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## Chapter III

# Ontologies in Higher Education

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## Abstract

*This chapter provides an introduction to the use of ontologies and taxonomies in higher education. After a brief introduction to the nature of ontology, examples of ontology in higher education are reviewed. Issues in creating taxonomies, including their incorporation into search engines and concept maps, are then discussed. Software solutions for developing and utilizing taxonomies are presented next, along with problems and issues for implementation. Finally, future trends in the development of KM strategies for ontology are discussed.*

## Introduction

Knowledge Management (KM) is based in large part on systems that help users focus their attention on key information that is relevant, timely, and available on-demand. The preparation of this information requires processes for knowledge

acquisition, engineering, and representation because "knowledge and expertise are embedded within otherwise diverse and scattered information sources" (Convera, 2004a, p.1).

Necessary to KM strategies is the act of "imposing a structure on the knowledge acquired in order to manage it effectively" (Benjamins et al., 1999, p. 1). This is because most information is unstructured, doesn't fit easily into database models, and is at best "difficult to manage." "Leveraging unstructured information is a chronic challenge for companies competing in today's economy," explains Venkata (2002, p. S12). Ontologies or taxonomies which categorize information represent "the most promising approach to solving the growing problem of information overload" (Inxight, 2003, p. 2).

In her discussion of taxonomies in the marketplace, Gumport explains that "Higher education often sees itself as an enterprise so unabashedly complex that it can't be sorted, classified, or pigeonholed" (1997, p. 23). There is, however, a long history of grand classification schemes in higher education, including those of the National Center for Higher Education Management Systems (NCHEMS), the U.S. Department of Education, the National Science Foundation (NSF), and The Carnegie Foundation for the Advancement of Teaching.

This chapter provides an introduction to the use of ontologies and taxonomies in higher education. After a brief introduction to the nature of ontology, examples of ontology in higher education are reviewed. Issues in creating taxonomies, including their incorporation into search engines and concept maps, are then discussed. Software solutions for developing and utilizing taxonomies are presented next, along with problems and issues for implementation. Finally, future trends in the development of KM strategies for ontology are discussed.

# The Nature of Ontology

An ontology is defined by Noy and McGuinness (2000, p. 1) as "a common vocabulary for researchers who need to share information in a domain. It includes machine-interpretable definitions of basic concepts in the domain and relations among them." The domain is the subject area and ontologies are, basically, systems of categories (Sowa, 2004a). While there is an obvious

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