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Digital Students and Digital Tutors Profiles
In Romania, Hungary, Finland and UK

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Abstract

This report describes a study performed in universities from Romania, Hungary, UK and Finland designed to identify the unique features of ‘digital students’, as a move towards building a customized model of an eLearning environment. To what extent might its students be described as ‘digital’? How might their characteristics influence the development of an adaptive and adaptable eLearning environment? A definition of digital students is refined and enhanced by the findings of the study, which includes both the active role of technology in their lives and also the students’ need, at an independent level, to control their environment.

1. Summary

The last quarter-century has seen the digitization of virtually all aspects of life - something Negroponte has called the “change of atoms into bits and pixels” (Negroponte 1996). However, for the generation born after 1980 the digital world is even more present and pervasive than for the rest of us: for them it is the only world they know. They are the ‘digital’ or ‘Net' Generation (Tapscott 1998): children or teenagers who have lived all their lives in a changing but (from their perspective) a predominantly digital world. Significantly, most students in higher education now belong to this group. We have identified these students as a special group due to their characteristics (Andone, Boyne et al. 2005 & Pemberton, 2005a) and we consider that this community has different learning habits from students of previous generations. The article of faith that underpins out work is that technology makes it possible to design learning situations that actively engage and guide learners while allowing them to choose their style of learning and organize their knowledge outcomes. This conceptualization of the learning environment allows learners to make the transition from learning in a physical space such as the lab or lecture theatre, to learning in a student-centred learning environment in cyberspace. Technology can change the education setting from a physical one to a virtual one. Virtual spaces may be in constant flux: they can be instantaneous, deliberate, mobile, synchronous and asynchronous. The student’s relationship with virtual space can shift rapidly and they may co-exist in several spaces at a time. These virtual spaces can play a bigger role in all aspects of higher education through the use and integration of technology (laptops, handhelds, mobile phones) and communication (wiki, blogs, SMS, podcasting, etc).
The full results of the early studies are presented in (Andone, Boyne et al. 2005 & Pemberton, 2006a; Andone, Dron et al. 2006 & Pemberton 2005b). The main characteristics of the digital student were identified as a result of this research. The characteristics of the technological confident digital students were found to include a strong need for instantaneity, a desire to control their environment and to have a technology based social life (or – to communicate socially by an extensive use of technology).

From our research perspective, 'digital students' are defined as young adult students who have grown up with active participation in technology as an everyday feature of their lives. Among the characteristics that define digital students are that they take the availability of email, instant messaging and text messaging for granted, and use unlimited online resources. The digital world has had a significant impact on their habits and behaviour (Barone 2003). They expect to try things rather than hear about them. They want to learn by doing - usually just by trying things out (Tapscott 1998) from which they develop understanding by synthesis. They tend to learn visually and socially (Livingstone and Bovill 2001; Livingstone, Bober et al.). Using technology to organize and integrate knowledge feels normal to them, as well as “doing rather then knowing” (Frand 2000).

They have very specific needs and expectations from their learning environments. They will enjoy enhanced interactivity and connectivity with others, and expect to learn in groups which may be physical or virtual. Papert (1996) says that young people’s “access to information is more interactive and non-sequential” and they learn for “the pleasure and benefit of discovery”.

As a result of their powerful access to digital media and to the endless information on the Internet they have learned to access facts and to assess them in particular ways; and to be able to process so much data, they need to synthesize. “In our generation, we reach for the manuals - if we don’t know how to do something, we ask,” says John Seely Brown (2000). “We don’t engage directly with the unknown and then do sense-making afterwards. Kids today engage and synthesize. Our generation is good at the analysis of things, as opposed to the synthesis of things.” However, digital students will engage in searching for information sources and, quite often, for other people on the Internet and based on this they will construct new structures and new information (Oblinger and Oblinger 2005).

Their learning expectations are different due to new patterns of behaviour developed over their school years. As Bob Woods (2002) says they “rely on the ‘Net to help them with completing their schoolwork. They use it for research, collaboration with other students, and as a resource for information passed on to them by other students or teachers. Students also use it as a ‘virtual guidance counsellor’ and as a way to store important school-related materials.”

