Human Computer Interaction and Romania's Future of Education

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Abstract

In our opinion, education has a central place in the development of creating and maintaining a modern contemporary society. Nowadays, more than ever, human capital is considered to be one of the most important assets of the society we live in and lifelong learning programs come to support higher education and its major role for human resources development.

It is a fact that Romania has reformed higher education as a consequence of competition pressure during the integration into the European Union, also willing to play a key role in the educational system in the next future.

Our paper "Human Computer Interaction and Romania's Future of Education" evaluates the stage of development of the e-learning system in Romania, compared to other EU Member States, in the perspective of the newly voted Education law on the tenth of January 2011. Our research started with a part of literature review that analysis the state of e-learning in the world and then continued with profound comparisons based on official statistics that we have considered as essential to our work. At the end of our presentation, we have showed Romania's indicators in the matter of e-learning, which even though are not at the level of other EU countries, proof an increasing interest in the field of Human Computer Interaction.

Introduction

In our opinion, education has a central place in the development of creating and maintaining a modern contemporary society. Nowadays, more than ever, human capital is considered to be one of the most important assets of the society we live in and lifelong learning programs come to support higher education and its major role for human resources development.

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Literature review on Human Computer Interaction

In order to present a better image upon the Human Computer Interaction, we have considered extremely necessary to present the most important believes that well known specialists have regarding this matter. In the rows bellow we have presented a literature review involving some important studies in this field.

Jones and O'Shea (1982) have stated that "that the perceived educational benefits of a computer system have little to do with the amount of use it gets. Instead, it seems that the quality and ease of the interaction are the most important factors. It is therefore argued that if human - computer interface can be improved one further barrier to CAI use will be removed" (Jones, A. & O'Shea, 1982). But Tufte (1989) believes that "Human-computer interaction can be viewed as two powerful information processors (human and computer) attempting to communicate with each other via a narrow-bandwidth, highly constrained interface" (Tufte, 1989).

Human - Computer Interaction (HCI) is defined by (ACM SIGCHI, 1996) as "a discipline concerned with the design, evaluation, and implementation of computing systems for human use and with the study of major phenomena surrounding them" (Dix et al. 1998).

Another definition given by Preece, (1994) that Human - computer interaction (HCI) is "the discipline of designing, evaluating and implementing interactive computer systems for human use, as well the study of major phenomena surrounding this discipline" (Preece, 1994). Furthermore, "HCI involves the design implementation and evaluation of interactive systems in the context of the users' task and work" (Dix et al., 1998).

Some specialists claim there is confusion what HCI is, a science, a design science or an engineering discipline. The definition as a science is "HCI is tempered by approximation, providing engineering-style theories and tools for designers" (Newell & Card, 1985). HCI as a design science, "developing a craft-based approach and new research methods to evaluate existing systems in their intended and tasks context, using the results to inform designers for the next generation of systems " defined by (Carroll & Campbell, 1989). HCI as an engineering discipline, Long & Dowell (1989) define as "...the design of humans and computers interacting to perform work effectively" while they decompose the discipline into design of humans interacting with computers and design of computers interacting with humans.

Human-computer interaction (HCI) studies how people interact with computing technology and how a computer system is designed more easily, more practically, and more intuitively. These interactions have specific emphasis on the "interaction at the interface" with the technology in a broader sense. Today, HCI has attracted considerable attention by researchers and "it is one of the most critical challenges facing computer science and engineering" (IEEE).

There has also to be taken into account that computer systems can have non-cognitive effects on the user, for example the user's response to virtual worlds. That is the reason why Reeves & Nass (1996) showed that "humans have a strong tendency to respond to computers in similar ways as they do to other humans" (Reeves, B., Nass, C., 1996).

HCI is regarded as an interdisciplinary field that interrelates with many disciplines as psychology, computer science, cognitive psychology, engineering, artificial intelligence, ergonomics end recently other discipline are input as sociology, anthropology, art sciences etc. This field incorporates the social as well as cognitive aspects of computing. Crucial factor in HCI design is the interrelation between Psychology and Computer science as (Carroll & Thomas, 1982) state: "Psychological theory and methods (...) can provide a foundation for better interface design; but reciprocally, interface design provides a rich and detailed practical domain in which to assess and refine psychological theories of complex learning behavior. Perhaps both disciplines are now mature enough to contemplate a serious relationship."

