

“German Association or Chinese Emperor?” Building COINs Between China and Germany

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Abstract This paper describes our experience teaching a distributed virtual course with teams made up by students from China and Germany. It is based on a distributed course about Collaborative Innovation Networks (COINs) which has been successfully taught for the last twelve years to students from Germany, the US, Finland, and Switzerland. In this course, students form teams from different locations and languages, and together complete a complex project analyzing online social media. In 2016-2017, we applied the same course framework to participants from China and Germany. To gather insights from the course, we follow a mixed method study design by analyzing qualitative interviews with course participants and quantitative communication data of course participants. We find that combining members from China and Germany into the same team poses a set of unique intercultural challenges, overcoming language and behavioral differences. We present key lessons learned to inform future courses combining participants from the East and the West.

1 Introduction

In the age of globalization, understanding and learning from cultural diversity is important for scholars and practitioners the like. People who work with culturally different colleagues need to know the cultures with which they are interacting and must appreciate their intercultural colleagues' natures, skills, experiences and behaviors. Rising dependence on intercultural teams in the modern workplace calls for growth in understanding of working and communication processes necessary to develop well-performing teams. To improve this understanding, numerous studies were published in the context of intercultural issues in global teams in the past years (e.g. Connaughton and Marrisa, 2007; Gloor et al. 2013, 2016; Krishna et al. 2004; Nicholson & Sahay, 2001; Ochieng & Price, 2010, Stahl et al. 2010). This paper contributes to this research on work and communication in intercultural teams by presenting the recent experiences we made in teaching an intercultural course on Collaborative Innovation Networks (COINs). This paper describes the extension of an

intercultural course on COINs, where students from different countries work together and innovate as distributed virtual teams. They solve complex social media analysis problems, coolhunting for trends and trendsetters on the Internet, doing prediction based on social media archives, or developing new tools for analyzing communication and collaboration. In addition, this is the first time we mix the East and West students together remotely, our experiences and teaching method will provide insights for further collaborations for Eastern and Western universities. We will provide more opportunities for students from the East to have an international studying experience without having to go abroad.

2 COINs Course Overview

The basic framework of the course has been developed and fine-tuned over twelve years with participants from different European countries, and universities in the US such as MIT (Massachusetts Institute of Technology), SCAD (Savannah College of Art and Design), and IIT (Illinois Institute of Technology). The course consists of an introductory block course, where the basics of the method are taught, and a 3-month project part where students form distributed teams. The teaming process is by now well established, with bi-weekly checkpoints, where all student teams have to present to the plenary in class, with the different classroom connected by Web conferencing. These mandatory checkpoints are complemented by at least once-per-week fixed-time meetings where participants from the different locations are meeting face-to-face using Skype or another Web conferencing tools such as WeChat. As part of the course, students also use the social media analysis tool Condor (Gloor 2017), which automatically analyses all types of online communication archives such as e-mail, Twitter, Wikipedia, Facebook, and blogs. We put big emphasis on pro-active communication, encouraging students to be upfront and tell their team members as soon as it becomes obvious to them that they can not deliver a milestone at the agreed-on time.

There is now also a detailed course manuscript available with detailed step-by-step instructions for the students, both describing the theoretical foundations as well as the technical aspects of the Condor tool which is used for online social media analysis (Gloor 2017).

In an increasingly global world, working in distributed virtual teams becomes a crucial capability. While this capability has been taught in previous versions of the COINs course mostly for mixed German-US teams, China is becoming an increasingly active participant in the global economy. Improving the internationalization level of a Chinese university is one of the critical requirements for future high-level Chinese universities. Opportunities to build bridges between the East and West are thus getting more and more important. We therefore, in winter 2016, extended the COINs course for the first time with participants from Jilin University, Changchun, China. Teams consisted of four to seven members,

where always at least two students had to be from both Germany and from China. They were all Masters' students; their majors were in business informatics, computer science, economics, and digital humanities. At the universities participating in Germany, University of Cologne and University of Bamberg, this course has been well established over the last eleven years, with the students knowing what to expect, and a large group of alumni who assist newcomers in the course. For the Chinese students, it was their first experience collaborating with Western peers, also they had no cohort of previous-year colleagues to ask questions for second-level support. The course included 27 students from China and 30 students from Germany working in 9 different teams on tasks such as developing a smartwatch-based "happimeter", and coolhunting about sports, political trends, diseases, and sustainability.