Treating the Internet and mobile phones as normal tools means that collaboration is an area of great potential for digital students. Using instant messaging, e-mail and text messages via mobile phones they’re able to create, join, leave and rejoin at will, what the Pew Internet group calls “virtual study groups” (Jones and Madden 2002). These groups can be synchronous or asynchronous but the ‘feeling’ is of instant communication. This has led to a continuous need for instant feedback which is also found in their learning attitudes (Andone, Dron et al. 2007).
Despite the traditionally restrictive educational settings in which they often have to function, today’s students perceive their learning environments as boundless. They tend to use physical space differently from prior generations and they blur the boundaries between physical and cyber space and between mine, yours, ours, and everyone’s (Andone, Boyne et al. 2005). They tend to use the Internet to search both for educational purposes and for information about their hobbies and interests. They use SMS (mobile text messaging) extensively for contacting their friends and colleagues, as well as IM - instant messaging. These results show that the use of multiple media and technologies is directly connected to their use in education, home and entertainment (Andone, Dron et al. 2006 & Pemberton, 2006c).

Though lagging very slightly behind their UK and Finnish counterparts, the students from Eastern European countries are becoming stronger in their ICT use and understanding and have jumped several technological steps. They started using the computer, the Internet and the mobile phone at around the same time, and after just a few years they are using similar tools (SMS, Instant messaging, search engines, online playing) at much the same level as their Western colleagues (Andone, Dron et al. 2006 & Pemberton, 2006a). They use the Internet for research, collaboration with other students, and as a resource for information passed on to them by other students or teachers (Andone 2008).

A large number of desirable attributes for e-learning environment emerged from the research, some of them contradictory. For instance, while participants generally want to have ‘things coming to them’ in a ‘rapid, fast way’, receiving un-requested learning objects disturbs them. It was clear that no single approach would be likely to satisfy all requirements, and an e-learning environment for digital student will need to use complementary methods and technology and leave the power of choice of the ‘right one’ to the student. The results were correlated with other research (Beasley, 2004; Dillman, 2000; Eurostat, 2003, 2004; Livingstone & Bovill, 2001; Oblinger & Oblinger, 2005; Rettie, 2002; Woods, 2002).

They simply ‘think differently’.

3. Survey

3.1. Methodology

The survey we developed constitutes one strand of a multi-faceted research effort to explore the idea of a digital student profile, and explore also how learning technologies could be tailored to match that profile. An online questionnaire was created using standard research techniques [9]. As the survey’s focus is on ‘Technology in Education’, we attempted to collect information from a relatively random sample of a specific target population of young students. The target group was young students 18-21 years old in universities from the UK, Romania, Hungary, and Finland. Our questionnaire design involved a review of similar published questionnaires together with personal observations by various groups of young students. Themes covered were digital literacy, Internet use, mobile phone use, learning attitudes, visual use, and IT expectations. The questionnaire was completely online with different sets of
questions: multiple choices with one choice or with several choices, rating questions and open questions.

The questionnaire was made available to students in different subjects for a three-week period during September 2004/January 2005, in different slots. Access was provided through the university’s online learning management system. Analysis revealed the following information about the sample group:

- The Romanian survey had 181 respondents - 113 males and 68 females. 25.41 % were aged 20 or under and 74.59 % were over 20. 7.18 % were in their first year of study, 20.44 % in the second year and 72.38 % on their third year or beyond, their specialisation areas varying between Computer Science and Information Systems.

- The UK survey had 216 students - 74 males and 142 females, of whom 50% were 20 or under. 47% were first year students, 22% second years, and 31% in the third or higher year. Subjects studied ranged from Business to Education and Social Sciences to Medical Care.

- The Hungarian Survey had 61 respondents - 26 males and 35 females. 49.18 % were aged 20 or under and 50.82 % were over 20. 32.79 % were in their first year of study, 57.38 % in the second year and 9.84 % on their third year or beyond, their specialisation areas varying between Technology, Business and Information Systems.

- The survey in Finland gathered 30 respondents - 20 males and 10 females. 16.67 % were aged 20 or under and 83.33 % were over 20. 10 % were in their first year of study, 0 % in the second year and 90 % on their third year or beyond, their specialisation areas varying between Computer Science and Business.

