



Creating A Digital Learning Object: Aiding Quality Management Delivery

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ABSTRACT

Historically, Information Systems students have difficulty comprehending the concept of quality management. This comprehension is integral to quality control, quality assurance, process assessment and Total Quality Management as it applies to Information Systems, in areas such as software development or project management.

Such a concept requires some rhetoric but students, as do employees, need a principle or two to get excited about. Hence, the creation of an experiential learning object requiring participants to make a decision, or test a hypothesis (Nichols, 2001). It is proposed that this digital medium may incite such excitement.

Gilbert (1992) and Scherkenbach, (1991) recognise that analysing the activities of the business processes (what is made) will identify the gap (what is wanted) where continuous improvements can be made. The learning object may allow students to close the gap by experimenting or analysing case studies using quality tools such as Pareto analysis or Ishikawa diagrams.

This learning object is a project developed by the author in conjunction with the e-Campus centre at UCOL. It is due to be released by semester one, 2003.

This paper describes the creation of the learning object and a framework for student and instructors use within a quality management unit of the Bachelor of Applied Information Systems degree at the UCOL.

Keywords: IS education, quality management, learning object

1. INTRODUCTION

eLearning and distance education have defined learning objects in terms of technical metadata standards and general formatting. Metastandards such as ADL's SCORM for example; and using XML for general formatting make the digital components of a learning object able to be easily reused.

However, successful construction of the context of the learning environment for the student is an area still to be clearly defined and linked to learning objects. Orrill (2000) is one of the few context theorists who provide an excellent analysis of using learning objects in constructivist settings. He recognises the power of learning is dependant on the successful contextualisation of the learning environment.

The definition used in this paper is adapted from Moore and Nichols (2002):



- ◆ Learning objects are digital learning activities that are responsive to student input. The objects provide some level of interactivity and encourage constructivist forms of learning.

This paper focuses on how a learning object, using interactive simulations and learning activities, can be effectively used in a constructivist way in a course using Moore and Nichols (2002) 'student and instructor's modes of use' framework. The learning object content is based on a 300 level quality management paper from the Bachelor of Applied Information Systems delivered at UCOL.

Nichols (2001) states that in terms of educational application an experiential learning object requires participants to "perform a task, make a decision, or test a hypothesis". Experiential learning objects can be used to reinforce abstract concepts such as quality management. The idea is to have students work with the concept and somehow experience it in action - and to experience the consequences of misconceptions (Ramsden, 1992). This learning outcome needs consideration of the wider context of the learning object.

To illustrate this, consider the example of creating a learning object designed by the author and the UCOL eCampus team on quality management. The project is due to be completed by semester one, 2003. It was determined that students will interact with a CD-rom website of integrated components that is accessible via Blackboard on the UCOL intranet.

The quality management material was applied to student-oriented and instructor-oriented modes of use, and then storyboarded in varying ways within these broad categories. The mode of use determined the learning object's context for the quality management course. However, different briefs could be constructed for other courses by reusing the components of the learning object.

2. STUDENT-ORIENTED MODES OF USE

Regardless of the content, some form of instructions must be prepared for students so that the learning object can be effectively contextualised for use (Moore and Nichols, 2002). The content was storyboarded around the following instructions, then the selection of appropriate media to create the components of the digital learning object was explored.

2.1 LEARNING PREVIEW

Students engage with the learning object before an instructor-led presentation on the topic the object relates to. This learning preview allows critical reflection questions to direct students to assumptions and contexts, and challenges them to identify underlying principles (Moore and Nichols, 2002). Quality is also an attitude that must be captured. The medium to achieve this will be either a video clip or cartoon strip. It will involve exploring the definition of quality - starting with a poor customer experience, and tracing a quality issue back to its source to demonstrate the importance of quality systems.

2.2 COLLABORATIVE DISCOVERY

Collaborative discovery requires groups of students use the learning object together to fulfil a particular task or set of tasks (Moore and Nichols, 2002). This collaborative discovery will involve exploring content. This content maps a complete Detailed Flow Diagram, DFD, for a process that is fairly representative of general quality systems. It will be possible to for students to investigate processes in the system to investigate its function and the likely quality issues that might be associated with it, and to see how quality control and quality assurance systems differ.

