et al., 2010; Jacob & Meek, 2013). Yet, research findings would suggest that cutting-edge research is best conceptualised in (virtual) transnational research collaboration (Olsson & Cooke, 2012).

One of the projects to stimulate international collaboration between the EU and China is the eBerea project (eBusiness Education and Research Network for Euro-Asian Collaboration). The eBerea project concerns a network, which was established in 2007 and dedicated to promoting and facilitating research on eBusiness and eServices among China and Europe (www.eberea.org). Since 2010 the eBerea consortium runs as an EU FP7 Marie Curie’s International Research Staff Exchange Scheme project “eBerea Irses”. With this relatively new funding type EU helps research organizations to cooperate with others, through a coordinated exchange program for their staff (http://ec.europa.eu/research/mariecurieactions/about-mca/actions/irses/). Compared to individual Marie Curie Actions, that provide mobility possibilities to individual researchers, this action provides support to research organizations to establish or reinforce long-term research cooperation. The eBerea Irses project studied in this paper is implemented by a network of five EU universities and three universities in China. The duration of projects was 4 years.

Interesting questions are then posed: Did the project succeed in reinforcing long-term research cooperation between partner universities or between individual researchers? How did the network of researchers evolve during the project? How the cooperation is influenced by cultural and media preferences? On a theoretical level this paper contributes to research in the field knowledge sharing between research communities. In this paper we focus on the network of researchers as well as on the way information is exchanged, and how individual researchers are collaborating by partaking in activities as joint research projects, exchanges, communities, forums and other activities (Ardichvili et al., 2006). With social network analysis we examine how the network changes over time, and analyse how the network structure and centrality of certain nodes, ties and cliques dominate the collaboration. Not only social network plays a role in collaboration, but also spatial, temporal, cultural and cognitive distances between partners make practical collaboration more complex, and affect knowledge exchange and collective learning. We illustrate the patterns of interaction and collaboration in the eBerea Irses project and track the change of the network of researchers since the beginning of the project.

We structured the paper as follows: first we present a literature review on knowledge sharing, culture and use of media, then we describe the eBEREA project and research method. Last we present the results from the network analysis and end with conclusions and discussions on expansion of the network and cultural aspects in collaboration.

LITERATURE REVIEW

Innovations and creativity, also in research, are derived to a large extent from collaboration and knowledge sharing between partners. Nonaka (1994) proposes that new knowledge can be created by dialogue, which brings up conflicting views. It seems that mixing of people with differing backgrounds and cultures would be the way to innovativeness. However, a prerequisite for innovative co-operation is that the parties are able and willing to learn and share knowledge. This challenge is realized in many
globalized projects collaborating with people at the other sides of the world - in our empirical case Europe and China. Nooteboom (2000) explains that information is useless if it is not new, but it is also useless if it is so new that it cannot be understood. That means there is a trade-off between need for cognitive and cultural difference for the sake of novelty, and similarity for the sake of efficient absorption (Nooteboom et al., 2007).

Broadly speaking, the sharing of knowledge is a flow of knowledge from one to another through a given set of methods. Within the concept of knowledge, a distinction is often made between tacit and explicit knowledge, pointing at the difficulty of how it is coded and transferred respectively (Polanyi, 1966). Explicit knowledge is easy to write down in the form of data, formulae, codified procedures or universal principles and can therefore be transferred relatively easy and through a variety of channels. Tacit knowledge on the other hand includes insights and intuitions embedded in a specific context, and is not easily visible and expressible (Nonaka and Takeuchi, 1995). Communities of Practice - defined as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly (Lave and Wenger, 1991) - are widely recognized to allow for the generation and dissemination of tacit knowledge (Nonaka, 1994; Arichvili, 2008). Examples of Communities of Practise in literature are insurance claims processors (Wenger, 1998) and service personnel repairing the machines in the field (Brouwn and Duguid, 2000). Also a scientific community of professors, research scientists and early state researchers engaged in a specific joint research area, and sharing the same professional interests and working methods accounts for a Community of Practise. In these Communities of Practice knowledge is shared and less experienced members can learn from interacting with more experienced members and with each other (Lave & Wenger, 1991).

