Chapter 11

E-Mentoring:
Issues and Experiences in Starting e-Research Collaborations in Graduate Programs

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ABSTRACT

This chapter introduces the interrelated concepts of e-Research and e-Mentoring, reviews some recent works related to them, and discusses their importance in a global, Internet-based world. In this chapter, a conceptual framework is proposed to distinguish among the concepts of e-Research, e-Science, and Cyberinfrastructure, which are frequently used synonymously in the existing literature. Then, some issues related to e-Mentoring are discussed, including its characteristics, benefits, challenges, and a review of different Web 2.0 tools that can facilitate and promote e-Mentoring practices in most research organizations. Some personal experiences in e-Mentoring are then related. These experiences involve different universities and international programs, and their study points out several key factors of a successful e-Mentoring collaboration.

INTRODUCTION

In the last decades, the proper training of new researchers has been gaining increasing interest, both in academic and industrial environments. This might be due to several factors, such as globalization and the emergence of new computing, information, and communication technologies. Nowadays, most noticeable research projects are being developed through joined collaboration among researchers from different institutions or even from different countries. These collaborations have been greatly facilitated by the continuous appearance of new Internet-based software tools as well as hardware infrastructures, which are modeling the concept of e-Research, i.e. the use of online or Web-based tools to support collaborative research (Anandarajan & Anandarajan, 2010). As a result, this technology has allowed two decades of 'remote' or geographically-distributed cooperation to reach major research breakthroughs without requesting physical presence of the researchers in a single geographical point (Borgman, 2006; Dutton & Meyer, 2009), and even without having to necessarily follow a synchronous model for developing research.

The main goal of this chapter is to analyze how e-Research technologies and methodologies can be successfully employed to perform the instruction and guidance processes of new young researchers. These formative processes usually require the assistance of university professors, or more experienced researchers, who serve as mentors for the would-be investigators. The role of mentors in the formation of new capable researchers is revealed as essential in the performance of the PhD and Master students (Erhut & Mokros, 1984). In fact, mentoring can be seen as a process by which experienced researchers instruct, counsel, guide, and facilitate the intellectual or career development of persons identified as protégés (Blackwell, 1989). Thus, mentorship is a bonded reciprocal developmental relationship aimed at helping an emergent researcher to be trained (Packard,

2003). Some of the mentorship characteristics are featured by long duration, great reciprocity, clear presence of both career and psychosocial functions, and a focus on the transformation of the protégé's identity (Johnson, 2007). When most of this counseling relationship is performed online, we are developing e-Mentoring, which allows a more continuous, and sometimes more perdurable, research link between the mentor and the protégée.

The chapter is structured as follows: the next section reviews the concepts of e-Research, e-Science, and Cyberinfrastructure, performing a literature review on these subjects and proposing a new conceptual model that establishes some differences among them. Afterwards, we analyze in more detail the mentoring process and discuss how the introduction of e-Research technologies and methodologies are facilitating the emergence of e-Mentoring. Subsequently, several benefits and challenges of e-Mentoring are examined, and we review some of the currently existing software that can be useful when developing e-Mentoring and e-Research practices. At that point, three different e-Mentoring experiences are described. From these experiences, some best practices and key factors of a successful e-Mentoring activity are extracted. Finally, a conclusion section summarizes the most important findings and results of this chapter.

E-RESEARCH, E-SCIENCE, AND CYBERINFRASTRUCTURE

The terms e-Research, e-Science, and Cyberinfrastructure have been sometimes used in the literature as interchangeable concepts. However, although they are strongly related, we prefer to establish some differences among them. First of all, the term Cyberinfrastructure has a more technical meaning. It focuses on the technological infrastructure, software, and hardware necessary to communicate and develop research throughout the Internet. This infrastructure includes high

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