New Challenges in Online and Distance Learning: Making the Jump from Printed Module to Hyperlinked-Integrated Module

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Abstract: In recent years open and distance learning (ODL) has become widely accepted and implemented by many higher education institutions. ODL aims at delivering education to learners in a distributed learning environment. Ccontrary to general perception that ODL education signifies e-learning, learners in ODL institutions still appear to rely heavily on the use of printed modules. Current learning management systems in most ODL environment do not seem to have been very successful in promoting active constructivist learning. This paper seeks to analyze the needs of ODL learners as compared to conventional learners. Based on their differing needs, the authors identify the limitations of the conventional printed modules and propose elements that need to be included in the design of effective ODL learning systems. Following that, the authors suggest the development and use of hyperlinked-Integrated Modules (HIM) to replace the conventional printed modul. Some functionalities of HIM are discussed.

Introduction

In recent years, open and distance learning has increased in popularity as an alternative learning system that emphasizes e-learning and eliminates the constraints of time and space in instruction and learning. ODL institutions have typically used technology as the main conduit for conveying knowledge to learners.

Contrary to the belief that the delivery of instruction in ODL environment is mainly in electronic form, it appears that learners in ODL institutions still rely heavily on the use of printed modules for learning. Current learning management systems in many ODL institutions do not seem to have been fully successful in providing a learning environment that promotes active constructivist learning.

This paper seeks to analyze the needs of ODL learners as compared to conventional learners. Based on their changing needs, the authors identify the limitations of conventional printed modules and suggest elements that need to be included in the design of an effective ODL learning system. Following that, the authors propose replacing the conventional print module with a hyperlinked-Integrated Module (HIM). A prototype HIM for the learning of fluid pressure is used as an illustration.

The Role of Printed Modules in ODL

Open and distance learning is both a philosophy and a model of educational practice (Nascimento & Morgado, 2003). “Open” in the ODL context means that learners are able to access the learning they desire, irrespective of financial background, age, gender or rank. And “distance” refers to the freedom afforded to learners

to transcend time and space, allowing them to study in a location that is physically separate from that of their instructors. In the ODL learning environment, learners need not be in a specific place at a certain time but can log in to their "class" anywhere and communicate with instructors and other learners, both synchronously or asynchronously. This model of learning opens up opportunities for potential learners who may be located in rural environments or war zones, or who need to juggle careers and look after their families with pursuing studies.

It has been observed that most ODL learning institutions adopt a blended learning model which sees learners engaging in various learning modes. As an example, for Open University Malaysia (OUM), Malaysia's first ODL University, the three main modes of learning are: learning using self-instructional materials, face-to-face interaction with tutors and facilitators and online learning via myLMS, its learning management system. However, self-instructional materials, mainly comprising print modules, account for almost 80% of the total learning at OUM. These modules, written by carefully selected and experienced module writers, are designed to be self-instructional, interactive and learner-friendly.

From the constructivist perspective, learners acquire new knowledge by constantly assimilating and accommodating new information with existing knowledge structures (Woolfolk, 1993). As such the extensive work experience that most ODL learners have lends itself suitable for constructivist mode of learning. However, it needs to be stressed that ODL learners, despite their age and experience, still require some form of guidance. In the conventional constructivist learning environment, the instructor is a guide, a facilitator and a coach rather than a transmitter of knowledge. Learning is essentially the result of the complex interplay of learners' existing knowledge, the social context and the problem to be solved (Tam, 2000). As such, the printed modules for the ODL environment should not be didactic in nature but should offer learners opportunities to draw upon their rich work experiences and share these with fellow learners. In short, the modules should contain elements of *interaction* and *interactivity*. One issue that arises is: how interactive can a printed module be?

Interactivity in HIM's model

Gilbert and Moore (1998) use the terms "interaction" and interactivity" interchangeably but Wagner (1997) draws a sharp distinction between them. She defines interaction as interplay and exchange in which individuals and groups influence each other but said that interactivity emerged from "descriptions of technological capability for establishing connections from point-to-point … in real time." In other words, interaction focuses on people's behaviour while interactivity focuses on characteristics of the technology systems.

While some researchers have voiced doubts about whether distance learning can ever have the same degree of interaction prevalent in a non-distance environment, others such as Horn (1994) and Hirumi and Bermudez (1996) believe that with proper instructional design, distance courses can actually be more interactive than traditional ones, providing more personal and timely feedback to meet students' needs than is possible in conventional, face-to-face courses.