3 Methods

To analyze the success of this year's course, we followed a triangulation multilevel mixed method study design (Creswell et al. 2003). Therefore, we collected different types of data to represent the different levels of analysis within the course with the intent of forming an overall interpretation of the course performance. In detail, we conducted interviews with 11 students (out of 57 participants) from Germany and China after the course was finished, allowing us to get a representative subset of the student population. During the interview, students were asked about their experiences working and communicating in a globally distributed multi-disciplinary group by listing their biggest challenges and successes in teamwork and project tasks. They were also asked about intercultural problems and issues, as well as about the communication tools and meeting frequency. In a second interview part, they were asked about the most valuable lessons they had learned during the course regarding working in multicultural virtual teams, and what they would do differently next time. In the end, we also asked them for suggestions on how to improve the course.

Further, we did a social network analysis of the e-mail archive of the e-mail communication among course participants. This archive was collected by asking the students to cc all their mails to dummy mailboxes, which were at the end of the course analyzed with the dynamic semantic social network analysis tool Condor (Gloor 2017).

4 Interview Results

We conducted a total of 11 interviews, with 4 German, and 7 Chinese students. During the course, we also got feedbacks about collaboration and communication issues mostly from German students. This already illustrates the key different in

culture, with the Germans being pro-active, and telling the Chinese what to do, and the Chinese much more passive, waiting for instructions. This is also one of the typical characteristics of Chinese students as most of the courses are given to a large group (above 100 students). In general, we found that compared to previous years, where the background of the participants was more homogeneous and firmly embedded in Western culture, this year's course was much more challenging. As the most positive lesson from the course, the students appreciated the opportunity to learn about working together with team members from radically different cultures. They noticed that in the beginning they had misunderstandings because of different cultural contexts and language issues, which they learned to cope with over the duration of the course. Students also noticed the crucial role of face-to-face communication in Skype to work out misunderstanding arising in e-mails.

Chinese/German teamwork was supported by similarities in culture that supported collaboration – for instance, the attitude towards being reliable and predictable in German and Chinese culture is similar, and people were on time for virtual meetings, and they also mostly delivered on promises made to their team members. For instance, the Chinese students appreciated what they called the “rigorous attitude” of the Germans: *“I feel the rigorous attitude of the Germans which is deserved learning”* - Chinese student 6.

They also felt that the Germans were more pro-active with regards to innovation, and were impressed by their willingness to try out new ideas and deviate from the well-trodden paths. The students in China and Germany also appreciated the opportunity to make new friends from a different culture, whom they would not have a chance to meet otherwise. The students were appreciative of the efforts of the teachers, who made themselves available and approachable.

“From the course, I learnt the knowledge about social network and the most valuable thing is how to cooperate with others” - Chinese student 1.

“The project offers us a chance to communicate with foreign students which has great significance” - Chinese student 1.

“There are some communication challenges, but I didn’t feel the cultural differences” - Chinese student 2.

“Cooperation with foreign friends is completely different. We need to learn to learn from others” - Chinese student 2.

“Our foreign teammates have a high efficiency all the time which is something also we should learn. In the meantime, they have a strong logic when they do anything” - Chinese student 2.

One main difference between the German and Chinese students was their attitude towards leadership. While the Germans were – in the spirit of COINs – working in self-organizing sub teams, the Chinese were looking for a strong leader:

“I think we need a leader as a team. Each team needs a leader to organize everyone to meet, and division of labor, so that everyone can participate in this event. A rudderless team will reduce efficiency”, according to Chinese student 3.

