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Developing intercultural competences for future engineers and managers

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ABSTRACT: Globalisation affects all sorts of organisations and, as a consequence, the work and life of engineers. In order to prepare students for these new conditions, universities have to offer the required contents in a most effective structure. In this article, the author introduces the topic of intercultural communication and negotiation, and provides definitions. The author outlines the aims for the development of intercultural competences and suggests training in the topic in the form of a seminar, which consist of up to six modules that can be combined. The first two modules deal with general intercultural concepts with the next two modules focusing on negotiation specific concepts. Additionally, there are also two modules that centre on preselected target cultures. In the article, the author also lists personal traits that enhance the acquisition of intercultural competences and he then explains the most important concepts in general intercultural communication. These concepts serve as the contents for the base modules of the seminar.

INTRODUCTION

The increasing level of globalisation (being defined here as the international meshing of societies and economies) in industry, science, education, as well as government and non-government organisations, is a fact most noticeable in everyday life. Given that many graduate engineers internationally will encounter situations where they deal with foreign professionals or engage in work in a foreign nation, intercultural competences and empathy for foreign cultures are important aspects to be considered in engineering education [1]. Korhonen states that organisations often emphasise expatriates' technical competence and experience, and ignore the non-technical knowledge and skills [2].

Apart from general communication, a large percentage of communication involves negotiations. Adler states that global managers spend more than 50% of their time in formal and informal negotiations [3]. Being able to effectively negotiate across cultures is seen as one of the single most important global business skills.

As a consequence, it will be increasingly necessary to integrate intercultural communication and negotiation contents into engineering curricula to facilitate the development of the required skills and competences within engineering students. Given the importance of the topic, this author outlines how intercultural competences, including general communication as well as negotiation skills, can be developed within engineering students. The author gives the aims of intercultural training and suggests a structure for such training, as well as outlines the most important concepts to be covered in this education process.

BACKGROUND AND DEFINITIONS

When growing up, every person develops a specific culture-dependent orientation of his/her perception, thinking, valuing and acting [4]. In the first decade of their lives, most people move within the framework of their own culture and they experience that the people around them follow an identical or very similar orientation. As a consequence, this experience leads to the conclusion that people follow similar aims and respect identical norms and values. Therefore, we tend to generalise our own views, behaviour and attitudes upon people of other cultures [5]. A precise definition of culture is difficult, not to say impossible. Already more than 30 years ago, Ajiferuke and Boddewyn stated that culture is one of those terms that defy a single all-purpose definition and there are almost as many meanings of *culture* as there are people using the term [6]. The anthropologists Kroeber and Kluckhohn catalogued more than 100 different definitions [7].

Nevertheless, in the article, the author shall provide some conceptualisations of the amorphous concept of *culture*. Williams sees culture as the *whole way of life of a distinct people* ... [8]. Richards et al view it as a *total set of beliefs, attitudes, customs, behavior, social habits* [9]. Borden describes a graphical representation of culture that consists of three primary dimensions: languages, physical and psychological [10]. In her works, Adler quotes one of the definitions of culture from Kroeber and Kluckhohn as one of the most comprehensive and widely accepted definitions of culture, as follows:

> *Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols constituting the distinctive achievement of human groups, including their embodiment in artifacts; the essential core of culture consists of traditional (ie historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other, as conditioning elements of future action* [7].

Culture and communication are so closely related that Hall maintains that *culture is communication* and *communication is culture* [11].

Bolten has criticised a narrow definition of culture and has argued for an extended, secular/worldly defined term of culture that does not separate, but rather integrates, and one that deprives itself of attempts of valuation [12].

Negotiation has been defined by Acuff as the process of communicating back and forth for the purpose of reaching a joint agreement about differing needs or ideas [13].

The topic of negotiation has originally been a domain of psychology and related disciplines (eg refs [14][15]). However, it has become increasingly interdisciplinary with the migration of concepts and learning across disciplines. A stronger contextualisation of the approaches applied has led to a broadening of paradigms. In the social sciences, for example, there has been a gradual shift from psychological approaches to approaches using social psychology, sociology and social anthropology [16]. Negotiation has also been analysed from a socio-linguistic perspective, often in the context of discourse analysis [17][18]. Negotiation has been viewed by researchers for many years only within the limits of their own culture. With the emergence of a globalised world, researchers have started to investigate the effects of culture on the negotiation process and integrated the cultural dimension into the negotiation domain.

