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IMPROVING SME'S CAPACITY THROUGH LEARNING AND NEW TECHNOLOGIES

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ABSTRACT

Economic pressure and other pressure issues faced by small and medium sized companies (SMEs) require continuous improving of their capacities, of staff knowledge, of training and learning to survive or stay competitive. This issue is at the top of European, national and regional policies. But due to limited resources, often managers reduce learning activities and using new technologies in their companies.
Blended learning is a suitable way to learn in SMEs to increase their efficiency, to keep up competitiveness/surviving of the companies. Scenario-based learning is one method to be used in blended learning in order to improve learner engagement and problem understanding. Cloud computing is one of the emerging ICT trends in the past seven years. It has received much hype particularly in the past two years, with many companies considering the efficiency of cloud computing for their business, reduced costs, and easy access of data and particularly of new emerging ICT applications with little overhead. This paper contributes in the existing literature with results of interviews and case studies within projects aimed at problems of SMEs like suitable learning methods, advantages of cloud computing for SMEs efficiency and presents examples. The paper's primary contribution is finding that blended learning is a suitable form for increasing competitiveness of SMEs and could be used also by introducing cloud services which will change the landscape of business also in SMEs in the next years.

Keywords: SME, Capacity, Blended learning, e-Learning, Scenarios, ICT, Cloud computing.

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Contribution/ Originality

The paper shows how European projects and cooperative work with participation of actors from different sectors can contribute to improving competitiveness and growth of SMEs

1. INTRODUCTION

Small and medium sized companies (SMEs) are important for the economic world, contribute to output and to the creation of employment but are under high economic pressure (European Commission, 2013). This economic pressure and other ones require continuous improving of company efficiency, of staff knowledge, of training and learning to survive or stay competitive. Due to limited resources, often financial ones, the managers reduce learning activities and introducing of new technologies in their companies. E-Learning is not in high demand with SMEs although it is suitable to quickly and up-to-date the requirements typical for SMEs (Beer *et al*., 2008; Hamburg and O'Brien, 2013). Some managers would like to preserve instructed, classroom-based learning to be the learning culture of the company. But the most liked form of learning in SMEs is the informal one. Blended learning can combine the positive aspects of different learning approaches, classroom-based learning and e-Learning, formal and informal ones. By mixing learning styles and different dimensions of learning suitable for SMEs at the course level, the usage of blended learning opportunities as a suitable way to learn in SMEs could be improved and so this increases or keeps up competitiveness/surviving of the companies. Scenario-based learning is one method to be used in blended learning in order to improve learner engagement and problem understanding.

Referring new technologies, SMEs can take a lot of capacity benefits from embracing business cloud solutions. Cloud platforms allow SMEs to participate actively in the cloud-controlled environment cooperating with cloud service providers (CSP) (Khalid, 2010).

Business Development Director Paul Bryce of Node4 stated that one of the most important benefits of cloud computing is the extensive environment that gives enough leverage for SMEs to compete with the giants in the industry. "They don't want to manage that equipment any more, it's just too intensive from a resource perspective and from a monetary perspective, and it's inflexible, as it won't adapt itself to companies during a time of expansion. With an on-demand infrastructure you can start with what you need today without worrying about tomorrow or the day after because the cloud can scale with you as and when needed," Bryce said.

In order to achieve necessary skills and facilitate the understanding of new technological approaches, blended learning and scenarios can be used. Scenarios broaden people's perspectives on future developments and help people and organizations to be more aware of the impact of change (BSI-Federal Office for Security in Information Technology, 2011).

This paper contributes in the existing literature with results of interviews and case studies within projects aimed at problems of SMEs like suitable learning methods, advantages of cloud computing for SMEs efficiency and presents examples. The paper's primary contribution is finding that blended learning is a suitable form for increasing competitiveness of SMEs and could be used also by introducing cloud services which will change the landscape of business also in SMEs in the next years.

2. BLENDED LEARNING IN SMES

The term blended learning is used in the literature for an integrated combination of traditional offline methods of learning with online methods (i.e. web-based ones) (Garavan and O'Donnell, 2003; Moebs *et al.*, 2006). Within blended learning, class-room based-learning is combined with computer-mediated instructions (Graham, 2006), but also various event-based activities (face-to-face class rooms, live e-Learning, self-paced learning) are combined.

Results of projects show that SMEs are restricted in the efficient use of different forms of learning and technology for learning and in adequate management learning approaches.

It is known that the most liked learning in SMEs is informal one and the predominant training method is workplace training for daily tasks as it is viewed as 'low cost'. (Admiraal and Lockhorst, 2009). The integration with formal strategically training is often not planned. Also the blending of face to face training with self-paced e-learning is not efficiently used (O'Brien and Hamburg, 2014). A blend of classroom-based learning with on-line learning in SMEs seems to be the most efficient approach in many settings.

