TOWARDS DEVELOPING A COMMUNICATION TRAINING MODULE FOR CUSTOMER-BASED PROJECTS

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ABSTRACT

The development of project work skills forms the backbone of curricula in engineering education. Engineering students gain valuable work experience, develop interpersonal competences and a "customer-first" mindset, establish a professional network, and experience a smoother transition to the engineering labour market when working in customer-based projects. Yet, in such projects the development of interpersonal and communication competences remains overlooked or it is assumed to develop through experience and not necessarily through a more systematic training process. The systematic development of interpersonal and communication competences can positively contribute to successful project outcomes in addition to enhancing the engineering students' overall competitiveness when they graduate. This paper aims to address this need in engineering education in general and more specifically to explore the current practices of communication between ICT students and project customers, find out example of good practices of communication, identify challenging areas and propose a list of training activities to improve communication. The scope of this study includes six exploratory qualitative interviews with Turku University of Applied Sciences ICT students and staff involved in customer-based projects. This paper concludes with a proposal for a training package to help engineering students acquire increased awareness of communication issues as well as tools and strategies for handling such issues in real life customer-based projects.

KEYWORDS

Communication skills, Customer-based Projects, Soft Skills, Training Module, Engineering, ICT students, Standards: 3, 5, 6, 7, 8

INTRODUCTION

The development of project work skills forms the backbone of engineering curricula for three reasons. Firstly, project-based learning promotes active learning in authentic real-life situations Secondly, through project work the students develop critical thinking, problem-solving, teamwork and communication skills in addition to subject knowledge. These skills are highly valued and desired by employers (Abdulwahed et al. 2013). Finally, project work especially in real-life projects helps students gain valuable work experience, develop interpersonal

competences and a "customer-first" mind set, establish a professional network, in addition to experiencing a smoother transition to the engineering labour market.

The Degree Programme in ICT at Turku University of Applied Sciences (TUAS) has fully embraced project-based learning in its curricula. Since 2006 The Degree Programme in ICT has also been practicing the CDIO engineering education framework (Kontio 2012, pp7-12) which is based on active and experiential methods of learning. According to the CDIO framework, the ICT curriculum includes an introductory course to the engineering profession, called Product Development taking place in the first year of studies and a capstone-type course in the third year called Innovation Project (Kulmala et al. 2014). Both courses support CDIO standards 3, 5, 7, and 8 (CDIO v2.0) and both courses are project-based with the latter course involving real life customers. However, these are not the only courses which involve project work with real life customers because specialization courses, for example Game Development, utilize real life projects (Luimula & Skarli 2014). To take matters one step further and create an ecosystem that supports project-based learning in a real-life project-based environment, The Firma (http://thefirma.fi/fi/). The Firma was established in autumn 2015 and is a learning environment which encompasses:

- Turku Game Lab (http://turkugamelab.fi)
- a working environment shared by TUAS and the University of Turku, where students from both the technical and artistic fields can meet and develop games together.
- The former ESCfi, a company-like learning environment at TUAS in which students deal with customer support requests and develop an entrepreneurial mindset.
- The former CloudIT, a student-run cooperative which offers webpage and graphics solutions and sells IT equipment.(http://cloudit.fi)
- ICT Portti, or ICT Gate in English, where TUAS, the University of Turku and Turku Science Park collaborate to support SMEs in SouthWest Finland to exploit ICT more efficiently. ICT Portti acts as a portal to support the transition to working life and enhances the students' professional skills (http://www.ictportti.fi).
- The Citizen's Helpdesk, a help desk where students provide any member of public free IT technical help, advice and training (http://thefirma.fi/en_US/kmt/).

From the above courses and environment, it is obvious that projects form the backbone of the curriculum. In particular, the Firma also supports CDIO standard 6, Engineering Workspaces (CDIO v2.0). Furthermore, it is also clear that in project-based courses and environments, students have the opportunity to have learning experiences that enable the students to apply "knowledge to engineering practice and prepare them (the students) to meet the demands of their profession" (Standard 7). Having to deal with real project customers helps the students develop personal, interpersonal, and social skills and these are skills that are mentioned in most CDIO standards.