2.1 Knowledge sharing, collaboration and networks

Within Communities of Practice collaboration can be realised and defined it in many different ways. Katz and Martin state that the most obvious definition for collaboration should illustrate how closely two or more people work together to achieve common goals (Katz & Martin, 1997). Harris et al. (2008) made a seven-point list to identify how closely people work together. Table 1 shows the seven steps in the collaboration hierarchy of researchers and the explanation at each level.

<table>
<thead>
<tr>
<th>Level of collaboration</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Linked</td>
<td>Researchers do not work together at all and have separate goals.</td>
</tr>
<tr>
<td>Communication</td>
<td>Researchers share information only when it is advantageous to either or both goals.</td>
</tr>
<tr>
<td>Cooperation</td>
<td>Researchers share information and work together when an opportunity arises</td>
</tr>
<tr>
<td>Coordination</td>
<td>Researchers work side-by-side as separate organizations to achieve common goals; efforts are coordinated to prevent overlap.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Researchers work side-by-side and actively pursue opportunities to work together, but do not establish a formal agreement.</td>
</tr>
<tr>
<td>Partnership</td>
<td>Researchers work together as a formal team with specified responsibilities to achieve common goals (have a Memorandum of Understanding (MOU) or other formal agreement).</td>
</tr>
<tr>
<td>Fully Linked</td>
<td>Researchers mutually plan and share staff and/or resources to accomplish common goals.</td>
</tr>
</tbody>
</table>

Table 1. Collaboration hierarchy (Harris et al., 2008)

2.2 Knowledge sharing and use of channels

Media richness is a concept used to define the ‘capacity’ of a communication medium in transmitting a message from a sender to a receiver (Bodensteiner, 1970). The media richness theory points out that there is no, one best choice, but it would depend on the situation and organizational structure what choice of media would be most effective. The idea in the basis for the media richness theory (Trevino et al., 1990)
are empirical studies in 1973 by Galbraith (Galbraith, 1973). Bodensteiner (1970) analyses the richness of media through its feedback capability, communication channels utilized, source and language, and whether the message is personal or not. All these aspects have to do with the equivocalness of the message that needs to be transmitted. Later on rankings of communication media have been presented (Daft & Lengel, 1983; Rice, 1992). Table 2 shows a list of communication media by Zmud, Lind and Young in 1990 ranked to accessibility, information quality and feedback possibilities in a case study performed (Zmud et al., 1990).

<table>
<thead>
<tr>
<th>Communication medium</th>
<th>Richness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>facilitate instant feedback, and transmit both verbal and non-verbal</td>
</tr>
<tr>
<td></td>
<td>highest forms of communication.</td>
</tr>
<tr>
<td>Video conferencing</td>
<td>slightly leaner in transmitting cues and body language because of slow</td>
</tr>
<tr>
<td></td>
<td>connections and a lesser personal experience than a real face-to-face</td>
</tr>
<tr>
<td></td>
<td>conversation.</td>
</tr>
<tr>
<td>Telephone</td>
<td>suffers less from connection problems but cannot transmit visual</td>
</tr>
<tr>
<td></td>
<td>expressions and other non-verbal communication</td>
</tr>
<tr>
<td>Voice messaging</td>
<td>roughly the same richness as the telephone but lacks the possibility</td>
</tr>
<tr>
<td></td>
<td>to get immediate feedback making it possible to misinterpret messages</td>
</tr>
<tr>
<td>E-mail</td>
<td>the interpretation of the words is totally up to the receiver; non-verbal</td>
</tr>
<tr>
<td></td>
<td>signals and gestures cannot explain how the words are actually meant.</td>
</tr>
<tr>
<td></td>
<td>On the other hand email is capable of including pictures, links, movies,</td>
</tr>
<tr>
<td></td>
<td>music and other media to increase the understanding of the message</td>
</tr>
<tr>
<td>Letter/written message</td>
<td>Similar to e-mail, but slower and cannot include movies or music.</td>
</tr>
</tbody>
</table>

