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Method and context perspectives on learning and knowledge creation in quality management☆

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Abstract

This research develops a framework of learning and knowledge-based quality improvement by integrating the two perspectives of learning and knowledge creation. One perspective focuses on adhering to a prescribed methodology while the other emphasizes managing the context. By conceptualizing a comprehensive quality program as comprising basic contextual and methodological elements, we develop theoretically how a comprehensive quality program such as Six Sigma can produce dissimilar types of learning and knowledge, and how a quality advantage can become more sustainable.

Keywords: Quality management; Knowledge management; Organizational learning; Innovation

1. Introduction

Quality improvement is inherently a learning and knowledge-based activity that emphasizes learning (MacDuffie, 1997; Sitkin et al., 1994) and knowledge creation (Mukherjee et al., 1998; Osterloh and Frey, 2000). Learning and knowledge creation in quality improvement relate to how an organization manages the cognitive processes of its members (MacDuffie, 1997, p. 501). The relationship with organizational cognition is critical because how a quality program successfully change practices in an organization depends on how the cognitive processes of its organizational members are managed (Reger et al., 1994). Organizational cognition research can be categorized into two streams—computational and interpretive: " (the) computational stream of research examines the processes by which managers and organizations process information and make decisions ... (the) interpretive approach investigates how meaning is created around information in a social context" (Lant and Shapira, 2001, p. 2). In this paper, we develop two perspectives of learning and knowledge creation for quality improvement – method and context – that parallel these two views of organizational cognition.

The method perspective stresses using a formal problem-solving method which promotes rationality and sound decisions by allowing an organization to

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systematically capture, generate, and apply knowledge (March and Simon, 1958). Having a method provides an efficient process and cumulative experience can be built by repeatedly applying a structured process or method (Nelson and Winter, 1982; Zollo and Winter, 2002). On the other hand, the context perspective emphasizes the importance of a social environment in knowledge creation (Brown and Duguid, 2000; Nonaka, 1994). Organizations are better managed by designing and enabling a creative environment for their organization members (Amabile, 1996). Context, then, also can be a driver of learning and knowledge creation.

These two perspectives reflect the dual emphasis of quality practices as technical and social—the technical part has been studied as core practices and the social part as infrastructural practices (Flynn et al., 1995; Powell, 1995; Samson and Terziovski, 1999). Past studies focus on examining the effects of practices on performance metrics such as customer satisfaction, quality and financial (Kaynak, 2003; Sousa and Voss, 2002). Although operations scholars have studied quality from both a technical and social point of view, some management scholars have viewed quality as predominantly technical, focusing on the use of techniques and scientific methods (e.g. Manz and Stewart, 1997; Winter, 1994). They found that, despite the core technical content of quality, social processes shape most of how quality is practiced within the organizations (e.g. Boiral, 2003; Detert et al., 2000; MacDuffie, 1997; Zbaracki, 1998). Overall, despite the work on quality as technical and social, there is insufficient understanding on how the technical and social components of quality practices lead to learning and knowledge creation. Furthermore, most literature studies quality implementation and its impact on performance. There is little insight into how a quality advantage can become more sustainable.

This paper attempts to bridge these gaps by developing a framework of basic elements underlying a comprehensive quality program such as Six Sigma and examines how learning and knowledge creation can be facilitated. In particular, conceptualizing a comprehensive quality program as comprising basic contextual and methodological elements allows us to develop a framework for how a comprehensive quality program can generate dissimilar types of learning and knowledge. And subsequently, how a quality advantage can become more sustainable. To illustrate some current quality practices that are consistent with our framework, we use those from the widely implemented quality initiative, Six Sigma. Overall, our framework contributes to the quality field by offering a theoretical lens to explain sustainability of quality advantage from the knowledge and learning perspective. In the following sections, we first develop the methodological and contextual elements. Next, we present propositions on how these two sets of elements can lead to different learning (exploratory and exploitative) and knowledge (tacit and explicit). Following that, we examine how contextual and methodological elements can complement each other in maintaining sustainability of quality advantage and finally, we discuss the implications of this study.

2. Methodological elements

Underlying the method perspective is the concept of structure in problem solving. The use of a structured method in solving quality problems represents an important component in a quality program (Imai, 1986; Ishikawa, 1985; Kume, 1985; Mizuno, 1988). Six Sigma is an example of a comprehensive quality program that emphasizes the importance of a structured method. The need of a structured method comes from the theory that the process of problem solving is programmable, expressible as a (computer) program (Newell et al., 1958, p. 152). It is programmable because there are similarities in the patterns of problem solving. Cognitive processes and thinking can be represented as "a sequence of states" (Ericsson and Hastie, 1994, p. 46) which further suggests that having a structure can be effective in facilitating problem solving. In this sense, learning can happen and knowledge can be created through problem solving in a programmable way.

Using computer programming as a metaphor, the methodological component in quality should consist of a consistent language, a sequence of steps, and a set of tools to enable learning and knowledge creation. This leads to three methodological elements: employing common metrics, adhering to stepwise problem solving approach, and analyzing with a set of tools. These elements relate to how we think and structure a problem. Common metrics affect the way we communicate and "talk" about our quality problems while stepwise problem solving and tools influence how we "think" in analyzing problems and generating solutions. These elements do not operate independently but they overlap with each other.

2.1. Employing common metrics

Use of common metrics across an organization can help in aligning effort in learning and knowledge creation (Orlikowski, 2002, p. 261). Common metrics