

Thinking skills and the context of higher education teaching today. What is known?

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“Perhaps most importantly in today’s information age, thinking skills are viewed as crucial for educated persons to cope with a rapidly changing world. Many educators believe that specific knowledge will not be as important to tomorrow’s workers and citizens as the ability to learn and make sense of new information.”

(Gough, 1991)

A time to think

Each of us can surely testify to the tidal wave of change sweeping through not only higher education, but all aspects of society, bringing with it a need to change the ways in which we think, learn and communicate. These changes signal a transformation in the very nature of the job market (Naisbitt & Aburdene, 2000) for the students we teach and are reflected in the requirement for creative, self-acting managers in the professions in which they will soon find themselves. A digital economy heralds the beginning of an “age of networked intelligence” (Tapscott, 1998) with its demand for immediacy and for instant communication. Whether we like it or not, we are now living in an age of choice and decision-making. The ability to think is being viewed as an employability skill for an increasingly wide range of jobs, and as a requirement for responsible citizens in a democratic society, and for many typifies what we, in higher education, might recognise as an educated person.

The educational implications of this are extensive. Preparing young people for the new millennium through approaches entrenched in outdated models of teaching and learning where students *receive* rather than *give* information and thoughts, must be replaced. Some traditional teaching and learning systems may find themselves obsolete: those based upon simple recall of a limited core of information have no place in this new age. Students nowadays need to be inquiring and creative, able to question and to understand. They must be enabled to take charge of their own learning: to “learn how to think” and to “think how to learn”. In order to become better thinkers they need to learn meaningfully, to think flexibly and make reasoned judgments (McGuinness, 1999).

There is currently a resurgence of interest in improving the quality of thinking in schools and universities that draws upon two core areas. First, it draws upon new research in psychology and in education that views learners as actively constructing knowledge by interacting with their physical and social environments and contributes new findings about how we organise our mental structures to accommodate new learning. Second, it is fuelled by a global interest in raising educational standards where teaching students to think is now a major international enterprise (Costa, 2001). The drive to improve standards, widen access to higher education and minimise social exclusion is already evident in strategies from many countries. In this country, apart from being located alongside a wider key skills framework, or developed in such a programme as Thinking Skills at Work (Blagg, Lewis & Ballinger, 1993) or in certain examination syllabi, thinking skills have not been widely evident in post-16 education and training (Moseley et al, 2004). Alarming in many foundation degrees and higher education courses, course planning, syllabi and assessment tools often exist without explicit reference to

theoretical frameworks of thinking and learning (ibid). So what is meant by the term 'thinking skills'?

Understanding thinking skills

Thinking skills have been conceptualised in a number of ways by various scholars and yet there is little consensus with regard to the actual term. From a wide literature (Ashman & Conway, 1997; Blagg et al, 1993; Gubbins, 1999; Marzano, 2001; Presseisen, 2001) I present the following as typifying those skills:

- decision-making
- problem-solving
- analysing information
- sorting and classifying data
- generating new ideas
- hypothesising
- evaluating options
- making predictions
- monitoring progress towards a goal
- drawing conclusions
- determining cause and effect
- understanding about content knowledge
- metacognition.

Thinking as a skill embraces the list above (and others) and is generally understood as being specific to an area of performance and has connections with a level of proficiency (the Oxford English Dictionary refers to it as expertness and a facility in doing something). Although overlapping, the term ability has more general connotations and is not necessarily linked to any one area. There are others who believe that thinking skill is a limiting term and prefer to consider thinking in terms of mental processes (that occur naturally or through learning and practice). Yet others consider the dispositional aspects to be important and terms like "habits of mind", and dispositions also appear in the literature (Perkins et al, 1993). Nonetheless, thinking skills is the preferred terminology and one that is sustained in theory and practice. In providing some clarification of the term I offer the following four points.

Thinking does ...

extend beyond the mere acquisition of knowledge (is more than rote learning)

Thinking does ...

engage a range of intellectual capacities (cognitive processes & abilities)

Thinking does ...

require a willingness to engage in the act of thinking (dispositional components)

Thinking does ...

require some understanding of oneself as a thinker-learner (metacognition)

Core concepts and taxonomies

Traditionally in higher education teaching, there has been a paucity of formalised approaches to integrating thinking skills in programmes of study, and yet opportunities to embed these in pedagogy and assessments are rich in our university. One way of taking this idea forward is by using a taxonomy of thinking. Several of these are in existence and whilst there are some

differences in scope and emphasis, there are also many commonalities that provide a useful framework for developing student thinking. It is beyond the scope of this paper to interrogate these taxonomies in depth but an overview and brief evaluation of some of the most commonly used taxonomies is given in Table 1.

Table 1: Selected thinking skill taxonomies relevant to higher education

Taxonomy	Purpose and structure	Indicators of quality	Relevance to teaching and learning
Feuerstein's Instrumental Enrichment (1980)	Promotes a learning to learn approach. Based on Vygotsky's theory of socially mediated learning.	Uses psychological vocabulary. Theory base uses established models of intellectual and perceptual abilities. Values humanism.	Offers special materials. Emphasises process rather than subject-specific content. Interesting use of dynamic assessment.
Gouge & Yates ARTS Project (2002)	To use the creative arts as a vehicle for cognitive acceleration. Based on Piaget & Vygotsky theory.	Technical terms are clearly explained. Promotes creative and critical thinking. Values social constructivist approach.	Provides learning through peer coaching and collaboration. Highly relevant for Key Skills.
Gubbins matrix of thinking skills (2002)	Provides a list of core skills common in many thinking taxonomies.	Clear terminology. Addresses the cognitive domain well.	Applicable to education or citizenship work. No particular pedagogical stance. Highly relevant for Key Skills.
Marzano's new taxonomy of educational objectives (2001)	Structured around self; cognitive and metacognitive components.	Broad scope. Comprehensive. Builds on Bloom's early work (1956). Little contribution from values.	More suitable in tutor-led contexts where control of knowledge objectives is with tutor. Less on enquiry-based approaches to learning.
Anderson & Krathwohl's revision of Bloom's taxonomy (2001)	Considers cognitive domain only. Direct relevance to post-16 phase.	Clarifies the role of metacognition well. Makes use of recent advances in cognitive psychology. Remains value neutral.	Provides tutors with a useful tool to analyse teaching objectives, activities and assessment.

(After Moseley et al, 2004)

Taking thinking skills further

This paper had two aims. First, to introduce readers to the idea of thinking skills in higher education against a backdrop where such skills are becoming essential in the world of

education, work and leisure. Second, to provide an overview of relevant taxonomies that might be adopted to develop students' thinking. There are a number of ways to take thinking skills forward. There are also a number of questions that this raises. It is very much an unfinished story.

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