Chapter 5

Where Are We Heading To?
Review of Distance Science Education Research (2000–2010) – A Content-Analytic Approach

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EXECUTIVE SUMMARY

The major intent of this content analysis of 126 articles published in six leading journals from three distinctive fields in education is to evaluate current trends in distance science education. The specific objectives of this attempt are to explore the major research themes studied, the popular teaching and learning approaches, and research methods employed in distance science education research from 2000-2010. Major findings revealed that the number of articles published on distance science education displayed a lesser degree of publication than that of all distance related articles published in the journals examined during this period of time. Collaborative research efforts in distance science education have been more popular than solo papers and only a few studies were conducted in international contexts within these years. Distance science education research has been noticeably focused on upper

grade levels, referring to high schools and colleges. Studies in this field also put more emphasis on evaluation and trends, instructional and communicational technology, learner attributes, and teaching and learning issues. Most studies employed survey and case study methodologies. Finally, three pedagogical approaches: science as inquiry-based teaching, collaborative learning, and problem-based teaching, have been widely investigated throughout this period.

INTRODUCTION

Due to the multidisciplinary and interdisciplinary nature of distance education, the research in this field has been varied in terms of theory and methodology as well as applications of distance learning technologies and learning and teaching approaches. To date, review-based studies in distance education, including meta-analyses, content analyses, and systematic reviews, have been focused on theories, research methods, and practices from a general standpoint, without reducing them into a single discipline. However, distance science education is differentiated from other distance social sciences in respect to learning environments and learning strategies. In particular, a separate evaluation of the previous research on distance science education with themes of nature of science, inquiry learning, technology integration in science classrooms, virtual field trips, virtual labs, remote lab applications will provide an opportunity to unearth effective teaching and learning practices and experiences in this area.

Even though the history of distance education goes back to late 1800s, distance science programs or applications are not that dated at all and it has recently and rapidly become a popular education model in various parts of the world. Moreover, not only growing demand for distance science education but also ongoing research and teaching interest in technology integration in science teaching are clear indications for its widespread use. In recognition of constantly evolving and changing information technologies and, thusly, renewing distance education models, such a content analysis on distance science would be a future reference resource. In other words, a systematic study only focusing on primary research data in distance science education would be a valuable source of information in assessing the current situation, emerging trends, policies, and progress in the field. Within this context, the current chapter attempts to review previously published articles on the topic of distance science education including online science and web-based science implementations in the years between 2000 and 2010.

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