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ABSTRACT

This issues paper, one of a series of eight, is intended to distill formative evaluation questions on topics that are central to the development of the higher and further education information environment in the United Kingdom. The topic of this first issues paper is a conceptual framework that can help members of a project (information resource) development team discuss and clarify key issues about how the resource on which they are working is intended to help students learn. This paper offers two aids to thinking about student learning: a set of four images of learning and a set of six characteristics of learning. Of the four images (passive reception, learning as discovery, learning as knowledge deficit and accrual, and learning as guided construction), the last one fits best with current scientific ideas about learning. "Guided construction" gives the learner an active part in learning in a way that resembles the discovery approach while acknowledging the important role of external guidance. Six characteristics of good learning are that learning is: (1) active; (2) cumulative; (3) individual; (4) self-regulated; (5) goal-oriented; and (6) situated (in a social and physical context). Project developers should consider these aspects of learning when planning a resource. (Contains 10 references.) (SLD)

How Students Learn: Ways of Thinking About 'Good Learning' in HE

EDNER Project

IssuesPaper 1

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EDNER
(Formative Evaluation of the Distributed National Electronic Resource)
Project
Issues Paper 1

Understanding how students learn is an important aspect of designing useful and usable learning resources - including electronic information resources. Educational research rarely comes up with definitive answers about how people learn. However, it is possible to sketch some images of learning and to describe some of the characteristics of 'good learning' that are well-supported by research. Such abstract accounts do not offer direct answers to detailed questions about how a resource should be designed. However, they can offer a well-founded conceptual framework - a set of *ways of thinking about learning* - which can help members of a project team discuss and clarify key issues about how the resource on which they are working is intended to help students learn. This paper offers two aids to thinking about student learning: a set of four 'images' of learning (of which we think one is best) and a set of six characteristics of good learning.

Four images of learning

Learning as passive reception

This is so well-established as a model that we sometimes fail to recognise that we are using its assumptions in our decisions about teaching. Passive reception implies a view of knowledge as something that can be broken into discrete 'chunks' and passed intact from a teacher to a learner. It is usually accompanied by a view of the learner as inactive: an empty vessel to be filled. When teachers use a phrase such as 'getting something across', they are implicitly subscribing to this model.

Learning as discovery

This is the mirror image of passive reception. It argues that knowledge cannot be pre-digested and passed from one mind to another. Rather, the learner must work hard at interpreting what they experience, building their own unique understandings through voyages of personal discovery. Since it is hard for a teacher (or any 'outsider') to know what will best fuel a learner's personal sense-making, the discovery approach tends to frown on intervention, leaving the learner free to plot their own course.

Learning as knowledge deficit and accrual

This model shares some features of 'passive reception' but is rarer in the teaching world. It is quite common, however, among builders of some kinds of computer-based learning software. It defines the goal of learning as the acquisition of knowledge in the form held by experts in the subject concerned. According to this model, learners move from novice to expert by accruing the expert's knowledge 'brick by brick'. Designers and researchers who use this model tend to place a lot of emphasis on accurate delineation of the expert's knowledge, paying less attention to the processes actually involved in acquiring expertise.

Learning as guided construction

This is the model which fits best with current scientific ideas about learning. 'Guided construction' gives the learner a very active part in their own learning – constructing their own knowledge in a way that resembles the discovery approach. However, the model also gives an important role to external guidance, whether from a teacher, a computer program, online resources or other learners. 'Guided construction' values the 'floundering' that is involved when one does not quite know how to solve a problem. It values subsequent reflection, through which one makes sense of the experience. It values the ability to stand back from one's learning and problem-solving, in order to take stock and switch to another strategy if appropriate. But in all this it gives a legitimate role to 'outside' sources of guidance and support.

Six characteristics of 'good learning'

There is a growing consensus around 'good learning', perhaps best summarised by thinking of learning as a guided process of knowledge-construction (see e.g. Shuell, 1992; Biggs, 1999; Simons et al, 2000). We are likely to have greater success in improving learning outcomes if we design in accordance with a model that emphasises the following six characteristics of learning: learning is active, cumulative, individual, self-regulated, goal-oriented and situated.

Learning is active

The learner must carry out a variety of cognitive operations on new information, in order to make it personally meaningful. The type of cognitive processing in which the learner engages will be the major determinant of what (how effectively) they learn. One important contrast between the types of cognitive processes that a learner may carry out is between 'deep processing' and 'shallow processing'. In the former, the learner expends considerable mental effort in making personal sense of new information, with the result that they can be said to understand it. In the latter, they may (at best) add the information to memory in such a way that they can repeat it word-for-word, but without any semblance of real understanding (Marton et al, 1997).

Learning is cumulative

What a learner already knows will play a large part in determining what sense they can make of new information. The extent of relevant prior knowledge – particularly knowledge activated during the learning process – is a major factor in determining the efficacy of a particular learning event (Tobias, 1994; Dochy et al, 1999).

Learning is individual

Every learner builds their own knowledge in an idiosyncratic way, using past experience and existing knowledge to make sense of new information. Since no two learners have the same knowledge and experience, all new information is dealt with in different ways by different learners. This does not mean that a teacher can have no insight into a learner's idiosyncratic ways of knowing, just that there may sometimes be tight limits on the scope of such insights.

Learning is self-regulated

Effective learning is characterised by both (a) the learner's awareness of their own learning activity (for example, they do not get bogged down in the details of a problem but can 'come up for air' from time to time and reflect on what is happening), and (b) the learner's ability to take action based on this reflection. When a learner (metaphorically) stands back from their current task, or 'moves up' to look at it from a higher level, they are said to be engaging in metacognitive activity. Metacognitive skills include reflectiveness and self-regulation. Effective learners often have a good idea about how they learn, and are able to use that knowledge to monitor and adjust their approach to problems (Vermunt, 1998).

Learning is goal-oriented

Teachers do not always have clear ideas about why they are asking learners to undertake certain tasks (for example, working through a set of exercises in a text book). The model of learning we are advocating says that clear goals are needed if learning is to be effective, and that these goals need to be understood by the learner. These goals may be set by the learner, or the teacher, or through a process of negotiation involving both. The important thing is that the goals are explicit and remain explicit.

Learning is situated

The more cognitively-oriented accounts of learning of the 80s and early 90s could be accused of over-playing the role and value of symbolic knowledge by drawing very close parallels between human cognition and computational processes. Seeing the human mind as a symbol-processing machine underplays the importance of the situatedness of human cognition. The work of Jean Lave, Lucy Suchman, Etienne Wenger, Allan Collins and others has been important in remedying this view. The social and physical context in which cognition (and learning) take place is usually very influential in shaping both processes and outcomes. Cognition can be distributed across individuals and artefacts, such that what a single individual can do on their own may be very different from what they can do when working with other people and/or with tools and other physical resources.

Concluding thoughts

Turning this *general* knowledge about student learning into something you can use in designing useful electronic information resources is more than a one step process. Few project teams spend much time discussing assumptions about learning and there are many *many* outputs from projects gathering digital dust because learners' needs were misunderstood. We recommend you spend at least a couple of hours in a group discussion of what is said about learning in this document. You may do no more than bring to the surface some contradictory assumptions about how students learn. Better to discover these at the start, rather than the end, of a project.

References and further reading

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EDNER Key Issues papers are intended to distil formative evaluation questions on topics which are central to the development of the UK's higher and further education Information Environment. They are presented as short check-lists of key questions and are addressed to developers and practitioners. Feedback to the EDNER team is welcomed.

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EDNER is being undertaken by CERLIM at the Manchester Metropolitan University with CSALT at Lancaster University