Chapter 18
Interactive Self-Assessment Questions within a Virtual Environment

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ABSTRACT

This study considers the impact that different levels of interactivity have on the memory and understanding. In particular, it focuses in the use of interactive self-assessment questions (ISAQs) as a mechanism to help students learn better. An ISAQ is a computer-based multiple-choice or text-entry question that requires input from the learner, and provides feedback based on that input. This study extends some of Mayer's (1990) multimedia design principles and considers their applicability in this context. The study also takes into account whether the incorporation of ISAQs has a measurable impact on learning as indicated by their performance in tests. The study considers three different types of ISAQs, designed to engage either memory or understanding, in an effort to determine which one is the most effective. It considers the effect of adding interactivity in the form of memory (retention) and understanding (transfer) self-assessment questions in a learning-object content management system used by undergraduate students at Brunel University in West London, UK. It was predicted that both types of ISAQ would increase the performance of learners in tests but with different degrees. The results indicate that transfer tests have a significant impact on retention.

INTRODUCTION

Interactive Self-Assessment Questions as a mechanism for student's feedback has a relevant and important effect in learning. Feedback used as a procedure to indicate the learner of when and how their learning experience can be improved has long been recognized as an important instrument for improving education (Marieke et al., 2008). Their research on the effectiveness of different types of feedback specific feedback content (elaborate versus global) and feedback timing (immediate

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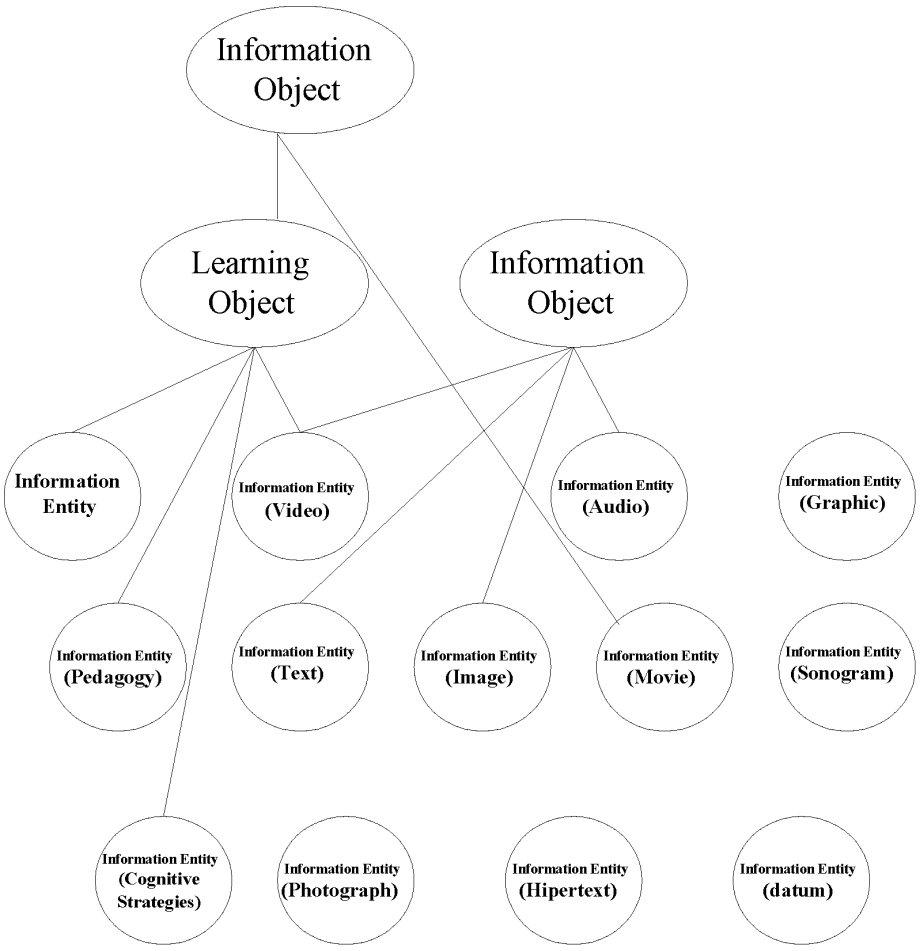
Figure 1. Learning object as part of an InfOb layout



versus delayed) for learning genetics in a web-based learning environment showed a significant positive effect of global feedback on learning outcomes for higher prior knowledge learners.

Feedback is usually related with assessment as a constructive response to coursework and exams (Gibbs, 1999). It is specifically a mechanism for providing either the teachers or the learners with vital information for improving their teaching/learning methodology and determines where mistakes have been made to reflect on them and becoming more effective, self-assessing, self-directed learners (Angelo & Cross, 1993).

High-quality individualised and meaningful feedback is expensive to provide. It takes time to design and implement (World Economic Forum, 2002) as research in the Open University has demonstrated, however, its effectiveness in improving learning has made valuable its implementation (Gibbs, 2003). It compensates the effort by actively engaging the learner and increasing the depth of student understanding in terms of increased performance in problem solving transfer questions (Evans & Gibbons, 2007). Different implementation has been used to maintain or increase these positive effects while diminishing the burden on cost and workload. For example Gibbs (2003) describes a two-stage test used in medicine that implements formative and summative assessment. In the first test, it is formative assessment only