

## **A personal experience of learning with print and learning with electronic media in open and distance education**

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### **ABSTRACT**

This paper is a personal exploration of the experiences of learning from print and learning using electronic media. The discussion is based on the way the author and other students experienced learning from both print and electronic media during a course which was offered by the British Open University in 2002. The course, H802: Applications of Information Technology in Open and Distance Education, was a distance learning course that used both print and electronic forms of media. Using evaluative comments captured during the course, I have attempted to map out the effects both forms of media have on learning interactions. The pedagogic functions of each media type in the same course are highlighted. Implications for designing instruction in a distance learning environment using different media are then finally presented.

### **INTRODUCTION**

Telecommunications, software, and the Internet are creating a monumental paradigm shift (Jones 2002). Computers, video, and telecommunications are changing the roles of both teacher and learner (French 1999). Open distance learning developers worldwide are seeking appropriate ways of determining the role technology plays in the learning experience and ways of designing teaching and learning strategies that correspond with the new learning terrain. This article is a personal exploration of learning from print and learning using electronic media. The focus is on the type and quality of the learning interaction each delivery mechanism allows, and how this could be used to inform the process of designing instruction for each media. This is a single, subjective and experiential case confined to one course. It is an attempt to explore learning interactions at a micro level (Jonassen *et al* 1994), using learner conceptions of learning experiences. The ultimate aim is to stimulate distance learning practitioners into thinking differently about how to design and present learning when using different media forms.

### **UTILISATION OF DIFFERENT FORMS OF MEDIA IN DISTANCE LEARNING ENVIRONMENTS**

In open and distance education, the physical separation of teacher and learner requires that communication between teacher and student be technologically mediated, using print, video, audio and most recently, computer-mediated technology (Rumble 1989). The exploration of the types and quality of learning interactions is important if we are to effectively create the learning environments necessary to foster meaning-making from learning (Hawkrigde 2002). Reviews of media influences on learning have consistently revealed that there is no significant advantage in the use of one medium rather than another (Russell 1999; Clark 1983). In fact there is a suggestion that the educational media debate should shift from a focus on the media and instruction to a learner-centred conception of learning (Jonassen *et al* 1994). Assuming that learning is an active process comprising learning activities a learner would have to perform, this exploration is designed to answer two basic questions:

- 1) What effects, if any, do media have on the quality of learner-media interactions?
- 2) How can this inform the distance learning design process?

The brief explorations of these two questions form the basis of discussion of this paper. They are based on my experiences and those of my fellow students of learning from print and electronic media during a course which was offered by Britain's Open University in 2002. The course, H802: Applications of Information Technology in Open and Distance Education, was a distance learning course using both print and electronic forms of media. Student quotations are taken from the evaluative comments which were captured at the end of each learning block. In exploring these two questions, issues concerning the design and development of the course will be highlighted as the evaluation of the course proceeds. The main aim is to illuminate views about the learner-media interactions from the perspectives of the learner group. The discussion begins with a differentiation of electronic and print forms of media and a brief overview of the course structure. This is followed by an exploration of media effects on learning interactions. Finally, implications for designing instruction in a distance learning environment are presented.

## **EDUCATIONAL MEDIA**

Educational media are used to represent reality or aspects of reality. According to Evan & Hawkrigde (1999:11), "Educational media are the means by which something is communicated between teacher and learner, and possibly vice versa". They are channels through which educational texts or messages are communicated. Texts can be words (written or spoken), images (still or moving) or even sounds (tunes and codes). They refer to "any continuous piece of spoken or written language that is meaningful" (Evan & Hawkrigde 1999:13). Media require different technologies to characterise and shape different types of educational texts. For instance, manuals and study guides (print media) use print technology to shape the printed word with still images text, while electronic mail and computer conferencing (electronic media) depend on information and communication technologies to characterise onscreen words with or without still images text. For this discussion, educational media (such as course guides, papers, books, articles), which use print as their base technology will be regarded as print media. Media (such as web pages, online conferences, multimedia CD-ROMs, DVDs and handheld computers) having an electronic technology platform will be regarded as electronic media.

## **THE H802 COURSE LEARNING ENVIRONMENT**

The aim of the course was to provide learners with "practical experience in using the technologies common in distance education" (Kaye 2002:4). The underlying pedagogic principles on which the H802 course was based were: experiential learning (learning by doing), critical reflection, collaboration and a social constructivist perspective. Kaye (2002:9) asserts that, "a social constructivist perspective integrates an individual's cognitive and social environments, but also attaches critical importance to the social negotiation of meaning, supported by collaborative construction of knowledge". The students enrolled for this course were adult educators/administrators from various institutions, with a wide range of IT experience, who use online collaboration tools in their working environments. There were 57 students from 18 countries.

