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MAKING EXPLICIT OUR THEORIES OF TEACHING AND LEARNING: DESIGNS THAT MOTIVATE OUR WORK AS INSTRUCTIONAL DESIGNERS

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Abstract

This paper examines the explicit design principles used to create an authentic learning module for a medical problem-based learning curriculum. It examines the 'design' process utilised by an instructional designer in the conceptualisation of a project. Secondly the paper focuses on epistemological beliefs of instructional designers and the need for designers to articulate their learning design for evaluation and research purposes. The third aspect of the paper outlines the learning design for the Sensitive Examination Technique (SET): Cervical Screening module.

Keywords

instructional design, learning design, creativity, constructivism

Generic 'design'

Interest in the nature of design has been long standing in the fields of architecture, engineering, interior design, landscape design and product design. However what do we mean by the concept of design? "Design is a quintessential cognitive activity" (Goel & Pirolli, 1992, p. 395). Design by its very nature gazes into the future and attempts to formulate and represent for a future use. Instructional design, the field of interest in this paper, creates 'educational tools' useful for a specific audience and focuses on analysis, design, development, implementation and evaluation. For instance it is suggested that instructional designers "believe that the use of systematic design procedures can make instruction more effective, efficient, and relevant than less rigorous approaches to planning instruction" (Gustafson & Branch, 2002, p.18). Although efficiency is important, the more challenging 'creative aspects' of design utilised by the instructional designer is neglected within the instructional design literature.

Design research has often focussed on attempting to determine the core attributes of design. Notably, Goel & Pirolli (1992) suggest that there is a common sequence of steps in 'design' that focus on exploration and decomposition of the problem (ie analysis) in the first instance; identification of the interconnections between the components of the problem; a need to solve sub-problems in isolation as opposed to tackling all components at the same time and then a combination of the partial solutions in order to solve the whole problem solution (ie synthesis). The steps outlined above provide support for our design, as do the more specific learning designs such as Herrington, Oliver and Reeves (2002). Following a learning design 'frees-up' an instructional designers effort by allowing them to concentrate on the more challenging aspects of creative design in multimedia. It is suggested that by systematising the logical analysis, these models provide efficient frameworks for instructional designers to concentrate on design so that we "unburden the designer to engage in the creative aspects of problem solving" (Goel & Pirolli, 1992, p. 397).

Many of the design problems addressed previously have examined ill-defined, ill-structured design problems in which there were ambiguous, underspecified, and unknown parameters at the beginning of

the project. For instance Mitchell, Keppell, & Johnston, (2003) examines a project to prepare children for hospitalisation; Wlodek, Ping, Kennedy, Kirk, Judd, & Keppell, (2003) examines physiological processes in female reproduction; Liaw, Kennedy, Marty, Judd, Keppell & McNair (2002) examine communication processes by doctors; Keppell, Gunn, Hegarty, Madden, O'Connor, Kerse & Judd. (2003) examines teaching medical students cervical screening processes; Keppell, Kan, Brearley-Messer, Bione, (2002) examines a virtual dental clinic; Kennedy, Judd, Keppell, Ginns, Crabb, & Strugnell (2001) examine bioinformatics. Many of these papers have examined the explicit learning design principles utilised by the development team but largely ignored the initial conceptualization phase which was often completed by the instructional designer. This paper examines the learning design from the instructional designer's perspective, particularly in the early phases of the project. In addition, as instructional designers we need to examine our underlying teaching and learning beliefs and make them explicit for both other design team members and for evaluation and research purposes.

Epistemological beliefs of instructional designers

A major factor that we must consider as instructional designers is our set of epistemological assumptions. As designers in virtual environments, Koschmann (2000) suggests that we have an obligation "to make explicit our theories of teaching and learning ... that motivate our work and that are embedded in our designs" (p. 2). It is essential that we are explicit about these beliefs about teaching and learning because they influence the entire design and development process as well as having a major influence on student learning. Bain, McNaught, Mills & Lueckenhausen (1998), suggest that academics differed on a wide range of beliefs about knowledge, which influenced the methods used in their teaching. They also suggested that these beliefs also influence the creation of technology-enhanced teaching and learning resources.

It is essential that instructional designers articulate the theories of learning that motivate their design when discussing technology options, as a means of dispelling the common belief that they are technology-driven interventions as opposed to theory-driven interventions (Koschmann, Kelson, Feltovich & Barrows, 1996). Learning, not technology, motivates instructional designers to develop educational technology interventions and rich learning environments. Technology is only useful when it enhances the learning environment by addressing an educational problem that cannot be solved more effectively using another teaching method. The multimedia module outlined in this paper focuses on a specialized content area which probably could not have been designed more effectively in another medium. In developing complementary teaching and learning resources "it is critical that we strive to be more articulate about the theories that underlie and motivate the designs of our technological artefacts, pedagogical activities, and assessment methods" (Koschmann, 2002, p.347). This is crucial to enable evaluation and research in relation to the intervention and to justify our educational rationale. The following discussion further outlines the specific design of a multimedia module.

