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On-the-job Informal Learning Practices for IS Students

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ABSTRACT

Information systems (IS) students find soft skills acquired in schools to be insufficient to fully prepare them for their jobs because soft skills are context-dependent and difficult to teach. To compensate for this adversity, students could acquire knowledge through continuous on-the-job informal learning; however, only 20 percent of what organizations invest in training is dedicated to enhancing informal learning. As a result, it is essential that students enter the work force with sufficient knowledge of informal learning practices in order to better acquire experiential knowledge. This paper recommends four techniques that universities can incorporate in IS curriculums to prepare students to become better on-the-job learners.

Keywords

IS education, informal learning, personal notes, reflection, stories, lessons learned

INTRODUCTION

Presently, universities and certification programs teach IS students both hard and soft skills in order to prepare graduates to be successful in their future jobs. Hard skills include specific training on methodologies, techniques, and tools used in common organizations' work practices. In contrast, soft skills such as communication, leadership, problem solving, and team building are useful to acquire experiential on-the-job knowledge. In spite of this training, IS students find soft skills acquired in schools to be insufficient to fully prepare them for their jobs (Stenström 2006), because they are context-dependent and complex to teach for reuse in new situations (Dunne, Bennett and Carre, 2000). While some curriculums engage students in learning from real-life experiences (Poston, 2010), this type of training is also situation-specific. One way students can overcome this adversity is through continuous informal learning on-the-job; however, only 20 percent of what organizations invest in training is dedicated to enhancing informal learning (Cross, 2007). Therefore, it is essential that students enter the work force with sufficient knowledge of informal learning techniques in order to better acquire experiential knowledge on-the-job.

This paper uses organizational knowledge creation theory to: 1) demonstrate the importance of capturing situation-specific experiential knowledge, and 2) recommend specific techniques that universities' IS curriculums could use to prepare students for on-the-job learning.

LITERATURE REVIEW

Organizational learning is a critical factor for change and innovation. The better organizations understand the process of creating new knowledge and discarding obsolete knowledge, the more likely they will develop innovative behavior and gain a competitive advantage (Rebernik and Sirec, 2007). Work histories play an integral role in the organizational learning due to a continuous accumulation of experience. IS project teams learn from this experience and become conduits of knowledge for other groups in the organization; however, the majority of organizations do not keep archives of accumulated experiential knowledge (Williams, 2008). For example, a study of 30,000 IT projects revealed that two-thirds fail not only due to processes, but also due to inexperienced staff (Standish Group, 2011).

The knowledge necessary to develop soft skills is what Nonaka (1994) refers to as tacit knowledge. This type of experiential knowledge is personal, difficult to explicate, and ingrained in action. It embeds skills that apply to specific actions. In contrast, explicit knowledge lends itself to capture via written words and can be stored in systems and archives. Nonaka's dynamic theory of organizational knowledge creation proposes that knowledge is created in a continuous interchange between the explicit and tacit dimensions of knowledge using four distinct patterns: (S)ocialization – employees convert tacit to tacit knowledge by observing, interacting, and imitating

experts. This includes face-to-face communication and experience sharing at work through the role of the master and the apprentice. The key is arriving at a mutual understanding through the help of shared mental models; (E)xternalization – employees convert tacit to explicit knowledge via the articulation of ideas, concepts, images, and written documents. This process is accomplished through the use of metaphors and analogies in order to convey the know-how, know-why, and care-why. To assist in this process, a mediator could be used to obtain and shape the knowledge; (C)ombination – employees convert explicit to explicit knowledge by sorting, categorizing, and joining knowledge via the use of information systems, meetings, conversations, or written reports; and (I)nternalization – employees convert explicit to tacit knowledge through continuous individual and collective reflection that integrates the experiential knowledge into the individual’s mental model. To manage these processes, Nonaka and Takeuchi (1995) proposed the SECI model (Figure 1):

