1. Introduction

Disseminating online learning, as well as building the perfect digital teaching environment, will be one of the hotspots in educational research in the near future. Cloud Computing will have a significant impact on the educational and learning environment, allowing users (students, teachers) to perform their tasks effectively, utilizing the available applications offered by Cloud service providers [1].

Over the last few years, the ongoing developments in the technological field of Cloud Computing have caused a discussion about the possibilities of its systematic utilization in educational environments. For this reason, studies are already being conducted at various levels (mainly at institutional and regional level). A European network called «The School on the Cloud network» has been set up to address this issue. The network consists of 57 participants, including 21 universities and teacher training departments, 9 Non-Profit Organizations, 8 schools, Media, research institutes, vocational education and training (VET) structures, a European Vocational Association and a library. The innovative nature of the network is that it undertakes a holistic approach to investigating the impact of Cloud technologies on standard education, targeting all involved and at all levels of education [2].

2. Methods

In the National Information System of Research and Technology (NISRT)[3] the Cloud Computing is defined as the on-demand centralized allocation of computing resources (network, servers, applications and services), with high flexibility, minimal user effort and high automation. In Cloud Computing, the storage, processing and use of data, software and services is done online, via remote computers in central databases. Services such as on-demand virtual machines, e-mail or social networks are often based on Cloud Computing technology. Cloud Computing can be public, private, or a combination of these.

3. Results

The Cloud Computing is widely recognized as a means of improving efficiency and promoting collaboration in education. Universities and institutions already benefit from this, not only in terms of cost, but also in terms of efficiency, reliability and portability. There are many cloud computing

RESEARCH ON ADVANCED TECHNOLOGIES – DESIGN AND DEVELOPMENT OF CLOUD COMPUTING MODEL

Alexandra Briasouli

PhD Candidate

Department of Computer Systems and Technologies

Technical University of Sofia

8 Kliment Ohridski str., Sofia, Bulgaria, 1000

alexandrabriasouli@gmail.com

Abstract: This article is a bibliographic review and focuses on a brief introduction to Cloud Computing as an innovative educational tool. Cloud technology is rapidly spreading in educational institutions, sometimes replacing the in-house infrastructure with cloud services. Education plays an important role in a country's economy and today, the educational model in many countries has evolved with technology. Schools and universities in the world extensively use cloud Based Technology. Digital teaching – E-Learning and cloud-based technology are the latest models that have been widely adopted in the educational field. The identified trends in the use of cloud computing in education are clear, ranging from the design of cloud-oriented learning environments for future information technology specialists to the training of information technology specialists to enable them to obtain competencies in the use of cloud technologies. Cloud computing is a distributed computing paradigm, where, instead of acquiring information technology products, users access shared resources under various service models through a network, usually the Internet. The application of cloud computing is very broad and growing daily because of many advantages to the users, and is driven by the increasing use of various mobile devices (laptops, tablets and smartphones) and mobile Internet access being more available. The perspectives of its integration in the learning process are highlighted, as well as the factors that make its implementation difficult. Finally, some general conclusions presented on how technologies should be adopted to meet the educational needs of this new global challenge and some suggestions are made for more effective training through the Cloud Computing, as the need for further research emerges

Keywords: Cloud Computing, Software Services, Education, Tools, Applications, Online Learning, Integration.

providers in education, such as Microsoft, Google App, IBM, Amazon [4].

In the field of education, applications such as Dropbox, SpiderOak, IDrive, pCloud, OpenDRIVE, Bitcasa, onedrive, Tresorit, google classroom, GoogleDrive, could be used effectively. What is required is free access, anytime, anywhere, from any kind of device, such as PC, tablet, smart phone, website and any kind of operating system e.g. Windows, iOS, Android [5].

In a report of the European Commission [6], policies and programs for the development of Cloud services are presented, which will utilize the digital student material and will provide applications suitable for education. For example:

- cooperation between Finland and Estonia;
- Sotogrande International School, in Spain;
- King Solomon Academy, London;
- Killingworth School, UK;
- Municipality of Ballerup, Denmark;
- European network «School on the Cloud» (18 countries including Greece). <http://www.schoolonthecloud.net/>;
- Forum for data protection and the establishment of codes of conduct. [https://www.crunchbase.com/organization/safegov-org](https://www.crunchbase.com/organization/safegov-org;);
- Global Flat Connections Project. <http://www.flatconnections.com/>.

