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ERP-based simulation as a learning environment for SME business

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ABSTRACT

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Small and medium size enterprises (SMEs) lack an adequately skilled workforce and managers, since university education generally focuses on large enterprises and their needs. Complementary skills needed by SMEs have been of lesser interest even though several approaches, methods and environments could be utilized. For example, enterprise resource planning systems, business simulation games and practice enterprise models all support the learning of complementary and practical skills the SMEs desperately need. Yet all these learning environments are problematic as they approach business phenomena from narrow viewpoints. In this paper, we present a learning environment that merges these three environments so that they complement each other, allowing the learning of the daily management of SMEs. In this way future employees are better equipped when they enter the labour market, being ready to contribute to the business of SMEs.

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1. Introduction

Small and medium size enterprises (SMEs) are major employers and contributors to the market economy (European Commission, 2010; McGibbon & Moutra, 2009). Small businesses also often drive innovation and change (Kelley, Bosma, & Amóros, 2010). Under these circumstances the SME sector has been seen as "decisive for the future prosperity of the EU" (Commission of the European Communities, 2008; see also Robertson, 2003). Such prosperity is actualized in China and its phenomenal growth led by SMEs (Li, Zhang, & Matlay, 2003).

The expanding SME sector has a need for competent management. Future SME managers and also employees, need to have

"transversal and generic skills [that] will be increasingly valued on the labour market: problem solving and analytical skills, self-management and communication skills, the ability to work in a team, linguistic skills and digital competences." (European Commission, 2008).

Management educators have also brought up the need for cross-functional integration in the business school curriculum (Crittenden & Wilson, 2006; Seethamraju, 2007). Yet it is argued that higher education institutions are not equipping their graduates with adequate skills that companies, specifically SMEs, require from their managers (Holden, Jameson, & Walmsley, 2007; Martin & Chapman, 2006).

According to Grabinger and Dunlab (1995), effective learning requires rich knowledge structures with many contextual links to help learners address and solve complex problems. They argue that it is not easy to transfer learning between people. Instead, learning is more likely to be transferred in rich, complex learning situations where learners take an active role in forming new understandings. Their learning is a collaborative process into which the learners bring their own needs and experiences. Skills and knowledge are thus best acquired within realistic contexts where the learners can rehearse and learn the outcomes that are expected of them under realistic conditions.

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A learning environment is a combination of physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the learner in an educational enterprise (Hiemstra, 1991). Grabinger and Dunlab (1995) define "rich environments for active learning" as comprehensive instructional systems that promote study and investigation within authentic contexts and cultivate an atmosphere of knowledge building learning communities. Such environments utilize dynamic, interdisciplinary learning activities that promote high level thinking processes through realistic tasks and performances.

In this paper, we will present a learning environment that supports the learning of the practical management skills needed in SMEs. It is based on experiential learning theory, which assumes that knowledge cannot be transferred from teachers to learners. Instead, learning is an active social process where knowledge and meanings are created by the learners and their interpretations and experiences of the world, and by their interactions with other people. Experiential learning further views learning as a continuous cyclical process with four steps: concrete experience, observing and reflecting that experience, forming abstract concepts and generalizations from the observations, and experimentation with new hypotheses (Kolb, 1984).

Several learning environments have been utilized in business education for providing practical skills. Enterprise resource planning (ERP) systems are widely used to support experiential learning (Davis & Comeau, 2004; Hayen & Andera, 2006; Jensen, Fink, Møller, Rikhardsson, & Kræmmergaard, 2005; Johnson, Lorents, Morgan & Ozmun, 2004; Targowski & Tarn, 2006). Business simulation games are used both in conjunction with ERP systems and as separate teaching environments (Faria, Hutchinson, Wellington, & Gold, 2009). Also another experiential learning environment, the practice enterprise model, aims at teaching entrepreneurship skills through a business-to-business network where the learners run simulated SME companies (Kallio-Gerlander & Collan, 2006). In this paper we suggest that these three learning environments should be combined to support the development of practical skills needed for managing SME business processes.

The paper is organized as follows. It starts by describing a profile of industry-relevant business competencies. Next, it gives an overview of the three learning environments and their learning objectives: educational ERP system implementations, business simulation games and the practice enterprise model. The paper continues by introducing the integrated learning environment that combines the three described environments into a single learning environment. Finally, the paper presents an example where the integrated model is used. The paper ends with discussion and limitations.

2. Profile for SME business competences

Jackson (2009) has summarized industry related competence requirements for business graduates. Fernald, Solomon, and Bradley (1999) have identified the skills that SME managers need in their works. Particularly for SME, their requirements underline the importance of hands-on marketing, financial management and procurement, while accounting, international trade and human resource (HR) skills are of lesser importance. A synthesis of Jackson's and Fernald's findings is presented in Table 1.

These requirements are well aligned with the other business skill requirements (European Commission, 2010). However, there is a gap between what is expected by SMEs and what is taught by the universities. This is conceptualized to be the issue that graduates need to be productive immediately after they get their degrees, while in larger companies they can be trained. Small companies do not have the infrastructure to organize training and personal development for prospective employees, but those skills need to be provided by universities (Woods & Dennis, 2009). Hence, as Westhead and Matlay (2005) state, SMEs are reluctant to hire business graduates because of the cost and work suitability, the extensive need for assistance and supervision, and concerns regarding their lack of flexibility and practical skills.

Martin and Chapman (2006) argue for a specialized SME syllabus that would improve skills in business management, marketing, finance, production, IT and HR management. These kinds of multi-management skills would especially be needed in the micro-business sector with very limited resources. In addition to management skills, SME owner-managers emphasize attitude, communications and interpersonal skills, motivation and self-management, the ability to network, and practical experience. According to McLarty (2000), SME managers implied that

> "personal attributes took the graduate to a certain level of acceptability, but business skills made the graduate employable" (p. 621),

thus emphasizing the disciplinary expertise in Table 1.

3. Business learning environments

In this section we will review three different learning environments that address the learning objectives identified earlier.

3.1. ERP systems as a learning environment

The utilization of ERP systems in business learning began in the late 1990's (Becerra-Fernandez, Murphy, & Simon, 2000; Bradford, Vijayaraman, & Chandra, 2003). ERP systems and simulations based on them are often used in teaching supply chain management, marketing, HR, and accounting (David, Maccracken, & Reckers, 2003; Hawking, Foster, & Bassett, 2002;