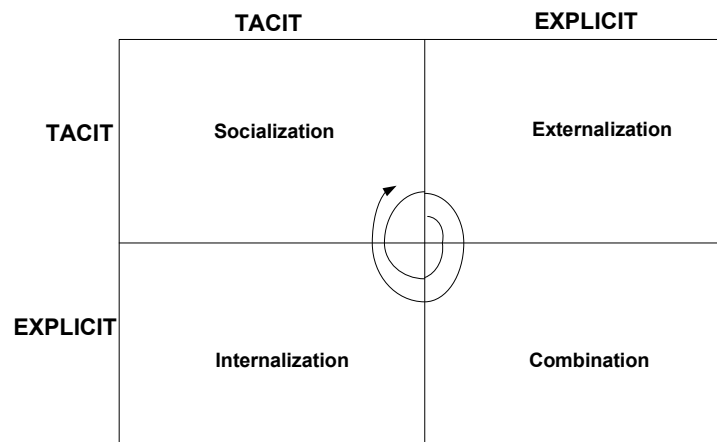


Figure 1. SECI Model of knowledge creation

The model is demonstrated by Voit and Drury (2006) who proposed that specific trigger, either a success or a failure, ignites the learning cycle. Once a trigger has occurred, people collect at the trigger scene to experience the tacit nature of the problem (“socialize”). Following this event, people are assembled and a root cause investigation begins. During this phase, people explicate their knowledge related to the causal chains of the event by reflecting on the past (“internalization”). After the completion of the root cause investigation, the information is collected into documents (“externalization”) and stored in a knowledge management system (KMS) for future sharing (“combination”). The learning process occurs through the unending cycle between all four patterns of knowledge conversion. As a result, to facilitate the students’ acquisition of on-the-job knowledge throughout the learning cycle, this paper recommends universities incorporate the following four techniques into their curriculums.

Personal Notes

One method to capture information during events is through the use of notes. For example, Koskinen and Aramo-Immonen (2008) examined the usability of individuals’ personal notes in remembering a project work context and whether they can be considered as a repository of knowledge. The survey consisted of 30 people from a number of small- and medium-size Finnish project-based firms. Results showed that 97% of participants take down personal notes and use them for problem-solving purposes and as memory aids. Notes were found to be useful for verbal discussions during negotiations, for further information seeking, to capture agreed issues and details, and to capture the opinions of others. The researchers concluded that taking personal notes is a common practice in project-based organizations that plays an important role for the individual and team level of work. As a result, personal notes can be used for remembering project context and are beneficial for capturing information that can be recalled after a long interval that separates learning and recall (e.g. to solve a similar problem that was resolved in prior years). Notes can also serve as mechanisms to feed the storytelling process.

Stories

Stories are narratives that provide a timeline of what occurred and means for a storyteller to express identity, strengthen the bond in a community of practice, and assist in the decision making process. Jonassen and Hernandez-Serrano (2002) demonstrated that project problems are solved by retrieving past experiences in the form of stories and applying these experiences to solve new problems. Newell (2004) showed that learning from the experiences of others facilitates knowledge transfer among project teams.

Goffin and Koners (2011) conducted a case study to determine whether lessons learned captured in a post-project review meeting was effective technique to transfer tacit knowledge. They observed that on average about every 20 minutes during meetings personnel exchanged metaphors and storytelling to relay important lessons. Whyte and Classen (2012) studied whether storytelling could be used as a means to convert subject matter experts' (SME) tacit into explicit knowledge. They collected 64 stories from SMEs of a South African oil company. Results showed that SMEs used stories to disseminate knowledge application, best practices, staff ideas, and knowledge culture. When these stories were distributed among other managers within different parts of the organization to determine usefulness, the general agreement was that all the stories captured important and useful aspects of the SME's knowledge.

Stories are powerful mechanisms for joining, sorting, and recombining personal and shared knowledge. They can also be used as input into the collective and self-reflection processes of the learning cycle.

Reflection

Knipfer, Kump, Wessel and Cress (2012) showed that: 1) through reflection, important lessons learned can be captured to enable the explication of tacit knowledge; 2) reflection can result in organizational learning; and 3) reflection is a medium for innovation of organizational processes and routines. Personal journals with specific questions called reflective guides have been studied as mechanisms to capture experiences and enable the identification of organizational knowledge artifacts such as sources of knowledge, learned lessons and best practices. Loo (2002) found that reflective learning journals facilitate learning of team building, conflict and stress management, interpersonal communication, and leadership skills. Maturro and Silva (2010) demonstrated the use of reflective guides to capture tacit knowledge in software projects. They used three independent software development projects with a total of 12 students (each project team consisted of 3-5 students) and each team's project used a reflective guide during their project to record reflections. The results showed that the use of reflective guides significantly contributed to the capture of best practices, useful lessons learned, and valuable implicit and explicit knowledge.

Reflection can set the stage for the capturing of collective lessons learned during project review meetings.

Lessons Learned

Lessons learned documents are created during post-project review meetings and represent powerful knowledge creation tools. They facilitate informal learning and acquisition of soft skills by externalizing tacit knowledge and converting it to explicit. Williams (2008) conducted a survey of 522 project managers and discovered that 86% believed their competency as project managers had increased as a result of doing lessons learned, while 55% believed their projects were more successful. According to this survey, 65% of the time lessons learned implemented into the organizations' processes, while over half of those surveyed believed lessons contributed to change in project strategy. Three quarters of respondents thought learning diaries and narratives should be used as methods to capture lessons learned, while 83% felt that stories would be of significant value for lessons learned. Tukul, Rom and Kremic (2008) demonstrated that lessons learned documents can inhibit the forgetting of key project lessons. They recommended employees engage in methodical documentation as part of informal learning process at work.

