Helping students achieve epistemological autonomy

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INTRODUCTION

In a study of student persistence in academic distance education, Garland (1993) identifies a cluster of problems related to the nature of the disciplinary knowledge itself, termed epistemological problems, which pose barriers to successful course completion. These problems result from incongruencies between the student's cognitive and affective perceptions of knowledge and the nature of the knowledge in the courses themselves. The student's epistemological stance is a screen through which new knowledge must be acquired. The screen can become a barrier when the epistemological stance of a course's content or expectations is incompatible.

A lack of personal relevance and interest in the content, and insufficient prerequisite knowledge can act as epistemological barriers. More of concern, however, is variance between the student's 'world view' of knowledge and that reflected in the content, such as a positivistic versus naturalistic stance, for instance. Another key aspect is an epistemological gap between presented course content and course expectations. Some materials and behavioural objectives seem to suggest the content as something to be learned by rote, whereas assignments often demand synthesis, high inference, abstraction of meaning, critical thinking, an ability to cope with ambiguity, and the contextual, interrelated nature of knowledge. More briefly, they demand that higher level cognitive skills be applied in using the knowledge provided in the content as underpinnings for new personal understandings.

Some students have no difficulty in making these types of epistemological adaptations; they are comfortable and familiar with this kind of thinking and the nature of knowledge at this level. Others are able to recognise and develop the sophisticated notions of what learning involves and be epistemologically flexible. For those who cannot, this is a significant factor in their decision to drop out. Helping students overcome these problems is, therefore, an essential component of effective distance education.

Marton, Dall'Alba and Beaty (1993) found six qualitatively different student conceptions of learning:

- increasing one's knowledge;
- memorising and reproducing;
- applying;
- understanding;
- seeing something in a different way; and
- changing as a person.

The first five are those identified earlier by Saljo. As in Saljo's work, Marton *et al.* differentiate between the first three and the last two, often called the surface and deep approaches to learning, with the latter marked by *meaning.*

Their sixth conception 'learning as change in a person' adds an existential aspect to learning. They explain that development of insights into phenomena results in seeing the world in new ways which, in turn, changes a person. This change has various aspects: an ability to see things in a new way; having a new conception of oneself as capable; and having a greater sense of power to control what will happen. It is congruent, then, with the popular notion of 'empowerment' and what Garland (1994) calls 'personal control' over their learning situation, that is, being able to assume responsibility for their individual learning and being self-efficacious. (It does not mean having control over the entire educational transaction.)

WHAT DOES EPISTEMOLOGICAL AUTONOMY MEAN?

Helping students achieve epistemological autonomy is a cornerstone in fostering their self-direction in learning, allowing them to exercise personal control. Student self-direction or autonomy has both situational and epistemological components, external managerial goals and cognitive function. It involves not only having the ability to organise and manage their learning environment in terms of goals, resources and time, but also having the cognitive maturity to learn in a critical manner and to exercise higher order thinking skills. Moreover, epistemological autonomy embodies epistemological flexibility, that is, the ability to cope with scientific and technical empiricism as well as with holistic abstraction, with concepts and theory as well as with practical, everyday information.

Students must not be allowed to remain in their comfortable ways of thinking but must be encouraged to confront and explore alternate conceptual models of the world that conflict with their own intuitive models. They must be able to engage cognitively with

epistemologically varied content, make connections to existing knowledge, and make sense of it in a personally meaningful way. Moreover, they must exercise critical thinking skills and metacognition in monitoring their own learning.

In comparison to the behavioural approach, some of the newer learning and instructional theories have promise in promoting these deep learning concepts and facilitating epistemological autonomy and personal control.

PROBLEMS WITH BEHAVIOURISM

Most distance education instructional design and delivery has been based upon behavioural learning theories and assumptions (Garrison, 1993; Jonassen, 1991). Nowhere is this probably more true than in the natural and applied sciences where, in spite of a shift to a more naturalistic paradigm, traditions such as the scientific criteria of objectifiability persist. Learning, according to behaviourists such as Skinner, involves an observable change in behaviour. Thus, behaviourism restricts cognitive concepts to their overt manifestations, restricting learning experiences. Since the act of knowing, critical thinking, understanding and other cognitive functions are unobservable, the application of behaviourist principles leads to a reductionist and fragmented approach, even to concentration on low-level skills. Winn (1990), argues that 'behavioural theory is inadequate to prescribe instructional strategies that teach for understanding.'