There is little doubt that a major weakness of print modules is the lack of interactivity. The content of most print modules is presented in a linear fashion. There are definite advantages to print modules, for instance, the easy accessibility and ready portability which allow learners to skim and scan, as well as flick through pages at will. But the lack of interactivity is a problem, especially with science-based modules which often require learners to actively construct knowledge based on simulations and experiments.

Students interacting with a simulation are definitely more likely to gain a better understanding of a real system, process or phenomenon as they can explore concepts, test hypotheses, and discover explanations (Hwang & Esquembre, 2003), especially in the case of experiments which are too expensive and risky to carry out. A module on the social sciences, on the other hand, can be more text-based although it should also incorporate interactive elements that allow learners to construct meanings.

The proposed hyperlinked-integrated module (HIM) is viewed as a better alternative which offers learners much more than just notes and printed text. It has immense potential to shift learning from a didactic manner to a motivating two way interactive process. The limitations in a printed module that can be overcome or improved via the use of HIM include the following:

a. It allows both linear as well as non-linear access of course content
b. It allows process visualisation by supplementing textual explanation of a process with simulation of the actual process.
c. It allows inclusion of microworld for exploratory learning
d. It allows self-managed assessment with computer generated questions and assessment activities

Prototyping the Hyperlinked-Integrated Module

To illustrate the functionalities of HIM, a prototype for the learning of fluid pressure is developed that may promote active constructivist learning in ODL. Below are some of the characteristics of HIM that will distinguish it from conventional modules:

a. The use of hypermedia such as hyper-buttons and hypertext to link information within the module as well as to access external resource through the World-Wide-Web (see Figure 1)

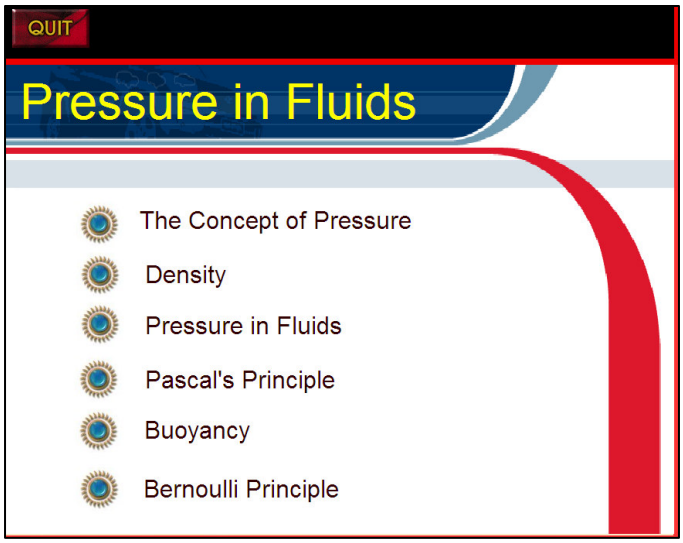

Figure 1: Hyper Buttons which allow Non-Linear Access to Content

b. Learning will come alive as certain abstract concepts can be learned through visualisation of the computer-generated simulation, which cannot be shown by just text and static pictures (see Figure 2).

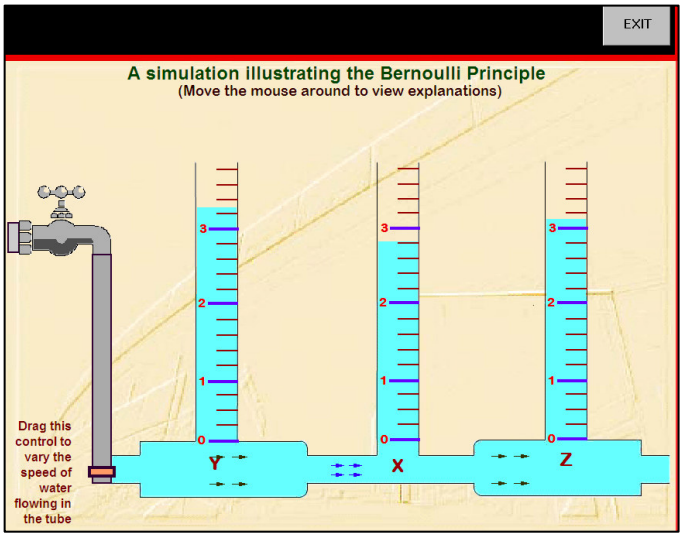

Figure 2: Understanding Bernoulli Principle through visualisation.

c. It allows learning by leaner-controlled exploratory activities (see Figure 3). This helps learners to actively construct their knowledge and at their own pace. Learning in this case will be more effective if well-designed task-questions are provided to guide explorations.

