Relationship Between Academics' Educational Beliefs and Their Design and Use of Computer Facilitated Learning

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Abstract: The leaders of 24 computer facilitated learning projects in higher education were interviewed about their educational beliefs and practices, and the transcripts and associated documents were coded on 16 belief and 16 practice dimensions. Shared patterns of beliefs and practices were sought by clustering the projects with the aid of hierarchical methods. Three example profiles are provide to illustrate the belief/practice connections which, although apparent, are not simply defined. Subsequent analyses will be based upon project narratives.

The impetus for the present work came from recent interest in the beliefs and understandings that academics bring to their teaching (Kember, 1997; Samuelowicz & Bain, 1992) including their use of educational technology (Bain & McNaught, 1996). There is some research suggesting that academics' educational beliefs and practices are closely coupled (Bain 1998; Quinlan, 1999), but more work is needed to uncover the details of the relationships involved, particularly in relation to educational technology (Reeves 1992).

For this study we selected 24 university projects incorporating computer facilitated learning (CFL), based on documentary material provided by an Australian competitive granting agency. We conducted two detailed interviews with each project leader, each of about two hours duration. The first interview sought information about the academics' development and implementation of CFL, and the second probed their epistemological and educational beliefs. The semi-structured interviews were audio recorded and transcribed. Two interrelated analyses are being undertaken, one to result in detailed narratives of the cases, the other to provide an analysis of the patterns of belief and practice. A preliminary version of the second analysis is reported here.

The transcripts and documentary material were used to code academics/projects on 16 belief and 16 practice dimensions, with coding based on the full weight of evidence rather than localised interview comments or archival details. Some of the dimensions were drawn from published sources (Bain et al., 1998; Samuelowicz & Bain, 1992; Reeves 1992) and others from preliminary examination of the interview transcripts and project documentation. Most dimensions were five point bipolar rating scales (c.f., Reeves, 1992), but others involved qualitative differences that could be ordered from less to more sophisticated. Examples are presented in (Fig. 1).

A preliminary analysis of the data was undertaken by applying hierarchical clustering (using several methods and distance measures) to the full set of dimensions. The aim was to find similarities in the belief/practice profiles of the participants. Six clusters were tentatively identified, three of which are illustrated with individual cases in (Fig. 1), using 15 of the 32 dimensions. What is evident from (Fig. 1) is that, although relationships between belief and practice profiles can be discerned, they are not simply defined. Some beliefs and practices seem to be interconnected in ways anticipated by Reeves (1992) and Bain et al. (1998) (e.g., *beliefs* concerning the origin of knowledge, the type of understanding and the role of discussion, and p*ractices* such as learning control, learning process and learning framework), but others are not.
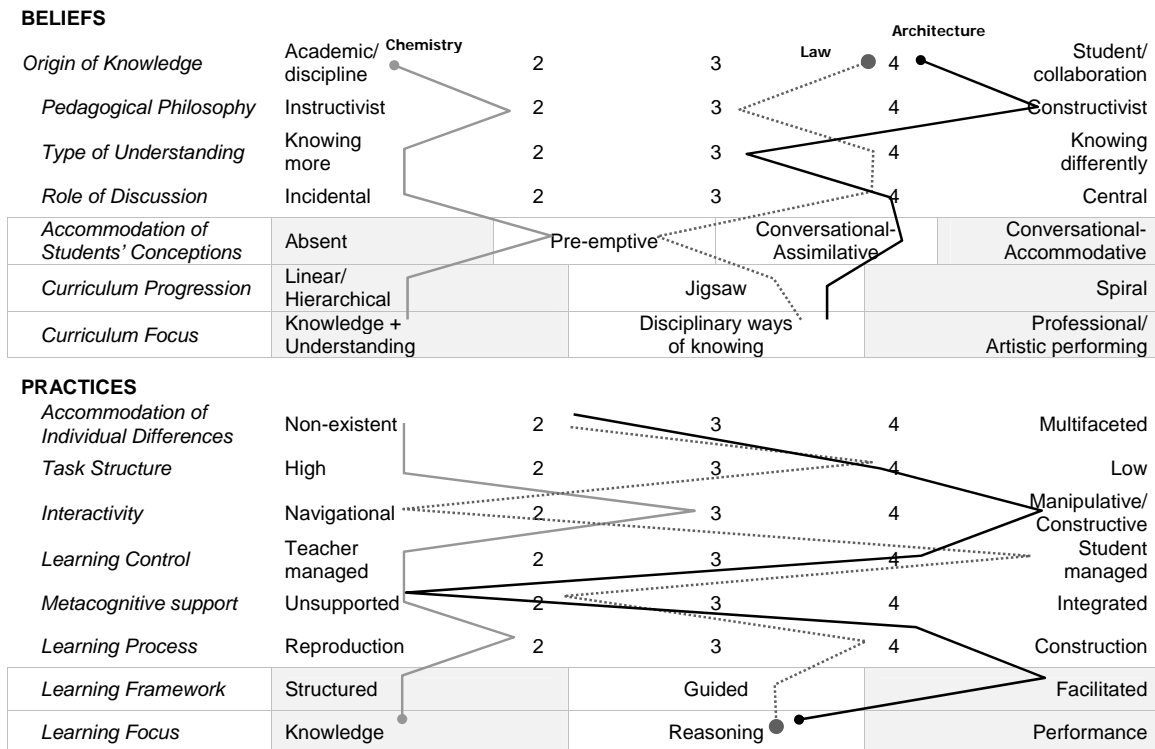
BELIEFS

Origin of Knowledge	Academic/ discipline	2	3	4	Student/ collaboration
Pedagogical Philosophy	Instructivist	2	3	4	Constructivist
Type of Understanding	Knowing more	2	3	4	Knowing differently
Role of Discussion	Incidental	2	3	4	Central
Accommodation of Students' Conceptions	Absent	Pre-emptive	Conversational-Assimilative		Conversational-Accommodative
Curriculum Progression	Linear/ Hierarchical	Jigsaw			Spiral
Curriculum Focus	Knowledge + Understanding	Disciplinary ways of knowing			Professional/ Artistic performing

(labels on figure: Chemistry, Law, Architecture)

PRACTICES

Accommodation of Individual Differences	Non-existent	2	3	4	Multifaceted
Task Structure	High	2	3	4	Low
Interactivity	Navigational	2	3	4	Manipulative/ Constructive
Learning Control	Teacher managed	2	3	4	Student managed
Metacognitive support	Unsupported	2	3	4	Integrated
Learning Process	Reproduction	2	3	4	Construction
Learning Framework	Structured	Guided			Facilitated
Learning Focus	Knowledge	Reasoning			Performance

Figure 1: Profiles of three CFL projects on seven belief and eight practice dimensions

Although this profiling approach is useful as a preliminary way to compare and contrast projects, we are convinced that a full understanding of the connections between beliefs and practices awaits the writing of the academics' narratives, based on their detailed commentaries and our rich descriptions of the CFL and its educational context (c.f., Bain, 1998; Quinlan, 1999). We anticipate that, once the narratives are to hand, we will be able to group like projects more convincingly than the profiling and clustering methods allow.

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