We feel the need to express some caution about the data so far obtained. The sample was clearly not completely random, since taking the questionnaire was entirely voluntarily and the fact that it was online implies at least some level of digital ability. Also, the answers were often expressions of preference and there was some latitude for different interpretations of what the questions meant. Finally, the surveys exhibited different gender distributions; and, as might be expected, there is greater use of technology by the Computer Science students. Yet overall the results of the surveys are quite similar; and as our intention is to identify ‘digitalness’ they will be presented together here.

Various strategies were used for analysing the results [9]: descriptive statistics (averages, number of students), inferential statistics (assessing the significance of data), simple interrelationship (cross-tabulation), multi-variate analysis (studying more variables) and in depth interpretation by analysing each student’s answers and comments. Qualitative research was analyzed in conjunction with other data (gathered from other research methods, or from literature) to form part of a qualitative study.

3.2 Results
As a result some desired attributes for a learning environment were identified, even though some results are equivocal (for instance, respondents were equally divided over whether face-to-face meetings, e-mail and text messaging are the most effective method of communication between peers).

As our main interest is in studying the ‘digitalness’ of the digital students we clustered their answers into 6 main groups and graded each respondent from 1 to 5 as a level of his/her: digitalness (the use of new, emerging technology and communication in different aspects of life), control (the need to be in control), independence (the preference for independent actions), direct information (the perceived need for direct/customised information), visual (the perception of visual things), eLearning (the use of eLearning in an adaptable environment). We then performed a covariance analysis for each factor and then calculated the averages for each level of digitalness and turned them into a simple line graph (so digitalness rises at a steady 45 degrees). (fig.1).

![Figure 1. Graph of digitalness correlation](image)

This graph shows a correlation between all the factors for those students with a high level of digitalness (3 or more). In particular, it demonstrates a fairly strong correlation between digitalness and control, some correlation with independence, a high correlation between low digitalness and low use of adaptive eLearning, an interesting correlation for digitalness and direct/customised information at the very top end of digitalness, and a parallel correlation at all levels for digitalness and visual.
These correlations do not all have equal significance, because some are closer than others – for example, the level of control. In the light of these results our initial definition of digital students has been refined to include the concept of control and independence: the strong need of digital students for control over their environment which reflects their constant need for independence in their actions. This is the first major outcome of our study. It has direct implications for the design of an eLearning environment which we believe ought to include several adaptable elements under direct student control.

We will present here some aspects of the survey results, concentrating on what seems relevant to the development of an adaptive eLearning environment.

**The use of technology**

The results clearly show a high level of use of technology (computer, Internet, mobile phone) and that technology is firmly embedded in the students’ lives, a large majority describing themselves as at least intermediate in computer competence (fig.2).

![Figure 2. The use of technology](image)

These results appear to be consonant with official Eurostat results in 2003 [10] and with EDUCASE results [5]. These students can be considered early adapters as their starting point for the computer use (53% start using computer at age 7-14) and the Internet (46% start using the Internet at age 14-18) matches the time period of the high global boom on computer and Internet use [10]. This result shows that the use of multiple media and technologies is directly connected to their use in education, home and entertainment. (fig.2, 3)
Technology is part of their education and also of their social life, both as individuals and at group level – but for an eLearning environment this will be reflected in several technical constraints.

**Communication**

Using technology for communication is part of students’ life-style and the results show an increased need for synchronous communication, but with asynchronous communication still very much anchored in their lives (fig. 2 and 4).
If email, SMS and instant messaging are part of the daily routine, using forums is a less regular occurrence, with a higher percentage being used by women, which conforms with Livingstone’s [5] results which show the same high use and acceptance of the new communication tools by girls. The students’ claimed online access to learning and training varies from daily to weekly. The high daily use of browsers indicates a strong emphasis on search methods, which can be expected to modify the students’ cognitive approach to learning and also their expectations about the learning environment – which should include powerful search engines, not just indexes or glossaries.

From the responses to several questions, a pattern emerges for communication. Synchronous communication is preferred when students contact one another while for educational contacts with their professors the asynchronous model is preferred. SMS is increasingly becoming the preferred communication tool because of its users’ need for instant response and feedback. Comments such ‘the quicker the better’ and ‘instant response’ were common among students’ responses. Students’ ability to select the ‘right’ communication tool for different purposes also shows their need for control and the development of independent skills.

