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CHAPTER XX

Intercultural Competence in Global Collaboration Courses in Computer Engineering

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ABSTRACT

With the rapid and ever expanding globalization of the workforce, international collaborations are becoming part of everyday life for people of many professions. Intercultural competence has therefore become one of the central professional competencies needed for students in higher education, in order to equip them for their individual careers as well as contribute to a prospering society as a whole. We will start by discussing some definitions of intercultural competence and then describe two annual international collaboration projects between students from the US, Sweden and Turkey. We will present how intercultural competence is addressed through the introduction of an external lecturer and the use of reflections and discuss the outcomes of this approach in relation to the definition of intercultural competence.

Keywords: intercultural competence, open-ended group projects, global collaboration

1 INTRODUCTION

With the rapidly expanding globalization of the workforce, international collaborations are becoming part of daily life for people of many professions. Intercultural competence has therefore become one of the central professional competencies needed by students generally in higher education, in order to equip them for their individual careers as well as contribute to a prospering society as a whole. For computer engineering students such a competence is perhaps particularly crucial, as companies in the computing and IT areas are at the forefront in terms of globalization. Outsourcing, off-shoring, and similar processes, are endeavors that often have to be taken into account and where intercultural competence is central. However, even though intercultural competence is crucial for students, few courses at the university have the development of intercultural competence as a learning goal. As a counterweight to this deficiency we present our experiences from working with intercultural competence in two collaborative courses.

We start out by discussing models of competence in general and especially that of intercultural competence. This is followed by a presentation of two student collaborations. Our experiences from addressing intercultural competencies in the courses through seminars, project work, and assignments are presented and related to our definition of intercultural competence. We substantiate our experiences with citations of comments from students and conclude with a discussion of how we plan to proceed with our efforts to create a learning environment where students develop intercultural competence.

2 INTERCULTURAL COMPETENCE

2.1 Professional competencies

There is general agreement that students of higher education need to possess a variety of professional competencies when they graduate. However, what constitutes these competencies is often unclear, as is how to develop or assess them. The matter is further complicated by the fact that very few course units specify professional competencies explicitly. Guidance can be found in definitions made by international organizations of professional competencies, e.g. by the Organization for Economic Co-operation and Development (OECD). The Definition and Selection of Competencies (DeSeCo) project (OECD 2005) is intended to provide a framework for an understanding of competencies in general and is based on definitions and assessment methods. It is designed to set overarching goals for education systems and lifelong learning.

The view in the DeSeCo project is that a competence is more than knowledge, it

is also the ability to deal with complex situations in particular contexts. The idea is to capture what is needed to deal with such situations in general through the definition of a few key competencies. These key competencies must:

- Contribute to valued outcomes for societies and individuals;
- Help individuals meet important demands in a wide variety of contexts;
- Be important not just for specialists but for all individuals.

The key competencies are classified in three broad categories: being able to use tools for interacting with the environment, being able to engage with others in heterogeneous groups, and being able to take responsibility for one's own life in a broad social context and act autonomously. Central to all categories is the ability to think and act reflectively. The interacting in heterogeneous groups key category contains three competencies that address the need to keep up to date with technologies, to adapt tools to one's own purposes, and to conduct active dialogue with the world. The first competence is the ability to use language, symbols, and text interactively, which concerns using spoken and written language skills, computation and other mathematical skills effectively in multiple situations. This is associated with communication competence and literacy. The second competence is the ability to use knowledge and information interactively, which requires critical reflection on the nature of information itself. This competence is needed in order to understand and form opinions, make decisions, and carry out informed and responsible actions. The third competence is the ability to use technology interactively, which is based on an awareness of new ways technology can be used in everyday life. Harnessing the potential of information and communication technology (ICT) is part of this competence.

2.2 Defining Intercultural Competence

Intercultural competence can be described as the ability to communicate effectively and appropriately in intercultural situations based on one's intercultural knowledge, attitudes and skills. In the past, the focus may have largely been limited to knowledge about the other culture. Today, and in line with the DeSeCo definition of competence described above, the concept stresses both knowledge and comprehension of one's own culture and other cultures, an attitude of openness, curiosity, respect and inclusion, as well as the skills that one may acquire based on this knowledge and an open, inclusive attitude. These skills would allow an individual to select and use appropriate communication styles and behaviour in different intercultural situations, adapt to new cultural environments and successfully interact with people from different cultures.

