

Chapter 3.22

Learning Organizations or Organizations for Learning? How Small Firms can Learn from Planned and Random Technical Problem Solving: Implications for Technical Education

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ABSTRACT

This chapter reports the findings of an empirical study whose purpose is to identify the attributes of the organization infrastructure that support organizational learning in small manufacturing firms through the creation of procedural knowledge. The study is based on the following assumptions:

a) organizations are cognitive systems that process information and knowledge; b) knowledge is a by-product of technical problem solving; c) innovation occurs as a stream of random or planned problem solving; d) many attributes of the organization infrastructure that foster innovation also foster knowledge generation during technical problem solving. Findings show that three dimensions of the organization infrastructure have an influence on learning: openness, innovativeness,

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and leadership. These attributes identify two typologies of organization infrastructures that differently affect the generation of procedural knowledge and learning. In particular, it was found that the organization infrastructure has a moderating effect on the relationship between some context factors (environment diversity, problem complexity, context ambiguity, and uncertainty) and the amount of procedural knowledge generated during technical problem solving. Implications for technical education are also discussed.

BACKGROUND

In the last years, the business environment has dramatically changed. This new environment demands that firms perform their operations with greater speed, flexibility, dynamism, and superior quality. Global competition imposes higher, global standards of customer service, creativity, and innovation that even those firms having no global market goals are forced to meet to protect their market share. Knowledge and the capability of firms to learn developing new knowledge are two main strategic issues that hold the highest potentials for gaining efficiencies, and creating value.

The learning organization and organizational learning have emerged as metaphors and models for the adaptation and growth for successful and competitive organizations (Argyris & Schon, 1978; Senge, 1990). Models of organizational learning are developed from models of human learning (Bandura, 1986; Kolb, 1984; Postman, 1976; Schein, 1993). Like the individual learner, organizations draw on experience, interpret and process information transforming it into knowledge, and purposefully use knowledge. Scholars distinguish between personal knowledge that an individual possesses by virtue of education or experience and collective or organizational knowledge, identified as organizational memory or a publicly documented body of knowledge (Nevis, DiBella, & Gould, 1995). As an individual

learner does, a learning organization accumulates experience, leveraging on feedback about past decisions to incrementally adjust its reactions to similar problems (Pennings, Barkema, & Douma, 1994). However, an organization by itself cannot develop, learn, grow, or take action independently of its members. Organizations have to capture tacit knowledge of individuals and make it explicit and/or shared in the organizational structure to create and manage organizational knowledge (Lynn, 2000). Moreover, in order to learn, it must apply knowledge. Indeed, organizational learning links cognition to action (Crossen, Lane, & White, 1999). Ideally, learning organizations are communities of learners, all working toward common goals. Some activities characterize learning organizations (Garvin, 1993): systematic problem solving, experimentation with new approaches, incentives for risk taking, steady flow of new ideas, learning from their own experiences and past history, learning from the experiences and best practices of others, transferring knowledge quickly and efficiently throughout the organization. Even though knowledge can also be brought in from the outside, either through market intelligence activities or by hiring people with a particular expertise, the outside knowledge has to be absorbed internally by the firm to be utilized in its operations, and the capability to do that depends on the knowledge resources the firm already holds within its boundaries, primarily knowledge embedded as organizational knowledge in the minds and routinized behaviours of its employees (i.e., its human and structural intellectual capital, see Bontis, Dragonetti, Jacobsen, & Roos, 1999). Human knowledge is created through social interaction between the explicit and the tacit knowledge, and in the organizational knowledge environment (consisting of the numerous interacting and interdependent social, cultural, cognitive, political subsystems that shape the creation, accumulation, flow, and use of knowledge within the organization), the organizational infrastructure is an important part

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