Chapter 7
Librarians' Roles in Informatics to Support Classroom Incorporation of Technology

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ABSTRACT

Informatics, particularly as applied to K12 settings, has received little systematic attention worldwide, although the field itself is growing due to the impact of technology and information advances. Too often, informatics has been approached as a tool-based skill rather than an academic domain with theoretical underpinnings. Content knowledge, technological knowledge, and pedagogical knowledge are required for success. School librarians can serve as expert partners in these endeavors. They have more knowledge and experience with informatics than anyone else in the setting, they can select and incorporate informational and technological resources and learning activities that are developmentally appropriate and relevant for students, they know how to manage knowledge effectively, and they know how to collaborate effectively with the rest of the school community in order to optimize curriculum development, instructional design, and delivery.

INTRODUCTION

Information and its transformation into knowledge constitute core functions of education overall. The systematic study of those informational structures and interactions – education informatics -- is less prevalent. Linking technology to informatics provides a 21st century lens for education. Within that scope, school librarians very explicitly manage, process, and transform information in support of curriculum. As school librarians seek to collaborate with classroom teachers, they need to

DOI: 10.4018/978-1-4666-2988-2.ch007

apply informatics principles and their knowledge of technology in order to optimize the library's ultimate impact on student achievement.

To this end, classroom teachers and school librarians need to examine several levels of information processing systems: student, faculty, program, institution, and governmental entities. How information is communicated among levels constitutes another critical aspect of informatics. Furthermore, teachers and librarians need to identify the conditions or environment of these information systems because the infrastructure, available resources, and knowledge base all impact student learning. Technology offers a means to optimize this investigation, and provides valuable informatics tools. With technology, teachers and librarians can assess their knowledge in order to determine how they can interact effectively to incorporate technology into classroom learning.

BACKGROUND

Most succinctly, informatics may be defined as the science of information, and usually refers to the processing and application of technology information. To that end, informatics depends on the representation of information: as text, image, and sound. In the digital world, this information can be represented in patterns of electronic bits: zeros and ones. With mark-up language, the format of the information is more thoroughly delineated so that idea and container are separately represented. Furthermore, information can be represented by a *description* of the information: information about information such as metadata. The most common example of such a representation is a bibliography or catalog. When this metadata is connected with the information itself and a searching device, then organizing and retrieving the original information can be facilitated. Thus, informatics focuses more on processes connected with recorded information more than the content of the information itself. More narrowly, Levy et al. (2003) defined educational informatics as "the study of the application of digital technologies and technique to the use and communication of information in learning and education" (p. 298), and emphasized the interaction among information, technology and people who use them.

History

Its history dates back to the 1940s, when technology calculation and information packaging supported war efforts. These advances were designed for specific secret purposes, not in response to computer theories. However, after the war, these projects were made public, and interested industry and academia. For example, Claude Shannon, who worked at Bell Telephone Labs, developed the concept of information packaging in an effort to transmit unmodified communication. Along with cryptographer Alan Turing and engineer Warren Weaver, Shannon helped shape information theory. Within that framework, informatics examines how information is processed and communicated, which includes its transformation from one from to another through organization and interpretation. Because these functions are increased accomplished digitally, this field addresses the interaction of information technologies with the production and use of information, both on an individual and organizational level (Feather & Sturges, 2003).

The actual term of information was first coined in 1957 by a German computer scientist Karl Steinburch, talking about automatic information processes. The term rose from combining the words "information" and "automatic" with the connotation of both the science of information and the practice of processing. By the early 1960s the term gained international currency. In Europe, where this term is used more than in United States literature, the informatics professional literature tends to meld computer or information science