**Control**

Our results suggest that the need for digital students to control their online and eLearning environment is directly associated with their high use of technology.
When accessing websites digital students want better interaction and they want to be able to change and control it, but they are less interested in control of the general design (fig.5). Our survey also leads us to suspect that their level of control is also dependent on their strategic thinking, developed by their experience in playing games (69% often played computer games). Their need for control is better seen in the answers regarding their perception of eLearning environments.

**eLearning**

Here we wanted to look at our subjects’ experience of eLearning and find out how they react to an online learning environment. We wanted to know which adaptable and adaptive items are preferred, the learning styles of the new digital students, how they approach text, image, links, and how they think about adaptability. Asked about how much control they wanted over different topics in education the students showed enthusiasm for direct participation and decision over certain aspects of the educational process (fig.6).
The need to personalize delivery, the need for instant feedback, and the lack of interest in writing or control over content delivery, all lead us to the conclusion that digital students want information fast but they want it presented in visual and interactive modes. They prefer being involved in subject-related activity (56%), problem solving (49%) and simulation (48%), so they have a strong interest in developing real projects and learning by doing/discovering or from practice. The results show a preference for a learning environment where the online materials contain hyperlinks, which Beasley claims to have the educational advantage of allowing students greater control over the order in and depth to which they explore a topic, allowing for more reflection and active gaining of knowledge [11].

4. The UPT-CSID Web Portal

Student support is a very important part of a successful eLearning programme [12]. The support which the “Politehnica” University of Timisoara (UPT) Center for Distance Education (CSID) offers to its distance education students can be split into general and personal support. General support is offered through the learning package (a combination of text based books and online course materials), access to the university computers, general information on-site and online noticeboards, etc. But recent years have proved that our students need more personal support provided on an individual basis. This was the first aim of the UPT Web portal – to provide online support for distance education students. The combination of regular student management and the Web led to completely new administrative procedures that helped UPT -
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CSID to achieve its goals in providing adaptive student support in the same time with assuring the quality of the education process. This was the second aim for the UPT web portal. [13]

The UPT-CSID portal is built as a first step of an eLearning environment, and hosts specific tasks:

- Educational information
- Schedule
- Course delivery – even if the student is provided with text-books, a lot of the courses provide the training materials online [14]
- Course advice and information
- Collection and distribution of marks
- Student counselling - Forum and mailing list.
- Communication –Forum, email, news [13].

We designed the CSID database to store different kind of data, separated in 12 tables: curricula, courses, exams, planning, presence, meeting, homework, ratings, marks, student, teacher, and forum [13]. To access these data on the MySQL Server we created a user account for the application and we granted privileges to users only for the database and tables they need to use. The access to the database is personalized for each student, professors, and tutor through a secured password interface.

Sessions were designed to offer a way to transfer user information on the web. The HTTP protocol used on the web is a stateless protocol. This means each request made to a web server is independent of all the other requests. We used this idea of session control so we are able, in an easy way, to track a user during a single session on the web portal.

4.1 Evaluation of the CSID portal

The UPT-CSID Web Portal (http://www.csid.utt.ro) has now been in use for more than two academic years. A constant evaluation and, as a result, constant updating has been the main objective of the CSID team with a main view of integrating the portal (which is now just an online support tool) in a full online learning environment. As part of our evaluation plan we run an extensive survey among all of our DE students (90% responses out of the 290 students) in January 2005. We will present here just the results which correlate with the topic of this paper.

The students’ access to the Web portal is weekly (68% declare a weekly access, while just 15% a daily one) which is also shown by the inside automatic tracking system of the portal, so the portal has become an important part of their education process.

Several tasks are among the most popular ones for students and also for the professors: course information, marks information, news, and forum.

The survey reveals that the most accessed information on the portal is the information about the education process – course data and information (75%), information about the assignments, submission dates and references (65%) as well as the schedule information about the face-to-face tutorials, exams and study periods (65%) (Figure 7). It also seems that students are in constant need of updated information about their education and academic structure, as these are the most requested topics when we ask them what other information they want.
From the responses to several questions, a pattern emerges for communication. Asynchronous communication is preferred by the students with the forum and email as their top preferences (Figure 1). Email is increasingly becoming the preferred communication tool also to the professors mainly because of the built-in feature in the portal which allows automatic multiple email to all the students or just to groups.