COGNITIVE LEARNING APPROACHES

In the context of the need for higher order thinking, with students active participants in their own learning, concepts such as constructivism, which posits that meaning is a function of individual experience, and situated cognition, which argues that learning occurs most effectively in context, are highly relevant.

Constructivism

Constructivism views knowledge as constructed by the individual in context, based upon interpretation of experience, previous knowledge structures, and consensual social validation. While behaviourists are concerned with what learners do, cognitive constructionists are concerned with what learners know and how they have come to that knowledge.

Constructivism goes beyond assimilation of facts to entail higher order thinking. Learning is seen as a process of active interpretation and construction of knowledge, which will vary according to the knowledge domain of the subject area and the nature of the problems encountered in that area. Since both a richly structured base of domain knowledge and higher level generic cognitive strategies are required, it provides a model for epistemological autonomy.

Reasoning, critical thinking, problem solving, the ability to develop and defend a particular position, and metacognition are among the generic cognitive skills needed for knowledge construction.

Merrill (1991) sees the semantics or content of the cognitive domain as individual but the syntax or structure as not. He says that 'knowledge has a syntax that is universal across domains; that knowledge can be represented using this syntax in a knowledge base that is external to the user; that learners can interact with the knowledge in a variety of ways; but that certain types of interactions are necessary if a learner is to acquire a particular type of knowledge or skill' (Merrill, 1991). Young (1993) says 'the true test for successful learning is transfer of learners' skills from the situations in which they are learned to novel situations in which the knowledge also could be applied.'

Situated Cognition

Following from constructivism is situated cognition which argues that learning occurs most effectively in context, with the context itself as an essential part of the knowledge base (Jonassen, 1991). This is an ecological perspective and approach which provides an instructional prescription, that is, the provision of instruction in relevant contexts, even authentic, situated problems. Young (1993) says that 'situated learning in realistic contexts can provide much of what is lacking in traditional approaches to instruction and instructional design.' Situated cognition is particularly relevant in helping to address the personal relevance epistemological barrier revealed in Garland's (1993) study. Mature students want to be able to relate what they are learning to their everyday experience, to see its practical relevance. At the same time they must be able to think abstractly, separate ideas from context, generalise and apply them in a new situation. The real world is complex; the student's learning environment should reflect that complexity.

Problem Based Learning

Closely related here is a prescriptive theory, problem based learning (Boud and Feletti, 1991). Problem based learning has as its starting point a problem, a query or a puzzle that the learner wishes to solve. According to Margetson (1991) 'problem based learning encourages open-minded, reflective, critical and active learning ... is morally defensible in that it pays due respect to both student and teacher as persons with knowledge, understanding, feelings and interests who come together in a shared educational process...[and] reflects the nature of knowledge -- that is, knowledge is complex and changes as a result of responses by communities of persons to problems that they perceive in their worlds.'

Problem based learning, then, reflects an integration of knowing *that* with knowing *how*, a marriage of content and process, the mastery of content knowledge and cognitive skills that are essential items in epistemological autonomy.

APPLYING COGNITIVE APPROACHES

In order to help students achieve epistemological autonomy, theories such as constructivism and situated cognition must be embedded in a curricular structure which supports such views. The components of such a structure would include:

• taking account of adults' wealth of prior experience, their rich and diverse knowledge base, not just a base for new learning but an on-going resource during learning.

• providing a tentative structure of knowledge, a framework to connect and make sense of the ideas and facts that Young (1993) calls 'scaffolding'.

While Jonassen (1991) argues that constructivistic environments are most appropriate for advanced knowledge acquisition where higher order skills and a deep learning approach are necessary, he also says that introductory knowledge should be explicitly taught, even by use of objectivistic approaches. The amount and type of scaffolding would be determined by the amount of learner control afforded by the learner context and the knowledge gap to be spanned. Moreover, the differences among academic disciplines in their knowledge forms and their communication conventions (Becher, 1989) mean that students need to be familiarised with the domain-specific vocabulary of concepts and ways of expressing them. Becoming comfortable with the discourse of a discipline is a significant foundation to learning in the discipline.

• embedding a collaborative 'teacher as guide' approach in the curricular structure.

