INTRODUCING CASE STUDY BASED TEACHING IN

COMPUTING CURRICULA*

PRE-CONFERENCE WORKSHOP

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ABSTRACT

The use of case studies is an effective method for introducing real-world professional practices into the classroom. Case studies have become a proven and pervasive method of teaching about professional practice in such fields as business, law, and medicine. The term “case study” is used in a variety of ways. In its most naive form, it simply refers to a realistic example used to illustrate a concept or technique. Although the use of case studies in education has shown success in the above mentioned disciplines, it is yet to be adopted in any significant way in the computer science education. One of the reasons for the lack of use of the case-study approach is the lack of sufficient material for this purpose. The main aim of the workshop is fourfold. First, the participants will be introduced to a comprehensive set of case study (the DigitalHome case study) that can be used throughout a computing curriculum, emphasizing full software development life cycle. Second, the workshop will include an interactive discussion of how to use the case study artifacts and the associated teaching support materials to complement their teaching artifacts throughout their computing curriculum. Third, the attendees will be asked to participate in the assessment of case study material and make recommendations for improving both the material and the delivery. Fourth, we intend to follow up with the attendees who are interested to participate in our project, by incorporating some of the case study material as part of their course work during the fall 2011 semester.
INTRODUCTION

Many computing programs have a software engineering course that involves a software development project in which students are grouped into teams to work on a semester or year-long software development project. Unfortunately, this is too often isolated from the rest of the curriculum and does not form a real-world basis for the entire curriculum. As a result, these programs produce graduates who are familiar with the basic theoretical concepts in software development, but lack the skills to apply these concepts in real-world development environments. Therefore, it is imperative that computing curricula introduce professional and real-world education into the academic programs. The use of case studies is one widely-used method for introducing real-world professional practices into the classroom.

Although many computing text books include the use of case studies to explain ideas, these cases seem to serve a specific purpose (e.g., discussing programming constructs, software planning or requirements analysis, design, risk analysis, construction or testing issues by using simple examples that are quasi-realistic), they often lack the following:

- Realistic artifacts (often space does not allow providing a complete requirements or design document)
- Completeness (covers only a portion of the life cycle, and not an end to end), with a focus on design and implementation
- Ability to decouple from the text and apply in ways not intended by the author
- Techniques for integration into course activities or into the curriculum as a whole
- A scenario format that would motivate students to get engaged in problem identification and solution.
- Guidance to the instructor on how to use the case study to teach a course topic or concept

The DigitalHome case study [1, 2] is intended to address these shortcomings by providing a complete set of artifacts associated with software development as well as providing case modules that can be used by faculty in teaching different subjects in a computer science curriculum. Each case module represents a mini case study and is associated with a specific teaching subject and learning objectives (e.g. requirements analysis, object oriented design, testing, team building...). Case modules also include an exercise booklet and a set of guidelines to assist the instructor in teaching the session.

WORKSHOP GOALS

The aim of this workshop is to advance the understanding of case study based teaching and to introduce the participants to a comprehensive case study in software development. The goals of the session are:

1. Describe the background and effectiveness of case study techniques in professional education.
2. Introduce the DigitalHome software development case study material.
3. Initiate the use of case study material (artifacts and case modules) by faculty in a variety of computing programs and courses.
4. Assess the quality and utility of the case study material by the participating faculty.
5. Assist interested participants in developing of plans to incorporate case study material as part of their course offering during fall 2011 and beyond.

WORKSHOP DETAILED AGENDA

The workshop’s detailed agenda is as follows:

1. (20 minutes): Facilitators and participants introductions and backgrounds
2. (15 minutes): Introduction and background to case study teaching, previous uses, and advantages.
3. (30 minutes): Description of the DigitalHome case study, its origins, artifacts, and case modules.
4. (50 minutes): Group exercise on the use of the DigitalHome case modules. Participants will be broken into groups of 4-5, based on their major area of teaching (i.e., programming, data structure algorithm, software engineering, etc). Each group will be provided an appropriate case module to discuss and evaluate. The participants will be asked to discuss the utility of the case module as well as suggest necessary changes to improve both the particular case module as well as the DigitalHome case study as a whole.
5. (40 minutes): Group discussion; groups report back on their activity in # 4 above.
6. (25 minutes): Workshop summary, final thoughts and discussions.
7. (60 minutes, after the completion of workshop): Development of initial plan for fall 2011 for interested parties.

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REFERENCES