AIMS FOR THE DEVELOPMENT OF INTERCULTURAL COMPETENCES

The aim of the development of intercultural competence is to enable people to successfully interact with people of other cultural backgrounds. It is important to note that in most real life working scenarios that do not occur at a strictly technical level (eg two technicians discussing a particular machine feature or programming code, or two chemists talking about a particular chemical formula), social competences are more important than technical competences in order to successfully interact. The more one moves away from the technical domain, the more important it becomes to consider this. Technical in this context means engineering or science related. To discuss commercial or legal requirements in an intercultural setting is much more difficult than for technical issues, despite the facts that most commercial, financial and legal experts would also consider their requirements to be of a factual/technical nature. The reason for this added complexity in the commercial/legal domain is that it is more based on cultural values, rituals and other practices compared to the technical domain. Hofstede points out that from a cultural point of view, accounting systems, for example, are uncertainty reducing rituals fulfilling a cultural need for certainty, simplicity and truth – regardless of whether this truth has an objective base. He also states that in individualistic countries (eg the USA), accounting information will be taken more seriously than in collectivistic countries (eg Asia, Arab countries), where people believe there are many other and more subtle clues to find out about the well being of organisations and the performance of people [19].

According to Kealey, there is a substantial consensus on the non-technical criteria required for intercultural competence and professional success in another culture [20]. The link of intercultural competence and professional success is also supported by a number of other researchers [21-23]. In this case, the concept of intercultural competence refers to a mixture of cognitive, affective and behavioural components [24]. In addition to linguistic skills, intercultural competence integrates a wide range of human relations skills.

As most intercultural communication in general, and negotiation in particular, happens away from the whiteboard or the computer display, it is important to train the people concerned appropriately.

According to Brislin and Yoshida, a good training programme incorporates at least four goals that are all related to people's adjustment and effectiveness, and are based on good intercultural relationships. These are as follows:

- Enjoyment and benefit: The training programme must put people in a position to feel a sense of happiness and excitement about their work or at least to see the benefits for their personal lives;
- The attitudes of hosts towards sojourners: It is not enough that sojourners get along well and like their hosts; this feeling must be mutual in order for the intercultural interaction to be effective;
- People's own goals: An engineer or a business manager will have different goals in his/her interactions than an international exchange student. As such. the training contents and methods have to communicate information and skills relevant to goal accomplishment;
- Stress reduction: A good training programme will prepare trainees to deal with differences that they will encounter and culture shock so that stress will be reduced (the concept of culture shock is detailed below) [25].

METHODOLOGY FOR THE DEVELOPMENT OF INTERCULTURAL COMPETENCES

How can a student develop intercultural communication competences? According to Hofstede, the acquisition of intercultural communication abilities passes through three phases: awareness, knowledge and skills. Awareness is the starting point. The student has to understand that he/she carries a particular mental *software* because of his/her upbringing and that others brought up in a different environment carry a different mental *software* [19].

For interaction with other cultures, one has to learn and gain knowledge about these cultures. Brislin and Yoshida divide knowledge into four categories, as follows:

- Immediate concerns (visas, housing, etc);
- Area specific knowledge (history, politics, economy, current events, etc);
- Culture general knowledge (theories or themes commonly encountered regardless of the cultures involved);
- Culture specific knowledge (language, rituals and superstitions, values, time and space, etc) [25].

Skills are based on awareness and knowledge; they are expanded by practice.

Bolten states that intercultural competences can only be learned autodidactically and that this is often based on experience [12]. Many practitioners confirm that it is often even possible to learn by experience without having a specific reference frame of knowledge. A question that could be raised in this context is whether or not this intuitive learning, based on experience,

requires certain individual personal character traits and predispositions in order to be effective. However having a basic reference frame of knowledge will enhance the acquisition of intercultural competences.

As illustrated in Figure 1, the structure of the training that is recommended to teach students culture general knowledge and negotiation specific knowledge consists of four modules. The first two modules cover cultural topics, whereas the next two modules deal with negotiation. These modules are a minimum requirement to lay the foundation for intercultural competences. The following two are optional and are intended to lead the student to intercultural negotiation competence. The first two modules could, alternatively, also be supplemented by two optional modules on culture specific knowledge to prepare a student for interaction with people from one specific regional culture instead of training a student in intercultural negotiation skills. Alternatively, it is, of course, also possible to teach all six modules, provided that sufficient time and resources are available in the curriculum (cf [26]).