"Our Chinese colleagues were much more observing. Sometimes we were not sure if they understood everything or listening. We were talking like all the time. We have some people in our group who would like to talk as well. Sometimes we didn't know if our colleagues in Jilin did understand everything or felt confident to ask something. They were very quiet. But they also did a good job." - German student 1

"German students always say: "we want to do". Chinese students are not saying what they want to do, they are waiting to be assigned. This got better over time." - German student 2

All the team projects were chosen based on the mutual interests of students. There were two teams working on the same task, one team with an appointed project manager (a German student) whose sole task it was to manage the team, the other with three informal leaders (two Germans, one Chinese) who took turns depending on skills and tasks. We evaluated the final project paper, the team with rotating leadership far outperformed the team with the rigid leadership structure.

In the interviews of both Chinese and German students a list of problems was brought up: The English language skills of the Chinese students were quite varied. While some students spoke and wrote excellent English, the English language capabilities of many Chinese students were rudimentary, which made communication extremely challenging. This is also because most of the university courses are given in Chinese. The percentage of English speaking students is very low. Therefore, Chinese students have no chance to use their English skills. Our course provides an opportunity for Chinese students to communicate with international students at no costs for students who are not able to study abroad.

The Chinese students encountered technology problems doing the Web analysis for the Coolhunting projects, which were chosen by most of the teams. This is because our course involves more social science students than computer science and engineering students. Coolhunting projects are more relevant for social science students. In particular, for those students, there were two technical problems, (1) Internet connectivity and (2) Chinese language support. The Chinese students had connectivity issues because of restricted Internet access in China to Twitter, Facebook and Google search, which form the backbone of analysis for doing social media coolhunting projects in Germany and the US. While there are other systems in China, such as Baidu, and Sina Weibo, there would still be a lot of Internet content in Chinese available in Twitter and Facebook, but the "great firewall" blocked this access for automated data collection with Condor. The second issue was the missing Chinese natural language processing capabilities of the Condor tool (which only supports Western languages such as English, German, French, Italian, Spanish and Portuguese). In the end, Condor was the coolhunting tool predominantly used by the German students. The Chinese students ended up using simpler Chinese tools such as manual searches with Baidu, and directly collecting data from Sina Weibo, the Chinese equivalent of Twitter.

There were also technology problems in video conferencing between China and Germany, and one instructor frequently participating from the US. We started

using Adobe Connect, hosted on a server in Germany. In the beginning, we had big connectivity issues, and so we started experimenting with WebEx and Skype, however we found that using the right settings, and asking for a high-speed connection at Jilin University solved these issues. In the second half of the semester Adobe Connect provided a satisfactory teleconferencing experience.

Despite these obstacles, the overall assessment of the students was quite positive, and they recommended keeping this seminar as a regular offering in the future:

“We liked”...“the method of collecting foreign data. The precious experience of communicating with foreign friends is also valuable.” - Chinese student 4.

“This teaching method is novel, it can be in line with international standards, so that we broaden our horizons.” - Chinese student 5.

5 Knowledge Flow Analysis Through E-Mail

In addition to the interviews, we also did an e-mail based social network analysis with Condor. During the teamwork phase of the course, all students were asked to cc their e-mail communication to a different e-mail address per team, which was then collected for analysis with Condor. Figure 1 illustrates the e-mail activity over time, peaks in activity before each bi-weekly in-class meeting are clearly noticeable. This nicely illustrates the need for these meetings, because otherwise students would defer all work to the end of the course.

