A Systematic Approach to Usability Practices in Computer Science Curricula

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1. Introduction

- HCI in Chile:
  - Relatively poor development
  - No coordination, poor collaboration
  - SIGCHI – only a "Prospective Chapter"…
  - There are exceptions!
- HCI in PUCV:
  - Optional subject in undergraduate CS curricula – since 2003
  - Compulsory subject in a graduate program in CS – since 2006
  - From isolated efforts to a systematic approach!

2.1 The HCI Optional Course in Computer Science Undergraduate Programs

- Main focus: Usability

- Course structure:
    - The field of Human-Computer Interaction,
    - The nature of Human-Computer Interaction,
    - Computer system and interface architecture,
    - Usability,
    - Interaction design,
    - Web design.

- Usability practice

- Usability evaluations – 2 usability labs since 2006

- HCI projects:
    - Usability engineering life cycle
    - Mixed teams

- Second optional course: *Usability Engineering*

2.2 Software Engineering vs. HCI

- Is it really a conflict?
- Software for real users – the purpose of the Software Engineering
- Usability – a basic attribute in software quality!
- Usability topic in Software Engineering course
- Relationships should exist between the Software Life Cycle and the Usability Engineering Lifecycle
- Common sense!

2.3 Usability Topic Early in Computer Science Undergraduate Programs

- The importance of users over the systems
- A practical approach, based on examples
- Involving students in usability evaluations
- Explaining the meaning
- Case studies!

2.4 HCI Topics in Graduation Theses

- The first undergraduate thesis in usability (in PUCV): 2003
- 2007:
  - 8 undergraduate theses
  - 6 graduate theses
- Theses on HCI or HCI-related topics:
  - Tremendous impact over the diffusion of HCI, both among students and professors
  - Bricks in building the awareness of the importance of HCI when forming CS professionals

2.4   HCI Topics in Graduation Theses

- 2007: 6 graduate thesis
  - *Usability in CMMI*
  - *Usability and security in software systems*
  - *Usability and accessibility in e-learning platforms*
  - *Usability in e-portfolios*
  - *Web-mail usability*
  - *Web-mail communicability*
- 2007: 8 undergraduate thesis
  - *Web Usage Mining for web usability evaluations*
  - *Usability evaluations of software for mobile devices*
  - *Tool for automatic usability evaluations*
  - *Languages for interaction modeling*
  - *Usability in financial software*
  - *User–centered development of web systems*
  - *Usability in e-commerce*
  - *Software accessibility for students with hearing disabilities*

2.5 HCI as Compulsory Subject in Computer Science Graduate Program

- A major step forward!
- Main focus: usability, usability evaluation
- New topics: elements of semiotic engineering
- Graduate students are performing both usability evaluations and communicability evaluations on a regular basis
- Web Engineering (usability and accessibility - oriented):
  - A new optional course: 2007
  - Very successful!

2.6 Bureaucracy or Good Will: A Subjective Perspective

Activity	Activity type	Level	Required effort
Usability and/or HCI topics early in the Undergraduate curricula	Compulsory	Undergraduate	"Good Will"
Usability and/or HCI topics in Software Engineering courses	Compulsory	Undergraduate	"Good Will"
HCI courses	Optional	Undergraduate	"Good Will"
Usability evaluations	Compulsory	Graduation thesis	"Good Will"
HCI or HCI-related theses	Optional	Graduation thesis	"Good Will"
HCI courses	Compulsory	Graduate	**"Bureaucracy"!**

3 New Challenges: A Systematic Approach to Usability Practices

- A new project was recently approved by PUCV (2007):
  - *Integración de pruebas de usabilidad de software en las prácticas docentes de la Escuela de Ingeniería Informática*

- Main purpose:
  - Systematically integrate usability evaluations (especially usability tests) into the formative process (undergraduate level)

- Three strategies:
  - To develop a user centered vision early in the formative process
  - To establish software usability as main purpose of the software process, in curricula's subjects related to the software development process,
  - To establish usability evaluations as current practice during the development of the graduation thesis (when the thesis involves software development).

3 New Challenges: A Systematic Approach to Usability Practices

- To develop a user centered vision early in the formative process:
  - Generalizing the introduction of HCI topics early in the CS curricula, in the very first course
  - Including novice students in usability tests, first as test users, then explaining them the aim and the techniques of the performed tests

3 New Challenges: A Systematic Approach to Usability Practices

- To establish software usability as main purpose of the software process, in curricula's subjects related to the software development process:

  - Usability evaluation workshops will be organized for all undergraduate students

  - Workshops will include, as voluntary supervisors, graduate students and students that develop their graduation thesis in HCI area

3 New Challenges: A Systematic Approach to Usability Practices

- To establish usability evaluations as current practice during the development of the graduation thesis (when the thesis involves software development):

  - Usability will have to be proved (not only stated) for all software products developed as part of the graduation thesis

  - Requires (at least) the agreement of the authorities of the School, and of all the professors involved

3 New Challenges: A Systematic Approach to Usability Practices

- Short-term results will be evaluated by:

  - Questionnaires applied to workshops participants,

  - A comparative study over the perception of usability and user-centered design in three groups of students:
    - those that studied HCI as optional course,
    - those that attended the workshops,
    - those without any experience in usability (or HCI background).

  - A comparative study over the perception of usability in two groups of first year's students:
    - those that participated in usability tests,
    - those that did not.

4 Conclusions

- HCI: basic part of the formative process of the future software professionals
- HCI practitioners in undergraduate programs
- HCI practitioners and researchers in graduate programs
- An appealing way to introduce HCI at all computer science curricula levels: systematically including usability practice
- Most of the projects require "Good Will", however some requiere "Bureaucracy"…
- Very rewarding efforts!

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Thank you!