Chapter 4

A Knowledge Creation Model for Graduate Research

Yoshiteru Nakamori  
Japan Advanced Institute of Science and Technology, Japan

Jing Sun  
Japan Advanced Institute of Science and Technology, Japan

Jianguo Wu  
Wuhan University of Technology, China

Jing Tian  
Wuhan University of Technology, China

Van-Nam Huynh  
Japan Advanced Institute of Science and Technology, Japan

ABSTRACT

This chapter proposes a model of knowledge creation and knowledge validation for the research of postgraduate students, and then introduces an evaluation method on research ability and research environment based on this model. The chapter reports the results of statistical analysis, using the data obtained by a questionnaire survey at a graduate school of computer science and technology. Among several discoveries, the great differences in the evaluation of research environment between teachers and students, and in the self-evaluation of research ability between female students and male students are noteworthy. It was confirmed that the proposed model and the evaluation method are effective for supporting research of graduate students.

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INTRODUCTION

Evaluation of higher education institutions is usually done by objective and quantifiable indicators, such as the number of research papers, the amount of research funds, the securing of excellent students, and the employment situation of students, etc. The reason why the objectivity of evaluation must be ensured is to use it for public decision making, such as determining the amount of subsidies from the government.

On the other hand, however, it is difficult to evaluate the improvement of students’ abilities and the effect of research environment on ability improvement. Most of the literatures on the evaluation of educational institutions are related to the evaluation of courses and teaching (Dunegan & Hrivnak, 2003; Rahman, 2006), and the knowledge survey of the increase in knowledge amount of students (Feldman, 1998; Fink, 2003). However, the importance of graduate education is not only the increase in the amount of knowledge but also the increase in abilities of knowledge management and creation. This is exactly the motivation to promote this research.

Knowledge management is a management method to systematically manage the process of discovering, accumulating, exchanging, sharing, creating, and utilizing knowledge as an asset of an organization such as a company (see, for instance, Davenport et al., 1998; Alavi & Leidner, 2001). Recent trends in knowledge management are described in detail in Dwivedi et al. (2011) and Iqbal & Mahmood (2012).

A number of studies on implementing knowledge management in school environment have been reported (Zhao, 2010; Leung, 2010; Chu, Wang & Yuen, 2011; Cheng, 2012). Studies that examined the SECI (Socialization → Externalization → Combination → Internalization) spiral, which is an organizational knowledge creation model proposed by Nonaka and Takeuchi (1995), in the educational sites are found in Joia (2002) and Wu, Lee & Shu (2013). These studies analyzed the strength and weakness of the SECI spiral model in training teachers and in transferring knowledge.

As knowledge management models for individual graduate students, although not as famous as the SECI model, some academic knowledge creation models were proposed in Wierzbicki and Nakamori (2006). Evaluations of these models were reported in Tian et al. (2009) and Sun et al. (2016). Whereas the SECI spiral is a knowledge creation model by a group, these are models of individual knowledge creation supported by a group.

In this research, basing on the above-mentioned models, we develop a new model of knowledge management in graduate research, and try to quantify the abilities of students and the efforts of teachers, which are hard to evaluate quantitatively. Therefore, this paper first proposes a knowledge management model to promote knowledge creation and validation in postgraduate research. Then, the paper reports the analyzed results of a questionnaire survey on the research ability and research
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