Chapter III

Peer Review in Computer Science: Toward a Regular, Large Scale Educational Approach

Vinícius Medina Kern, Instituto Stela, Brazil
Roberto Carlos dos Santos Pacheco, Federal University of Santa Catarina, Brazil
Luciana Martins Saraiva, Instituto Vias, Brazil
Joyce Munarski Pernigotti, Porto Alegre City Hall, Brazil

Abstract

Several experiences with peer review in computer science education have been reported in the literature. What is needed to turn it into a continued, regular educational approach? We try to answer that question beginning by presenting the skills required by computer science international curricula, as well as the skills exercised in peer review, an approach that can match those requirements. The practice of peer review in computer science education is reported, revealing very positive results, but with little sign of institutionalization and long-term application. The learning outcomes, the software available, the types of student work reviewed, and the different
approaches are detailed. The issues of a methodological approach for continued, regular, large scale application are discussed.

Introduction

Computing is pervasive in society, and it continues to grow in influence. The discourse on this influence goes from admonishing advice, as in “Tools get under our skin” (Talbott, 1995, p. 30), to technological overenthusiasm. No matter what the stance is, computers are originally built, programmed, and run by people.

Computer science international curricula and codes of ethics and professional responsibility demand from computer scientists the mastering of non-technical skills for which they are not prepared by the university. Given that this request has been in writing for more than a decade, it is possible that future accreditation processes demand from computer science courses a clear strategy for the development of those non-technical skills.

Peer review, the quality control system of science, has been applied to computer science education with the aim of exercising students’ non-technical skills such as autonomy, collaboration, cooperation, and critical thinking. A reviewer has to read an unpublished paper with an open mind, with no presumption about its quality. This is closer to what an instructor does when grading a paper than what a professional does when reading published material (Smith, 1990). It is also cause of anxiety and occasional enthusiasm or resistance.

Initiatives of student peer review reported in the literature are generally successful. However, they seem to fade out, since several authors quit publishing on the subject and there is no notice of their efforts becoming larger, institutional initiatives. While there is a considerable body of knowledge on technical aspects of peer assessment and evaluation (Falchikov & Goldfinch, 2000; Topping, 1998), there is still little light on how to guarantee the benefits of peer review and on how to make it accessible to a larger number of instructors and students.

There is need to create and make advanced educational approaches that promote non-technical skills of computing professionals. As Haddad and Draxler express:

Countries and institutions seem to be willing to invest huge amounts of money in ICT projects with little knowledge of their potential benefits, but are unwilling to invest a small fraction of these amounts in research and development to protect their large investments and improve their effectiveness. (Haddad & Draxler, 2002, p. 200)