At the heart of these skills lie communication and soft skills which are often overlooked or taken for granted (Luimula & Skarli, 2014) in projects. In the recent years, there have been studies which have classified the body of skills, both technical and soft skills needed by software engineers in particular (Penzenstadler et al. 2009, Sedelmaier & Landes 2014) and provided examples of courses where project communication is incorporated in software engineering courses (Kumar & Wallace 2014) Yet, the need for developing soft skills (Kumar & Hsiao 2007, Gonzales Morales et al. 2011) still remains. Indeed, these skills are very important for the success of any project as well as for developing engineering leadership (Kumar & Hsiao, 2007). Unfortunately, developing these skills in a customer-based project context at TUAS appears to happen organically and without formal training or explicitly documented procedures or "code of conduct" handbook.

PURPOSE AND RESEARCH QUESTIONS

This paper aims to address the need for the development of a communication training module for ICT students who work in customer-based projects. In particular, this paper attempts to establish the communication issues and competences that need to be developed when ICT students liaise with customers in projects in the Faculty of Business, ICT and Chemical Engineering at TUAS in order to create content for a training module that addresses this need In other words, the focus is on the communication needs of the particular students in a specific faculty. The questions this paper aims to answer are:

a. What is the context and purpose in which communication between students and project customers occurs?
b. What are the current practices and protocols (if any) when students communicate with project customers?
c. What are the best practices for enhancing communication?
d. What are the most challenging communication situations for students, non-teaching project staff and supervising teachers?
e. What kind of training activity would be appropriate for developing better communication?

METHODOLOGY

The method for answering the above questions were exploratory interviews with the three stakeholders, namely, students, supervising teachers, and project staff (non-teaching staff). In total, six interviews were conducted. The interviewees were 2 students, who have worked with projects with the Turku Game Lab and both of them have started their own business; 1 teacher who has been supervising students in projects; 1 senior lecturer who is responsible for R&D in the faculty; 1 project manager responsible for running customer-based projects; and 1 project worker.

The interviewees represented well the students and members of staff at TUAS involved in customer-based projects. Interviewing external project customers was out of the scope of this study and they will be interviewed as part of a future study. The interviewees were briefed on the purpose of the interview. The interviews were recorded and lasted on the average 18 min. Then the findings of the interviews were summarized, and classified according to the themes that emerged. The following sections present and discuss the findings of these interviews.

RESULTS AND DISCUSSION

This section introduces the findings of interviews in relation to the research questions.

Context and Purpose of Communication between Students and Project Customers

Communication between the ICT students and project customers starts taking place mainly in their second year of studies. Typically the students do their compulsory Work Placement and this involves participating in a project that involves a customer. A Work Placement can be found in the industry independently, through the Firma, by directly contacting staff that are involved in R&D, or by applying for a Work Placement advertised usually internally. Students also communicate with customers in project-based specialization courses, such as Game

Development as well as in the Capstone Innovation Project. In addition, students usually do their thesis as a project commissioned by a customer, usually a company or a local governmental organization, e.g. a hospital, a different Faculty or Unit of TUAS, or as part of a larger R&D public-funded project which involves companies, educational and/or research institutions or public organisations. Thus, the customers can be internal or external to TUAS. The types of projects range from a simple design and implementation of webpage including customer training; carrying out a study to improve an update an automation system for a company; to larger EU-funded R&D projects, such as GeoSmart City (http://www.geosmartcity.eu/).

Communication between students and customers mainly occurs in physical (face-to-face) meetings taking place on TUAS premises, customer premises or a public meeting place, such as a cafeteria. Before the student or students meet the customer, a staff member, for example a project manager or a project worker has had a meeting with the customer to assess the needs of the customer, to clarify the scope and tasks to completed by the student, the timetable and the price if there is a paying customer. The member of staff then briefs the students about the project and the task involved.

The aim of the first meeting of the customer and the student(s) is to discuss the purpose of the project, the project tasks/deliverables and the deadlines. This first meeting is in most cases supervised by a TUAS member of staff and is attended one student or a small group of students. Sometimes, there may not be a member of staff present. This happens when a student usually works for a company and has to do a project for the customer of the employing company or when a student has his own company and does a project for a paying customer or when the student has enough project experience to be trusted with meeting the customer. The subsequent meetings are status updates meetings, occurring at weekly or bi-weekly intervals. These meetings are attended by the one or two students, usually the student project manager and the student who is responsible for a specific task, and the customer. The project closes with a final meeting where the final version of the project deliverables are presented to the customer.