Fig. 1. Activity of E-Mail over time

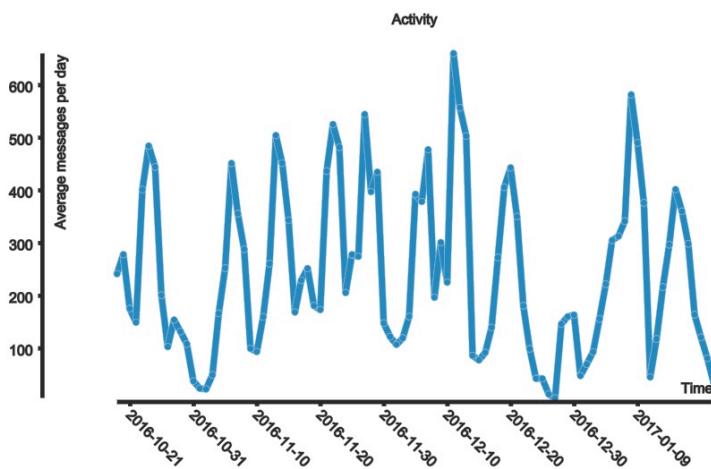


Figure 2 illustrates the sentiment, complexity, and emotionality of the e-mail content. Sentiment (the blue line in figure 2) is positive and above 0.5 most of the time. Sentiment of 0.5 would denote neutral language, values below 0.5 denote negative sentiment. We find that right before Christmas sentiment drops somewhat to 0.4, which might be because of coordination problems between Germans and Chinese students during the vacation time. At the same time, emotionality (the green line) is jumping up, illustrating the same more emotionally charged discussion style. Complexity (the yellow line) is quite high, illustrating the complex technical topics discussed by the different teams. Complexity is measured as the probability of distinctive words in individual messages compared to the occurrence of these words in all other messages (Gloor 2017). Emotionality (the green line) is measured as standard deviation of sentiment.

Fig. 2. Sentiment, emotionality, and complexity over time

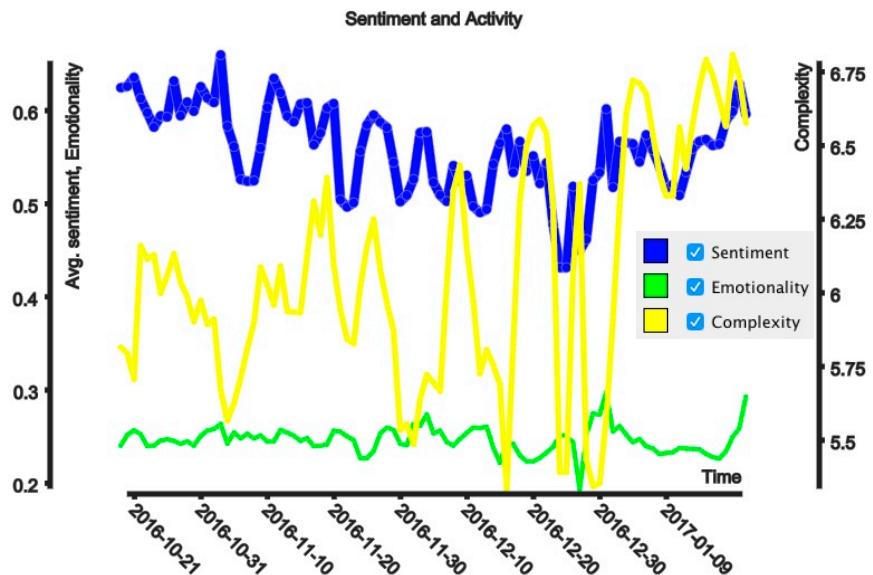


Figure 3 illustrates the word cloud, most words are in green, denoting the positive context of the words. Only words such as “problem”, or “app”, which was the product of one of the teams, are shown in red, indicating negative sentiment. The most popular words were “presentation”, “meeting”, “time”, and “peter”, the first name of one of the instructors. This illustrates that students were working from one bi-weekly presentation to the next, and discussing who would be presenting next at the meeting.

Fig. 3. Word cloud of contents, the greener the text, the more positive is the context of a word

