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1   ICT, the Internet and Theories of Learning

About this chapter

In this chapter you will encounter:

- an explanation of the purpose and structure of the book
- a general review of learning theory as it might relate to the use of the internet
- a detailed consideration of constructivist learning theory with particular reference to the use of ICT and the internet.

INTRODUCTION

This book has been written with the intention of looking in detail at some of the issues surrounding the increasing use of the internet in schools. The book also looks at the associated areas of learning theory and pedagogy, which are likely to have an impact on the realisation of the expected learning outcomes that teachers formulate and work towards.

The book provides the background to learning theory relevant to a consideration of internet use in schools, and presents an overview of current views and developments concerning pedagogy in the light of the advent of new technologies in general, and the internet in particular.

To exemplify some of the important ideas and approaches considered in the early chapters of the book a series of case studies, grouped according to learning and pedagogical principles, is also included. The case studies serve to provide a strong practical input, helping to make the book useful for academics and practitioners alike. The case studies are based on classroom research and as such are examples of the sort of work currently being undertaken by teachers. The case studies emphasise the planning and practicalities of the work and links are made to the theory that is considered earlier in the book. The case studies also consider the learning outcomes and compare them, as far as this is possible, to the outcomes which might have been achieved if the work had been undertaken in a more traditional and non-ICT related way.

LEARNING THEORY AND THE USE OF ICT AND THE INTERNET

Naturally everything that teachers do in their planning and their teaching, as well as most of their interactions with their pupils, is centred on the idea that children learn in certain ways and that teachers plan and design activities to take advantage of this.

The arrival of new technologies in schools in the 1980s had little impact on the way that teachers planned and taught. Many computer applications that were used in classrooms were copies of approaches that teachers had used, and in some cases, had stopped using over the years. An example of this is the increase in the number of programs that gave extensive repetition in basic skills and became known as "drill and practice" programs. There is a place for this type of program perhaps, but to concentrate the power of a sophisticated and expensive piece of equipment on an outdated approach to learning with questionable value is not wholly satisfactory.

With the growing awareness of the theory associated with learning and a growing interest in the ways that new technologies might change the way that teachers teach and children learn, there is scope, perhaps even a real need, to look at what is currently known about learning, especially in relation to the new possibilities afforded by Information and Communications Technologies (ICTs).

If we deal quickly with the behaviourist view of learning, we will be able to concentrate on the constructivist theories, which seem to give far better representations of the complex processes involved in learning. Put simply, behaviourists see learning as a process by which learners become able to make specific set responses to particular stimuli. This perhaps sounds very basic, and in some ways it is, but behaviourists believe that all behaviour can be divided into small actions, each of which can be mastered by a process of training, rewards and sometimes punishments, and that learning proceeds in that way, often without the all important ingredient of understanding.

To be able to respond with the number 56 when asked the question "What are seven eights?" is certainly commendable. However, simply responding with the correct number cannot give any insight into the level of understanding of the respondent. Of course we can say that as long as the answer is correct it does not matter, but understanding is at the heart of effective and lasting learning. Some would argue that being able to make the correct response is fine and that understanding may follow on behind for many, and if it does not, then at least the response is correct.

In many contexts behaviourist style learning may be the answer, reciting multiplication tables may be one of these contexts, and there are others – automatically looking both ways before crossing a road; saying "please" and "thank you" appropriately; putting "i" before "e" except after "c". There are many more contexts when what is really needed is the flexibility that comes with understanding. Generally speaking we have moved away from behaviourist style teaching and learning for most learning activities, and the school of thought that holds sway, though not always explicitly, is the school of constructivist learning.

Constructivism, in contrast to earlier theories, puts understanding at a high level of priority. Constructivism, as the name suggests, sees learning as a building activity in which individuals build an understanding of events, concepts and processes, based on their personal experiences and often supported and developed by, amongst other things, activity and interaction with others.

Let us look at this in a little more detail. If we were to distil what has been written about constructivist learning we might come down to the following four statements.

