

Chapter 8.8

Web-Based Education Accountability System and Organisational Changes: An Actor–Network Approach

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ABSTRACT

The learning and accountability needs in a teacher education department drove the development of a novel Web-based education accountability system (EAS). To fit the EAS with the organization, actor-network theory (ANT) was used to guide the social and technological development. In the course of fitting the technology to the educational setting, a novel multi-dimensional perspective to ANT was formalized. Four dimensions of organizational culture, politics, process, and profession were used. Participant observation, field notes, and interviews were used to reveal how standard teacher education practices were created and recreated. Detailed

translations occurring at multiple levels provided insight into the technical agency of the EAS and showed technology shaped the emergence of a socio-technical solution for a teacher education program.

INTRODUCTION

This chapter considers the introduction of a new ‘educational accountability’ technology in a teacher education program. The interactions between the technology and the educational organization are explored. Contributions of the chapter include the method of developing the technology and observations about how an educational organization can best exploit its technology.

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Educational accountability is critical to successful education. A search on the Educational Resource Information Center (ERIC) citation database in May 2007 for citations containing the term ‘accountability’ returned 18,000 citations. Multiple books on the subject of education accountability were published in 2007, including Wilkerson and Lang (2007) and Drake (2007). Many of the ERIC citations are related to teacher accountability and the use of information systems to support accountability.

Teacher education accreditation has presented great challenges to teacher education programs in the United States. The introduction of new standards by the National Council for Accreditation of Teacher Education (NCATE) has accentuated these challenges (Castenell, Benson, deMarrais, Butchart, & Lewis, 2001; Linn, 2000). The comprehensive data collection mandated by the NCATE 2000 standards require advanced IS solutions and organizational changes (Wise, 2001).

To better understand the interplay between technology and organizations, the “black-box” of technology and process must be opened to expose the embedded socio-economic patterns (Bijker & Law, 1992). The implementation of an information system (IS) is shaped by the organizational context and simultaneously shapes the organization (Orlikowski, 1991). Economic, political, and cultural issues should be examined together with the IS as a “web of computing” or “socio-technical interaction network” (Kling, Kim, & King, 2003). Common approaches to researching technological innovation in education focus on the technical aspects of an innovation, and cannot account for the interactions between IS design and organizational changes (Scacchi, 2004; Orlikowski & Iacono, 2001). *actor-network theory* (ANT) treats equally the contributions of both human and non-human actors, and can capture the complex interactions between humans and technology.

The notion of actors and networks is fundamental to understanding how information systems diffuse in educational organizations (Lewis,

Marginson, & Snyder, 2005). The actor-network approach has been used to interpret the relationship between existing technology and education (Morgan & Ryan, 2003). This chapter looks at both the development and the use of an information system in education with the help of ANT; the education application is teacher education accreditation.

This study extends ANT analysis with multi-dimensional views to examine the successful implementation of a Web-based education accountability system (EAS). The EAS was implemented in a teacher preparation unit (hereafter called the ‘unit’) in a Department of Education at the University of Maryland, Baltimore County. The EAS was used to help the teacher candidates to learn and the unit to teach. The impact of Web technology on learning (e.g., Esnault & Zeiliger, 2000; Folkman & Berge, 2002) has been extended in this study to overall program improvement.

Theoretical Framework

Technological determinist approaches to technology innovation contend that only the ‘most appropriate’ innovations are adopted, and assume that all outcomes of technological change are attributable to the technological rather than the social (Grint & Woolgar, 1997). At the other extreme is social determinism, which holds that social factors can be used to explain technological change (Law & Callon, 1988) and concentrates on the investigation of social interactions, attributing little to technology. Intermediate approaches emphasize the *contingent relationship* between the social and technical: social context enables and constrains the usage of a technology, while technology conditions the social context (Barley, 1986; Giddens, 1984; Kling, 1987; Orlikowski, 1992). One approach that strikes a balance between the social and technical elements is ANT (Doolin & Lowe, 2002; Neyland, 2006). In terms of the adoption of technology in education, ANT stands in sharp contrast to diffusion theory (Rog-

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