Chapter 24
Collaborative Sustainability
Strategies for Online Laboratories

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ABSTRACT
This chapter describes a wide range of issues relating to the collaborative aspects of sustaining an online laboratory at both a local and a strategic level. The discussion focuses on the benefits that the key stakeholders can obtain through collaboration, methods for establishing and sustaining collaborations, and the ways in which collaboration can enhance didactics. Current trends and future opportunities for amateur, research, and industry-driven online laboratories are also discussed. The chapter concludes with three case studies which illustrate the recent past, the state-of-the-art and the imminent future of online laboratory learning, and the ways by which progress towards a sustainable infrastructure can be made in a complex and culturally diverse world. It is advocated that the online laboratory community should move beyond a narrow peer-to-peer approach and engage increasingly with the full range of stakeholders.

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INTRODUCTION AND BACKGROUND

Since their inception 15-20 years ago (Trevelyan, 2004; Henry, 1999), remote experiments (REs) and virtual laboratories (VLs) have steadily increased in use to become a common feature in universities throughout the world. In many cases, the full potential of these learning resources has not been realized for a wide range of reasons; typically inadequate communication between user and provider, scepticism from potential user groups and a lack of continuity in the didactical preferences of changing teaching staff. As will be explained during the remainder of this chapter, most of these problems can be solved if resources are effectively procured and allocated. A higher-level strategy involving voluntary and financial support from collaborators in industry, academia and beyond is one possible way to help facilitate this. There are many ways in which each of the stakeholder groups can benefit from such collaboration, but there are also a number of potential pitfalls. For example, industrial and academic partners can sustain an initiative, but when it does not improve end-users’ learning or professional life, ‘sustainability’ is meaningless (Hýlen, 2007). Furthermore, a failure to make good use of the resources provided is likely to result in withdrawal of support.

In the current economic climate (Richardson, 2010), many governments around the world will be unable to sustain the levels of public funding that have previously been allocated to the educational sector, and it is likely that private industry will play a major role in developing the online laboratory concept. Universities that participate in collaborative e-learning initiatives with industry can benefit from a new source of funding, increased status, publicity, additional skills and experience for staff, improved relationships with the company and new technologies which may be applied in their research. The main challenge for universities is in addressing long-term sustainability issues. These include production costs (human resources, workflow processes, technology), dissemination costs (bandwidth, media inventory), and the cost of using and reusing/adapting resources. Reuse or adaptation also means that the materials must be localized to make them pedagogically effective in specific contexts.

By using authentic industrial e-learning resources, students can gain convenient access to relevant training, which will improve their awareness of industry, give them the skills companies require, and improve their overall employability. At the same time, special effort is required on the part of the content provider to ensure that the students find the resources interesting and immersive, given that the user is not physically present in the lab. Industrial tools must also be adapted to suit the educational level of the student and the limited training time available during a university course. Sustainability can be promoted using peer-collaboration in online environments that enable trust relationships and motivate end-users to participate and even contribute to further development of the teaching resources.

Collaboration with the educational sector provides an opportunity for companies to increase exposure, experience, and brand recognition with the next generation of scientists and engineers, as will be discussed in the case study on the Cambridge Weblabs later in this chapter. A major challenge for many industrial e-learning resource-providers is in achieving a balance in the exposure of the underlying intellectual property (IP); a subject which is discussed in the srm websuite case study. Enough access to the company’s proprietary tools must be allowed in order to provide an authentic and useful learning environment; at the same time, providing unrestricted access must not compromise the value of these tools. For established market leaders, the resources invested provide major benefits with very few negative impacts.
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