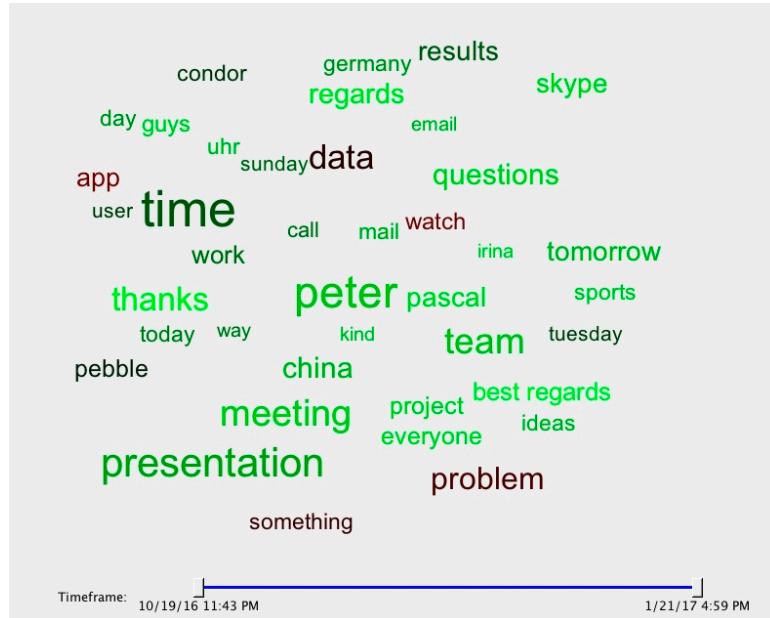


Figure 4 shows the social network, constructed by the e-mails exchanged among the students and instructors. Nodes are colored by location. We find that the German students (in green) are closer to the center and the instructors (in blue), indicating the more pro-active communication style of the Germans. The Chinese students (in orange) are all much more peripheral. The nodes are sized by influence as calculated by Condor. Condor measures influence by tracking who introduces a new word first, and who picks up this word next. We find the German members of one team, which was building a smartwatch based communication-tracking system to calculate happiness of wearers of the smartwatch, to be most influential. As the students are from very different fields, for each team, the topic they chose was also very different, most of the students prefer to work as a team instead of communicating with other teams. However, during our interview to students, they would like to communicate with the teams that have a similar topic.

Fig. 4. Social network of class, node size by influence

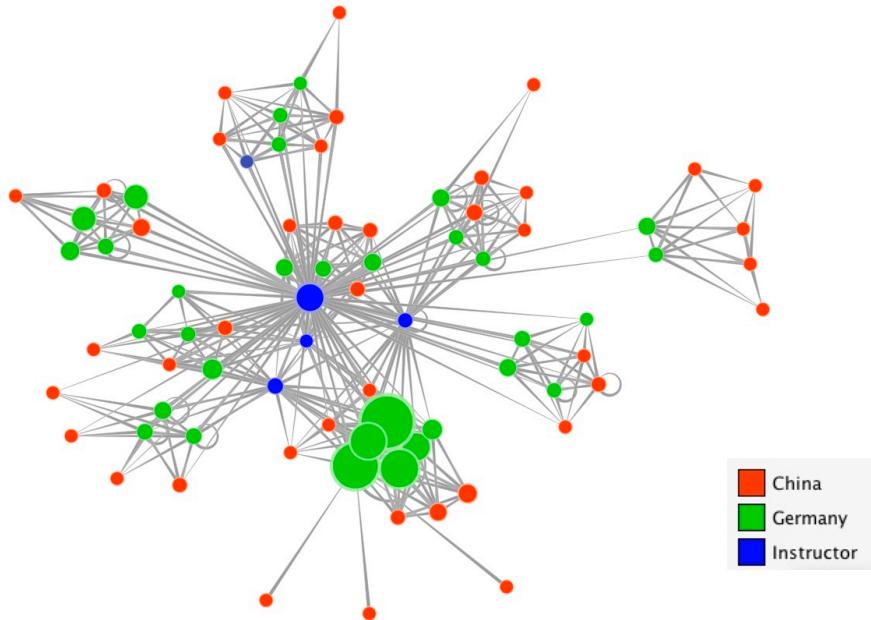


Figure 5 illustrates the temporal social surface. In this representation, the x-axis shows the different people, the y-axis shows time, and the z-axis shows betweenness centrality of each person. The more this picture looks like a “stormy sea”, with changing betweenness curves for each person, the more creative is the group. In figure 5 we see four major spikes. The first one, in the back, shows the central role of the main instructor (Peter) in kicking off the course, by exchanging e-mails with many different students. The second spike illustrates the first bi-weekly project status meeting, where again Peter is exchanging e-mails with many different students. After this initial phase, the communication becomes much more decentralized, with many different students assuming leadership roles, resulting in many smaller spikes over the rest of the course.