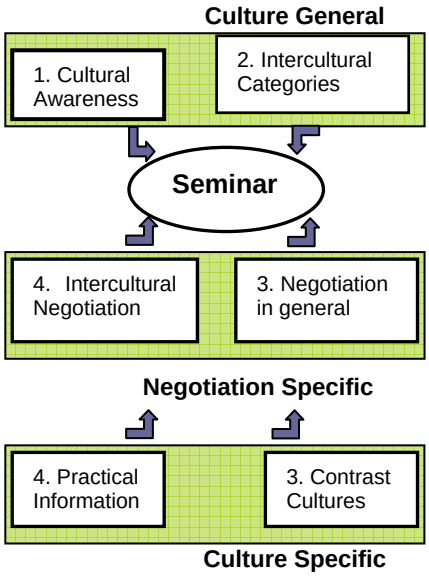

Figure 1: Structure of the training.

Cultural Awareness

Awareness is the starting point and an absolute prerequisite for the acquisition of intercultural (communication) competences. The student has to understand that he/she carries a particular mental software because of his/her upbringing and that others brought up in a different environment carry a different mental software [19]. Participants are made aware of the mechanisms by which they view the other cultures, and how other cultures view theirs, stereotypes and prejudice included. This module of the training also covers the concepts of ethnocentrism, attributions, disconfirmed expectancies and culture shock, and will help raising the level of tolerance of ambiguity within students.

Intercultural Categories

This module of the training explains the concept of cultural level variables, ie individualism versus collectivism, as well as time, space and context. However, depending upon the length of the training, this section could be expanded to cover other important cultural level variables conceptualised by Hofstede to categorise cultures, as well as other elementary anthropological models [19]. It will provide students with general knowledge about other cultures and build the foundation for learning about specific cultures. Based on this, students can then more readily foresee how nationals from various countries are likely to behave and how to react in a specific context.

Negotiation in General

The aim of this module is to explain to students the various approaches to the development of theory with regard to negotiations. This will cover theory from psychology and related disciplines as it was first applied to domestic negotiations. This module will introduce the elementary concepts in conflict resolution, decision theory and game theory.

Intercultural Negotiation

This module of the training explains in more detail the process of intercultural negotiations, the types of cultural influences on the negotiation process and how this knowledge can be used to be a more effective intercultural negotiator. It will elaborate on the summarised information given in the background section of this article and will explain, using selected cultures, how culture and negotiation styles are connected, and how this knowledge can be used to develop appropriate negotiation strategies.

Contrast-Culture Training

Contrast-culture training looks at specific cultures. Therefore, it is culture specific training. This training can only take place after it has been decided what the target cultures are, ie for what cultures people should be trained. The contents of this module will cover language, rituals and superstitions, values, time and space, etc, for a specific culture or a number of specific cultures. It will compare these aspects of the target culture(s) with students' own culture and hence define areas of potential misunderstandings and show ways to avoid these.

Practical and Detailed Information

The final module should provide students with specific information on a given target country. This can cover area specific knowledge such as politics, the economy, current events plus immediate concerns, such as housing, health system, schools, banking, public transport, etc.

Depending upon the time available for the total training, it is possible that the final two modules (or four modules in case it is envisaged to offer all four additional modules in the curriculum) are offered as electives for those students who have already completed the first two modules. It is also possible that these modules are offered to experienced professionals (eg graduates already working) who have completed the first two modules during their university education and who now need further training in intercultural negotiation competences or need to be prepared for a foreign assignment in a specific regional culture.

Depending on personal predispositions, some students will find it easier to understand the above described concepts and to adjust accordingly. In general, it is preferable and advantageous if students have the following personal traits:

- Affective features (eg empathy, high level of tolerance);

- General flexibility;
- Good communicators;
- General knowledge about communication and culture;
- Foreign language skills.

The form of a seminar is suggested to teach the above concepts as it allows effective learning and training in small groups. Alternatively, it is also possible to teach these concepts in the form of a regular lecture supplemented by a tutorial in which the training methods can be applied in the form of exercises and practical work.

CONTENTS OF THE INTERCULTURAL TRAINING MODULES

A good training programme should cover a number of concepts whose basic understanding will lay the foundation for successful intercultural communication. Grasping these concepts will help people to better understand themselves and the other side in an intercultural encounter. The following concepts should be covered, as detailed below.

