New challenge for teachers: dealing with soft skills in multinational environments

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Abstract: Globalization is not only influencing social and economics perspectives of Society. It is also a challenge for higher education teachers. In the case of IT degrees, well known curricula models and proposals as well as specific studies are diminishing uncertainty in the area of technical knowledge and skills. But success in multinational IT professional environments strongly depends on deployment of non technical abilities (the so called soft skills) which should be promoted among students to enable graduates reach best results. But which soft skills are most important in this type of environments? This paper presents results of a specific survey among experts and students intended to contribute to the determination of a recommended set of skills to be promoted by teachers in multinational teams of students.

Introduction

'Soft skills' are considered as a key factor for success in computing labour market and are gaining increasing importance in all areas of computing (while originally more appreciated in user support area) (Lee et al., 1995). Different studies have highlighted the need of an adequate mix of technical competence and non technical skills for certain IT positions (Wade & Parent, 2002) or in general (Seymour et al., 2006), when referred to certain locations (Lee, 2006) or in general (Landry et al., 2000). The underlying reason is that, to help identify the most "adequate" employees for professional positions (i.e., those who are most likely to contribute to organizational results), organizations are tailoring their employee recruitment and selection criteria toward the assessment of interpersonal and communication abilities as key factors once a minimum level of technical skills is achieved (Sullivan, 1995).. Moreover, even students are in favour of soft skills as a basic requirement for computing professionals: e.g. (Chinn, &VanDeGrift, 2008) reflects the importance of non technical skills for students when they adopt the role of people in charge of hiring computing professionals: 88% and 84% for project managers and software developers. Even more, as it is shown in (Lewis et al., 2008), soft skills are essential for retention in computing educational programs so they should be explicitly included within the curriculum.

As a confirmation of this trend, RENTIC series of reports (http://www.cc.uah.es/lufesa/RENTIC/) developed by one of the authors offers an analysis of job requirements in Spain based on a sample of more than 3000 IT job ads. This series of studies analyze requirements for employment in knowledge and skills categories databases, communications, environments/applications, development languages, hardware, software engineering, operating systems, other technical requirements, idioms, training, etc. Obviously, technical profile is highly dependent on the position. As an example, if we want to profile a typical software analyst mentioning the two most mentioned item in each category (data since January of 2006), the result would be like the following one:

- Programming languages: Java and COBOL (e.g. for programmers, JAVA and .NET).
- Software engineering: UML and software analysis methods
- Databases: Oracle and DB2
- ERP and environments: Sap and ABAP
- Communications: CICS and Websphere
- Operating systems: Unix and Windows (in general)

: However, the most interesting result is not concerned at technology: soft skills are the hallmark of success. Data reveal that 71,17% of them require some kind of personal competence or skill. It is tempting to answer the question of which are the skills which are most important for an IT professional with a simple answer but the reality is not so

simple. It clearly depends on the position (Litecky, Prabhakar and Arnett, 2006). Thus for CIOs (or equivalent denominations as director of data processing, etc.) the required skills are clearly different of those ones for a programmer (see comparison with a subset of data from 2006 in Table 2). Moreover, 36.85% of offers for CIOs require at least one soft skill whereas those intended for programmers only show this requirement in a 16.1% of total (in the case of analyst the percentage is 25%). In general, soft skills have increased their presence in the descriptions of requirements for candidates during these years: during 2006 and 2007 they were present in a 27.6% of the total while only a 13.4% is observed from 2002 to 2005.

However, these data and additional ones from other similar studies are mainly focused on local or national environments so they do not serve as trustable guidelines for teachers when dealing with the challenge of educating technology students for real multinational environments, both in academic setting and in professional ones. After participating in several intensive educational experiences (some of them under funding as Erasmus Intensive Programs), keeping in mind students and teachers tend to be worried about strengthening necessary skills for getting the best results, it was decided to get information for addressing this challenge. Sadly, no useful systematic information was found so it was decided that we should collect directly quantitative data for helping teachers to devise a specific training for helping students to be prepared for such type of experiences and for future multinational professional life. In this paper, results of an extensive survey about which are the most important skills for success in multinational environments are presented and discussed to offer guidelines for the new challenge of globalization teacher should face.