Practices and Protocols Used in Project Customer Communication

Based on the conducted interviews, it appears that there is a process to be followed when working on a customer-based project. However, there seems to exist no documentation in a form of a handbook of code of conduct when interacting with a customer. For example, a short document giving guidelines for writing a first email to the customer or some ground rules concerning how a first meeting and/or the subsequent meeting should be conducted, how to more customer-focused or describing customer-focused behavior as well as providing communication techniques and language for particular functions. Communication seems to be developing organically; in other words, the more the students become involved in projects, the better their customer communication skills become. Thus, there is a small gap here for development of communication and soft skills, namely, establishing rapport, credibility, creating good first impressions.

The interviewed students mentioned that the first meetings they have had with customers were "free flow" but soon they developed their own communication strategies and checklists for running efficient meetings with customers. Concerning the actual content of the communication with the customers, one of the students mentioned the use task management software, e.g., Trello, for collecting items for the agenda of the meeting and ensuring that nothing important that needed to be discussed was forgotten.

Best Practices for Enhancing Communication

When asked about the best practices for good communication with customers, all interviewees mentioned **preparation**. For the students this meant knowing the purpose of the meeting, preparing questions that they would like to have answered, for example, the tasks, the requirements, the timetable, and the deadlines. In addition to these, for progress status meetings, preparation meant regularly communicating with the customer, preparing an agenda, going through what was done, finding different ways of demonstrating progress and explaining what they will be working on next. For the staff, preparation meant analyzing the needs of the customers, clarifying the scope of the project, defining the tasks, agreeing on deadlines, briefing the students on the project and managing customer expectations.

Another good practice was **following the agenda** to ensure that nothing important is left out and that the meeting are kept short so that no-one's time was wasted.

Politeness was also mentioned. The examples of politeness that were mentioned had to do with good manners, for example, taking off hats, not chewing gum, looking the customer in the eye, softening their tone when explaining to the customer that a demand is unrealistic. In addition, another example of politeness mentioned was providing information to a company providing the host server of their customer. Thus politeness here is a mixture of good manners, soft skills, and professionalism.

Using appropriate and clear language when presenting, explaining, or sending emails was also perceived as a good practice. In particular, using a language that the customer could understand and "*not bothering the customer with too many d*etails" were highly appreciated. From one of the interviews, it emerged that the students who worked at the Citizen's Helpdesk or had taken part in a course where they had to offer IT support to the general public in a public library developed very good customer service skills.

Finally *"**creating a good impression**"*, that is, giving the impression of *"being a professional rather than a hobbyist"* was considered very important by all the interviewees. Examples that were given included the writing of the first email to a customer, using formal and very clear language; and the students' self-introduction to the project partners where they briefly explained who they were, how long they have been studying, what experience they had and their interest in the project.

Communication Challenges

The communication challenges that emerged from the interviews can be classified into two categories: customer-related and student-related.

Customer-related Challenges

The first customer-related challenge mentioned by the interviewees was that some customers tend to be quite talkative about issues not relating to the agenda, therefore the meeting goes off-track and lasts longer than planned. In addition, the students mentioned that in such cases they had to send emails to enquire about information they needed. The students also mentioned that they found it quite hard or impolite to interrupt the customer and get the discussion back on track.

The second customer-related challenge has to with customer expectations in combination with the fact that the customer may not be a technical expert. This is point where the role of the project manager becomes invaluable because the project manager analyses the customer needs and negotiates a work package which is realistically feasible in terms of resources, skills and time. For example, a customer might require an X solution without realising that in order to implement the X solution, solutions A, B and C are pre-requisites and this might take a considerable pool of resources.

Student-related Challenges

The student-related communication challenges were mainly mentioned by the staff members and they are a mixture oral and written communication, non-verbal communication, interpersonal skills and attitudes. The staff interviewees felt that generally the majority of students communicate well with customers but there are always a small room for improvement.