Haughey (1991) uses the metaphor of travel to clarify this approach. She likens it to a learner's individual journey, albeit with travelling companions and the instructor/tutor, along a curriculum route. 'The guide has to help place the traveller within the landscape, and yet provide the context for the transformation of the way the traveller understands what he or she thinks' (Haughey, 1991).

Teaching is more complex and challenging under these circumstances as individual student differences in experience, beliefs, goals and values must be considered along with the learning environment itself and the nature of the content construct. A dialogue must be maintained with the student in order to guide their perception-action-learning in an evolving process. As Young (1993) puts it: 'the teacher's role should be to "tune the attention" of students to the important aspects of the situation or problem-solving activity, specifically those attributes that are invariant across a range of similar problems and therefore will transfer to many novel situations.' He says that assessment should focus on the processes of learning, perception and problem solving, not static, factual knowledge, and be an integral part of the learning environment.

Moreover, learning must take place in an atmosphere of collegiality and interdependence underpinned by the instructor's sensitivity to the social conflict involved in mature adults undertaking the role of student and their concomitant needs for respect, personal control and fulfilment (Garland, 1994). A personal, empathetic rapport in a climate of respect, support and safety is needed to enable students to maintain their sense of status and power. The instructor or tutor must act as a mentor, providing sustained support, both academic and moral, while helping students wean themselves from dependence upon these support systems. Achieving an appropriate balance will be an on-going challenge. Appreciating that students are learning individually not independently is key.

• solving realistic problems appropriate to the students' context, especially to their work and career expectations, and the real world.

Situated cognition needs a divergent set of authentic examples and rich contexts. These should stress conceptual interrelatedness and illustrate multiple perspectives. Learning in a variety of ways and contexts is essential.

• providing a technologically rich, situated learning.

Alternative media and methods are needed to illuminate from a variety of directions both abstract concepts and a diversity of technical specifics, and to provide for differences in student learning styles. Possibilities include multimedia projects, structuring printed texts, small group tutorials (face-to-face or distance), practical work, computer simulation, and examination of case studies. Flexibility in the design of the course package would allow students to iterate through the learning process in idiosyncratic ways.

• providing a high degree of interactivity, facilitated by technology, which includes extensive, meaningful dialogue.

Interaction not only between the student and tutor but also among students is essential. 'The learner takes responsibility to construct meaning actively, not in isolation, but through dialogue with oneself as well as others' (Garrison 1993). Dialogue must be of the type defined by Evans and Nation (1989): '*dialogue involves the idea that humans in communication are engaged actively in the making and exchange of meanings, it is not merely about the transmission of messages*'. This type of dialogic construct allows the collaborative learning that underpins the teacher as guide approach, allows students to better integrate, develop, refine and restructure concepts because they must elaborate and argue their position to others as well as themselves, and it encourages students to

develop socially acceptable systems for exploring their own ideas and those of others. At the same time, there must be provision for reflection. Although the amount and frequency of dialogue will ultimately be determined by the students, depending on their disposition and perception of their needs, there should be a proactive tutorial approach.

- emphasising critical thinking skills.

Since critical thinking is a process of identifying and questioning assumptions, challenging the importance of context, imagining and exploring alternatives, and practising reflective scepticism (Brookfield, 1987), it provides an ideal focus for the development of higher-order cognitive strategies. It is particularly relevant because, although context is emphasised in the various cognitive approaches, students must also be able to decontextualize their learning in order to apply their knowledge elsewhere. Furthermore, since critical thinking can also be interpreted as emancipatory learning (Brookfield, 1987), it is aligned with the concept of personal control.

SUMMARY

Helping students achieve epistemological autonomy is a cornerstone in fostering their self-direction and enabling them to assert personal control over their learning. Epistemological autonomy involves being able to exercise higher order cognitive skills, and being epistemologically flexible, that is, able to engage epistemologically varied content, within or among disciplines, relate it to prior knowledge, and make sense of it in a personally meaningful way.

Embedding concepts such as constructivism and situated cognition in curriculum development and delivery is crucial. The challenge for distance educators is to provide a rich, supportive learning environment which includes taking account of the learner's prior experience, providing the necessary knowledge scaffolding, using a collaborative 'teacher as guide' approach, providing diverse real world contexts and problems, providing alternate media and methods, facilitating extensive dialogue, and emphasising critical thinking.

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