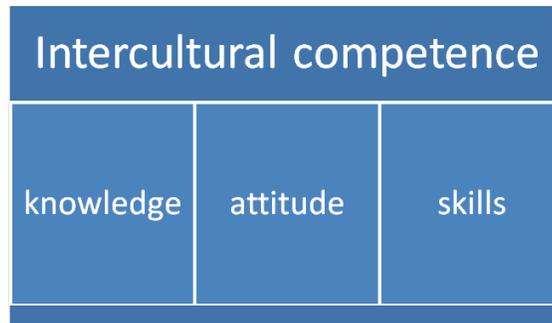


Figure 1 Intercultural component model based on Byram's Model of Intercultural Communicative Competence (1997)

This model of a competence as a combination of knowledge, attitude and skills reflects for example that of Byram (1997), and the Intercultural Competence Components Models by Howard-Hamilton et al. (1998).

We will in this paper adopt a view of what constitutes intercultural competence based on Byram's model depicted in Figure 1. We also stress the importance of capturing the invisible aspects ("codes") of what a culture is. These aspects are discussed by Hofstede and Hofstede (2005) and Trompenaars and Wooliams (2003) described them in terms of layers of an onion. A similar analogy regarding the invisible aspects is that of an iceberg, where only a very small part is visible above the surface, e.g. language and traditions, and most is invisible below the surface, e.g. values, emotions and attitudes. Thus, we have a model of intercultural competence where the components are:

- *Knowledge* about different cultures and culturally inherent values in general and the target cultures in particular, about social processes and "codes", e.g. how people from other cultures may perceive you and interpret your behaviour, as well as knowledge about your own cultural identity.
- *Attitude*: to emphasize and encourage openmindedness and a desire to continue to learn, to be curious about other cultures, continually reflecting on your own behaviour and be open to adapt it (without giving up your own identity).
- *Skills* : these build on knowledge and attitude and concerns the ability to choose and develop appropriate behaviour and communication style when interacting with people from other cultures, to create trust and build intercultural relationships.

3 THE STUDENT COLLABORATIONS

This paper describes experiences from addressing intercultural competence in two student collaborations. These collaborations are shortly presented below.

3.1 The Collaboration Between Uppsala University - Rose-Hulman Institute of Technology

The local setting for this study is a global collaboration between 4th year Computer Science (CS) and IT engineering students at Uppsala University, Sweden, and 2nd and 3rd year CS and Software Engineering students at Rose-Hulman Institute of Technology, Indiana, USA. This setting and different aspects of it have been described elsewhere, as for example in (Cajander et al. 2009a, Cajander et al. 2009b, Cajander et al. 2011, Daniels 2010, Daniels et al. 2010, Daniels 2011, Laxer et al. 2009), but a short summary is given here to provide the reader with a quick overview.

The educational setting is aimed at developing professional competencies that are essential in relation to working in a global collaboration setting. This setting is based on the Open-Ended Group Project (OEGP) concept (Daniels 2011), where complexity and many options for how to approach a problem are central issues. OEGP is hence a suitable concept for preparing our students for working on a global arena.

An important aspect of the educational setting is that the project is placed in a real environment with a real client. This adds to the complexity but is also shown to increase motivation for the students (Marra and Wheeler 2000). An issue with real clients is that they also have other obligations and it can be hard to get reasonable access. This has been addressed by only using one reliable client and putting all students, typically around 25 with a majority in Uppsala, into one project. Another issue with a real client might be that some students feel ethically constrained to help certain clients, e.g. for political, religious, or competition reasons. We have for that reason chosen to work with a client in the public health sector, i.e. the Uppsala County Council and the associated academic hospital.

3.2 The Collaboration Between Bilkent University and Rose-Hulman Institute of Technology

The collaboration between the Rose-Hulman Institute of Technology and Bilkent University, Ankara, Turkey, is the other experience this paper is based on. The setting and student feedback from the initial collaboration has been described in detail elsewhere (Chidanandan et al. 2010). The Rose-Hulman students are drawn from the same cohort as in the Uppsala - Rose-Hulman collaboration and the students from Bilkent involved in the project are 3rd or 4th year students studying at the Department of Computer and Instructional Technology Teacher Education at the Faculty of Education.

In this course, using their Computer Science (CS) background, students were expected to work with a team to analyze, design and develop an IT solution in cooperation with a real client (International Children's Center). Although the Bilkent students are not CS majors, they do follow a CS track in their program and the IT project is well matched with the educational goals of their program. The

client was selected based on the criteria that the organization should ideally be a non-profit organization with an international focus in order to minimize language and client communication issues. The class sizes in the two experiences of the Bilkent - Rose-Hulman collaboration were 11 (8 from Bilkent, 3 from Rose-Hulman) and 17 (10 from Bilkent, 7 from Rose-Hulman).

