Knowledge Spirals in Higher Education Teaching Innovation

Ángel Fidalgo-Blanco, Laboratory of Innovation in Information Technologies, Technical University of Madrid, Madrid, Spain

María Luisa Sein-Echaluce, Department of Applied Mathematics, University of Zaragoza, Zaragoza, Spain

Francisco J. García-Peñalvo, Computer Science Department, University of Salamanca, Salamanca, Spain

ABSTRACT

A R&I&i process for a knowledge management system development is presented. It transforms different institutions experiences into organisational knowledge applicable to an entire sector, the higher education one specifically. The knowledge management system allows classifying, organising, distributing and facilitating the application of the knowledge generated by the faculty. A study, with more than 1000 system users, reflects that the system helps to the faculty in the way they perform educational innovation activities. The supported model integrates both Nonaka’s epistemological and ontological spirals. This allows defining ontologies and used them in order to transform the individual knowledge into organisational one. The knowledge management system encapsulates complex logic expressions and ontologies management, making easy for the users obtaining successful results that may organise in their own way, becoming a powerful knowledge management process that combines epistemological and ontological knowledge spirals to convert individual experiences in educational innovation into organisational knowledge in the higher education sector.

Keywords: Educational Innovation, Higher Education, Knowledge Management System, Knowledge Spirals, Ontologies

1. INTRODUCTION

All societies are symbolized by resources. In agriculture, the grain is a symbol of its activity, the industry itself in the industrial sector, and the knowledge in the current society. For centuries it has been considered that knowledge contributes value to people, but it is the knowledge society that considers that it contributes value to organisations (Sánchez and Elena, 2006) thus making them more competitive (Van den Hooff and De Ridder, 2004; Yang, 2007). However, that contributes value to organisations should be managed, then knowledge management is born with the aim to improve competitiveness. The first experiences in knowledge management came about in private companies (Whitworth, 2012). Currently, most industries use knowledge

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management to achieve competitive advantages (Tan et al., 2007; Wu et al., 2011).

Knowledge management is based on collecting, organising, distributing, sharing and using the intellectual assets of an organisation (persons, knowledge resources and relationship) and should benefit its members (Tseng and Kuo, 2014). Therefore, an activity centred on knowledge implies the exchange of knowledge between organisation members (Bartol and Srivastava, 2002; Koulikov, 2011) and this exchange can contribute to the application of knowledge and the innovation (Sheng and Noe, 2010). In addition, innovation in organisations is closely linked to knowledge management (Nonaka 1991; Nonaka and Takeuchi, 1995; Davila et al., 2006) and both improve competitiveness (Al-Husseini and Elbeltagi, 2015).

On the other hand, higher education is also in a competitive context (students and funding) (Roffe, 1998), so it incorporates knowledge management in order to improve the quality of their services (Weatherly, 2003). Due to all of the foregoing, higher education has the same global challenges as the companies, because it is also in a changing context (Al-Husseini and Elbeltagi, 2015).

The innovation, knowledge sharing and knowledge itself are factors considered in higher education, like in the industry, to improve the quality, to adapt, evolve and compete. Innovation and exchange of good practices (Roffe, 1998) are the means used by universities for the continual improvement of their quality (García-Peñaño, 2011). Innovation is a strategic option (Child, 1972; Whitworth, 2012) that creates knowledge (Nonaka and Takeuchi, 1995) and its management is necessary. However, that universities have strategic plans to encourage innovative practices, it does not mean that innovation occurs. Knowledge management mechanisms are necessary, such as spaces where innovation practices can be located (Gunn, 2010), replicated and applied in the own learning. Transferring knowledge from experts to novices (Hinds et al., 2001), sharing the most relevant information and using resources more efficiently, are all essential objectives (Davenport and Prusak, 1998; Damodaran and Olphert, 2000). Therefore, it is necessary to manage the Educational Innovation (hereinafter EI) and that management should be based on exchange processes of good practices (Koulikov, 2011).

The capability to identify and access the knowledge created in different units of the organisation has significant benefits to improve the performance (Hansen, 2002; Boh, 2014). Consequently, teacher performance improves and it produces more effective work of teachers with students (Cochran-Smith and Lytle, 1999; Kao and Tsai, 2009; McLaughlin, 2002). The EI is a tool that helps universities to adapt to new demands, new competitive forms, new business models and most importantly, to reduce academic failure rates and improve learning results. It is common that universities use the ICT to share knowledge about EI in a virtual way (Alavi and Leidner, 2001) through institutional repositories (Gray and Meister, 2004; Ma and Agarwal, 2007; Boh, 2014). -This leads to the cost of the knowledge search, the difficulty to find relevant information in those repositories (Schultze and Vandenbosch, 1998; Gray and Dürckova, 2005; Huang et al., 2007; García-Peñaño, 2015). This cost is very high when the repositories are not designed to enable the knowledge reuse (Huber, 2001; Markus, 2001), one of the main problems of the knowledge transfer. If good practices have not been created to be shared, then the cost of the search is excessive and the repositories become completely ineffective (Fidalgo and Ponce, 2011). The main objective of this study is to convert the knowledge derived from the EI experiences (produced by teaching staff in higher education) into sectorial knowledge applicable to the whole sector of higher education. To do so, a methodology is proposed, that increases the effectiveness of a knowledge repository to organise and manage EI good practices and its efficiency in searches, which favours the exchange of knowledge. The difficulties that need to be overcome and are characteristics of higher education are shown in the next section. Then the theoretical model of the repository and its performance under different approaches are
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