### **Course structure**

The H802 learning environment basically consisted of two structures, the online environment and the print environment. The first three blocks were delivered online using web-based resources and FirstClass conferencing software. The final block used print-based materials with

optional conferencing. Supplementary resources were used in both environments. There were three tutor-marked assignments at the end of each block with an Examinable Component at the end of the last block. Credit was awarded for the quality and relevance of the written essays, for use of web-based and print-based resources, and for evidence of utilisation of both individual contributions and those of other students.

### *The print environment*

The primary forms of media used in the print environment were the study guide, books and articles. The printed course guide included an introduction to each of three blocks (1, 2 and 3) and block 4. Block 1 introduced teaching and learning online, Block 2 mainly dealt with using the web as a medium for teaching and learning, Block 3 related to the use of interactive multimedia in teaching and learning and Block 4 drew together the issues, theories and literature on both print and electronic media in distance education. Included in this block, was a critical analysis of the theoretical underpinnings of media, text and technologies, a social and contextual analysis of media use and an introduction to the evaluation of media innovations. The typical student for this course was expected to be familiar with print media.

### *The online environment*

This environment had two basic structures, the online study guide and the FirstClass (asynchronous) conferencing system. Supplementary media included audio tapes, CD-ROMs, e-mail and a web cast (synchronous messages which were recorded and could be accessed from the web). Other sites of value to the students were the Virtual H80X tour (a web-based map of the course signposts and key stages), and links to the International Centre for Distance Learning (ICDL) resources and the Open University library.

Overall, the H802 web-based learning environment was well structured and easy to navigate. There were four learning blocks, each with one or more sets of activities and learning tasks. The first, Block 0, contained introductory activities, such as an introduction to conference skills and messaging, to help the learner get used to the technology and the facilities on the site. In block 1, the learner was introduced to the web with the major activities being a quiz and a structured debate. Block 2 was about the role of the web in teaching and learning. Here, HTML principles and searching techniques were introduced. Issues relating to the context, design and development of web-based courses were also explored. Block 3 was about interactive media in teaching and learning. At the beginning of the course, each student was assigned to an electronic tutor group with a designated tutor. The tutor coordinated the activities and tasks in each block, monitoring the discussions closely and contributing where necessary. The tutor marked the assignments at the end of the course. My group had 14 members from 7 different countries in Europe and Africa.

### **Initial learner experiences of the online environment**

Initial learner experiences in the online environment were mixed, as was indicated in the group quiz summaries. Some of them were positive, "H802 is a learner-centered environment. On a formal basis, it provides tools that enable contextual and active learning", according to a Group 1 member. "Overall, the H802 learning environment provides an excellent framework for teaching and learning online. It provides a 'Virtual place' to meet and combines communication tools with resources very effectively", was the perception of a group 3 member. Another positive comment from a member of group 4 was, "The website is in hypertext format, which enabled a non-linear

study approach; the participants navigate through the various directories in a manner which suits their particular interests and needs."

There were issues concerning the structure of the FirstClass conferencing system, "Why all the areas can't in the system be brought into alignment?" was the question of one participant. Another learner's remark was, "The First Class system is not very intuitive and takes some time (and help from other participants) to learn to use in a productive way. From my personal view, the structured debate exposed some of the complexities of organizing and sustaining computer mediated activity in an educational context. This activity was too hurried and there wasn't sufficient time for learners to experience the different roles (proposing, opposing, and moderating summarizing) or to construct collaborative resources.

On the whole, the initial positive comments were directed towards the structure of the course, the links between communication and learning resources, and the opportunity for learners to pursue individual learning paths. The negative comments were directed towards pace (time) and issues concerning access to and familiarity with the technology. As a group 3 member suggested at the outset, "The success of certain activities depends very much on acquiring new skills both with the software and also knowing which tool to use for which job and how to communicate in an environment with a lack of immediate feedback and non-verbal signals."

### **Learner experiences of the print environment**

The print environment was a far more familiar territory of operation and no evaluative questions were designed for this section. The course included numerous articles with a mixture of articles selected for each block. There were three written essay assignments and the final summative assignments at the end of the course. Most of them were online resources. Block 4 used the print format only. This is the period in which each learner was required to condense and reflect on the learning received in the entire course and prepare for the summative essay. No group activities were designed during block 4.

## **MEDIA EFFECTS ON LEARNING INTERACTIONS**

In order to understand the impact of media on the learning interactions we need to discuss the educational transaction and symbol systems.