The first challenge that was mentioned was **failing to communicate with the customers** about the progress of the project. Students are instructed to inform the customers about their weekly progress. In this particular case, the students kept working but for some reason they did not inform the customer about it. Thus the students were more focused on producing the deliverables and forgot about communicating their progress. In order to understand the occurrence of this incident, we need to examine the attitude and the students' way of thinking. Most students studying information technology are passionate about programming and love to concentrate on that. They might also be very shy and communication or interacting with the customer somehow becomes of secondary importance to them. However, the staff members are very much aware of the importance of this communication because "*even if you are not in direct contact with a customer, still in a company you have internal customers, for example, the marketing team.*"

The second set of student-related challenges relates to **behaviour and communication during the meetings**. The challenging behaviours mentioned by the staff included:
- Not speaking confidently
- Not speaking loud enough
- Not making eye contact with the customer
- Being too quiet
- Behaviour not considered polite and respectful (e.g., not taking off hats, chewing gum)
- Speaking too much about themselves
- Displaying strong reactions to customers' suggestions without softening their tone or offering an explanation their reaction
- Not listening to the customer and focusing on the customer needs.

The third set of challenges could be named as **mastering the use of communication systems**. The example that was mentioned in the interviews was "*knowing how booking meetings with the calendar works*" and knowing the functions of project management tools used by the customer. This relates to larger R&D projects in which the partners use such tools.

A final set of challenges mentioned relates to **written communication**. One interviewee (staff) mentioned *"sending relaxed emails to customers"*, meaning that the emails sent were written in a very informal manner considering that the recipient is a customer and not a classmate or a friend. Another challenge relates to larger R&D projects where the students have two sources from where they can address their inquiries or questions, the TUAS contact person (staff) or the project customer. In these cases, the students sometimes send emails to the customer asking them for information that the TUAS contact person can very easily answer. A final

challenge that was mentioned relates to special needs. For example, the documentation produced by a dyslexic student needs editing before sent to the customer.

Training Activities for Better Communication

The interviewees were asked what kind of training activities could be offered to students to address the challenges in communication. From the responses, it became obvious that the students would benefit from examples of efficient and not so efficient meetings. These could be videos of real meetings followed by discussion and briefing and feedback not only from a member of staff but also from a customer.

Another type of activity could be role play practicing various typical situations and roles where the students could practise using language functions and communication techniques, for example, re-directing the discussion back to the agenda, clarifying and eliciting information, explaining concepts and ideas in a clear and simple manner without using technical jargon, rephrasing ideas, confirming and summarizing actions. Two interviewees specifically mentioned that these activities would be good to practise face-to-face with someone they were not familiar or through a virtual platform where they would not know whether they are communicating with their friends or someone else.

Concerning practicing written communication, there are two types of activities that came up from the interviews. Firstly, the written tasks, such as memos, agendas and emails and phone calls could derive directly from a bank of real life videos of meetings. Secondly, the students could be practise using a project management tool.

Finally, one of the interviewees suggested the following method, "*theory, practice, and doing the real thing"* meaning placing the students in a situation or an environment where they could practise their customer interaction skills. A suitable environment for that purpose would be the Citizens' Helpdesk.

CONCLUSION

The purpose of this paper was to explore the current practices of communication between ICT students at the Faculty of Business, ICT, and Chemical Engineering and project customers, find out example of good practices of communication, identify challenging areas and propose a list of training activities to improve communication. For this purpose, six interviews with TUAS ICT students and staff involved in projects were conducted. Based on these interviews, it emerged that the development of communication skills occurs in an organic manner rather than being a result of a systematic process or training. From that perspective, a handbook of communication in projects which would include code of conduct and checklists would be a good place to start with.

However, a handbook of communications in projects would only cover certain aspects of communication. The proposed handbook would need to be accompanied by training activities that simulate the typical student-customer interactions. Such training activities could include:
   a. Video recordings of real life meeting would provide excellent training material for the students followed by discussion and feedback from the communication trainer and the customer's perspective
   b. Role play or simulation of student-customer interactions based on real life scenarios.

Finally, to create a full training package in addition to the proposed handbook and the training activities, we would need to incorporate real field practice in an environment where the students would have to interact with a real customer and practice their communication skills as well as soft skills with customers who have no technical knowledge or experience. This field practice would be followed up with a personal development discussion.

The scope of this study was limited to and intended for ICT TUAS students and staff. Areas for future study would include interviews with customers of different types of projects and actual observation and videotaping of customer meetings. In addition, a further area of future development would the evaluation and assessment of the training module to be developed. These areas of future study and development would facilitate the creation of a more systematic process and subsequent training material for an integrated curriculum.

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BIOGRAPHICAL INFORMATION

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