5. eLearning perspectives

In the last 2 years of evaluation we researched also the possibilities of introducing an eLearning environment and the students’ acceptance of such a solution. The results of the January 2005 survey showed an increased interest in eLearning, almost double then the last year ones.
This result cannot be generalized to all students as the students which answered them are students in new high-tech specialisations, but it has become clear that they are starting to consider eLearning a viable solution. The result is backed-up by the students’ high use of computers (70% use the computer daily, and a large majority describe themselves as at least intermediate in computer competence), the Internet (55% use it daily) and mobile phone (51% use it daily). These results appear to be consonant with official results as the number of the Internet users in Romania was in 2004 – 24%, with an increase of 10% since 2001 [15]; the number of computers sold in Romania in 2004 was 2.1 millions, on top of the 1.5 millions in 2002 [15]. But the real expansion has been in mobile phones as in 2004 the number of users increased to 7.35 million from 4.5 million in 2002, [15] which represents about 35% of the Romanian population.

We also investigated their possible reaction to an online learning environment. When asked which education topics they wanted to be delivered online to them, the students showed enthusiasm for direct online participation and decision over certain aspects of the educational process (Figure 9).

![Bar chart](image)

**Figure 9. Students’ desired topics for online delivery**

It seems that the acceptance level [16] is passed, and that eLearning has become part of the educational rhetoric in Romania, strongly promoted though the media, so young people start to know about it and to understand what it means.
6. Digital Tutor

1- INTRO
Internet is the main resource for many contemporary activities
Internet as environment, as resource, as technical instrument fostering human activities
Instruction is nowadays Net-conditioned
New professionals with new competences are required in the educational field
We need a particular kind of expert, the DIGITAL TUTOR, which is able either to manage the students' educative requirements and to deal properly and "naturally" with the Web 2.0 and new technologies in general
The Digital Tutor coordinates e-learning activities
The Digital Tutor develops new e-learning activities
The Digital Tutor guides students in choosing their own curricula
We need to specify a professional profile in order to identify them and interview them about VICADIS development and, in general terms, about DIGITAL STUDENTS needs

2- WHO IS THE DIGITAL TUTOR
Tutor is from latin "Tutor, tutoris", he/she who cares and protects
Tutors are operating in universities, schools, organizations
In all these fields the role and competences of tutors are often strictly defined
Tutor is not just a communicator or a spokesperson, tutor is mainly a guide
Tutor guides the student during the process of assuming A NEW LEARNING METHODOLOGY in a new learning environment
The student should not be addressed directly to contents, but he should be aided in order to become able to define and conduct autonomously the learning process, acting knowledge ACTIVELY
Digital Tutor is the proper tutor for Digital Students

3- COMPETENCES
It is not an easy process to define competences, because "being competent" in something means to manage different features in a specific sector
A non-exhaustive list of competences for the D.T.
- Complete control ("MASTERY"!) on the subject/s of the course/s. A deep knowledge of the subject is preparatory to any educative activity
- Didactical and METHODOLOGICAL COMPETENCE either in conducting virtual and in-presence groups
- Competence in managing non-linear learning processes
- Competence in evaluating non-linear learning processes (the student, in e-learning courses, is subjected to simultaneous but different and diverging solicitations)
- Competence in cooperative learning methods
- WILL to co-operate: as a facilitator of the learning processes, the Digital Tutor should be always present in the virtual and in the real class, as the Digital Tutor was a student
- Manager of cooperation between students
- Facilitator of relations between students
- Competence in managing and moderating communication feeds
- The Digital Tutor should in general work for the building of a common learning ground, shared by different students

4- FUNCTIONS
To define functions is not an easy task as well; however, it should be pointed out that the FUNCTION of the tutor is DIFFERENT from the FUNCTION of the teacher
Teacher keeps and transmits knowledge
Tutor attends students during the learning process
The tutor's functions:
MOTIVATION
ANIMATION
COORDINATION
COMMUNICATION
ORGANIZATION
SUPPORT/REINFORCEMENT

5- APPROPRIATE BEHAVIOUR
D.T. should know how to act in an on-line environment
D.T. should be aware of the Netiquette, i.e. of a correct way of behaving among subjects using ICT tools
The Core Rules of Netiquette are excerpted from Virginia Shea, Netiquette, London, Albion Books, 1994:

