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Designing eLearning Spaces for Higher Education Students of the Digital Generation

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Abstract

The main aim of this research project is to investigate the relationship between students and their electronic learning environments, and in particular, how eLearning spaces influence and are influenced by the adaptable and adaptive learning attitudes of the new student generation. In particular, it focuses on what I defined as digital students as young adult students who have grown up with active participation in technology as an everyday feature of their lives. The characteristics of the technologically confident digital students were found to include a strong need for instantaneity, a desire to control their environment and to channel their social life via extensive use of technology.

The main assumption tested within a multi-layered argument was: Digital students have different characteristics as the ubiquitous use of digital technologies so an eLearning environment should favour these characteristics and provide appropriate digital technologies in order to improve student participation in higher education.

A model of what it means to be a digital student was established, using a multi-method research. The investigation comprised online surveys administered to students in the UK, Romania, Hungary and Finland, followed by a number of focus groups carried out in the UK and Romania. Later, based on issues identified by the investigation, scenarios were developed as part of the socio-cognitive engineering research method used. Based on the results of this investigation, an eLearning environment, DIMPLE (Digital Internet and Mobile Phone eLearning Environment), was developed and furnished with a number of learning and communication tools, using a dual device interface (online and mobile phone), based on the assumption of an ‘ecology’ of learning. We studied the impact of these features on the experience of the new student generation. The environment was used in normal University courses by groups of both “digital” and “non-digital” students and evaluated for its usability, desirability and effectiveness over both students groups, in higher education in UK and Romania.

The results indicate that an eLearning environment which has the appropriate tools and involves student control leads to greater engagement in the learning process and a higher level of satisfaction of the group which we identified as digital students.
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Diana Maria Andone
Declaration

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree.

Diana Maria Andone

26 September 2011
Chapter 1

Introduction

1.1. Background

This thesis represents the result of several years of research, done as part of the pursuit of the PhD, as well as my former academic and research experience. The research presented here was done in several steps. The first one is between 2004 -2007 and represents the core, the main part of the research to define digital students, an eLearning environment and a first step evaluation. The second is part of an international project funded by the European Commission, which sought to implement the first research ideas and concept at a larger scale and in extensive academic situations.

My entire work sustains the idea 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 organise their knowledge outcomes.

Electronic learning (eLearning) has become an integral part of education over the past decade. From colleges to accounting firms to software developers and to hotel chains, people are training at their desks and in their own time, logging on between business meetings, during visits to the library, or at home. The Internet holds an important educational promise for providing efficient ways for enabling students to increase their repertoire of knowledge and skills.

Despite the increased popularity of eLearning, it appears that online training providers, both in academia and in industry, experience a variety of problems and frustrations. One of these issues is related to the lack of adaptability of eLearning programs.
In his article, *Growing Up Digital: How the Web Changes Work, Education, and the Ways People Learn*, John Seely Brown (Seely Brown, 2000) uses ecology as a metaphor to describe an environment for learning. Brown says, "ecology is basically an open, complex adaptive system comprising elements that are dynamic and interdependent. One of the things that make ecology so powerful and adaptable to new contexts is its diversity." Brown further describes a learning ecology as "a collection of overlapping communities of interest (virtual), cross-pollinating with each other, constantly evolving, and largely self-organizing." Brown's ecology concept requires the creation and delivery of a learning environment that presents a diversity of learning options to the student. This environment must offer students opportunities to receive learning through methods and models that best support their needs, interests and personal situations.

A learning ecology can be also be understood as a framework for the development of technological resources along with the expectation of particular learning processes and situations. In this research situation, it can be seen as a set of contexts found in physical or virtual spaces that provide opportunities for learning: scenarios, activities, material resources, communication and interactions.

In a broader scenario the learning ecology can be assumed to exist within developments in information ecology and it can affect other aspects of the development of an eLearning environment. This environment must offer all students opportunities to pursue learning through methods and models that best support their needs, interests and personal situations.

Adaptive eLearning spaces are characterized by the capability of dynamically customising environment features according to the characteristics of each user or of a user model (Brusilovski, 2001). The adaptive system dynamically composes a user model from user behaviour. Such a model may be scrutable and adaptable, so that the user is explicitly involved in updating and creating it. This is what could be described as an adaptable system.
1.2. Digital Students

In the last quarter-century the digitization of virtually all aspects of life - something Negroponte has called the “change of atoms into bits and pixels” (Negroponte, 1996) –has had an impact on us all. However, for the generation born after 1980, the digital world is even more present and pervasive than for the rest of us, for it is the only world they know. They are the “digital ones” or the “N-Gen – Net Generation” (Tapscott, 1998, p. 15). The majority of them are children or teenagers still, who have lived all their lives in a changing but (from their perspective) predominantly digital world. Significantly, most students in higher education now belong to this group.