Important aspects of SMEs blended learning could be Self-Paced Learning, Mix of Methods and Media, Quality, Time Flexibility, Learner-centred, Motivation, Flexibility, Accessibility and Workplace-related Learning. The trainees have the possibility to choose when they study, distance and schedules becoming irrelevant. The students are not required to take into account each other's time restrictions, can also choose content necessary to their tasks. In some projects like SIMPEL (Beer *et al.*, 2008) coordinated by the author, the use of e-learning in SMEs has particularly analysed. The conclusions were that properly developed training based on e-Learning not only contributes to improve competences of SME staff, but also to create a growing repository of knowledge. This knowledge can be continuously provided to employees at a determined time and in a way that can be individualized, to be more efficient. E-Learning has a great potential for the expansion of educational opportunities but it is to consider that "social presence is a strong enabler of satisfaction also in a computer conference" (O'Brien and Hamburg, 2014). In this context there exist many barriers that impede the collaboration in e-Learning based training like costs, academic quality and lack of required ICT skills.

The design of blended learning material has a great importance and several authors developed frameworks to guide this process. An important aspect is the design of the appropriate content for blended learning guided by the SME's knowledge requirements. Content can involve knowledge required by staff to perform their tasks and help to improve products and services offered to clients, knowledge about new technological approaches to be introduced and used. Knowledge concerning new markets, customers and suppliers that needs to be transferred to the staff by blended based training can also be part of the content of training.

Managers of SMEs need to be aware of the importance of mixing other forms of learning like mobile learning, webinars, access to on-demand learning resources and social learning supported by social media for up to date skills and information.

3. SCENARIOS

Scenarios are particularly useful to explore a range of possible futures and what could lead to these futures. Scenario methodology has a major advantage over some methods - it can be participatory. If it is used within blended learning could engage learners and provide them with resources to improve their knowledge.

System thinking used in conjunction with scenario planning leads to plausible scenario story lines because the causal relationship between factors can be demonstrated. Decision makers can use scenarios to think about critical risks and opportunities in the future and to explore ways in which these might unfold. Scenarios are a vehicle to highlight the critical uncertainties ahead that might affect learning. Scenario development provides a process, a common language and tools so that people from a variety of disciplines and backgrounds can work together effectively examples.

There are a number of different scenario planning tools available, however they each provide a means of looking at reality (Godet and Roubelat, 1996) and encourage a company to look at the current situation, different events that can occur, how they can impact on the business and how the business can plan effectively to take advantage or combat the negative effects of these events. They can be categorized depending on the direction the company wishes to take. In addition it "simplifies the avalanche of data into a limited number of possible states" (Schoemaker, 1995). This is particularly appropriate in today's knowledge environment where the amount of data is growing exponentially each day.

Chermack and Swanson (2008) examined the use of scenario planning as a learning tool in which knowledge is developed. "Scenario planning is designed to support exploration of a constantly changing environment and uses multiple narrative stories about the past, present, and the future to stretch the thinking inside the organization". Thus scenario planning involves gathering information about events that have occurred and will occur in the future and understand possibilities to address these. Thus it involves generating knowledge and skills Scenario planning is also heavily influenced by the social elements advocated by the organisational history and culture elements of Vygotsky's constructivist learning theory as "Scenario planning is also dependent upon the situation in which it is employed as a tool for learning and planning".

Scenario planning combined with blended learning can help SMEs to identify the future state of their organisation if they use new technologies like cloud computing technologies accounting for all the limitations and issues that they need to consider.

4. ADVANTAGES OF THE CLOUD FOR SMES

It is known that many SMEs maintain some level of dedicated server infrastructures and this is not always economically beneficial for the company because ICT hardware depreciates quickly and becomes obsolete Karabek *et al.* (2001). These dedicated servers could be replaced by centrally administrated services within cloud approaches. IT systems for SMEs are less complex than in case of large corporations and so cloud services offer a real alternative (Hamburg, 2012a; 2012b).

The NIST definitions of Cloud Computing (BSI-Federal Office for Security in Information Technology, 2011) are used as a starting point for the discussion in this paper. "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction"

In addition Marston *et al.* (2011) define cloud computing as "an information technology service model where computing services (both hardware and software) are delivered on-demand to customers over a network in a self-service fashion, independent of device and location. The resources required to provide the requisite quality of service levels are shared, dynamically scalable, rapidly provisioned, virtualized and released with minimal service provider interaction. Users pay for the service as an operating expense without incurring any significant initial capital expenditure, with the cloud services employing a metering system that divides the computing resource in appropriate blocks"

Advantages for SMWs to use cloud computing could be (Khalid, 2010; Marston *et al.*, 2011; Layo, 2013):

- Up-to-date cloud software solutions without placing too much cost on the business
- Availability of unlimited data storage from the cloud, which can be expanded anytime
- Access to data from anywhere and anytime means portability and flexibility; giving more time and effort to be placed on business strategies and solutions
- Sophisticated and high levels of security protocol that ensure business and data protection
- Better business performance due to the portability, flexibility, efficiency and productivity that cloud provides
- Simplified back-end data management and control using automatic cross referencing and reconciliation cloud features.