*Table 2. Communication media (Zmud et al., 1990)*

2.3 Knowledge sharing and culture

Several studies indicate that the effectiveness of knowledge sharing is influenced by the cultural values of the individuals involved (Hutchings & Michailova, 2004; Bhagat et al., 2002; Leidner & Kayworth, 2006 Chinese were expected to be for). Transfer of this knowledge is therefore subjected to the preference of the individual. The preference of the individual is a concept that is much more complex than just the national culture one originates from. Where national culture could be a layer of personal traits defining collective behavior in groups, there are much more influences that alter ones behavior. This research tends to focus on culture as defining factor in behavior. It could just as well be social, geographic, demographic, organizational or economic factors that define small groups of individuals to behave the same. Given these complications, the research tends to discover if culture defines (part of) humans preference in sharing knowledge.

A lot of research on knowledge transfer has been done on the basis of Hofstede, Trompenaars and Triandis’ theories on culture, each of them using their own concepts (Trompenaars & Hampden-Turner, 1997; Triandis et al., 1988; Hofstede, 1991). Hofstede’s work has been criticized for having methodological flaws and focusing on territory of nation states (McSweeney, 2002). Nonetheless, in the absence of alternative models it provides a framework that may help understand cultural differences. Sticking to the terminology of Hofstede (Hofstede, 1991; 2001; 2011), like so many researchers have done (Rice et al., 1998; Ardichvili et al., 2006; Guo & Ambra, 2003; Hwang et al., 2003), most studied concepts in this field are: individualism/collectivism, long/short term orientation and low/high uncertainty avoidance. In general, collectivistic societies seem more ‘warm’ than individualistic societies. Warm meaning here, a collective group feeling, emphasized by harmony and looking after each other (Hofstede 1991; 1994). Uncertainty avoidance relates to dealing with the unknown and unfamiliar and is defined "as the degree to which people in a country prefer structured over unstructured situations" (Hofstede, 1994).
2.4 Culture and use of channels

Collectivism is closely associated with respect, dignity and modesty (Triandis et al., 1988). Modesty is especially interesting as it is proved to directly influence one person’s self-enhancement (Kurman, 2003). Modesty explains one’s reluctance towards participation in online communities and internet-based knowledge databases (Bansler & Havn, 2003). Intrinsic behavior of people in a collectivistic environment makes them feel that participating in online communities and internet-based knowledge databases are a form of bragging or showing off. Empirical findings from Ardichvili et al. (2006) support this claim, stating that, for instance in Chinese culture, it is not acceptable to stand out in the crowd or to speak up a lot. For individualism and collectivism, it is also, according to the same researchers, the tendency to share knowledge between members of the same group (in-group) easily, but a strong tendency of distrust towards people of the out-group. This difference in treating in- and out-group members could be a real barrier in making collaboration work with people that at a first glance don’t belong to the trusted in-group.

Related to individualism/collectivism is the issue of face. Face may be defined as “the positive value a person effectively claims for himself by the line others assume he has taken during a particular contact” (Goffman, 1955). It can be seen in close relation to respect, prestige and honor. Hwang et al. (2003) confirmed the relationship between gaining face and individualism, but also found that fear of losing face, or respectively the willingness to gain face, would influence the way they choose between formal and informal communication channels. Informal communication is likely to form bonds between individuals that ultimately result in collaboration (Kraut & Egido, 1988). With especially collective cultures putting a lot of emphasis on relations between individuals, groups and for instance family and organizations, a distinctive preference towards rich media, seems very likely (Guo & Ambra, 2003; Ardichvili et al., 2006). The extent to which cultures prefer to use a certain media channel might therefore hamper in making collaborative ties with fellow researchers on a distance. On the other hand, some literature claim that negative impact of distance has for a large part been covered by the emergence of many computer mediated communication media (Jones et al., 2008; Cairncross, 1997).