- Learning is a process of interaction between what is known and what is to be learned.
- Learning is a social process.

2 The Internet, Pedagogy and Learning

About this chapter

In this chapter you will encounter:

- background to the use of the internet in schools
- the importance of evaluating internet resources
- a discussion of the key features of ICT as they relate to learning
- an overview and discussion of different pedagogies as they relate to the use of ICT and the internet
- reference to the essential links between pedagogy and learning theory
- characteristics of constructivist learning, which might be present in effective ICT related lessons.

NATURE AND HISTORY OF THE INTERNET IN SCHOOLS

The national curriculum for schools in England (DfEE/QCA, 1999) sets out four strands which, when combined, make up the notional subject of ICT. The word "notional" is used here because there is a strong emphasis placed on the use of ICT as a means of supporting learning in subjects, rather than ICT for its own end. There is a debate in academic circles concerning the nature of ICT as a subject, but this will not be discussed here. (See Hammond, 2004, Webb, 2002, Somekh, 2000, Cordes and Miller, 2000)

The four strands are:

- finding things out
- developing ideas and making things happen
- exchanging and sharing information
- reviewing, modifying and evaluating work as it progresses.

Traditionally, insofar as there is a tradition concerning the use of the internet in schools, it is the first strand of the national curriculum for ICT – finding things out, that has been the focus of internet use. There have been, however, many developments that allow the internet to support all of the strands.

When Tim Berners-Lee (Berners-Lee, in Dern, 1994: 73), sometimes referred to as the inventor of the internet (even though no one person can be considered to be individually

responsible), described the result of his supposed invention as a, "… wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents", he described the mysterious nature of something that many of us take for granted. The different elements of his definition are considered below.

Wide-area: The World Wide Web spans the entire globe.

Hypermedia: It contains a range of media, including text, pictures, sound and video. The individual elements are connected by hyperlinks that connect pages to one another, and allow for swift movement from one internet location to another.

Information retrieval: Viewing a web document is very easy thanks to the help of web browsers, which are the point of contact between the user and the web. Web browsers allow the user to retrieve pages just by clicking a mouse button when the pointer on the screen is over a "link", or by entering appropriate web addresses. Information may be retrieved from the web extremely quickly by any suitably set up computer with an internet connection.

Universal access: No matter what type of computer, or what type of computer the page that is to be viewed is stored on, web browsers allow for apparently seamless connection to and movement between many different internet locations which might be stored on many different types of computer system. Increasingly newer mobile devices, including mobile phones, are adding to this universal access.

Large universe of documents: Anyone can publish a web page. No matter what obscure information you want to find, there is certain to be someone who has produced and published a web page about it. It will not necessarily be exactly what you want, it might not be accurate or written in an appropriate style, but it will be there. "The Net consists of 2.5 billion documents, growing at a healthy clip of 7.3 million pages per day." (Varian, undated)

INTERNET USE IN SCHOOLS

The internet, by means of the World Wide Web, and initially by the use of simple e-mail systems, has become the latest in a list of technological advances to be introduced into classrooms. In the early to mid 1990s to use the internet in a primary school setting was to take a bold move into the unknown. (Only 17 per cent of primary schools even had access to the internet by 1998, see below.) At first access was slow and unreliable and the internet was only a tool for the enthusiasts. To make use of the internet in school was not a particularly obvious option to follow. Certainly information of one sort or another could be sought out for use in lessons, but to rely on the system, which was an expensive undertaking apart from anything else, to provide access for the duration of a lesson, was asking too much. The use of e-mail was introduced experimentally, and in some schools contact was made, sometimes only locally, with other classes. Examples of contact between more remote locations at home and abroad soon came to light. As the availability and reliability of the equipment increased, so did the opportunities for teachers to try out new communications-based activities.

Official figures from the UK Government give a picture of the current position as far as schools with internet access is concerned: since 2002 more than 99 per cent of