Main delivery models are (BSI-Federal Office for Security in Information Technology, 2011; Hamburg and Marian, 2012):

- Cloud Software as a service (SaaS)
- Cloud Platform as a service (PaaS)
- Cloud Infrastructure as a service (IaaS)

By using Cloud services SMEs can have benefits which allow them to compete in an innovative ICT environment, and give a level playing field required to succeed in business (Layo, 2013). SMEs could grow their business without the need for a new equipment or infrastructure that gets outdated easily.

Because many SMEs are oriented to high-speed networks connections and cloud allows them to take advantages of hosted services it is expected that many SMEs will start to adopt cloud.

With any technology there are also a number of limitations or issues with cloud computing. One of the main issues is the reliability and security of data and the accessibility of this on a 24/7

basis, particularly when the cloud service provider has an outage. Marston *et al.* (2011) emphasized the fact that many companies may be wary about the lack of control over their ICT systems and data and apprehensive about the impact of CSP becomes insolvent.

These issues may inhibit a SMEs decision to migrate to a cloud computing environment. In addition there are other factors which may influence the decision (Carcary *et al.*, 2013):

- The lack of understanding of the infrastructure, cost and appropriateness to the needs and scenarios of different companies from different business environments
- The IT skills levels of users, managers and entrepreneurs
- The readiness of SMEs to adopt cloud computing from a business perspective
- Time

Some of these issues can be addressed by educating employees on the concept of cloud computing and developing business based IT skills in SMEs. This will allow them to make informed decisions about the appropriateness of cloud computing to their business strategy and what aspects can benefit them the most.

Few studies have been conducted into the emerging ICT skills required for cloud computing. Much research has focused on the technological aspects of cloud computing rather than the skills and preparation companies required to allow them avail of the strategic benefits this technology offers. The focus from primarily technical skills has moved to business skills those that are concerned with enabling and managing ICT as well as strategy development and managing change. Skills in the security of information were viewed as one of the most important.

5. EXAMPLES

Within the projects SIMPEL (Beer *et al.*, 2008) and ReadiSMEs (Hamburg and O'Brien, 2013) worked by the author studies have been done to improve the SMEs efficiency. Different forms of learning within SMEs have been tested and scenarios have been developed showing different learning strategies and their consequences.

One project worked by author in connection with cloud approaches is SmartPA (www.smartpa.eu). Within this project the needs of public administrations and SMEs referring cloud services have been analyzed. The conclusions are that the ICT support of SMEs business is more transparent and simple than in big companies and so easily to adapt to cloud services (Hamburg and Marian, 2012; 2014).

Germany is a "slow" enhancer of cloud technology and German SMEs are cautiously optimistic about this technology.

SME staff from Germany responds that they prefer local ICT providers which could offer them personal and flexible services, knowing the SME ICT landscapes and offering also adequate consultation services. In order to do this local ICT service providers should become expertise in IaaS and SaaS in order to have benefits.

In order to research the needs and problems the German SMEs have at moving to cloud, some interviews have been done by authors with managers and ICT responsible from SMEs.

After evaluation of the interviews it became clear that scenarios for the introduction of Cloud Computing in SMEs following the results of the interviews are necessary.

One example which will be used is an adapted version of the scenario developed by Fraunhofer FOKUS (2010) called *Business Incubator for SMEs.*

An open market place aims at integrating administrative procedures and services offered by private sector companies, in particular SMEs without the capability to maintain an elaborated IT infrastructure. By participating in the market place, these companies can provide appropriate offers to concrete situations and specific types of customers. On the other hand, activities such as moving, building a house, finding a suitable playschool in the new environment, etc., can be comprehensively managed.

Of particular interest in this scenario is the interworking between business processes of SMEs, public sector services, and end user (citizen) services.

Mentoring is a professional relationship in which an experienced person (mentor) assists another (mentee) in developing specific skills and knowledge (Hamburg and Marian, 2012). The approach we developed in the project DIMENSAAI (www.dimensaai.eu) coordinated by the author, as an efficient human resource one, will be used also within Smart PA in order to assure an inclusive introduction of technology with the participation of staff with disabilities and older ones.

6. CONCLUSIONS

The improvement of SMEs capacities is a key topic for Europe's competitiveness and grow. In order to find solutions it is important to understand business goals and particularly where SMEs need help.

Results of our projects show that the developing and using suitable learning strategies is missing in many European SMEs.

A mix of learning styles and of different dimensions of learning for specific needs of SMEs seems to be more efficient than other forms of learning.

Results of literature research, discussion within European SMEs and projects show that there is not clear what means a "good" mix of learning for SMEs and this should be a further research and discussion topic. There are big differences between requirements of SMEs from different European countries and between different sectors. Countries from former socialist countries are more willing to test new forms of learning and to use scenarios.

In connection with the introducing of cloud approaches the conclusion was that cloud services i.e. standardised, scalable ICT resources and services provided via network will change the landscape of business also in SMEs in the next ten years, improving efficiency. At the moment there are differences between European countries as enablers of this approaches i.e. UK and Spain are more "advanced" in this context, Germany is a slow enabler.

A general conclusion of our projects is that mentors have many advantages in introducing new technologies and integrating people with special needs into work.

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