3 THE EBereA IRSES CASE

eBerea, (www.eberea.org), is a research network dedicated to advance research and higher education in the fields of electronic business in EU and China. It builds on networks of researchers for the exchange of information between and among Chinese and European Universities. Originally, the network was established by researchers in two Finnish and two Chinese universities: Helsinki University of Technology (now part of Aalto University, AALTO), University of Jyväskylä (JYU), Southwestern University of Finance and Economics (SWUFE) and Xi’an Jiaotong University (XJTU). In 2007, the rectors/presidents of these four founding member Universities signed a Memorandum of Understanding to advance joint development of educational programs, the exchange of staff and students, and research cooperation by and between the universities. The eBerea network did not have any dedicated funding but was building on enthusiasm and vision of a few individual professors about building a community of practise of eBusiness researchers between Europe and China. In practice, the co-operation was supported by separate short time projects ran by the professors.

The research carried out by eBerea researchers focuses on business modelling and design of electronic business and services. Research collaboration in this field of research is to provide a solid foundation for developing the educational, scientific, and cultural as well as business relationships between the regions. Through the collaboration the European partners can have access to valuable sources of information in China, such as market statistics and comparative case studies. Perhaps more importantly, the eBerea partners are expected to benefit from the creation of an eBusiness community and social network of researchers in the field. This would foster the growth of future eBusiness higher education network. The experiences, concepts and mechanisms could then be implemented in other relationships of the participating universities and in widening the eBerea network with new European and Chinese partners.
In 2009 four new universities joined eBerea: Delft University of Technology from the Netherlands (TUDelft), Åbo Akademi University from Finland (AAU), University of Trento from Italy (UNITN) and Renmin University of China (RUC). This increased the number of eBerea partners to 5 European and 3 Chinese Universities. At this point the network made the co-operation more coordinated by setting up a management board and by agreeing on by-laws. In 2010 the EU approved the application by eBerea consortium for financial support from FP7 Marie Curie’s International Research Staff Exchange Scheme (Ireses). The four-year Ireses projects are designed to reinforce research collaboration of universities through seconding and hosting researchers between Europe and China. It can fund at least part of the traveling costs from the research exchange, both from China to Europe and from Europe to China. The Ireses project, combined with other smaller research project such as Ubiserve (http://ictalliance.org/future-services/), provided the eBerea universities the possibility to foster and increase their research collaboration ties within the eBerea network.

The areas of research were divided in main categories such as: i) business modelling and design, ii) regulatory issues and trust enhancing mechanisms, and iii) financial services for consumers and citizens. Each work package included a number of research tasks which were carried out by the eBEREA participants during the and between researcher visits.

4 RESEARCH QUESTIONS

We defined the following research questions concerning the evolution of a Community of Practise:

- Did the project succeed in reinforcing long-term research cooperation between partner universities or between individual researchers?
- How did the network of researchers evolve during the project?
- How the cooperation is influenced by cultural and media preferences?

To answer the questions we first analysed the size of the network and the collaboration ties within the community in the beginning of and after two years of the EU Marie Curie Ireses project. The network analysis was enhanced with suggestions building on the previous literature that Chinese are highly collectivistic, whereas European more individualist.

- Collectivistic societies have a higher tendency to share knowledge with people of the same group (in-group) than people outside of their group (out-group) probably influencing what collaborations will be formed. This would mean that the potential expansion of collaboration would be most evident within the Chinese partners compared to European counterparts.
- High levels of collectivism in China result in usage of richer media, likewise, European individualistic societies tend to use less rich media. Looking at communication in such groups, it seems more likely that people in your intimate ‘business’ surrounding are offered a ‘warm’ communication mode like face-to-face communication and video conferencing, than a ‘cold’ message, note or email. More individualistic are expected to use less rich media.
- High levels of collectivism in China influence the issue of face-saving, preventing them from, what others see as bragging, resulting in higher tendency to use informal communication.