The collaboration experiences in 2009 and 2011 have similarities and differences. Both included external professionals; during the first collaboration the invited speaker gave a presentation on Turkish and American cultural differences, and in the second collaboration the invited professional gave a workshop on intercultural communication at the beginning of the course. In addition, while the supervisor for each project course was different, it was for both their first involvement in a global collaborative project course. One of the course supervisors was a Canadian who had lived in Turkey for 10 years. In the first experience, there was one project and one client, in the second one there were two clients, three user groups and one common project theme.

There is a difference in the actual or perceived focus of the project at the respective institutions. At Bilkent University the course has a strong product focus and Bilkent students usually perceive this course as their senior project course in which they utilize their IT skills, before starting to take the pedagogical courses. At Rose-Hulman the course is offered as an elective course with a focus on the process and global/intercultural awareness.

4 EXPERIENCES FROM ADDRESSING INTERCULTURAL COMPETENCE

A common objective in the courses is to cover the different components of intercultural competence as defined above. The components are addressed in several ways, for example by the students acting in a globally distributed project with team members with different cultural background, by the introduction of an expert on cultural awareness, and by having assignments in which the students are asked to reflect on cultural aspects of their collaboration. In this section we present our experiences in these three areas and relate them to our definition of intercultural competence. We substantiate our experiences with citations of comments from students.

4.1 Introduction of an External Lecturer in Intercultural Collaboration

The external lecturer was introduced in the Uppsala - Rose-Hulman collaboration in 2007 (and has been returning annually since). The same lecturer worked with the students in the Bilkent - Rose-Human collaboration in 2011. In the collaboration in 2009, a presentation on cultural differences was given by a different speaker (as described above). Even though all of the teachers involved in these global collaboration courses have extensive intercultural experience and could bring

a great deal of empirical competence to the table themselves, we have found that introducing an external expert in the field has not only provided additional credibility and some extra “gravitas” to the subject, but also sent the signal to the students just how important we, the teachers and faculty, view this competence. The following quote represent a common view among the students and illustrates this point.

“After the seminar with Helena Bernáld, I realized that intercultural skills are more important than I thought they were. Two months on a part-time basis is too short to learn another culture, but I think it will be long enough for me to at least get a general idea, and experience how another culture does business.”

The quote also address the issue of learning intercultural competence as a life-long process. Starting the collaboration with a boost of the knowledge component is essential in our experience, since it is noticeable that some of the students have little intercultural knowledge. It is not unusual that their expectation before entering the project course was that the only difficulty in a global distributed project would be handling the time difference, as in this quote:

“I have never worked on a team of people from a different culture as my own. Before this class started I didn't expect to get much out of it. I don't know what I expected, but it wasn't what this class turned out to be. I had no idea what it was like to work on a international team, and I didn't expect it to be different or more complex than just dealing with a time zone difference. From what I have seen in just four weeks has changed my opinion of this course. There are so many issues and items to consider when dealing with international teams that I never thought about. I hope the amazing opportunity presented in this class will help me in both my professional and personal development.”

4.2 Introduction of Reflection Assignments

Intercultural interaction provides excellent opportunities for reflection and learning. Schwartz, Xiaodong, and Holmes (2003) note that intercultural experiences, “in addition to alternative models of practice, [---] provide contrasts that help people notice aspects of their own practice”. Reflections can be used to address specific areas to enhance learning and in the courses it has been used as a way to make the students reflect on their intercultural experiences as well as on other aspects of the collaboration. Moreover, reflecting on practice or in practice can be seen as one of the key components of life-long learning in professions, as defined by for example Schön (1983). In the Uppsala - Rose-Hulman collaboration reflections have been used since 2007, and a written reflection on their experience of cultural differences has been a part since then.

Regularly reflecting on cultural differences, on one's own development and intercultural behaviour, is imperative in the process. Some of the students express how they really discussed and reflected on the cultural differences during the weeks when the students met, as in this example:

“During the RH week we experienced some cultural clashes despite the seminar by Helena. The clashes I'm referring to are the way we Swedes communicate (we

don't always say what we think), some bad manners at the restaurants and attitudes towards women. I think all of them were harmless though, partially because of everyone's will to be open minded."

The experience from the teachers is that reflection assignments definitely have a positive impact on the students' acquiring intercultural competence. It has not least drastically reduced the tendency to blame "the other side" when things didn't work out well, since most of them realized that they most likely had a part in why things worked as it did themselves (and possibly also realized that they were likely to get a question about what they had tried to do to make things better).

4.3 The Actual Collaboration Project

Creating opportunities for students to have intercultural experiences is seen as essential by most researchers in the field, but it is also pointed out that spending time in a different culture is not enough, as it takes more than mere contact with, or presence in, a different culture to develop intercultural competence. As Deardorff (2009) points out, building authentic relationships through dialogue, listening, observing, asking those from a different background to teach and share their cultural values etc, is key. It is the attitude and skill components of intercultural competence that really matters in achieving this in the real collaboration project.

