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Review

Epistemological development in higher education

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ABSTRACT

Research has been carried out on students' epistemological development in higher education for at least 50 years. Researchers on both sides of the Atlantic have converged on accounts that describe students' epistemological development in terms of a sequence or hierarchy of qualitatively distinct stages or positions. The rich qualitative data obtained from longitudinal investigations do demonstrate intellectual changes, but whether the same scheme fits all students and whether the changes found are a specific result of exposure to higher education are open to debate. Well-validated quantitative instruments that could be used to measure epistemological development in large samples of students are still lacking. Unresolved issues include: whether students can adopt multiple epistemological positions; whether these are culturally and contextually specific; and whether they are mental entities, discursive practices or social constructions.

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1. Introduction

This article provides a historical and integrative review of the literature regarding students' epistemological development during higher education. This research has been motivated by the idea that how students themselves think about knowledge, learning and teaching is a primary factor influencing their experience of higher education itself. Most researchers have relied upon qualitative research methods, although a number of attempts have been made to operationalise the emerging constructs as scales in questionnaires. The article will take a broadly chronological approach and will consider in turn:

- the distinction between stage and non-stage theories, which forms the main dividing line between different theories of epistemological development in higher education;
- William Perry's scheme of intellectual and ethical development, the first articulated example of a stage theory of epistemological development during the college years;
- the account of "women's ways of knowing" that was presented by Mary Belenky and her colleagues as an elaboration and extension of Perry's scheme;
- Marcia Baxter Magolda's theory of epistemological reflection in men and women and her account of the development towards "self-authorship" before and after graduation;
- research by Roger Säljö, Erik Jan van Rossum and others on qualitative differences in students' conceptions of learning as reflections of their epistemological development;
- the system of epistemological beliefs that was devised by Marlene Schommer on the basis of questionnaire surveys with junior college and university students; and
- the Cognitive Development Inventory that was developed by Li-fang Zhang in order to compare students' epistemological development in China and the United States.

The concluding section summarises what has been learned from research over the last 50 years, what remains open to debate and what issues have been left unresolved. The latter issues include: whether the same individuals can adopt multiple epistemological positions at the same time; whether accounts of students' epistemological development are universal or specific to their social and cultural context; and whether students' conceptions of knowledge, learning and teaching are mental entities, discursive practices or social constructions.

The research literatures on epistemological development during primary, secondary, and further education are beyond the scope of this article. However, some researchers who have investigated epistemological development during higher education have for comparison also studied students in secondary education (high school) (Schommer, 1993b; Schommer & Walker, 1997) or in further (post-compulsory) education (Säljö, 1979a, 1979b; Severiens & ten Dam, 1998). This might encourage the view that epistemological development follows a continuous trajectory from primary to secondary to further to higher education. Nevertheless, given the paucity of evidence to support that view (see Chandler, Hallett, & Sokol, 2002, for a critique), this literature review will focus on higher education.

2. Stage and non-stage theories

As in other areas of human development, accounts of epistemological development in higher education can be categorised into "stage" theories, which assume that students follow a fixed sequence of qualitatively distinct stages or positions, and "non-stage" theories, which assume that students develop along one or more continuous dimensions (Kohlberg, 1969).

2.1. Non-stage theories

Probably the most influential non-stage model of student development is that devised by R. Heath (1964), although similar accounts were offered by Chickering (1969) and D. H. Heath (1978). In all three cases, intellectual development was regarded as just one aspect of the growth of the whole personality. On the basis of longitudinal sets of interviews, R. Heath described an ideal student (the "reasonable adventurer") and three non-ideal types whose intellectual growth approximated the ideal in different ways. The "non-committer" was a cautious yet complacent extrovert who needed to be challenged or stimulated in academic situations; the "plunger" was an impetuous, unpredictable introvert who needed to be given support and structure; and the "hustler" was an ambivalent though competitive intermediate type. The reasonable adventurer succeeded in combining these discrepant tendencies, using each according to the demands of particular academic situations. A more recent example of a non-stage model is that of Schommer (1990, 1993a, 1993b), discussed in Section 8.1 below.

2.2. Perry's scheme

Stage theories of human development are more common than non-stage theories, and the most well-known stage theory is that devised by Piaget and his colleagues (Inhelder & Piaget, 1958). The most influential example of a stage theory that is specifically concerned with the development of students in higher education is that of Perry (1970, 1981), who explicitly

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