5 RESEARCH METHOD

5.1 Questionnaire and Sample

Data was collected at two time points: first one year after the launch of the eBEREA Ireses project (summer 2011) and the second time two years later (summer 2013). The data was collected by using an online survey (surveyworld.net). A link to the web questionnaire was sent out via email to all known participants, that were included in some of the activities of the eBerea network ($N_1 = 46$ and $N_2 = 115$), from the eight universities. The questionnaires contained questions on (1) affiliation, nationality, and
universities visited; (2) cultural aspects from Hofstede et al. (2008, validated question sets available from http://www.geerthofstede.eu/vsm-08) and (3) network related questions. The network questions presented individual researchers (with photo’s) grouped by university, and asked the respondent to rate to what degree he/she is linked to each other researcher in the eBEREA network (possible answers ranging from not linked, communicated, cooperation, coordination, collaboration, partnership, fully linked based on Harris et al., 2008, see table 1). In 2013 survey also questions related to (4) media richness and scales on formal and informal communication were added. Previous questionnaires (Guo & Ambra 2003; Hwang et al. 2003) with their results tested on validity and giving satisfactory results, were preused and only few new 5 point Likert scale questions were added.

5.2 Non-response and data analysis

Unit non-response refers to actors’ answers completely missing from the network, that is when an actor does not participate in the survey at all. Unit non-response rates of our surveys were 51% (1st survey) and 42% (2nd survey). Concerning the unit non-responses, even though for network analysis, in theory, response rates of 90% or more are desirable, in practice, population surveys may have more than 25% non-response rates (Knoke, 2012). Especially when it comes to non-anonymous answers, like in the case of gathering network data, this percentage is sensitive to increase. For instance, in the second survey, due to the unit non-responses, out of 13110 all possible links, 5472 or 42% of links would be missing, even though they could be referred by those who took the survey. The information provided by the respondents of the survey can therefore prove useful, as the links between non-respondents and respondents are indicated by the respondents. As Huisman illustratively points out: “This information can and should be used to adequately analyze the incomplete network” (Huisman, 2009). Based on that, instead of keeping out of the network the non-respondents, the reconstruction method is used, as it is also the most appropriate one for undirected networks (Huisman, 2009). Reconstruction assumes that actors share the same perceptions of their interaction. Thus, when the answer of actor i is missing, leading to the value \(X_{ij}\) to be missing, then \(X_{ij}\) is replaced by the value of \(X_{ji}\), which is the answer given by actor j indicating his linkage with actor i.

In the instructions of the questionnaires, the participants had the option to leave empty the answers referring to people they do not know at all, thus an item non-response is considered as response of not being connected/having collaborated with a participant.

Gephi as well as UCINET 6.0 (Borgatti, Everett, & Freeman, 2002) is used for network statistics and visualization. This allows to illustrate the structure of the current network of eBerea in individual and university level and use it as a basis for comparison with the initial eBerea network. Besides measuring the number of actors, the frequency of their interaction and the amount of collaborations among eBerea participants, density, centrality and other network measures are used focussed on cohesion and prominence.

6 RESULTS

On average every participant had contact with 23 other eBerea members at least once during the project, and with 7 of them frequent contact. The network has been developed through its lifetime, the current network is analyzed and studied in comparison with the initial eBerea network. For this reason, only the “interaction” relation is studied, as this is the one corresponding to an initial study on the network (Yang, 2011). Table 3 summarizes the results that are discussed afterwards.

<table>
<thead>
<tr>
<th>Level of analysis</th>
<th>Measure of the network</th>
<th>2013</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Density</td>
<td>20.6%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Individual level</td>
<td>Degree centralization</td>
<td>52.2%</td>
<td>20.8%</td>
</tr>
<tr>
<td></td>
<td>Betweeness centralization</td>
<td>10%</td>
<td>30.9%</td>
</tr>
</tbody>
</table>
As density denotes the ratio of existing and possible ties among participants, it can be used to compare the current eBerea network with the initial one. Higher density indicates more communication paths among participants (Haythornthwaite, 1998). While the number of participants increased also the density increased. Thus, after the three years of the eBerea program, information is now spread faster and more freely across a larger network than at the beginning of the program. Concerning the prominence of the network, the average distance among eBerea researchers is 1.9, meaning that every actor can reach another by 2 steps on average, whereas at the beginning of eBerea project the average distance among researchers was 3 steps. Individual researchers are currently closer with each other than at the beginning of the program. If we compare the networks with regard to its structure we see that nationality and affiliation still are dominant.

