Chapter 18
Examining Diffusion and Sustainability of E-Learning Strategies through Weblog Data

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ABSTRACT
The study focuses on ‘horizontal’ and ‘vertical’ adoption of e-learning strategies at The Chinese University of Hong Kong as revealed through computer log records in the centrally supported learning management systems. Horizontal diffusion refers to whether e-learning has spread to influence the practice of more teachers and students. In vertical diffusion, the authors examined whether or not teachers tend to adopt more varied online learning activities in successive years. The overall findings are that, while adoption of simple strategies is increasing, there is little evidence of horizontal and vertical diffusion of more complex strategies. Indeed, the use of some of the more complex strategies, which may relate to greater potential learning benefits, decreased. Results have led to discussions about new focuses and strategies for our institutional eLearning Service.

CONCEPTUAL CHANGE
Adoption of innovations is challenging. Many individual and social factors relate to the acceptance of the use of technology in teaching and learning, including whether teachers have enough motivation and support for the conceptual change involved in new ways of working. The process of conceptual change was studied by Lewin (1952) who looked at how social changes were made possible through group decision-making. Lewin’s work was adapted to education by a number of researchers in science education in the 1980s (e.g., Nussbaum & Novick, 1982; Strike & Posner, 1985;
West, 1988). In the conceptual change process three stages are involved:

- “A process for diagnosing existing conceptual frameworks and revealing them to those involved;
- A period of disequilibrium and conceptual conflict which makes the subject dissatisfied with existing conceptions; and
- A reforming or reconstruction phase in which a new conceptual framework is formed” (Kember et al., 2006, p. 83).

One way of capturing this challenge is with the J-curve model (Figure 1). The J-curve is a mathematical and economic theorem developed in the early 1900s and has been widely used to study productivity, business value and/or returns on investment arising from changes within organizations over time. It has been widely applied to many contexts – both individual companies and entire nations (Bremmer, 2006). Put simply, things often get worse before they get better because of the expenses and challenges that occur early on in the innovation cycle.

**ADOPITION OF E-LEARNING INNOVATIONS**

Two possible ways of examining the adoption of e-learning innovations are presented here. First, we may consider a ‘horizontal’ spread so that more teachers begin to use appropriate e-learning strategies; this is the concept of diffusion of innovation. Second, the continuous use of a strategy by the same teachers year after year so that it ‘vertically’ benefits multiple cohorts of students is the concept of sustainability. Adoption of innovations can be studied in either or both of these dimensions.

**Horizontal Diffusion**

Diffusion is an important process if e-learning strategies are to gain popularity among university teachers and students, and thus have significant impact on the overall institutional learning environment. Thomas, Lam, and Ho (2009) interviewed eight teachers in a Hong Kong university and found that individual teachers who used innovative e-learning strategies did not effectively disseminate their practice. The primary obstacle to uptake of e-learning was the apparent reluctance by other teaching staff to commit any effort because of the perceived time involved. Another social barrier related to senior professors tending to be somewhat removed from the innovative work of more junior teaching staff. We therefore do not expect individual teacher cases to lead to significant conceptual change across an entire institution.

Even if the ‘early adopters’ (Rogers, 2003) are willing to disseminate their new ideas and methods, there is still the question of whether other teachers will readily accept them. Fitzgibbon and Jones (2004) reflected on their experiences in organizing e-moderating courses for the teaching staff in a UK University and noted that teachers generally did not have the time for the training, many of them lacked the confidence and competence in IT skills, and they were also uncomfortable that they had to adopt new teach-