Model of Meta-Reflection and In-Depth Analysis of Knowledge Creation Process in Design

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ABSTRACT

This paper proposes a model of meta-reflection and in-depth analysis of the knowledge creation process (KCP). The authors focus on observation of the KCP in research on creative design. The new method of meta-reflection is applied both to reflection on ‘research about design creativity’ and object of research—‘design creativity’. One result of the applied method of meta-reflection was that the analysis of KCP in research on design involved different tacit forms of knowledge and creativity and included a wide spectrum of knowledge processes and knowledge types. The roots of creativity and imagination were identified, which then stemmed into certain parts of research activities, such as development of hypotheses and theory proposition. The authors produced a model of meta-reflection (MMR) and an in-depth analysis of the KCP. This study is a step that provides understanding of the role that human creativity and imagination play in research.

Keywords: Creative Design Research, Creativity and Imagination, In-Depth Analysis of Knowledge, Knowledge Creation Theory, Knowledge Process Analysis, Knowledge Science, Meta-Reflection, Reflective Verification

INTRODUCTION

Knowledge is a subject of investigation in many studies on the processes involved in scientific research. However, the role of creativity and imagination in research environments is not yet understood from the point of view of knowledge processes and knowledge creation. This lack of understanding is the main motivation for undertaking this research.

The purpose of this research is to propose a model of meta-reflection and in-depth analysis of knowledge creation processes (KCPs). We pay attention to possibilities for describing knowledge creation processes emerging in research projects. Moreover, this paper addresses the importance of meta-reflection on knowledge creation processes in research projects. We focus on observation of the KCP in case of research on creative design, particularly on the role that imagination plays there. The particular case we focused on is a research project about creative design, i.e. this is a case where creativity is an object of investigation in the research project and is an element involved in the knowledge creation process. Thus, the objectives of the
work are to investigate the KCP in creative design, and to provide a new method based on meta-reflection.

This study is based on an approach consisting of reflective and meta-reflective verification and analysis of knowledge creation processes. The meta-reflective verification is supported by data that are collected from discussions, observations and document analysis of the research project under investigation. Our approach includes critical analysis and integration of a number of theories on knowledge creation. The approach chosen targets creativity in research projects and the role that imagination plays there. Our model is a result of this study (one paradigm of the approach employed is knowledge meta-reflection). Ultimately, the model of meta-reflection can lead to tools and methods to support creativity and imagination both in research and other academic activities.

The paper is organized as follows. The following section discusses knowledge creation processes and reflection. The section after the following discusses the analysis of the knowledge creation process. The paper further presents the aims and methods of the research. Section about research project on creative design extensively analyses the knowledge creation process in a case study. At the end of the paper, we present our model of meta-reflection, discuss its properties and conclude with the results of the study.

KNOWLEDGE CREATION PROCESS

In this paper, we understand the knowledge process as various kinds of knowledge-related work that are carried out in the context of the project under investigation. The knowledge creation process (KCP) is the process of making tacit knowledge explicit (Nonaka et al., 2000).

Moreover, the dynamics of organizational knowledge creation are characterized by the knowledge creation spiral (Nonaka & Toyama, 2003). The spiral’s main characteristic is conversion between tacit and explicit knowledge—represented in a model with the basic steps of socialization, externalization, combination and internalization (SECI-model).

These kinds of models of KCP help one to understand the nature of knowledge creation and manage the KCP effectively. To do this, it is particularly important to understand individuals’ reflection on the KCP.

Definitions

In our framework, we adopt the following definitions:

- Reflection – Critical and thoughtful consideration of knowledge processes (Schön, 1983; Rodgers, 2002). This consideration is facilitated by applied knowledge creation theories and fundamental concepts from those theories.
- Meta-reflection – Reflection included in the perspective of the knowledge process and its inherent reflection (reflected reflection).

Reflection and meta-reflection are the essential parts of the method used in this paper. Moreover, reflection is understood as inquiry into processes otherwise considered intuitive or creative (Schön, 1983). These processes might be placed within the framework of reflective ‘conversation with the situation’, which can partially account for cases such as scientific investigation or engineering design.

KCP and Research on Creative Design

Reflection is a popular technique for accessing self-consciousness (Schön, 1987). Reflection is a relevant approach to investigate one’s own knowledge creation process. Schön found that people with high levels of creativity often reflected objectively on their own creative processes. Moreover, it has been confirmed as a useful method for examining our understanding of the design process.

The effectiveness of objective reflection has been reported in creative design research.
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