Because of the rapid development of hardware and software technologies and their decreasing costs and development of new techniques like speech and audio processing and computer vision, people more and more will use computers in their everyday lives, even people that are from other fields not

very familiar with computers. According to other specialists "due to one reason or another some users cannot be able to interact with machines using a mouse and keyboard" (Rudnicky, A.I., Lee, K.F., and Hauptmann, A.G., 1992). All this will lead to designing new multimodal human computer interactions that involve different input techniques like speech or voice, paper-like writing or pen, computer vision (giving the computer the ability to see its surroundings and to interpret them), eye - input technology and gesture. A multimodal HCI application responds to input in more than one mode of communication in a sense of sight, touch, hearing, smell that can be input in a computer through respective input devices. Until now, desktop applications have used mechanical input techniques via keyboard, mouse and visual display and using familiar WIMP conventional interfaces. At the beginning there was a single user – computer interaction in the traditional HCI applications. Other specialists show that the use of multi - user multimodal interaction to the computer utilizing new hardware technologies (cameras, haptic sensors, olfactory, microphones and other) gives "the promise for effecting a natural and intuitive communication between human and machine" (Jason J. Corso, 2005) (in the new generation of interfaces that include computer vision, he calls the human computer interaction a "communication between human and a machine". Also, Preece J. (1994) states that "Virtual environments and virtual realities typically offer a sense of direct physical presence, sensory cues in three dimensions, and a natural form of interaction (for example via natural gestures)".

This implies new quality of interfaces of these systems, as (Faconti, 1996) says: "User interfaces of many application systems have begun to include multiple devices which can be used together to input single expressions. Such interfaces are commonly labeled multimodal because they use different types of communication channels to acquire information". As the number of the interactive computer-based systems is growing, human activities are rapidly becoming mediated by computers. HCI is concerned "with the design, implementation and evaluation of those interactive computer-based systems, as well as with the multi-disciplinary study of various issues affecting this interaction" (Stephanidis, 2001), while the main concern is to ensure "ease-of-use", operability, discoverability, simplicity, and learning ability moreover safety, utility, effectiveness, efficiency, accessibility and usability (Stephanidis, 2001) and flexibility (refers to variations in task completion strategies supported by the system).

Romania's Education and the place of Human Computer Interaction

In Romania the Ministry of Education, Research and Innovation (Romanian: Ministerul Educatiei, Cercetarii, Tineretului si Sportului) is one of the biggest ministries of the Government of Romania. Over the years the Ministry changed its title: initially it was called the Ministry of Religion and Public Instruction (Romanian: Ministerul Religiei şi Instrucţiunii Publice), then the Ministry of Public Instruction (Romanian: Ministerul Instrucţiunii Publice), then it changed to the Ministry of Teaching (Romanian: Ministerul Învaţamantului), the Ministry of Teaching and Science (Romanian: Ministerul Învatamantului si Stiintei), than changed back to the Ministry of Teaching (Romanian: Ministerul Învatamantului). When Andrei Marga became Minister, it introduced the largest reform measures, starting with the name of the institution: the Ministry of National Education (Romanian: Ministerul Educatiei Nationale). In 2000 the name was changed to the Ministry of Education and Research (Romanian: Ministerul Educatiei si Cercetarii). This title was kept until April 2007, when it changed to the Ministry of Education, Research and Youth (Romanian: Ministerul Educatiei, Cercetarii si Tineretului). Since December 2008 the title is Ministry of Education, Research and Innovation (Romanian: Ministerul Educatiei, Cercetarii si Inovarii).

Of course, in Romania the Education Law changed as well, and in January 2011 was voted the most recent version of it.

In regard to the studies concerning Human Computer Interaction, only between 1990 and 1999 there were published 1374, according to A. D. Hunt (http://www.idemployee.id.tue.nl/g.w.m.rauterberg/publications/HCI-Journal-Research-Review(1990-1999).pdf).

It is generally known that nowadays there exist an enormous number of computer - based systems that enable the human activities and make them in essence computer mediated. And that is the reason why we believe that a literature in human computer interaction is to be reviewed and the technology aspect of human computer interaction is to be analyzed. According to all these issues, recommendations to designing a good human - computer interface for e-learning programming environment are going to be analyzed and proposed in the case of Romania.

Today, computers and computer and information technologies have an important role in education through utilizing e-learning environments and different computer based systems. That is the reason why efficient human-computer interactions must be designed, having in mind their effective use. The involvement of ICT has made a big change in education environments from physical environments to virtual learning environments. Also, the usage of VLEs in learning is a new field of research, due to the fact that virtual environments become attractive alternative for developing more realistic and interesting user interfaces.

According to research literature, the user interface is a crucial component that influences the efficiency and quality of usage and communication between user and the virtual environment as well as in the learning process and nowadays, there are a number of VLE developed with very advanced graphical user interface, but the role of the human computer interaction is left behind any consideration.

Conclusion

The Romanian education is confronting itself for many years with many changes involving the need to reform and restructure the Romanian Education system in order to create a clear and comparable system with the ones that already exist in the European Union and all over the world. The intention is to create a better system centered on the individual and in time able to generate prosperity and better results. The human computer interaction is at the beginning here in terms of education, but we believe that in the next years there will be made considerable efforts to generate a better educational system with the help of human computer interaction.

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