Figure 3: Explore and observe understand the fluid pressure calculation.

d. It enables learners to engage in self-assessment using computer-generated interactive questions (Figure 4)

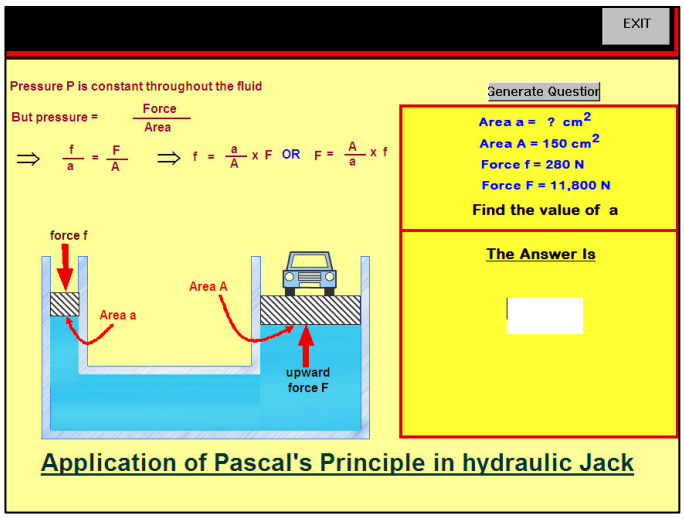

Figure 4: An interactive question generator on Pascal's Principles.

e. It allows learners to tap into new media technologies and enjoy quality short lectures in the form of video clips
f. It offers learners a fun learning element via interactive educational games.
g. It motivates learners by offering immediate feedback which reinforces learning.

HIM will be designed primarily with constructivist principles in mind to give learners control over their learning and allow them to participate actively in exploring, conjecturing, testing and discovering their own knowledge.

The downside is, of course, the initial high capital outlay for developing HIM. But in the long run, this will be offset by its effectiveness in helping learners achieve the required learning outcomes.

Challenges and the Way Forward

Khoo and Idrus (2004) highlighted the fact that concern for quality in higher education is at an all-time high. There is no doubt that customer perception of quality is of utmost importance today and that those institutions which offer quality products and services will survive and prosper (Jenkins, 1991). In the ODL environment, quality assurance and certification is especially important because its learners are embracing a way of learning that is radically different from the traditional learning paradigm. Before there can be quality assurance, however, ODL education providers need to understand who ODL learners are, what motivates them, how they feel as they progress in their learning and how they accommodate the role of learner to other roles in life. This is crucial to designing satisfying and meaningful ODL programmes.

A successful ODL learner is one who exhibits initiative, independence and persistence in learning. He accepts responsibility and views problems as challenges, not obstacles. He also has a keen sense of self discipline, a high degree of curiosity as well as a strong desire to learn or change. He is confident, goal oriented and able to organise time. To offer these learners a quality ODL learning experience, faculty needs to look at things from their point of view and try to meet their needs. The HIM prototype strives to do this but there are challenges ahead.

Firstly, the prototype needs to be able to accommodate distance learners with different levels of preparedness in using technology. In a developing country like Malaysia, the gap between the most and the least prepared learners can be very wide.

Secondly, the prototype needs to be backed by good support services, especially committed tutors and facilitators. A research study by Woo and Lim (2009) showed that not all ODL instructors have constructivist beliefs and practices and may require assistance to incorporate such principles into teaching and learning.

Thirdly, technology has limitations that may undermine the effectiveness of the prototype unless we are aware of these weaknesses and able to deal with them, for instance, slow or delayed input due to inadequate broadband width, the frustrations learners feel when they fall behind, etc.

Conclusion

To conclude, this paper highlights the need for ODL institutions to consider progressively replacing the printed modules with hyperlinked-integrated modules that can engage learners in active constructivist learning. The initial challenge lies in identifying the subject that is most suitable for developing the prototype and in designing and developing the learning objects that should be embedded into the hyperlinked-integrated module. Finally, integrating the prototype into an institution's learning management system will be the greater task. It is also necessary to carry out on-going evaluations of HIM for the purpose of continuous improvement. It is strongly believed that the success of the project would bring great benefits to ODL education.

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