

Information–Rich Learning Contexts

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BACKGROUND

Williams (2001) points out that plagiarism in pupils' school work is widespread and, perhaps more importantly, that it has been made significantly easier in recent years as a result of the increased use of and familiarity with new technologies. Lewis, Wray and Rospigliosi (1995) also highlight difficulties pupils have when faced with a large amounts of textual information. Pupils copying passages is not a new phenomenon, but it is quite clear that for many uninitiated young learners, copying and pasting electronically is perfectly acceptable.

If learning activity becomes a process of cutting and pasting, then very little effective learning will take place. Pupils need to be taught, and encouraged, to use strategies to assist with the processes of searching and of making selections from the mass of information with which they will be confronted. Learning objectives set by the teacher will not be met if all that takes place is the transfer of text and pictures from one location to another.

DIFFICULTIES WITH RICH INFORMATION SOURCES

The use of search engines and the skills of defining searches accurately are topics that deserve attention in schools, but the problems brought about by the locating information are of a less-serious nature than those brought about by finding enormous volumes of potentially useful information and not having the skill or knowledge to make effective use of it. The problems can be summarised as in Table 1.

- **Overload:** Information overload does not have a clear definition (Fournier, 2000). Wurman (1989) considered this a problem and defined it as "...the inability to extract needed knowledge from an immense quantity of information for one of many reasons" (p. 23). Education-

ally ineffective approaches are sometimes taken when faced with a situation of overload, such as plagiarism. This may be unintentional plagiarism, but plagiarism nonetheless.

- **Plagiarism:** The advent of the Internet and the availability of other electronic sources has made plagiarism incredibly easy. The act of copying is not restricted to the young and uninitiated; there are reports of plagiarising from infant schools to post-16 settings. "... at all levels of education, ... a great deal of copying of information, even plagiarism is creeping into written work in school. Sometimes this is deliberate, and at other times it is unintentional and a result of not knowing how to set about the work in question." (Pritchard, 2002, pp. 1283-1292)
- **Wasted Time:** When faced with a plethora of written information on a host of different Web sites or CD-ROMs, it is easy to jump from one to the other and to lose track of what was where and which elements were useful and likely to help in fulfilling the tasks to be completed.
- **Reliability:** There is a strong temptation to accept as true anything that comes in written or published form. Information accessed via computer seems, for some, to have special credence. The skills of Web site evaluation are an essential for anyone who uses the Internet for information gathering (Pritchard, 2000).

21ST CENTURY LEARNING

Constructivist learning theory, which is generally accepted as the pre-eminent paradigm in the early years of the new century, asserts that knowledge and understanding are constructed by the learner on a foundation of what is known and understood. Learning is an active process (Brooks & Brooks, 1998) of adjusting our mental models to accommodate new experiences.

Table 1. Potential problems with rich information sources

Possible Difficulty	Comment
Information Overload	The sheer volume of information can lead to a state of virtual paralysis.
Plagiarism	Whether intentional or not, it is possible for “chunks” to be copied and presented as original work.
Inefficient Use of Time	Without specific initial guidance, it is possible to spend a lot of time to no apparent benefit.
Reliability	There are not always guarantees that the information accessed is accurate, reliable and unbiased.

These are the principles of constructivism:

- Learning must start with the issues around which pupils are actively trying to construct meaning.
- The learning process focuses on linked concepts, not isolated facts.
- For teaching to be effective, teachers need to understand the mental models that their pupils use to understand the world.
- The purpose of learning is to construct personal meaning, not to memorise answers by recalling meaning created by someone else.
(After Brooks & Brooks, 1998)

Cognitive psychologists refer to the complex structures of knowledge and understanding, which are held in the human mind, as schemas. Each of us will have thousands of different schemas. New schemas are created and existing schemas are constantly updated.

Mayer (1983, p. 209) gives four elements to describe a schema:

- **General:** a schema may be used in a wide variety of situations as a framework for understanding.
- **Knowledge:** a schema represents something a person knows.
- **Structure:** a schema is organised around some theme.
- **Comprehension:** a schema contains slots filled in by specific information.

The terms assimilation and accommodation (Piaget, 1973) refer to the ways in which new information is dealt with during the processes of

learning. Assimilation and accommodation are a part of the process of adaptation; that is, the process by which existing knowledge structures are changed to comply with any new information which is either added to (assimilated) or causes alteration to (accommodated) the existing schema. Brown (1995) explains that this process “... will rarely be a simple matter of assimilation. ... Usually the existing schema will have to be adjusted to accept the novel experience. A process of accommodation” (1995, p.19). Sewell (1990) concludes that, “... if the material to be learned/taught can be related to an individual’s existing schemas the more easily this information will be acquired, stored and recalled” (p. 216).

The principles of constructivism have certain implications for the ways in which teaching and learning situations are designed. In constructivist teaching contexts, there needs to be a distinct focus on making connections and creating new understandings; there needs to be a moving away of teaching strategies from simple pupil responses towards dialogue, open-ended inquiry and a focus on collecting, analysing, interpreting, predicting and synthesising information.

These key activities are in need of more consideration. In a hierarchy of learning activity, certain levels of sophistication have been defined by writers over the years. These structures are set out in terms of behaviours, which begin as simple and become more complex. Bloom, Englehart, Furst, Hill and Krathwohl (1956) made the first consideration of this notion of a hierarchy of behaviours. Others (Kohn, 1967; Biggs & Collis, 1982; Vosniadou & Brewer, 1987) have produced other interpretations of the same phenomenon. At the simplest level, the “learner” collects information. Those who work effectively at this level recall factual information, or

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