Further sample cases from three actual businesses will include one manufacturer, one service provider, and one IT business making quantitative analysis possible. The cases will show how such data can be used to identify and isolate quality problems and present associated qualitative issues. The data will be generated by Macromedia Flash and able to be exported to an application to be manipulated to create Ishikawa diagrams or histograms such as Pareto analysis.

2.3 INDIVIDUAL DISCOVERY

Individual discovery requires students to work on their own to explore the relationships between their inputs and the outputs generated by the learning object. Interpretive questions can build on responses given to technical reflection questions from the sample cases (Moore and Nichols, 2002).

2.4 LEARNING REVIEW

Students engage with the learning object in order to experiment with different outcomes, making links between their input and its consequences, and

otherwise exploring the principles learned earlier. Technical questions (such as 'What happened?') have a practical focus, emphasising scientific observation and summary (Moore and Nichols, 2002).

3. INSTRUCTOR-ORIENTED MODES OF USE

Instructor-oriented modes of use serve the instructor's direct interests of assessment, presentation and instruction (Moore and Nichols, 2002). It is anticipated that the real life material captured in this learning object will be frequently referred to in class discussion, for actual examples to theory.

3.1 INTERACTIVE PRESENTATION

After students complete learning preview then the subject lecturer can use the learning object in a classroom or group to demonstrate 'closing the quality gap' between customers and an organisation and the consequences of different types of input (Moore and Nichols, 2002). Video clips taken from interviews with staff of the case study businesses on aspects of QA and quality management will reinforce the presentation material.

3.2 FORMATIVE ASSESSMENT

Assessment will consist of formative quizzes on general quality assurance issues, and students' perceptions of the potential quality issues associated with various stages in a quality process. The case studies will provide the quality processes for the latter tasks. This includes the creation of a quantitative data engine. For each of the three case study DFDs it will be possible to have a random set of quantitative data generated by Macromedia Flash to simulate process output. An accompanying key code will provide access to a model answer. The focus of the case studies will be on problem solving and analysis of the process rather than number crunching.

3.3 SUMMATIVE TESTING

The object can also be used for assessment purposes. This might involve assessment using tasks inherent in the learning objects themselves, or else students performing tasks external to the learning object that require some interaction with the learning object for successful completion (Moore and Nichols, 2002).

4. CONCLUSION

The student and instructor 'modes of use' for the quality management content is one of multiple ways that the learning object can be constructively integrated into a course. Different briefs may also be prepared for different courses, enhancing the reusability and flexibility of this learning object.

The aim for the learning object components -video, cartoon strips, and case studies is to breathe life into a highly theoretical topic. The launch of the object is in semester one, 2003 and students' reactions will be observed.

REFERENCES

- Gilbert, J. (1992).** How to eat an elephant: A slice by slice guide to total quality management. Kent, England: Tudor Publishing.
- Moore, M., Nichols, N. (April, 2002).** Learning objects and the 'E-Context', Proceeds of the DEANZ conference, pp.343-352.
- Nichols, M. (2001).** Teaching for learning. TrainInc.co.nz; Palmerston North.
- Ramsden, P. (1992).** Learning to teach in higher education. Routledge: London.
- Scherkenbach, (1991).** Deming's road to continual improvement. Tenn., USA: SPC Press.

BIBLIOGRAPHY

- Learning Technology Standards Committee (2002).** Draft Standard for Learning Object Metadata. Retrieved 27/2/02 from the World Wide Web: http://ltsc.ieee.org/doc/wg12/LOM_WD6_3a.pdf.
- McGreal, R., and Roberts, T. (2001).** A primer on metadata for learning objects. Retrieved 15/12/01 from the World Wide Web: <http://www.elearningmag.com/issues/Oct01/learningobjects.asp>.
- Orrill, C. H. (2000).** Learning objects to support inquiry-based online learning. In D. A. Wiley (Ed.), The Instructional Use of Learning Objects: Online Version. Retrieved 7/04/2002 from the World Wide Web: <http://reusability.org/read/chapters/orrill.doc>.
- Wiley, D. A. (2000).** Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy. In D. A. Wiley (Ed.), The Instructional Use of Learning Objects: Online Version. Retrieved 7/04/2002 from the World Wide Web: <http://reusability.org/read/chapters/wiley.doc>.

