CLOUD SERVICES IN TEACHERS' EDUCATION

A THEORETICAL APPROACH IN GREECE

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Abstract
Technology and its products change very quickly and become more and more accessible. This will lead education in the upcoming years to be accessible by everyone, teachers and students, in cooperation and learning anywhere, locally and globally. The classroom of the future will probably include pupils with physical presence but also online from anywhere, and respectively the same may happen with teachers. Cloud-based services are constantly evolving. Many of these services, known as Web 2.0 services because of their innovative features, have added an important element in the cloud, the interactive features, in a way that allows users to use them creatively. This gives us the ability to create orchestrated services that provide learning experiences, which until recently were impossible to implement. The purpose of this paper is to present a theoretical approach to the use and utilization of cloud services in Educational Technology and Multimedia Laboratory in Higher Education Pedagogy School, at the Annex of Patras.

INTRODUCTION

Distance learning helps to cover geographical and time constraints. The development of technology offers the right tools in order to address the constraints and a lot of educational organizations (especially higher education) use systems and methodologies in distance learning (Armakolas, Panagiotakopoulos, Alimisis 2013; Panagiotakopoulos, Lionarakis, Xenos, 2003). The Educational Technology Lab of the Higher School of Pedagogical & Technological Education (ASPETE) in Patras supports modern educational practices, such as Web Based Learning through Synchronous Audiographic Conferencing, Cloud Educational Environments (CEE).

When we refer to cloud and thus the computing cloud, we mean a service or application, or even any simple work that is done using a set of computers connected together in a network (Internet, Intranet, LAN). An efficient connection is essential and we can be located anywhere at every different stage of the process, to get the work completed. A specific computer is not required, just any computer where we can connect to our account. We do not need our own hard drive or USB, everything can be stored in the cloud.

Moreover, the ability to create heterogeneous learning environments is given, which are easily customizable. That means that we can customize services to the needs of each user, which is the main objective of Cloud Educational Environments (CEE) (Mikroyannidis, 2012).

The set of services offered by the cloud can be divided into three categories (Chappell, 2008):

IaaS - Infrastructure as a Service: A virtual computing power and memory (storage space) is provided. A typical example is Amazon Web Services service.

PaaS - Platform as a Service: There is an interface with servers, databases, and everything else needed. In this case we have the example of Google App Engine, an environment that Google provides to anyone who wants to design an application.

SaaS - Software as a Service: There is usually a browser-based application that can be used directly. Here we have many examples that are used fairly often. The best known service of this class is Google Docs, giving the possibility of opening and editing doc, xls, ppt files through a browser, without any additional software installation.

One element that is common to these three categories is the high degree of automation, as they are Cloud Services (Jansen et al., 2013).

CLOUD SERVICES AND EDUCATIONAL ENVIROMENTS

The CSs make modern applications more adaptable while improving safety in relation to the availability, data storage and communication. CSs give a new perspective on the use of well-known services such as Twitter and Facebook (Jansen et al., 2012). These services, Cloud Services in fact, can be used to introduce remarkable activities in synchronous and asynchronous training scenarios.

The future, which we are talking about, will find the teachers not just putting their work on the network, but being able to comment and evaluate through the network, keeping real-time track of the operations' evolution. Students will have direct access to grades, tasks and comments through a device, which can be even their mobile phone. The format of the traditional classroom itself will change radically (it has already changed for other reasons that are not the subject of this article, we can adapt positively to this new reality).

The main advantage of cloud applications, formerly known as Web 2.0, is that they are constantly being improved in terms of user-friendly features. This very important attribute opens to users creative perspectives. Emphasis is now given to the ability to adapt the environment to the needs of each user, in contrast to the recent past when basically the end user was forced to adapt to the exact features of the specific environment (Pettersson 2012). We can liken the CSs with an educational ecosystem, where services and resources are available to anyone at any way needed.

Below are described some basic categories in which the CSs (Cloud Services) can be classified, depending on their use in Teacher Education in ASPETE. It is important to note that these categories are not completely separate, that means it is likely a service to belong to more than one category. Nevertheless, the understanding of these categories can lead to generate a common communication and creation code, on the future development of the CEE themselves and the applications that use them.

A) Communication Services

Cloud-based communication services can facilitate communication through computers among students within a co-operational educational scenario. This can be done either in the same location (for example a room or laboratory) or on different sites (i.e. every participant in

their house). This regards training scenarios which exploit synchronous and asynchronous processes. The best examples of such cloud-based Communication Services are the chat in Facebook and Google+.

B) Storage Services

This category allows users of Cloud Services to create repositories in the cloud where they can store and retrieve files. Typical examples of such services are Dropbox and Google Drive. These services provide a starting place for data storage for free, which can be increased at cost. Files are stored on external drives that are hosted in the cloud. There is such integration between the storage services and the operating systems (Windows, Linux, MacOS, etc.), that when a file is stored in the cloud it is like it's stored in a local disk drive.

Other examples of such services are more specialized solutions, for example for video (like Youtube) or photos (Flickr, Instagram). There are two dimension of differentiation in comparison to the more comprehensive solutions mentioned before. Firstly, it is obvious that they are specified to certain file types, and on the other hand these services are amplified by the asynchronous communication mechanisms (reviews or discussions). As mentioned earlier, these are examples of services that belong to both categories (they belong also to the previous one because of providing communication services).

The most important element these services have to offer is the sharing of content between a large number of users. This feature makes them quite interesting as a perspective for educational scenarios. For instance, repositories can be created with educational materials that can be used as a basis for the educational activities of teachers (Neven & Duval, 2002).

Γ) Production Services

The third category of CSs, production services, focuses on the creation of new content and / or information enrichment. The web-based application MindMeister for creating concept maps is an example of such a service used in training teachers in ASPETE. Very often, production services combine services of the first two categories to assemble and rearrange information from different sources, all in a new application. In the user's screen, these services are often presented as a so called mashup. A mashup is an application that collects data from different sources into a new application, which usually focuses on a new user group (Rizzardini et al., 2012).

CONCLUSION

The cloud services contribute to the creation of educational materials with a high degree of integration of different applications of the new technologies. Additionally, they enhance the interaction between teacher and learner. This combination enables the production of new data on teacher education.

The future of education, according to several recent studies (Means et al., 2009) is in ICT. The development of ICT is cloud computing. There are already individual efforts of its implementation, but we should see a more complete application of cloud-based services in education in order to obtain better results (STEM+ Education, 2012).

The school of the future should provide very fast Internet connections and wifi throughout its facilities. This will be a necessary technological infrastructure. With cloud the whole world will be a classroom. Students will be able to learn from everywhere and teachers to teach anywhere. We do not know what will be the device of the future, but we know for sure that it will work on the cloud (Britland, 2013).

In the present study a theoretical reference to the use of cloud in education has been presented. Future research will evaluate the use of cloud services in education.

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