To get the students to truly interact is however not something that comes easy and is one important reason for arranging an introductory week when most of the students meet face-to-face. The work during this week, and the social activities that are organized by the students in the evenings are generally mentioned as an invaluable aspect for the outcome of the project and the acquisition of intercultural competence in the reflections on intercultural experiences. This positive effect has impacted the organization of the introductory week, and since two years all the American students come to Sweden in the beginning of the semester. Another change made to improve the possibility for intercultural learning was to offer housing of American students in the Swedish students' homes. This made it possible for the students not only to meet during working hours, but to actually spend a whole week together. This has been much appreciated by the students, as described in the following quotations:

"The first week together with the Americans was one of the, if not the best week yet at the university. It wasn't just all fun though, it was also an eye opening experience regarding cross cultural communication and cooperation. This is something I most probably will have use for later on in my life, since I want to work with projects across the borders in the future."

and

"I feel like everyone in my team went into this project with a very good attitude and willingness to do their very best for it to be a success. As I have mentioned earlier I think this has a lot to do with the introduction week in the beginning of the project where we get to know each other. You feel a lot closer afterwards and when you care about the people you work with you are even more prone to do your best work since you do not want to let your friends down."

4.4 Discussion

Our objective for the intercultural aspect of the courses, is to bring the necessity of intercultural competence into focus and to raise the students' awareness of culturally inherent values in general and their implications for successful communication and collaboration. Our aim is for the students to acquire a more clearly defined picture of their own cultural identity, including inherent Swedish, Turkish and American values and how these manifest themselves in communication patterns, decision making and choices made in professional and social situations. Discussing the concept per se with the students seems to have a positive effect on the competence development process, as well as focusing part of the seminar on how they can learn from each other, how to keep an open and inclusive mind if they encounter challenging or frustrating situations in their interaction with the students from the other culture, and how to adapt their own communication style and behavior to overcome these challenges. As some of the quotes above have shown, many of the students have expressed focusing on being observant of cultural differences during the collaborations. A majority of the written reflections and evaluations testify to the students making a conscious effort to keep an open mind seasoned with goodwill and to accommodate the culture-related communicative differences, as expressed in this quote:

“The seminar of cultural differences in the beginning of the week I really liked. That gave all of us something to think about when we interacted with each other and planned the project. We learned more each day how to interact and adjust to our differences.”

As noted above, the reflections on cultural differences reveal that most of the students have little or no prior formal knowledge of intercultural competence when they start the global collaboration courses in our learning environment. Some of them have prior intercultural experience, for example from having studied abroad, and some may have worked in multicultural teams in their local environment at the university, or spent a semester studying abroad. However, very few students claim to have studied or addressed the various dimensions of intercultural interactions before, and for many, this is the first time they become aware of the potential challenges at hand. This is depicted in the following quotes:

“Thanks to the presentation by Helena, a good portion of understanding my Swedish

counterparts has already been taken care of. That was quite possibly one of my favorite days of the week in Sweden and by far the most eye opening experience. I had never considered many of the different aspects of their culture that Helena brought up.“

and

“The Swedes have an entirely different cultural perspective and in some cases an entirely different world view driving their perception of this problem.”

5. CONCLUSION

The paper is based on experiences from close to ten years experiences of running international student collaborations with an aim to improve intercultural competence among the students. Our conclusion from this is that there are no “silver bullets”, but also that it can be done. We believe that the above given definition of intercultural competence is clearly beneficial in arranging a learning environment where students develop intercultural competence.

The intercultural competence definition has, for instance, been useful in finding a balance between scaffolding and openendedness in the educational setting. Scaffolding like the introduction of lectures by an expert in cultural awareness has been highly successful, in particular with regard to both the knowledge and the attitude aspects of the competence. One difficulty with providing scaffolding is that it complicates assessment of intercultural competence in that the students learn what to say to appear having the competence rather than acquiring it. This view is based on having a social constructivist (Vygotsky 1978) view of learning and that intercultural competence is achieved through real involvement in such a community.

The use of assignments where the students reflect on their collaboration is another example of scaffolding in that it provides aid to observing the mechanisms of the intercultural collaboration. These assignments have also been introduced to raise understanding of potential consequences of cultural differences and especially lead to a higher appreciation of the contribution of their peers. The aspect of creating an environment where it is easier for the students to appreciate each other is an interesting consequence of striving to achieve intercultural competence in an educational setting. To value the contributions of peer-students is a central learning activity in the Contributing Student Pedagogy (Hamer et al 2008) and our approach fits smoothly with the philosophy of this pedagogy.

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