2. Survey

In order to gain a deeper understanding of which soft skills are the most important ones to help students and professionals, a survey with international experts related to multinational teaching environments was carried out. The list of skills taken as reference were the ones determined in a study made by a Spanish university with 70 people in charge of recruiting in top companies of the different sectors using a Delphi technique (UEM, 2000). After processing many data, the study determined the top ten list of personal/soft skills that were most important for professional success of graduates. They were the following ones:
- Responsibility
- Self-confidence
- Awareness of ethics
- Communication reception skills (as receiver of messages)
- Communication sending skills (as sender of messages)
- Flexibility
- Teamwork
- Initiative
- Planning ability
- Innovation/creativity

The study offered exact definitions agreed with employers' representatives which were described as shown in Table 1. With this reference, a survey was delivered to two different sets of respondents:

a) A mix of 30 students (25) and teachers (5) participating in two intensive multinational educational experiences referred to IT in Sweden (2006) and in Spain (2008) with presence of people from Spain, Denmark, Finland, The Netherlands, Sweden, Austria and USA. This served as pilot collection of data.
b) A wide survey oriented to respondents with one or several of the following profiles:
   a. University and higher education teachers experienced in dealing with multinational (at least, two nationalities with a significant number of members each) groups of students in regular/degree programs or in intensive/seminar experiences
   b. Experts with significant experience or sharing professional activity with multinational (at least, two nationalities with a significant number of members each) groups of people in computing/engineering organizations.

The online wide survey (www.cc.uah.es/encuestas) attracted collaboration of 46 experts with the following profile:

- Male (56,52%) and female (43,48%) experts with experience in coordination of Exchange programs (71,74%), in teaching regular lectures for degrees for multinational groups (56,52%) or for intensive programs or seminars (39,13%) and in coordination of multinational teams for research (36,06%) or for IT projects in companies (36,96%).

Responsibility	Commmitment to successfully complete tasks; Well organized and careful for good job; Assumption of consequences (positive or negative) of actions; Evaluation of pros and cons and risks, acting in consequence
Self-confidence	Believe in his/her own capacity; Capacity to accept challenges; Able to express disagreement in a consistent manner; Express his/her own opinion even whn conflicts arise; Acting with determination even when others disagree
Awareness of ethics	Capable of developing a basic ethical analisys of professional situations Proposals of decisions consistent with ethical analysis and capacity to defend them in a rational manner Knowledge, respect and defense of basic human rights as foundations for coexistence
Communication skills; empathy	Two faces: interpersonal understandability (one as receiver of communication) and communication skills (one as sender) Wanting to understand the others: sensitivity to mother's feelings; Listening paying attention Understanding attitudes, interests, needs and points of view of others; Exploiting diversity Capability to adopt other's view Structuring ideas for a good exposition; Capacity to manage different pieces of information and to decide what data should be presented; Capacity to persuade audience using the most adequate reasons Adaptation of written and oral exposition to the audience; Clear and persuaing messages (verbal and non verbal) Good and correct oral and written communication; Control of stress when facing formal audiences
Flexibility	Capacity of adaptation and good results in different situations/groups/etc.;Capacity to understand and appreciate new or opposite points of view Capacity of adapattion to changes inn job organization or work requirements; Natural acceptance of challenges and risks Flexible adaptation of rules and guidelines considering situation; Changes in his/her own point of view when new information is available
Teamwork	Work in cooperation with others; Identification with the project; No need of being the lider or having the formal authority to work; Request ideas and opinion from others; Integrate those ones who do not participate; Encourage healthy debate Constructive criticism; Public recognition of others' merits; Work for a good work climate; Prioritize group objectives to individual benefits
Initiative	Interest to assume and carry out tasks; Try to reach higher objectives Do what it is requested to improve results; Obstination to reach objectives Foresee problems or opportunities that are not evident for others
Planning ability	Ability to analyze, specify and proritize actions to reach goals; Capacity to determine specific and realistic goals Capacity to identify and use resources to meet goals; Good time management
Innovation/creatividad	Capacity to foresee or anticipate changes; Interest for assuiming process changes and tasks with no clear tradition or well-established methods Proposals of changes and new solutions; New solutions to known problems;Share information about new practices and methods

Table 1: Definition of soft skills taken as reference for the survey

- All experts focused on technology and/or engineering degree areas: IT (43,48%), Telecommunications (10,87%), Electronics (15,22%) and other similar specialities (30,43%).

The survey was open from April to September of 2009. Experts were attracted through direct contact exploiting previous relations from participation in different intensive multinational programs from 2005 to 2009 in different countries: Netherlands, Sweden, Finland, Denmark and Spain.

3. Results and benefits

The pilot survey with students and teachers who were participating in two intensive multinational programs collected opinion from 30 people. Respondents were requested to choose the five most important skills (from the list) for success in multinational environments. The results are summarized in Table 2. As can be seen, teamwork, responsibility, communication skills and flexibility were considered the most important ones.