In our country there are inequalities regarding the possession and access to ICT, both between levels of education and between regions or even schools, which makes it difficult to adopt cloud-level technologies [7]. Weaknesses are focused on the current state of IT labs, the lack of maintenance, the fact that computers are affected daily by the rapid developments in IT science and the fact that the country's school labs have different capabilities in terms of logistics infrastructure and educational software available.

4. Discussion

The use of Cloud Computing services has many advantages [8], as it is able to facilitate learning in different contexts and is based on a wide range of teaching strategies. Specifically, Cloud Computing facilitates easy access to information and resource software, easy storage and sharing of files and data and their better organization. It contributes to the development and improvement of educational tools, while reducing the cost of equipment, software licenses and maintenance. Educational institutions can manage their re-

sources more efficiently, and develop more profitable capital investments in IT.

Research in a rural area of West India confirms the above and adds that the Cloud Computing helps save energy and time, as well as provides increased flexibility to teachers working in special education fields. Enhances their professional development and improves their ability to use ICT. Improves communication and cooperation between both teachers and students, enhancing their active participation in collaborative activities. It allows greater student autonomy, takes initiatives, increases motivation for school work. It unlocks the hidden potential for people with communication difficulties and prepares young people for future jobs. Helps students with vision and hearing problems, as well as with significant and varied learning difficulties to communicate more easily [9].

Finally, the Cloud Computing contributes to equal and quality education for all, to student autonomy, to bridging geographical or mobility constraints. It offers opportunities for personalized learning for people with disabilities, rich tools (e.g. Google Voice) and virtual learning environments where everyone can easily access information [10].

Despite the many benefits of Cloud Computing, there is a great deal of caution and challenge that needs to be addressed. Reliability is a concern, as cloud breakdowns occur, resulting in the inability to access, for several hours, data and information stored on it. Data protection, from external and/or internal risks, ensuring the smooth operation of computer systems, confidentiality, as well as the slow transfer of data in the «clouds», are issues that need to be improved.

Additional obstacles are the institutionalized formal duties of teachers, the strictly structured education system combined with the absence of reforms. Also the lack of specialization, the inexperience of the staff and the lack of training of teachers in ICT issues. The size, structure and curriculum of the school require teachers to devote a lot of time to their classrooms. This, due to the misconception that CC is a time consuming and complex process, which is likely to cause problems in classroom management, leads to the adoption of negative attitudes.

Negativity also evokes perceptions that this technology will not enhance or help students understand the nature of science. Also, the feeling that a lack of student-teacher face-to-face communication will lower students' levels of commitment and consistency. The lack of modern infrastructure and equipment in schools makes it difficult to implement CC services. The lack of positive attitudes and beliefs about the

usefulness and pedagogical value of such practices, as well as the adoption of a conservative culture, emerges as an obstacle to such innovative actions [11].

5. Conclusions

According to research results, in students with different social backgrounds, in Russian Federation, attitudes towards teaching with methods based on «clouds» are greatly influenced by the social, economic background and family environment of students [12]. These data, as well as what was found in this brief literature review, lead to the conclusion that the integration of the Cloud Computing in the learning environment should be designed to enhance student performance, and to ensure:

- security and protection of personal data;
 - sustainable technology, evaluation and efficiency;
 - various integration trajectories, personalization and individual guidance;
 - need for a consultant - coordinator and training;
 - sharing cognitive tools;
 - strengthen communication, cooperation and development of initiatives;
 - promotion of student-centered teaching models;
 - ensuring social inclusion and equal opportunities;
- In summary, it is possible to say that the need for the dissemination of digital educational tools and know-how is highlighted, with the development of innovative actions and the implementation of further research on a number of issues, such as:
- search for educational scenarios related to the Cloud Computing;
 - design, implementation and evaluation of appropriate educational practices concerning all levels of education;
 - developing and testing applications and tools suitable to meet special educational needs, and other specificities in a heterogeneous student workforce.

Cloud Computing is a promising technological tool, which seems to occupy the educational community in the coming years. Its effective integration in the learning process will depend on the degree of its acceptance by teachers and students, as a result of their information and training in digital technology issues. The design and implementation of innovative actions and programs in this direction, in conjunction with the development of software for secure information flow and protection of personal data, is the golden section for the creation of the new digital school of the 21st century.

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