Ethnocentrism

Ethnocentrism is derived from the Greek words ethnos (=nation) and *kentron* (=centre). The derivation suggests that ethnocentrism, which occurs when a person perceives his/her nation as the centre of the world, is closely linked to people's sense of identity based on how they have been socialised as children [27]. When people make ethnocentric judgements about other culturally diverse individuals or groups, they impose the standards they are familiar with given their own socialisation [3]. This means that ethnocentric judgements are based on feelings that one's group is the centre of what is reasonable and proper in life [28].

Attributions

When people observe behaviour of others that is different from what they would expect, they make judgements and draw conclusions so that they can explain the behaviour and make sense out of their observations. Attributions refer to judgements about the cause of behaviour [29]. Internal questions centre on why people are behaving as they do, what reasons they have for their choices, who might influence them, how these people came to the point when they made certain choices about their behaviour, and so forth.

The attributions or judgements about the cause of behaviour is often incorrect if the observer is not aware of the behavioural guidelines of other cultures [28]. When people make attributions about an entire cultural group based on limited knowledge of a few members, they make what is called the *ultimate attribution error* [30]. When people learn enough about other cultures they can make *isomorphic attributions*, ie they can make the same explanations for behaviour as people socialised in the other culture do. In this process, it is important to become aware of the underlying reasons why people think the way that they do [28]. This results in a better understanding and in less cases of disconfirmed expectancies, which is another concept central to intercultural training.

Disconfirmed Expectancies/Disconfirmed Messages

When people make incorrect attributions in an intercultural encounter, they may also behave incorrectly before they find out that their attributions were wrong. The discovery that both attributions and behaviour were faulty involves an added set of emotional reactions that stem from disconfirmed expectancies. The degree of the emotional upset is based on the difference between expectation and reality [28].

A similar concept is that regarding confirming and disconfirming messages. Here confirmation is defined as a process through which individuals are recognised, acknowledged and endorsed [31]**.** Similarly, disconfirmation occurs when strangers are denied, their experiences are denied, or their significance is denied [32]. People engaged in intercultural encounters should understand the underlying causality of their attribution and behaviour, and the reaction they get based on the attribution and behaviour. They should understand that the reason for the disconfirming expectation or message is most often cultural and not so much personal.

Cultural Level Variables

Cultural differences can be measured on a number of dimensions. Some of the most important cultural level variables will be briefly explained in the following paragraphs. Looking at these cultural level variables, it is important to keep in mind that, next to the cultural level, there is a second level, ie the individual/personal level of analysis, which will be further explained below. The cultural level can be used to explain a general tendency that exists in every culture for a particular variable. As an example, Figure 2 shows the hypothetical distribution of individualistic tendencies in two different cultures [27].

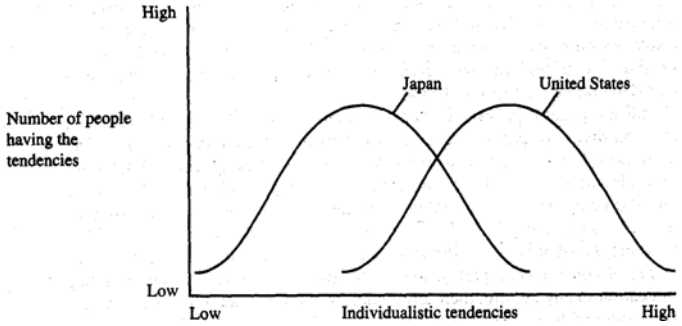

Figure 2: Hypothetical distribution of cultural level tendencies in two countries [27].

Individualism versus Collectivism

According to Gudykunst, individualism-collectivism is the major dimension of cultural variability used to explain cross-cultural similarities and differences in communication across cultures [27]. Individualism exists when people define themselves primarily as separate individuals and make their main commitments to themselves and their own goals. Individualism implies loosely knit social networks in which people focus primarily on taking care of themselves and their immediate families. Individualist societies are primarily North American and Western European and countries strongly influenced by these areas. Collectivism is when a group, whether familial, religious or organisational, determines values for its members and establishes goals based on what is best for the group. Collectivist societies are primarily found in Asia, Africa, Central and South America and small Pacific island societies.

