

# Re-Purposeable Learning Objects Based on Teaching and Learning Styles

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## INTRODUCTION

Web-based distance learning is hampered in many cases by a failure to deliver material in a manner consistent with the ways in which students learn and instructors teach best in traditional environments (Samoriski, 2002). Excellent teachers are successful because of the ways in which they mediate content and place the content within the context of the subject matter. It is not the specific content or images the successful teacher presents, but rather the manner in which they are presented and framed within the scope of the topic area. Excellent teachers teach by presenting the content and then providing the students with substantive opportunities to apply the content to real-world problems in an effort to promote critical thinking on the part of the student. This is a highly interactive process with much information being transmitted between the student and the instructor. The interchange between the instructor and the student helps the student build a knowledge base with the assistance of the instructor's experience and expertise in the topic area. The exact nature of the interchange is not predetermined and depends to a great extent on the creativity and breadth of experience of the instructor. The successful instructor adjusts his or her interaction with the students to the learning styles best suited to them. How do we provide the learner with this important component of traditional classroom education in asynchronous distance education or technology-mediated traditional classes? Web-based instruction is rapidly becoming the preferred mode of distance education, and we must adapt our instructional interaction styles to this medium. Our students

now expect more interactive and immersive materials in Web-based learning than that typically provided in the traditional classroom or correspondence distance education (Samoriski, 2002).

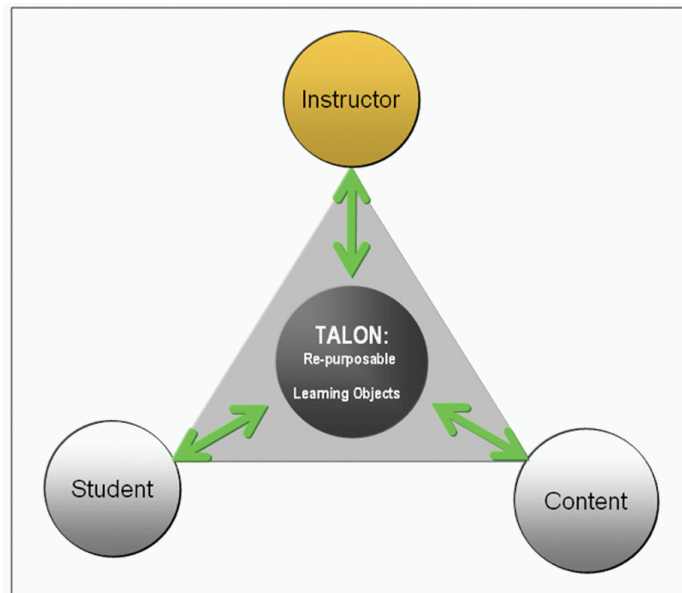
The TALON learning object system is a series of repurposeable learning object templates based on styles of teaching and learning as described by Dunning et al. (2003). These flash-based templates allow instructors to design and execute interactive learning objects in approximately 10% of the time required to create them from first principles, because the use of them requires little or no alteration of existing source code or writing of additional code (Abtar, Dunning, Harvinder, & Halimatolhanin, 2004; Dunning et al., 2004). The fact that the learning objects are based on the successful learning styles experienced in the traditional classroom ensures that the student is both engaged and allowed to build a knowledge base about the content being covered.

## BACKGROUND

The overall online course design process can be classified broadly into four phases: analysis, development, delivery, and results. The development phase is collaborative in nature where the actual course gets designed and constructed; the delivery phase is where the instructor interacts with the students via the online course; and the third phase is where outcomes translate into learning competencies.

Retention and attrition issues in an online course are often attributed to the level of interest the course

Figure 1. The TALON learning object suite in design context



generates. The immersive nature of a course depends on its engaging features. Often, complex concepts or phenomena can be taught better through interactive models that encourage the student to explore and learn. Appropriate design of a distance education course delivered through suitable media and using befitting strategies enhances learning (Fennema, 2003). Designers of effective distance courses delivered through the Internet must consider the interactivity of the medium and employ it to enhance the instruction of the distance learner (Hirumi & Bemudez, 1996; Starr, 1997).

*Learning Objects.* Learning objects have been defined in a number of ways by many researchers. Some define learning objects as any visual feature that engages the student's attention (Wiley, 2000). Others require a certain degree of interactivity for material to be considered a learning object (Wisconsin Online Resource Center, 2003). For the purposes of this discussion, it will be assumed that learning objects must be interactive to be considered true learning objects. The National Learning Infrastructure Initiative defines learning objects as "modular digital resources, uniquely identified and metatagged, that can be used to support learning." The common threads in all of these definitions are summarized in Table 1.

*Learning Styles.* Although most educational researchers agree that individual differences in the ways in which students learn play a role in learning, there is little agreement on the nature of the different ways

students learn. There is little agreement even on the terminology applied to ways in which students learn. Terms such as learning styles, cognitive styles, learning preference, learning strategies, and learning modalities are used to describe the same basic phenomenon—the manner in which students learn. Researchers use these terms almost interchangeably; however, learning style is the most commonly used term and will be used here. Learning style is generally accepted to be a student's existing learning strengths or preferred manner of learning (Kaplan & Kies, 1995).

Marinetti (2003) and De Bello (1990), among others, have classified learning style as a subset of cognitive style. Others (Morse, 2003) feel that learning style encompasses cognitive style. The majority of researchers agree that individuals have different learning styles and that an individual modality of learning is not equally effective for all learners (Sims & Sims, 1995). Sadler-Smith (1997) identified four categories of learning styles: cognitive personality elements, information processing style, instructional preferences, and approaches to study.

A number of assessment tools and quantitative indices have been developed to define an individual's learning and cognitive styles. The early seminal work includes the Myers-Briggs Type Indicator, the Cognitive Preference Test (Messick, 1984), the Cognitive Style Profile (Kuckinskas, 1979), and the Learning Style Inventory (Kolb, 1976). More recent reviews

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