

APPROACHES TO USE E-LEARNING, CLOUD COMPUTING AND COOPERATION IN SMEs

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Abstract: *Small and medium sized companies (SMEs) assure economic growth and employment in Europe and it is important to have qualified staff by using efficient education methods and digital technologies. In this paper we present shortly the learning methods in SMEs particularly the use of Problem Based Learning (PBL) supported by digital technologies as an efficient form for SMEs and entrepreneurship education. Within the European project Archimedes with the authors as partners PBL is used supported by an ICT platform (www.archimedes-tiki.eu)) make possible E-Learning. Cloud Computing offers many opportunities for SME business and can help companies improve their business and use technology more efficiently also for E-Learning. In the European project IN-CLOUD a partnership was created and the authors analysed the use of Cloud Computing for nosiness and learning in SMEs.*

Keywords: *SME, PBL, Cloud Computing*

1. INTRODUCTION

Small and medium sized companies (SMEs) are the heart of Europe's economy, assuring economic growth and employment in Europe. Some of them have not survived the financial crisis; others have had to innovate in order to be competitive. There are some 21 million SMEs in Europe, supplying about 85% of jobs. All that allows Europe to control one fifth of world trade and so it is very important to have qualified staff by using efficient education methods and digital technologies also for learning (E-Learning) [1]. Training and skills development have an important role on business success. However for many SMEs the resources are very tired and training budgets are often the first to be reduced or removed [2], [3]. E-Learning has tried to address issues of time and cost in SMEs, by allowing employees to access learning resources remotely. The learning material is easy to keep updated; the trainers can integrate multimedia content which facilitates understanding and motivate the participants. Results of project worked by the authors like ARIEL, SIMPEL, ReadiSME show that this form of learning is not used efficiently in SMEs.

In this paper we present shortly the learning methods in SMEs particularly the use of Problem Based Learning (PBL) supported by digital technologies as an efficient form for SMEs and entrepreneurship education. Within the European project Archimedes with the authors as partners PBL is used supported by an ICT platform (www.archimedes-tiki.eu)) make possible E-Learning.

Cloud Computing offers many opportunities for SME business [4] and can help companies improve their business and use technology more efficiently also for E-Learning. The European Cloud Computing Strategy includes the creation of a "European Cloud Partnership" providing strategic options to turn cloud computing into an engine for sustainable economic growth, innovation and cost-efficient public and private services. In the European project IN-CLOUD a partnership was created and the authors analysed the use of Cloud Computing for nosiness and learning in SMEs.

2. LEARNING IN SMEs

Results of projects show that SMEs are restricted in the efficient use of technology for learning and in adequate management learning approaches [5]. The most used learning in SMEs is informal one [6] and the predominant training method is workplace training for daily tasks and "being low-cost". The integration with formal strategic training is often not planned. Also the blending of face-to-face training with self-paced E-Learning is not efficiently used [7]. Within blended learning, classroom-based learning is combined with computer-mediated instructions, but also various event-based activities (face-to-face classrooms, live E-Learning, self-paced learning) are combined. Some important aspects of blended learning for SMEs could be Self-Paced Learning, Mix of Methods and Media, Quality, Time Flexibility, Learner-Centred, Motivation,

Flexibility, Accessibility, and Workplace-Related Learning. Managers, who do not know the advantages of E-Learning, would like to preserve instructor, classroom-based learning as the learning culture of the company. They and staff should be aware of integrating training/learning in the company business contributing to company growth. They should understand the importance of using other forms of learning like mobile ones, webinars, access to on-demand learning resources and social learning supported by social media.

3. PBL IN SMEs

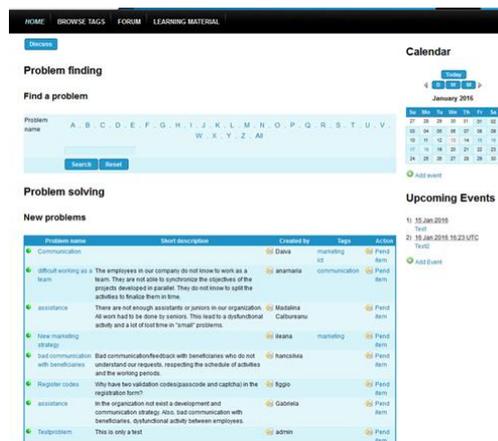
Problem Based Learning (PBL) [8] is an educational approach which uses real problems to motivate staff and students for learning. The use of PBL could lead to the achievement of the following objectives

1. Better acquisition and retrieval of knowledge related to the context (problem to be solved) and to integrate many disciplines
2. Motivation of the students, and providing them with responsibility of learning
3. Development of the ability of self-learning
4. Adapting the learning to the needs of the students
5. Development of the ability to work in team

Two main characteristics of the PBL which contribute to the achievement of the objectives are interactive work in a team and the facilitator/tutor/instructor. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to the solving of the problem. The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process. Steps which will consider in our projects by teaching PBL and corresponding questions are

1. Clarifying the task
2. Defining the problem
3. Brainstorming
4. Rating of Brainstorming outcomes
5. Formulating learning objectives to cover knowledge deficits
6. Self-study of the group participants.
7. Rating of possible solutions and working out a final solution
8. Reflection and feedback of all participants

PBL is supported in Archimedes by an ICT platform (www.archimedes-tiki.eu) by the use of TikiWikian open source Content Management System (CMS). The figure shows the Archimedes Platform to practice L.



4. CLOUD COMPUTING

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, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” (NIST Definition) [9]. Cloud computing enables companies to use resources as a utility rather than having to build and maintain computing infrastructures in-house. Advantages of the Cloud for SMEs are [10], [11]:

- 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 that cloud provides.
- Simplified back-end data management using automatic cross referencing

Besides advantages within business, Cloud Computing can be used for improving learning. Some aspects which could be improved by using Cloud Computing to implement E-Learning are scalability of E-Learning systems at the infrastructure level, development and assigning of resources only for determined tasks, need to configure and add new resources making the costs and resource management less expensive [12], [13]. Two main characteristics of Cloud Computing which could be an alternative to traditional ICT centres and could improve the E-Learning approaches in SMEs are the use of resources “on demand” and the transparent scalability so that the computational resources are assigned when they are necessary without the necessity of infrastructure understanding by the users. Costs related to computer infrastructure maintenance disappear [14], [15]. Within the project IN-CLOUD analysis have been done in partner countries about the use of Cloud Computing for business and learning. A set of didactic units and a set of VET Qualifications with instruments to validate them are in the development as well as learning materials on practical applications of cloud computing,

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