

Teaching HCI in a Manifold Environment

Tiziana Catarci
Sapienza Università di Roma
Roma, Italy
catarci@dis.uniroma1.it

Valeria Mirabella
Sapienza Università di Roma
Roma, Italy
valeria.mirabella@gmail.com

ABSTRACT

This paper presents the experience of teaching HCI in the context of the Master of Science in Engineering in Computer Science, in conjunction with the International Master of Science in Product Design. The HCI course is attended by engineers and designers from Europe, south Asia, east Asia and Arabic area working in teams on developing usable products by following the UCD approach.

Author Keywords

HCI, Education, UCD, multicultural classroom, interdisciplinarity.

ACM Classification Keywords

K.3.2. [Computers and Education]: Computer and Information Science Education – computer science education, information systems education, curriculum.

INTRODUCTION

In the last years technology has been characterized by a dramatic speed of change and a relevant impact on everyday life with the emergence of personal mobile devices, pervasive and ubiquitous computing, wearable technologies, augmented reality, and social networks. In several context technology is not just an opportunity but it is increasingly becoming the main, or even the only, way to perform an action. Nowadays technologies should be learnable, usable, and comprehensible, but systems and applications must also be aesthetically attractive and emotionally appealing, and they must provide the right level of challenge and satisfaction for the users [1].

How can HCI experts address such a wide range of challenges? And how can we teach how to do it? One of the key factors is multidisciplinary that today is even more important than in the past, but unfortunately is still uncommon in Italian degrees and academic careers [7].

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CONTEXT

This paper presents the experience of teaching HCI in the context of the Master of Science in Engineering in Computer Science. The course started in 2007, taught in Italian for engineering students. From the very beginning, the course has been based on a combination of theory and practice. The practice part consists of a project to be carried on in teams of three-four students. Students are asked to assemble their own team and to choose the project topic. At the beginning most of the projects were web oriented. In the last years web based projects have been replaced by projects dealing with mobile environments or smart objects. Since 2012 the course has been given in English to encourage the participation of foreign students (mainly from the Arabic area and south Asia, India and Pakistan in particular).

Since 2015 the course has been also addressed to design students from the International Master of Science in Product Design, thus becoming the first highly interdisciplinary course in the context of the Master of Science in Engineering in Computer Science. Thanks to this opportunity new students joined the course, mainly female, mainly from east Asia (China, Korea), all with very different educational background and an already acquired approach to work in group.

CONTRIBUTION

As described in the previous section, from 2007 to 2011 students were all Italians, mainly male, with a background in computer engineering; from 2012 to 2014 there have been international students with a background in computer engineering. Since 2015 we are experiencing a class with international students, comprising engineers and designers, still with a higher (but less high) male percentage. Due to these changes we feel we have been teaching along the years several slightly different HCI courses according to the ever-changing context. This happened because we experienced the necessity to change the approach following the growing variety of the students in the class.

In 2014 we conducted an informal survey asking the students what they liked or not about the course. The results came at no surprise. Students appreciated the course because it is an opportunity to take into account human factors, but they also emphasized that it was extremely time consuming and that the average final mark was often far from their wishes. Furthermore students said that they would have been interested in having more support for the

implementation step, for instance through seminars focusing on specific technologies.

We analyzed the feedback and decided to keep the lessons on the theory, though introducing seminars on specific interactive technologies (e.g. Kinect) and IoT tools (e.g. Arduino). We also replaced the written exam with an oral one.

In the 2015 edition a relevant number of designers joined the course for the first time. We observed an increased quality in the projects presented by mixed teams (team composed by engineers and designers), but also the arise of conflicts within the teams that let some students to change the group or, in few cases, to abandon the course.

In 2017, we started encouraging students to work on the project during the lectures, so enhancing the project-based experiential approach [3] [4] [5]. In order to facilitate this process we asked them to form a team and to choose a project topic at the beginning of the course.

We redesigned the course so that each lesson on a specific HCI topic was followed by a practical lecture aiming at driving the teams in applying the lesson content in their projects. A second lecture on the same topic was dedicated to the presentation, by each team, of the work done. The last part of this second lecture concentrated on discussion and feedbacks. Just to give an example, let's consider the lesson on the Heuristic Evaluation (HE). After such a lesson two practical lectures were given. The first lecture was divided in two slots. During the first slot, each team designed and prepared the material to be provided to the expert in order to perform the HE. During the second slot, each team performed the HE on the project of another group. In the second lecture the teams updated their project documentation with the HE results and gave the presentation of the work done to the class in order to collect feedback.

At the end of the course we sought again for an informal feedback. One of the outcomes was that the students appreciated technical seminars but, for the future, they would also have additional implementation details. They also liked the idea to be evaluators for other teams' projects. This gave them the opportunity to experiment different contexts (for example mobile versus home automation). They also enjoyed the feedback from other teams because this helped in recognizing the user as a real person. Students had a mixed feeling with forming a team and choosing a topic since the very beginning of the course. On one side they were confused by not knowing what to expect as for the project, but, on the other hand, they appreciated having more time to familiarize and work together during the lessons. This also reduced the conflicts inside the teams. A student said that, after few weeks, teams rather than single students composed the class.

LESSON LEARNED

In our experience we addressed some challenges aiming at delivering a better HCI course in terms of both hard skills (HCI contents) and soft skills (teamwork, communication), but also as for course attractiveness.

Cultural diversity introduced some challenges. First of all we observed language related problems: quite often students from different geographic areas had initial difficulties in communicating even in English. Secondly, there was an initial mistrust based on background knowledge (engineers versus designers and vice versa). Despite such minor troubles, we believe that a major added value comes from having multidisciplinary (engineers and designers) teams. The association with the International Master of Science in Product Design was a crucial step forward a truly interdisciplinary course. Note that we also observed a sort of gender segregation, with male only and female only teams. An issue we should try to address in the next editions. The new approach we introduced in 2017 should favor the integration among students, but we did not have yet the opportunity to observe its outcomes due to the short elapsed time. For sure it seems facilitating the students in passing the exam earlier because the majority of them is giving the exam during the summer.

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