Cervical screening module

It has been shown that medical students have few opportunities to observe or perform Pap tests. In addition negative screening experiences by women are a major barrier to regular cervical screening. With this information in mind a collaborative undertaking between three universities began the development of a learning module to address these issues. The aim of this initiative was to assist medical students to explain and perform cervical screening in a way that enhances the doctor-patient relationship. The unique feature of SET is that the student needs to think of issues from the woman's perspective. By emphasizing the patient's perspective throughout the module we hope to facilitate the development of empathic as well as clinical and communication skills. Whilst the main target group for SET will be medical students (as doctors perform most Pap tests) the final product may be used by nursing students, postgraduate doctors and nurses, cytologists and gynaecologists who perform intimate examinations. The SET module should be viewed as one part of a new approach to teaching students about intimate examinations using cervical screening as an example (Keppell, Gunn, Hegarty, Madden, O'Connor, Kerse, & Judd, 2003).

(see Keppell, Gunn, Hegarty, Madden, O'Connor, Kerse, & Judd, 2003 for an in-depth examination of the learning design for the SET module)
Authentic activities have real-world relevance
The clinical case was developed in conjunction with medical experts from three different universities State health departments involved in cervical screening also participated in the design of the module. Topic 1 examines five cases from different cultural and ethnic backgrounds. Topic 2, 3, 4 follow one woman into the communication, examination and follow-up stages. The virtual clinic was based on photographs of an actual clinical setting. Actual case information was used to build the scenario.
Authentic activities are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity.
Topic 1 requires the student to examine the different types of personal barriers. Students should begin to understand the influence of personal factors, previous experience with cervical screening and cultural norms in relation to treating different women in the clinical setting. A variety of resources can be utilised to answer open-ended questions. A glossary and library provide additional resources for examination.
Authentic activities comprise complex tasks to be investigated by students over a sustained period of time
The clinical case involves students for approximately 3-4 hours. It is expected that the student would return to the case as their knowledge is elaborated in the area. The video examples of communication and examination provide a means for the student to view best practice examples before clinical practice and as revision after clinical practice.
Authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources.
A wide variety of resources assist the student to obtain an in-depth examination of the case. These resources include: clinical photographs, video of ideal communication between the doctor and the woman, video of ideal examination procedures, patient history, medical history, social history, expert opinions from practicing doctors, definitions of key words in the glossary, extended information in the library, expert feedback.
Authentic activities provide the opportunity to collaborate.
This module was created as a self-directed learning activity and as an adjunct to a cervical screening program. It is expected that participants in the clinical screening program will discuss key issues and concerns using aspects of the module as a trigger for activities. Collaboration with other students is not explicit at this point in time although teaching staff could complete collaborative group activities at certain points in the tutorial.
Authentic activities provide the opportunity to reflect.
Explicit reflective activities have been included in the design of the module. A reflective notebook allows the students to document reflections and ideas throughout the module. Open-ended questions require the student to complete a detailed response before proceeding. The use of questions immediately following the presentation of the video segments may encourage students to re-examine information.
Authentic activities can be integrated and applied across different subject areas and lead beyond domain-specific outcomes.
The module examines a difficult and sensitive area in which students may experience some awkwardness. It is hoped that students will begin to learn skills in empathy and improve communication skills. Generic skills of observation, analysis, synthesis and professional behaviour would be fostered.
Authentic activities are seamlessly integrated with assessment.
Formal assessment has not been determined. Future implementation will determine this assessment. Self-assessment activities are embedded throughout the module. Students are asked to complete activities after viewing each video segment.
Authentic activities create polished products valuable in their own right rather than as preparation for something else.
This module is valuable in its own right as a clinical case. The clinical case is also the fundamental interaction utilised by the medical doctor in clinical practice.
Authentic activities allow competing solutions and diversity of outcome.
Students examine the clinical information and create a schema for future medical consultation. The design of the case encourages the student to re-examine the clinical information.
(based on Herrington, Oliver and Reeves, 2002)

Table 1 outlines the authentic learning principles and the design of the SET module.

Conclusion

The theme of this paper has been grounded in making explicit the ‘designs’ that motivate our work as instructional designers. As creative designers we need to develop self-awareness of the frameworks that guide our work. In addition we must be aware of our own epistemological beliefs and their effect on the design and development environment. “One aspect of being more articulate about our theories, therefore, is being more explicit about our analytic frames and our reasons for choosing them” (Koschmann, 2002, p. 353). The SET: Cervical screening module illustrates how creative instructional design is enhanced by a ‘design scaffold’. A program of evaluation and research will be undertaken in Australia, New Zealand, United Kingdom and Hong Kong in relation to the SET project. Because of the careful articulation of the learning design, the evaluation and research has a foundation for future work.

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