There is a central role for the project leader and for national champions, while some persons have a strong bridging position due to affiliation to multiple universities. On a network level China is most prominent represented (violet nodes in Fig 1a), followed by Finland (blue nodes in Fig 1a). On a university level the University of Jyväskylä is most prominent (green nodes in Figure 1b). As can be seen from figure 1b sub areas of collaboration are mainly determined by the university to which participants belongs. If we look to the hierarchical clustering (Figure 1 c) within the network we find more or less four clusters, one centered around the project leader (Marikka/Jups Heikkilä), one around Qi Li and Yu Zhang, one around Junying Zhong and Matti Hämäläinen, and the fourth of mainly Chinese researchers.
The preferences of researchers in collaborating with others that are based close to them can be illustrated through Table 4. The first column of the table indicates the country that the researchers are based. Italy is a special case because it only concerns one researcher. Dutch researchers are equally open to research with national as well as with international researchers. Researchers from China have focused more on collaborating within their country than outside. The overall E-I index of the network (-0.5) indicates a moderate tendency of individuals to collaborate more with people inside their country.

<table>
<thead>
<tr>
<th>Base country of researchers</th>
<th>Ties with researchers inside the country</th>
<th>Ties with researchers outside the country</th>
<th>Total</th>
<th>E-I index</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>246</td>
<td>48</td>
<td>294</td>
<td>-0.673</td>
</tr>
<tr>
<td>Finland</td>
<td>116</td>
<td>59</td>
<td>175</td>
<td>-0.326</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>9</td>
<td>9</td>
<td>1.000</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>8</td>
<td>8</td>
<td>16</td>
<td>0.0</td>
</tr>
<tr>
<td>Overall rescaled E-I index</td>
<td></td>
<td></td>
<td></td>
<td>-0.498</td>
</tr>
</tbody>
</table>

Table 4. Collaborative ties among researchers based at different countries

Aalto, SWUFÉ, XJTU and RUC have much higher dense ties when it comes to collaborations inside their own universities, whereas the members of AAU, JYU and UNITN form more collaborative ties with researchers outside of their own university. This means that, for example, eBerea researchers from SWUFÉ university are more possible to form collaborations with other researchers from SWUFÉ than with researchers from any other of the eBerea universities. In general the collaboration between the eight universities is intensified (see Figure 2 a and b). Aalto University, South Western University of Finance and Economics (SWUFÉ), Xi’an Jiaotong University and Renmin University of China have the most dense ties. The line weight represents the strength of interaction among universities: the thickest the line, the more ties of interaction among the nodes it connects.
Interesting question is now how cultural dimensions play a role within this community of practice. First of all, based on Hofstede’s measurement tool we conclude that the Chinese participants of eBerea network are more collectivistic than the European participants. However, contrary to what Hofstede in his initial study (1991) proposed, our results show that the Chinese participants are actually more uncertainty avoiding than their European counterparts and the Europeans are slightly more long-term oriented than the Chinese participants. Based on Hofstede Chinese participants were actually believed to score substantially lower on uncertainty avoidance and a lot higher on long-term orientation.

Analysing the results of the media richness preferences some interesting point arise. The preference to use various kinds of media channels is not so distinctive in this project as suggested in previous literature. The data indicates that both nationalities strongly prefer use of email. Secondly face to face meetings are preferred. For the European nationalities this is understandable according to the literature, but Chinese society was expected to prefer a richer media channel due to their cultural traits. Now looking back at the actual research sample, Chinese participants within the eBerea project have indicated that they are relatively short term oriented and not as collectivistic as literature makes do believe. From this point of view face-issues and modesty are less predominate and at least for some part this could give some understanding to the different outcomes of this test.

With regard to preferences for formal or informal communication there is only a significant difference with regard to informal settings where fellow participants are met (Mean Chinese participants = .25; Mean European participants = -.53; t=3.002; df=65; p<.01). This confirms our suggestion that the use of informal communication seems to be significantly more preferred by the higher collectivistic culture (Chinese).