To illustrate further, individualists will strive to obtain a job based on personal education, experience and abilities. At the

actual workplace, collectivists will place an emphasis on loyalty and cooperation, while individualists place importance on distinct traits and social skills. Individualistic workplaces are based on equity, meaning that even if a group does a project, compensation will be based on the individual's input into the project or job. However, employers in a collectivist society base compensation on equality, where it is divided equally among the members of the group to avoid problems or jealousy within the group. Although no culture fully ignores individualistic or collectivistic goals, cultures differ significantly on which of these factors they consider to be more critical [3][19][27][28].

Time, Space and Context

Time, space and context are three very important concepts about cultural differences and were first described by the works of Hall [11][33-37]. They are essential to understanding verbal and non-verbal intercultural communication, as well as behaviour in an intercultural encounter. Hall has stated the following:

> *Time is one of the fundamental bases on which all cultures rest and around which all activities revolve. Understanding the difference between monochronic time and polychronic time is essential to success ...* [33].

Monochronic time has been characterised as linear, tangible and divisible. In monochronic time, events are scheduled one item at a time and this schedule takes precedence over interpersonal relationships. Polychronic time, on the contrary, is characterised by the *simultaneous occurrence of many things and by a great involvement with people* [33]. To illustrate the different concepts of time in different cultures, researchers have introduced the dichotomy of *clock time* versus *event time*. People from clock-time cultures, such as Germany or Australia, would give much attention to writing down exact appointment times and punctuality. They would also exact the same or similar behaviour of others. In an event-oriented culture conscientious people are expected to react appropriately to unexpected demands on their time [28].

Space here refers to the invisible boundary around an individual that is considered to be personal. This sense of personal space can include an area or objects that have come to be considered as being that individual's territory.

Context, specifically *high context* versus *low context*, refers to the amount of information that a person can comfortably manage. This can vary from a high context culture, where background information is implicit, to a low context culture, where much of the background information must be made explicit in an interaction. People from high context cultures often send more information implicitly, have a wider network and thus tend to stay well informed on many subjects. People from low context cultures usually verbalise much more background, ie they explicitly state more information in their verbal communication. They also tend not to be well informed on subjects outside of their own interests [11][33-37].

Personality

Individualism versus collectivism, as explained above, is one of a number of cultural-level variables. These cultural-level variables are helpful to understand general differences between people when moving from culture to culture. However, cultural-level variables only show a general summary and do not show the wide differences in personalities that exist within all people of one particular cultural background. Therefore, it is important to look at the second level of analysis that can be used to explain cognitive and affective patterns, as well as the behaviour of various people, and that is *individual differences*. Figure 2 shows that there are personal differences in how salient cultural level variables are within the population of a certain country. It is important to point out these differences in individual personality and to avoid the pitfalls of stereotypes and prejudice.

Culture Shock

Reactions to new situations have been called culture shock [27]. It was Oberg in 1958 who first coined the term culture shock in connection with the experience of anthropologists who must learn to manage the violation of their social reality, where this violation represents a challenge to their primary socialisation [38].

During the process of socialisation, people unconsciously acquire certain values. Based on these values, they develop culturally induced *mental software*. On a conscious level, they experience more superficial manifestations of culture, such as rituals, heroes and symbols. When people enter a new culture, they have to learn all over again, like infants. This will result in culture shock [19].

According to Hofstede, culture shock follows an acculturation curve that goes through four phases, as follows:

- Euphoria (positive feelings);
- Culture shock (negative feelings);
- Acculturation (feelings becoming more positive again);
- Stable state (three possibilities: better, worse or just as good as before at home) [19].

CONCLUSION

Globalisation will continue to increase in all aspects of life, such as business, education, science and leisure. Domestic interaction is increasingly being replaced by international and, therefore, often intercultural interaction. Apart from general communication, which can serve many purposes, a lot of communication involves negotiations. Hofstede states that intercultural communication skills can contribute to the success of negotiations on whose results depend the solutions for crucial global problems [19].

Engineers are often involved in the intercultural negotiations that are necessary in order to solve these crucial global problems. In order to equip engineers for these changed requirements, new and expanded competences will have to be acquired. In order to achieve this efficiently, new educational concepts and contents will have to be developed by universities. In this article, the author attempts to describe the significance and magnitude of the topic, and to introduce some of the most important concepts of intercultural communication. However, the suggested approach is only one example in methodology and contents.

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