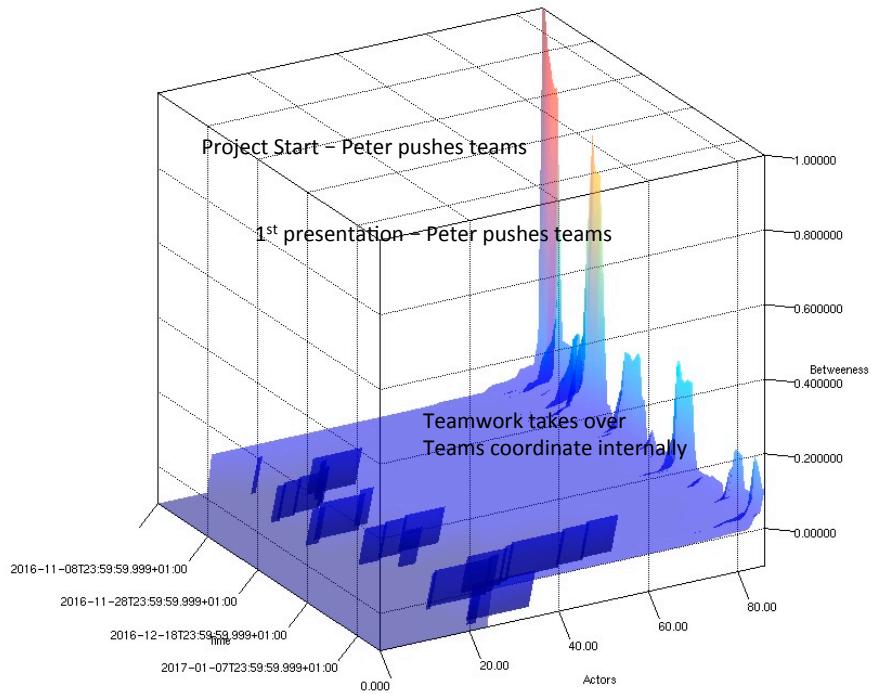
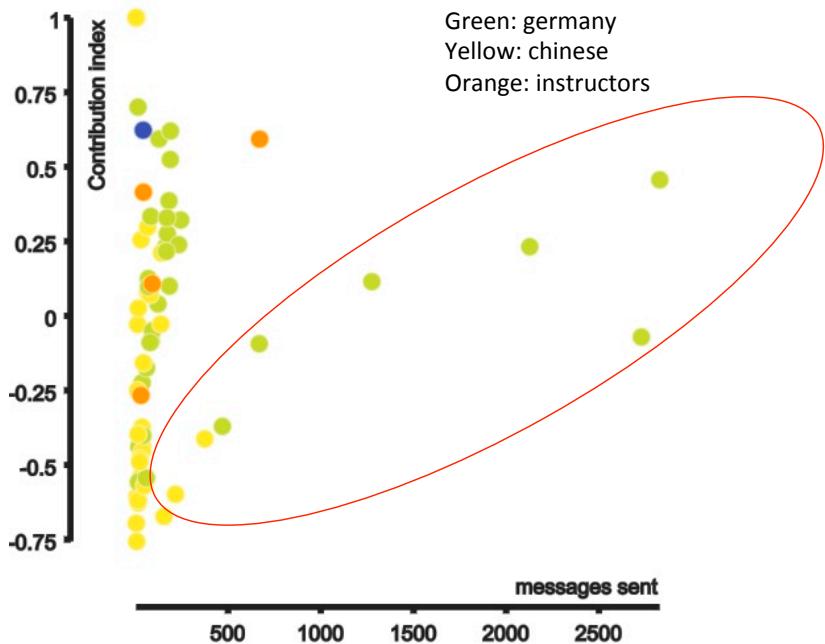
Fig. 5. Temporal Social Surface

Figure 6 illustrates the contribution index, which shows how pro-active a participant is. Each dot in figure 6 is a person, the farther to the right a person is, the more she sends or receives e-mail messages. The higher up the person, the more she sends. If a dot is at the top ($y=1$), she only sends e-mails, if she is at the bottom ($y=-1$), she only receives e-mails. The large red oval illustrates the same team 9 as discussed in figure 4. We find that the German students in team 9 (the green dots) are the most active participants in the course, sending the most e-mails. We also find that the yellow dots (the Chinese students) are more passive, as they are farther to the left, and farther down, than the German students, confirming our findings from the interviews.