### **The education transaction**

"At the heart of distance education is the education transaction based on a two-way communication," (Nunan 1999:30). This education transaction supports four forms of learning interactions (Hawkridge & Edirisingha 1999:113), namely:

learner-instructor:	between the learner and the expert preparing the learning text
learner-learner:	between peer learners
learner-learning content	between the learner and the learning texts
learner-interface:	between the learner and the media interface

The "learner-learning content" interaction underlies all the others" (Hawkridge & Edirisingha 1999). The learner-interface interaction is critical in electronically mediated transactions, especially in those contexts where the learner is not familiar with the media interface.

## **Media support for different types of learning interactions**

Print and electronic media differ in the types of learning interactions they support. Learning interactions vary from “one-way” (learner-teacher) interactions to more dialogic “two-way” (teacher-learner; learner-teacher) forms of collaborative interactions. These interactions may be “one-to-one” or “one-to-many” forms of communication (Kaye 2002). Usually in a distance learning course, a study manual supports a one-way interaction while computer conferencing or electronic media support one-to-one, one-to-many, many-to-many forms of interaction.

## **Symbol systems and media**

“Learning is meaning making via discourse” (Nunan 1991:35). Fairclough (1989:24) describes discourse as a “whole process of social interaction of which text is a part”. Texts are both products and resources of a discourse. In order to learn, students access educational texts indirectly by interpreting the teacher’s descriptions of the world (Hawkrige 1999). In creating these descriptions, a teacher generates instruction. The teacher uses symbol systems (words, pictures, diagrams, numbers etc) as tools for generating this instruction. This process requires media.

## **Media influence on the quality of the learning interaction**

Not only are different media able to accommodate different sets of symbol systems, they can also accommodate them differently. For instance, the print medium can accommodate static words and still pictures. The computer can accommodate static words and pictures, moving pictures and sound, and has the ability to accommodate them in a different format (the words can be linked through hypertext for web pages). The quality of the learning interaction could be very strongly linked to each medium's capability of accommodating symbol systems. According to (Hawkrige 1999:78), “Symbol systems shape knowledge acquisition and organization through a particular medium”. Depending on the way these symbol systems are organised, each medium has the ability to influence the learner interactions differently. This will also affect each learner's ability to get involved in the learning process.

## **Media characteristics and learner interactions**

Media have characteristics which can change the nature of learner interactions. In general these relate to issues such as:

- accessibility to students (the skills required to access the learning content)
- ease with which the student can manipulate (re-play, re-organise, add, remove, search text)
- portability (removal from restriction to place)
- familiarity with the media on the part of the learner
- sense of immediacy they bring to the learning interaction
- cost of reproduction and distribution.

In order to illustrate how each medium would affect learner interactions, a comparison of a study manual and computer conferencing along these dimensions is given in table 1.

**Table 1****Comparison of characteristics of a study manual and computer conferencing**

<b>Characteristics</b>	<b>Study manual (SM)</b>	<b>Computer conferencing</b>
accessibility to	accessible if learners are literate	same as study manual but learner must have typing and conferencing tool skills
ease of manipulation	easy to manipulate, re-read, annotate, search etc	depends on structure of conferencing tool, and ability to store contents off line.
portability	very portable	portable if you own a notebook and can get connected easily
familiarity to learner	very familiar depending on language	depends on previous exposure and location of learner, rural/urban, academic setup etc.
sense of immediacy	does not give sense of immediacy	gives a sense of immediacy
cost of reproduction and distribution	cheap	expensive, in terms of connectivity setup and maintenance
limitations	linear representation of text	can be expensive to maintain

**Quality of interaction and "depth of processing"**

(Hawkrigde and Edirisingha 1999:109) contend that "the quality of interaction depends on the depth of processing. Perhaps the *processing depth* can be linked to the five learning activities which seem to be able to accommodate notions of desirable learning (Kaye 1999; Hawkins 1991; Hawkrigde 1999). These are:

- *Acting on* (learning by doing) or experiential learning, which suggests that the learner must leave his or her mark on the learning text.
- *Interpreting or making meaning*, reformulating the content.
- *Reflection* is a central learning activity involving forming individual points of view and critically considering issues raised; *self-reflection* is a major component of adult learning.
- *Collaboration* is a learning interaction which allows the learning processes to become not only democratic (Rumble 1989) but also cognitively stimulating and challenging, particularly for adult learners. Some of the outcomes of this form of learning include high mastery and retention levels, improved quality of reasoning strategies and positive effects on social, motivational and attitudinal outcomes in addition to academic outcomes (McConnell 1994).
- *Articulation*, because as a second language user, like younger learners (cf Hawkins 1991), I often spend a lot of time trying to re-state my interpretations because my thought processes employ a different language.