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.

1.3. Research Aims

The main aim of this research project is to investigate how adaptable and adaptive eLearning spaces influence and are influenced by digital students’ learning attitudes.

The research intends to concentrate on environments that can offer students opportunities to receive learning through methods and models that best support their needs, interests, and personal situations. So, the expected result is to construct and evaluate an adaptable and adaptive eLearning environment for young students and to provide a set of guidelines for the design of eLearning environments from the perspective of their impact on the learning of the new student generation. This we have called DIMPLE (Digital Internet and Mobile Phone eLearning Environment).

Therefore, the research aims:

- To investigate the level of e-literacy of young adult students and attempt to identify the unique features of ‘digital students’, for example through comparisons with existing data
- To map the capabilities of eLearning spaces onto the needs and attitudes of digital students
➢ To investigate how factors such as a student’s motivation and national and cultural perspectives impact the effectiveness of adaptation interfaces.

➢ To create and validate a model for the development of effective adaptable and adaptive eLearning environments

These research aims are designed in such a way as to enable the assumptions to be evaluated within a multi-layered argument:

*Digital students have different characteristics as the ubiquitous use of digital technologies therefore an eLearning environment should favour these characteristics and provide digital technologies for a positive student participation in higher education.*

The assumptions specified and then evaluated are:

➢ Some students have some distinctive features which allow us to identify them as digital students

➢ The digital students want different things from the higher education eLearning environment than the non-digital ones

➢ The new digital tools embodied in an adaptable and adaptive eLearning system will be used mostly by the digital students

To test the assumptions we have designed an eLearning environment that will comprise preferred and non-preferred tools and will involve digital and non-digital students. We will evaluate the use, desire and preferences of both groups of students in using DIMPLE by enabling each group to use different functionalities and challenges of the environment.

The research intends to investigate a series of research questions - that generate these specific objectives:
Have we found digital students within the groups of students which we looked at in different countries, and what are their characteristics?

To answer this question a number of questionnaires and focus groups were carried out in the UK, Romania, Hungary and Finland, backed up with an extensive literature review. To investigate if the characteristics change over the years and by group age, the surveys were scheduled for the autumn of 2005, 2006 and 2007.

What are the digital students’ preferences regarding a higher education eLearning environment and how this can be designed?

The investigation started from the questionnaire analyses and led to a scenario which was again perfected over successive focus groups in the UK and Romania and a study of distance education student group performed in Romania.

What kind of learning environment can be developed to the benefit of digital students?

The theoretical framework of the research and of eLearning and mLearning was established and fulfilled with the study of digital students. This gave a structure of an adaptable and adaptive eLearning environment that was developed and evaluated. The evaluation is placed in the broader stage of higher education, analysing the whole context in which learning occurs, with discussions leading towards the strategy from instructional, technical and management point of view.

How can a set of features of an eLearning environment be perceived as useful, desirable and effective by the digital students?

The DIMPLE environment was evaluated from the general requirements of an eLearning environment, for its usability, desirability and effectiveness over both students groups (digital and non-digital) in higher education.
1.4. Thesis Chapter structure

The overall structure of the thesis is:

**Chapter 1: Introduction**

Chapter 1 provides the research background, research ideas and assumptions and an overview of the thesis chapters.

**Chapter 2: eLearning environments and technologies**

This chapter focuses on existing eLearning environments, on eLearning development, with an emphasis on environments that use new student interactions. There is already extensive research done within eLearning and several studies in the area of eLearning environments, but research that looks at the ecology of the environments is minimal. We have also done a critical analysis of existing systems and technologies used in eLearning and mLearning. Within this context we summarise any missing areas, which we identify, and what we are investigating.

**Chapter 3: Digital students’ characteristics**

From the literature review this chapter provides a general overview of the digital students, net generation and X generation characteristics and studies performed until now.

**Chapter 4: Research methodology**

Here we describe the socio-cognitive engineering methodology used, followed by the description of online questionnaires, focus groups, scenario, and evaluation methods used.

**Chapter 5: Studies**

This chapter will comprise the results of UK questionnaires, results of UK, RO, FI, HU questionnaires and the results of focus groups.