Fig. 6. Contribution index

6 Lessons Learned and Conclusion

While we still have much to improve, we found the existing COINs course framework robust enough to teach distributed virtual teamwork to participants from cultures as different as Germany and China. Table 1 below lists our key insights.

Table 1. Key Lessons learned

Issue	Recommendation
English language skills	Make it crystal clear that English language skills are a prerequisite (particularly in China)
Passive work style of Chinese	Constantly encourage Chinese to ask questions and speak up
Long-distance project management	Encourage students to have clear deliverables for each milestone for each student
Self-organizing work style of Germans	Encourage them to allocate tasks to Chinese students
Non-aligned holidays	Encourage students to share their mutual holidays (e.g. Chinese New Year, Western New Year, Carnival in Cologne)
Not loosing face	Encourage students to ask questions and inform their peers about what they do not know
Attitude towards paper writing	Make it very clear the copying text from the Internet for the final paper is plagiarism.

Even though we found that the Chinese students were more passive during the collaboration phase of the project, most of the Chinese students gave positive feedback about the course. Based on interviews with the students, they were attracted by the novelty of the framework of the course, which was totally new to them. First, most of the classes in Jilin University are given in Chinese, there are only 4% courses are given in English. Second, the university is collaborating with a large number of international universities. However, the students haven't gotten enough chances to work with international students yet. Thirdly, the students have never collaborated with another international university through virtual meetings. Finally, most of the Chinese students are used to sitting in a class and passively listening to the lecturers' presentation. The learning efficiency is very low. This teaching method requires the students to work together in a team, which drastically improved their productivity.

While the goals of the team projects were challenging, students were motivated to finish their assignments, as they did not want to "lose face". During the learning process, most of the Chinese students reported that they learned new behavior and processes never experienced before. First, as the course is based on international collaboration, Chinese students were forced to present to the whole group every other week through virtual meetings. To prepare their presentation, they needed to communicate with each other occasionally. Secondly, they learned a lot from the German students such as their working attitude and time management. *"It is a good opportunity for us to do a work with the students from a different cultural background although there are many challenges. We can learn many things from our teammates, such as the way of thesis writing. The students from Germany has high efficiency but are also a little stubborn..."*, according to

Chinese student 3. Chinese students are used to be “assigned” and keep “silent”. After experiencing the course, they became more critical than they used to be and started expressing their own opinions. Thirdly, most Chinese students are good at English exams rather than using English as a language for communication. The course provides students an opportunity to break the wall between Chinese and German students. They had to find a solution to communicate with each other first.

As for German students, they were surprised by the much more passive initial attitude of the Chinese students. As German behavior is more pro-active, they ended up assigning the team tasks to individuals and coordinating the projects. Also, as on average they had better English skills, they ended up writing most of the final papers. There were two main reasons why the Chinese students contributed very little to writing the final papers: (1) their English skills were not sufficient to write a scientific paper, and (2) they did not get enough credit from their university to invest large amounts of time into writing the final papers.

While the German students expressed some frustration, their overall assessment was quite positive, as they reported a unique experience not possible otherwise. To close with a quote from a German student: *“Overall, the project was an amazing experience, and over long periods of teamwork we had a lot of fun interacting with our Chinese colleagues.” – German student 2.*

In response to what we have learned from the fall semester course described in this paper, we improved our teaching methodology in the spring semester for both Chinese and German students. In the new COINs course, the local instructor asked the Chinese students to take the initiative in the team meetings. The preliminary results show that the Chinese students can be more active when being guided. The quality of team communication has also been improved. The local lecturer has reported to the university to change the general regulation so the Chinese students can be motivated to take a more active part in the team projects in the future. We therefore think that this course framework provides a unique learning environment to both students from East and West.

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