6 DISCUSSION AND CONCLUSION

Based on the analysis we can draw some interesting conclusions

*eBEREA Irses project reinforced long-term research cooperation between partner universities and between individual researchers (Community of Practice):* First of all the eBerea network, a community of practise of eBusiness researchers in Europe and China, has developed over the years from a network with limited interactions to a larger network with higher density. As the expansion in the number of participants normally leads to a lower density, it is clear that intensification of interaction and collaboration within the eBEREA network has progressed in the two-year period covered in this study. The number of researchers more than doubled.

Furthermore, even though the difference between the “popularity” of key actors and the non-key ones –in terms of numbers of people they interact with- is bigger than in the initial network, it is interesting to see that in total more alternative paths of interaction have been developed than initially. Practically this suggests that the current eBerea network is less “dependent” on only some of the persons for its function: in the case that a key researcher leaves the program, the possibility that the people that he knows will be
“left out” the eBerea as well (because they would not know anybody else) is currently lower than in the beginning. Given the dynamic character of eBerea, this is a positive result.

The above findings together confirm that the eBerea network supported by EU Marie Curie International Research Staff Exchange Scheme has succeed in reinforcing Community of Practise in long-term research cooperation both between partner universities and between individual researchers.

Evolving of the network. The network analysis shows how the network and relationships intensified during the project. The lower average distance among participants comparing with the initial eBerea network indicates that researchers have come closer to each other during the years of EU Marie Curie Irses project. Practically this means that, for example, when an eBerea researcher wants to find information for a part of his research, on average he has to go through less intermediaries than before. Furthermore, researchers have through the years taken the advantage of the opportunities that arise for interacting with other scholars in the network. The fact that more people now know more people, comparing with the beginning of the project, also indicates that information runs faster among researchers. Thus, in the case of a new finding in a research area, for example, the related information can disseminate faster through the eBerea researchers than previously.

As proposed expansion of collaboration is most evident within the Chinese partners compared to European counterparts. The central roles in the network have changed since its' beginning: whereas it was European universities that were the most central ones at the beginning of the project, the Chinese universities are now involving more participants, developing more contact ties and thus getting more central positions in the network. It should be noted that even though the collaboration between partner universities is clearly intensified, the ties are still stronger inside each university of origin than with people from outside the university. Based on physical proximity this is a result that can be expected. The same holds for collaboration among countries and continents: the researchers collaborate more with partners close to them (from the same country or the same continent) than with colleagues outside of their country. Especially researchers from China have focused more on collaborating within their country than outside.

Influence of cultural and media preferences: With regard to the cultural dimension, we have to conclude that in the context of a community of practise of eBusiness researchers our empirical findings are contrary to what Hofstede suggest. Chinese participants are a bit more collectivistic than European researchers, but not as strong as expected. Likewise the dimensions defining long-term orientation is almost equal between the Chinese and European participants, where Chinese were expected to be far more future oriented. We do not have explanation for these results, but we can speculate whether the Community of Practise consisting of scientists sharing interest in eBusiness and having similar working environments (universities) would also share similar cultural values. The dimension of uncertainty avoidance holds the most unexpected result; pointing at a far more avoiding stance of the Chinese participants over the European, something that was expected in the opposite direction. There are, though, other recent studies reporting that there has been a shift in the uncertainty avoidance level due to the rapid changes over the last decade on China (Rajaram and Bordia, 2013).

Moreover we could not relate the cultural aspects to the network characteristics in a significant way. Also with regard to preferences for channels or the formal and informal ways of communication the results are rather homogeneous between the sub samples, except that the Chinese participants in the eBerea project have a significantly higher tendency to use and speak within informal settings.

The research has some limitations. First of all, the size of the sample is small. The study also suffered from high non-response rate. The survey was also conducted in English which is not the native language of most of the participants, potentially hampering the response rates as well. The non-anonymous questionnaires are also another limitation of the study, they were, nevertheless, necessary. The time required to fill in the survey, could also potentially influence respondent’s answers in a negative way.

References