However, some informal additional collection of data only from students during another intensive multinational educational experience confirmed that innovation and planning ability were again in the least chosen ones while ethics and self confidence clearly were included in the most important ones. When compared answers of teachers and of students in the pilot survey, some differences appear. Specific informal feedback tended to suggest more variability or inconsistency in students' answers due to specific characteristics of their unique experience in such type of multinational events. This suggested the need of collecting a wide sample of data only from experts with considerable experience in this type of environments. As a result, the second wide survey was focused on opinion from qualified experts trying to have representatives from many countries and specialities. Participants were

requested to suggest skills not only for academic success during multinational educational experiences but also for real professional work in multinational teams. The results are shown in Table 3.

Teamwork	25	83,3%
Responsibility	21	70,0%
Communication skills;Sender	18	60,0%
Communication skills; receiver	18	60,0%
Flexibility	16	53,3%
Initiative	13	43,3%
Self-confidence	9	30,0%
Planning ability	9	30,0%
Awareness of ethics	6	20,0%
Innovation/creativity	2	6,7%

Table 2: Most important soft skills in the pilot survey

Soft skills	Students	Professional
Teamwork	71,74%	67,39%
Responsibility	28,26%	45,65%
Communication skills;Sender	36,96%	30,43%
Communication skills; receiver	54,35%	47,83%
Flexibility	56,52%	54,35%
Initiative	60,87%	60,87%
Self-confidence	60,87%	76,09%
Planning ability	34,78%	34,78%
Awareness of ethics	34,78%	30,43%
Innovation/creativity	47,83%	41,30%

Table 3: Most important soft skills in the wide survey

As can be seen in Table 3 and figure 1, there is only one slight difference between the profile for students in educational settings and the one for professional projects: responsibility is highlighted in the professional setting. The rest of skills show really small differences. As a guideline, teamwork, initiative, self-confidence and flexibility cope the top positions.
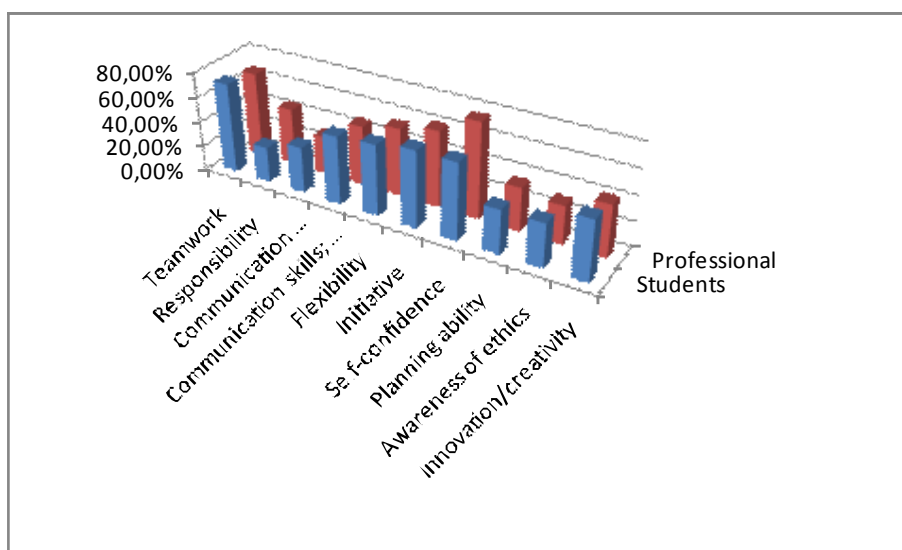
Figure 1: Student and professional profile from survey

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One final free space in the online questionnaire was included to collect comments and suggestion of additional important skills: 11 respondents included information. A great variety of additional skills or attitude was included although we can mention cultural empathy, knowledge and respect as well as motivation and adventurous attitude as the most significant ones.

4. Conclusions

Soft skills are recognized as important items in the education of computing graduates. Different studies in the related literature have observed the importance of these skills for education and for labour market. This implies the deployment of teachers' new roles to ensure a good orientation to employment of the educational programs whatever the discipline or scientific branch of the degree is. There are interesting studies on the recommended set of soft skills to help students to reach highest levels of professional performance and success in local environments. However, it is difficult to find similar guidelines for their application to multinational teams or working environments although higher education is increasingly facing new challenges derived from internationalization and globalization of programmes. Thus teachers have to adopt additional new roles to address the specific requirements of skills for this type of environments. Our work is aimed at offering them information on which skills are most important for students in the area of information technology. With this help it is possible to use specific techniques for promoting development of these skills before engaging in international or multinational experiences: e.g. staying abroad with specific exchange programs like Erasmus, applying to positions in IT projects to be developed in multinational teams or specific intensive programs or seminars in other university with nationals of a varied set of countries. As an example, confirmation of the importance of teamwork ability has been used in recent multinational educational experience to include a specific training session based on the TBA technique (Fernandez et al, 2009).

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