**Chapter 6: Shaping and Implementation of the DIMPLE environment**
In this chapter we shape the environment based on the studies, and we present the DIMPLE scenario. The theoretical framework of the DIMPLE is established and consolidates the study of digital students’ characteristics, of the adaptable and adaptive eLearning environments and of the learning affordances of the mLearning.

This chapter also discusses the design and implementation of DIMPLE, the framework, the techniques and the technology used.

**Chapter 7: Results from the DIMPLE implementation**

In this chapter we will present the evaluation and the results of the DIMPLE evaluation via questionnaires and focus groups: general requirements, usability, desirability, learning effectiveness. The DIMPLE was tested in 3 different studies in UK and Romania.

**Chapter 8: New developments of DIMPLE in ViCaDiS**

As the idea of DIMPLE evolved a new environment ViCaDiS (Virtual Campus for Digital Students) as part of an EU funded project, was implemented and tested in an international environment. The studies performed are briefly presented here.

**Chapter 9: Conclusions**

Chapter 9 provides an insight and reflections of overall research processes. The discussions take into consideration the ideas of such a learning environment from instructional, technical and management points of view. It provides concluding remarks and a several further research and future work.
Chapter 2

eLearning Environments and Technologies

This research was conducted in the vast area of eLearning but focused on eLearning environments and technologies. To be able to pursue the modelling an eLearning environment for digital students it was necessary to understand the concepts and organisation of the existing ones. The eLearning environments and technologies analysis, performed between 2004 and 2007, and are presented in this chapter.

This chapter aims to provide a brief insight into the basics of eLearning (2.1.), a general view of eLearning environments and how they broke through in the global education world (2.2.), on the history and growth of eLearning in Romania, as one of the systems in which my research was based (2.3), all within the insight of my research (2.4).

2.1. A brief insight into the basics of eLearning

Nowadays, education is developing at bewildering speed into a wide variety of new shapes and manifestations. eLearning, involving electronic device-enabled education, usually delivered from a remote location has emerged as a genuinely attractive alternative to traditional courses which require students’ physical attendance and face-to-face interaction with teachers.

eLearning has become an integral part of education over the past decade. From colleges to accounting firms to software developers and to hotel chains, people are training at their desks and on their own time, logging on between business meetings, during visits to the library, or at home. The Internet holds an important educational promise for providing efficient ways for enabling students to increase their repertoire of knowledge and skills. All of this is part of informal
learning, which recently influences (also the) formal learning (Moore and Anderson, 2003) (p68).

A comprehensive definition of the term eLearning requires a thorough review of the specialist literature which features numerous ways of conceptualising “online” education.

Keegan defines distance learning as the sum of the teaching-learning arrangements which keep teachers and students geographically apart and focus on the course design, learning and instruction within such circumstances (Keegan, 1986) (p24).

Jay Cross is credited with coining the term “elearning” in 1998 (Cross, 1999) and with identifying its pitfalls:

“We thought we could take the instructors out of the learning process and let workers gobble up self-paced lessons on their own. We were wrong. First generation elearning was a flop.”

Paulsen, for instance, argues that

“eLearning is virtual education, internet-based education, web-based education and networking computers-mediated education” (Paulsen, 2002).

Although for many authors the use of electronic devices in learning environments is regarded as sufficient to label the activity in question eLearning, such a definition is extremely superficial and the simple use of electronic devices is insufficient to apply the term eLearning.

In order to highlight the new features and multifaceted nature of eLearning against the traditional pedagogical methods, (Tavangarian et al., 2004) advance the following definition:

“ELearning is to be understood as the sum of the teaching and learning forms that are procedural by nature, quality and goal in order to realise the learning process and expected outcomes in close relation to the learner’s individual and practical experience and knowledge. The information and communication systems, be they inside or outside the network, are used as environments specifically geared to implement the learning process.”

Similar, Moore (Moore, 1993, p.20) states
“most striking feature of all distance learning forms was the student-teacher communication via electronic publications and media such as broadcast, recordings, computer-assisted interactive telecommunications, audio/video conferences, any other combinations of these media forms”.

Similar, eLearning includes “aspects of distance and online education, as well as blending with face-to-face learning” (Mason and Rennie, 2006) (p xvii).

These are the first core features of distance learning and they influence the actual shape of how distance education is being provided in different institutions around the world.

The second core feature of distance learning pertains to its first feature and points to a new approach to the training process which can be broken down into its component parts. One or even all its parts are prepared in the absence of the learner, who receives them via the existing communication technologies that ensure the learner-tutor interaction as well.