RECOMMENDATION

By incorporating the four techniques from the literature review, universities' IS curriculums would prepare students on how to better acquire and convert on-the-job experiential knowledge. To illustrate this process, the four techniques are applied in the knowledge conversion patterns (Figure 2).

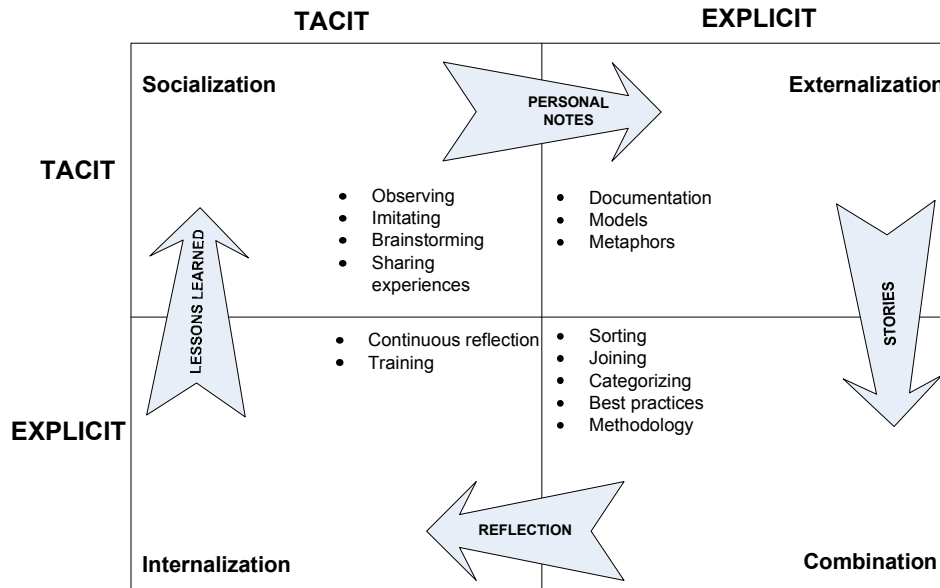


Figure 2: Informal practices for knowledge conversion

Personal notes could be used to capture important information, metaphors, and models about work events. Some note taking techniques like Read, Encode, Annotate, and Ponder (REAP) and mind mapping have been shown to increase learning success levels, uncover new options, and build common understanding among peers (Buzan, 1970; Mehmet, 2010). Personal notes can serve as an ideal input into the storytelling process.

Learning the art of storytelling can help students sort, categorize, join, and recombine historical knowledge into new patterns and best practices. Law (2009) proposed the following five elements of the story: 1) The agent (who performed the act); 2) The act (what happened or will happen); 3) The scene (where and when it did or will happen); 4) Agency (what methods or tools were used); and 5) Purpose (what was the goal). Küpers, Mantere and Statler (2012) recommended that stories should be presented as tragedies, epic, or comedies and include a hero and redemption.

Learning how to perform critical self-reflection, including what types of questions to ask and how to document the resulted knowledge should also be included in IS curriculums. Atkins and Murphy (1993) propose a reflection model with three stages. In the 'awareness stage,' the student becomes cognizant of a unique situation of which she has no prior knowledge. This is followed by the 'reflection stage' in which the student analyses the situation in relation to her past experiences by describing, synthesizing, and evaluating the experience. Finally, in the 'learning stage' the student develops new perspective of the situation as a result of reflection.

Knowledge acquired via reflection can be shared and used as brainstorming during the lessons learned process. The systemic lessons learned and captured knowledge (SLLCK) model has been shown to influence the sharing and application of work lessons (Duffield and Whitty, 2012). Observing and partaking in the knowledge sharing during post-project review meetings via lessons learned documentation can help students convert experiential knowledge. The use of specific templates for the meeting agenda, interview guide, and lessons learned documents have been demonstrated as successful tools for knowledge conversion (Buttler and Lukosch, 2012). Additionally, microblogging has been recommended as a tool for capturing lessons learned (Cleveland, 2012).

In conclusion, this article addresses the importance of teaching students how to capture, share, and convert situation-specific experiential knowledge. It recommends four techniques that universities can incorporate into their IS curriculums to prepare students how to become successful on-the-job learners.

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