Using the five different learning activities (acting on, interpretation, articulation, reflection and collaboration) as rough barometers of desirable activities for engaging learners, it is possible to obtain an idea about potential pedagogic function for each type of medium within a learning environment. Table 2 is a representation of my personal views about the pedagogic functions of the two types of media, based on my experiences with the H802 course. I used the study manual to act on and reflect on the learning materials and I kept returning to the printed text to refine my ideas. The conferencing facility assisted me in my collaboration and articulation although I was often limited as regards participation because of the cost of the connectivity.

**Table 2**

**Using the five different learning activities (acting on, interpretation, articulation, reflection and collaboration) as rough barometers of depth of processing**

Learning Activity	Study manual	Computer conferencing
acting on	very high level	moderate level
interpretation	moderate (internal)	high, because one has to communicate with others
articulation	low	high
reflection	can be very high, depending on the learning activities	moderate, depending on the learning activities
collaboration	none	high

The other issues which tended to affect learning on media were related to how the tutor used the learning activities, coupled with the tutor's awareness of each medium's capability to support different learning activities and learner needs.

### **Implications for designing instruction in a distance learning environment**

The design process is a product of intuitive ideas and logical decision making. Designing an effective learning environment requires an analysis of the learning (what needs to be learned), identification of the relevant support mechanisms and a choice of the correct instructional methodologies. Boyle (1997) distinguishes two layers within the design process, a conceptual design layer informed by theoretical knowledge about learning, and a presentation design layer which is about media choice and integration. In order to design effective learning environments, one also requires expertise in:

- (1) pedagogy (learning)
- (2) the learning domain or area
- (3) knowledge of the particular media used

These are explored briefly in the remaining sections.

#### **(1) Pedagogic approach**

The designer should be able to draw on some of the theories about learning and instruction. The pedagogic poles extend from instructivist approaches to the more prevalent constructivist and collaborative, student-centred approaches. Within a South African environment, the trend is to use an outcomes-based learning paradigm.

#### **(2) Learning domain /area**

This specification of the learning tasks and activities or strategies is determined by the learning requirements within each learning domain (Accounting, Physics, Computer Science etc). One would also have to consider the appropriate sequencing and structuring of learning tasks linked to the learning outcome(s) to be achieved. There are some generic activities such as those used in the H802 course (quizzes, the structured debate and collaborative assignments) that could be utilised in different learning domains. In the case of online group tasks, factors such as group size and duration of activity are important. The role of learner interactivity cannot be underestimated. Learners should be encouraged to use materials and tools rather than to watch teacher activities. The principle of "reciprocity", a component of the learning-teaching interaction

whereby tutors and learners engage in two-way cross-fertilised communication is encouraged. This is one of the ways in which meaningful learning can occur. This type of reciprocity was strongly featured in the H802 course.

### **(3) Knowledge of the medium used**

The designer needs to know enough about the medium used in order to be able to choose appropriate technology options and to avoid design decisions which may prove in the end to be complex, unattainable and expensive. The designer has to judge a technological system's fit with education contexts and learner needs. Within a South African environment, there are also issues of resource organisation, access to different forms of media (such as Internet access) and the level of scalability for future uses.

As part of the H802 course, a summary was made of guidelines that could be used for designing and presenting learning environments. These included:

- a clear purpose for the learning task
- choice of activities that would allow for possibilities of repetition of activities and flexibility of use by diverse groups of students
- inclusion of provisions for obtaining feedback from students
- mechanisms for monitoring learner progress.

Laurillard (1994) introduced a useful analysis of the factors which affect student learning through any medium. Her analysis is useful because it locates the use of media in a wider learning context. The learning context includes so many variables that are required to encompass the cultural context of learning. These are: the learning outcome and task, student's prior knowledge, approach to task, nature of the medium, physical logistics, motivation, perception of assessment and teaching, actual assessment and teaching. According to Laurillard (1994:22), "Successful use of media depends on the learning context together with an understanding of how selected technologies work and under what conditions they appear to be effective".

## **CONCLUSION**

In order to design for the different media forms, the two questions that need to be asked are:

- What forms of interaction are possible through the media?
- What is the quality of the interaction?

The answers to these questions are not static or final, but will be greatly influenced by learner needs, type of learning desired and the context in which learning is taking place. One should begin with a context and with a purpose or an idea relevant to the context, and then design a learning event (learning problem and media) that will address that purpose or idea. At all times it is advisable to adopt an approach that considers the learner's experience of the media. The key to success is a balance between applying useful concepts about learning, and implementing innovations using the best attribute of each medium used (Salmon 2002).

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