Unlike traditional learning courses, distance learning courses are intended to be delivered to a larger audience and across wider geographical areas. The large number of professionals involved in the course design and student support imposes observance of several system design principles in order to ensure entire course delivery within the projected time frame and maximized learning outcomes with the targeted audience (Moore and Thompson, 1990, p. 83). The major requirements imposed on eLearning systems are linked to the provision of various adapting methods as integrated parts of the functionality included in these systems (Eklund, 2003):

E-learning is a wide set of applications and processes which use all available electronic media to deliver vocational education and training. The term covers computer-based learning, web-based learning, and the use of mobile technologies; it includes virtual classrooms and digital collaboration and uses. There are many identifiable drivers for ICT-enabled instruction, and these may be classified as technical innovation, organisational and business developments, or characteristics of the needs and demands of the individual learner. Often it is a combination of these three components that brings about change.
Jarvis (Jarvis et al., 2003, pp 117-128) argues that, initially, the use of the term blended learning was associated with the simple correlation of traditional class-based activities with eLearning activities. Gradually, the term has extended its meaning so that nowadays it covers a larger number of learning strategies. Blended learning may feature one or more of the following dimensions: event-based activities, including face-to-face classroom-based events, live eLearning and self-paced study. It often implies mixing traditional training forms supervised by a trainer, asynchronous individual learning and in-company training delivered by a tutor or a more experienced employee. IBM consultant Margaret Driscoll (Driscoll, 2002) points out that the term blended learning has different meanings for different people. Her study acknowledges four distinct concepts covered by this term, namely: combining or mixing web-based technologies (e.g. video streaming, virtual classes, collaborative learning, self-study, audio, text, etc.) with the aim of achieving a learning goal; combining different pedagogical approaches in order to get optimum outcomes; combining any instructional technology (e.g. video tapes, CD-ROM, WBT, movie) with face-to-face training delivered by a trainer; combining instructional technologies with job-related tasks with the aim of achieving a learning/job-specific outcome.

**CBT** (computer-based training) entails the use of the computer as the core instruction-delivering tool. Books are not necessary. Instruction can be delivered at one’s own pace, using the interactive content of a CD or via computerised conferences among learners. Briefly, it refers to learning content delivered to trainees by way of computer applications. The term CBT is broadly interchangeable with the term CAI (computer-assisted instruction) (Mason and Rennie, 2006) (p.xxvii).

**WBT** stands for web-based training and designates instruction delivered via public or private computer networks that can be accessed by way of a web browser. WBT is not downloadable CBT but on-demand learning content stored on a server and accessed via a network (Rosenberg, 2001, p. 42). WBT content cannot usually be updated very rapidly or frequently and access to it is given by the training-provider (Rosenberg, 2006, p. 71-72).

**CBL** or computer-based learning refers to the integration of the computer into classroom-based activities and, broadly speaking, to the use of the computer for pedagogical purposes. Lately, an ever-increasing importance has been given
to the identification and implementation of efficient solutions for the integration of computer-based activities in classes (Eklund, 2003).

**Distance learning** is defined as the form of instruction in which most of the training process is being realised when the learner and the trainer are not in the same place (Keegan, 1986, p. 34.). Distance learning may imply study via mail and/or audio and video technologies or computer-based technologies.

**mLearning** or mobile learning entails a set of more flexible educational methods inasmuch as access to the educational content is made from anywhere and at any time by way of mobile devices and wireless communication technologies (Sharples, 2000).

These concepts of using ICT in education evolved during time and benefited of new technology. But the essence of communication between tutor and students remained the same; just the technology used is different.

The interaction between students and tutors may take place through **synchronous or asynchronous activities**. The choice of one or another type is influenced by factors that include the available technology, inherent costs and maintenance, where activities are adapted to match the course, tutor and audience. The synchronous components have the tendency to bind people in time and space since students and tutors enjoy live interaction via a package of programs that offer voice and video transmission tools (Rosenberg, 2006, Singh, 2003). Although the term asynchronous learning is not new and, originally, it was used to designate the use of audio and video tapes or mail-delivered materials for educational purposes, it currently refers to learning mediated by multimedia web pages. It follows that students can access learning content at any time from any place. Asynchronous Learning Networks (ALNs) are networks that enable people to interact by way of electronic connection tools in order to simulate the interactivity of virtual encounters. Despite the fact that the advantages of eLearning tools are so obvious both for local and distance learning, the excessive arrangements necessary to deliver asynchronous multimedia-enabled educational material have always been a challenge for course designers (Rosenberg, 2006).

