

DiLight: Providing Flexible and Knowledge Rich Access to Support Digital Library Learning

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Educating students on Digital Library (DL) research and practices has become an important course taught in many universities. However, due to many perspectives, models, and activities developed in DL field, students need help in their exploration of DL topics. Learning support systems, particularly e-learning systems, can help students in their leanings. However, a well designed learning support system should 1) collect fragmented but related course materials, and organize them in an intuitive, meaningful, and effective way. 2) manage and present the materials in a dynamic and flexible manner because students have diverse backgrounds and learning preferences. 3) allow multiple ways to access materials from any place and at any time. Current available learning support environments (such as Blackboard) cannot provide such learning supports.

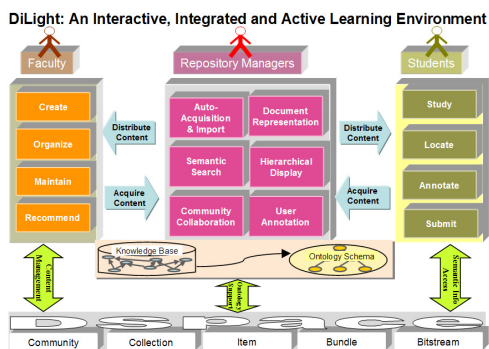


Figure 1: The Conceptual Architecture of DiLight System

DiLight is an interactive, integrated and active learning support environment. By building on top of DSpace, a leading open-

source DL system, DiLight takes the advantage of DSpace's powerful and flexible content management and multiple access tools. DiLight is designed to provide flexible and knowledge rich access to support digital library learning. At the collection management aspect, DiLight concentrates on organizing lecturing slides, videos, reading materials and students' comments into meaningful topical related items/documents. The corresponding in-class delivering recorded on digital videos are integrated too. The videos and their corresponding slides are associated with each other based on slide turning information. Each item has its associated Dublin Core metadata.

However, the most innovative part of DiLight lies at its multiple means of accessing documents. The goal is to provide suitable methods for students with varied tasks, needs and preferences.

Besides functions like simple keyword search and browsing via lectures, DiLight also builds the following three access methods based on its ontology that organizes DL topics and related course materials into a network of 16 classes and 43 relations:

Ontology-based browsing: students can roaming through the ontology to discover often unaware context of a learning task, or relationships among concepts.

Ontology-based search: students' search capability can be enhanced by the ontology to find materials that are semantically similar to the query regardless of the surface difference,

Associated recommendation: with the help of ontology, the relationship between concepts can be expressed and thus observed by students beyond links between parent and child nodes. Documents can be linked together across the ontology.

We examined the roles of DiLight in supporting students' learning tasks through informal surveys and a formal summative experiment. Our evaluations show that DiLight can provide better support not only in helping students' basic knowledge recall and retrieval tasks, but also in helping students' advanced knowledge association tasks. The multiple access methods built based on digital library and ontological methods were attributed as the major contribution of this system, and students praised the usefulness of DiLight in overwhelm majority.

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