Rule 1: Remember the Human

Rule 2: Adhere to the same standards of behavior online that you follow in real life

Rule 3: Know where you are in cyberspace

Rule 4: Respect other people's time and bandwidth

Rule 5: Make yourself look good online

Rule 6: Share expert knowledge

Rule 7: Help keep flame wars under control

Rule 8: Respect other people's privacy

Rule 9: Don't abuse your power
Rule 10: Be forgiving of other people’s mistakes

6- FOUR DIFFERENT PROFILES
We can identify four different profiles for the Digital Tutor

**Basic Digital Tutor Profile**

The Digital Tutor is mainly a facilitator, helping students in accessing, using and participating in every course’s feature, and backing them individually and collectively during the learning process. In details:

- Facilitates access to learning objects
- Supports users involved in creating new learning objects
- Helps students to reflect on their own learning process and their changing competences
- Facilitates users’ participation in group and community activities
- He represents the institution’s users interface
- Helps users in using the platform
- Monitors didactics and performs evaluations

**Contents Management Tutor Profile**

The Digital Tutor helps students in understanding the contents of the course, analyzing and clarifying concepts, terms and whatever is related to the subject. Can also join the teacher in administering disciplinary contents and learning evaluation. In details:

- Plans, organizes, manages and supports specifically subject-oriented e-tivities (e-learning didactic activities)
- He uses the web or specific tools in order to build new learning objects
- Joins the teacher in administering disciplinary contents and learning evaluation

**Didactic Management Tutor Profile**

The Digital Tutor can be represented as the “tutor of tutors”, mainly controlling the course’s quality, either on a didactical and on a management level. Thus, The Digital Tutor has to work in strict connection with the Project Manager, the Instructional Designer and the contents’ authors. In details:

- Supervises tutors in monitoring the whole course process
- Tests accessibility and usability of the learning objects
- Tests accessibility and usability of the platform
- Verifies the coherence of the learning objects with the aims of the course

**Community Management Tutor Profile**
The Digital Tutor is mainly the facilitator of group relations, either helping users in developing e-learning communities and communities of practice, thus fostering communications, sharing of knowledge and building of good relations in formal and informal settings. In details:

- Plans specific actions in order to support motivation towards group work
- Provides management suggestions
- Fosters group performances
- Helps the building of communities of practices
- Tempts users to develop informal relations

8. Conclusion

Technology makes it possible to design learning situations that actively engage and guide learners while allowing them to choose their style of learning and organize their knowledge outcomes. This conceptualization of the learning environment allows learners to make the transition from learning in a physical space such as the lab or lecture theatre, to learning in a student-centred learning environment in cyberspace. This in turn leads to customized learning, to adaptive learning and to learning by entertaining. As our interest is in broad trends we are led to the belief that technology integrated with methods for communicating knowledge can enhance and stimulate learning. Our results lead us to believe that we are identifying new ways in which, with the use of technology, knowledge can be structured and delivered by students themselves. Such knowledge will be:

- Hyper-linked, not just hierarchical
- Multi-dimensional, not just linear
- Constructed, not just displayed
- Held in graphic, audio and video formats, not merely as text
- Supporting dynamic interactions with the audience, not just as static presentation
- Incorporating powerful search engines, not just indexes

Students can structure knowledge in new ways and this enables them to think, interact, and communicate differently. We note that the most powerful forms of knowledge have always capitalized on using the most effective medium.

Our intention is to integrate these findings with the studies we are currently undertaking in other countries so as to develop a common scenario for an adaptable and adaptive eLearning environment. Subsequent research will test the viability of this scenario by bringing it into life on a real learning situation.

Our study indicates that, in the medium and long term it is very likely that eLearning will be implemented in CEE countries (mainly in Romania and Hungary) educational institutes. A need has been established for developing eLearning environments, especially for high level courses (e.g. IMM, MBA, other master programmes) as well as for continuous training for employed people.
At regional and national level, the “Politehnica” University of Timisoara is at the avant-garde of technical higher education. UPT was groundbreaking in certain fields, and it was the first in Romania to introduce high-tech specializations, and then to offer them through Distance Education, the first one to offer an online master degree and also a double-degree European diploma. And its success can be used as a springboard to perpetuate innovation in education in Romania. Further studies will test this possible scenario as well the success of implementing a full eLearning in Romania.

10. References