Siemens argues that eLearning can be viewed as the marriage between technology and education, while the designer’s most important role is to bridge
the two worlds. More precisely, it is vital for designers and programmers to ensure the optimal development of the conceptions devised by experts in a specific area or subject. Unfortunately, in the case of eLearning, the role of instructional design (ID) is often misunderstood because of the perceived complexity of the process and the insufficient comprehension of the pedagogical needs of eLearning. Broadly speaking, ID is the process by which learning, not technology, is brought to the centre of eLearning (Siemens, 2002).

Instructional design represents the art and science of creating a pedagogical environment and materials that will enable the learner’s process of understanding specific tasks. ID draws on theoretical and practical research in areas such as knowledge, educational psychology and problem-solving. Essentially, it can be viewed as the process of creating materials with the purpose of bringing about a change in the learner’s skills or his attitude. ID is often confused with ISD, i.e. Instructional System Design. The ISD methodology mainly adopts the ADDIE approach (Analysis, Design, Development, Implementation, Evaluation) (Cross and Hamilton, 2002). This is probably the best-known ID model, frequently used in academic environments.

eLearning is based on eLearning environments which “from a naïve perspective (...) consist[s] of the computers and software that are used to provide e-learning.” (Dron, 2007, p. 8). The core of the eLearning environment is based on learning objects, structure and deployment, which is the focus of the my research in this thesis.

Learning Objects, mainly deployed to reuse educational material, provide the base of the electronic tool-enabled learning process, i.e. eLearning. In 2003, IEEE’s Learning Technology Standards Committee formalised the term and defined the learning object as any digital or non-digital entity that can be used or reused as reference in technology-enabled learning. Examples of such learning include computer-based training systems, interactive learning environments, intelligent computer-aided training systems, distance learning systems and collaborative learning environments. Examples of Learning Objects include didactic and multimedia content, pedagogical objectives and programs, persons, organizations or events referred to in the course of the technology-enabled learning process. Metadata Learning Objects are attributes necessary to describe
fully or adequately a Learning Object. The LOM standards establish a minimum set of attributes that allow the use, placement and evaluation of the Learning Objects. The relevant attributes of the described LO include the object type, author, owner, distribution terms and format and can be compulsory or optional. Where applicable, LOM may also include pedagogical attributes such as the teaching and interaction style, marking system and compulsory premises. Any LO may have more than one LMO (IEEE LTC, 2002).

A set of standards is used to adapt and reuse educational content or, more precisely, learning objects. SCORM, an ADL initiative, is among the best-known standards at the moment (ADL, 2004). SCORM is a collection of standards and specifications adapted from more sources to provide an all-embracing set of eLearning methods for web-based educational content formatting. These standards enable:

- Interoperability (the ability to take instructional components from one system and use them in another system);
- Accessibility (the possibility to locate and access instructional components from multiple locations and to distribute them to other destinations);
- Reuse (the possibility to use informational components in multiple applications, courses and contexts);
- Durability (the capacity to resist technological change over time without the costs of redesigning, reconfiguration and recoding);
- Long lifespan/Maintainability (the capacity to resist content changes without the high costs of redesigning, reconfiguration and recoding);
- Adaptability (the ability to allow changes in such a way as to satisfy the needs of different users) (ADL, 2004)

The adoption of an eLearning system and its long-term viability must be decided by the higher/education/training institution in question after a careful analysis of the learning program goals, targeted audience, existing infrastructure and learning content in close connection with the list of advantages and disadvantages. Equally important, the use of eLearning as an educational content-delivering method is undoubtedly increasing and its obvious benefits, as noted by many professionals, will ensure its important role in the strategy adopted by education (James, 2002).
Simultaneously with the increase of occasional students and the proliferation of learning content-delivering terminals, learners’ demands are changing in the sense that they expect to have access to courses from anywhere. The multitude of terminals used by students requires the possibility of starting a course on one of these devices and continuing it, if necessary, on another, depending on the way the student changes his/her learning circumstances. The new information and communication technologies influenced also the role of teacher in education (Wheeler, 2001), by creating several new possibilities but also constraints.

Despite the increased popularity of eLearning, it appears that online training providers, both in academia and in industry, experience a variety of problems and frustrations. One of these issues is related to the lack of adaptability of eLearning programs.

eLearning is generally associated with distance education. However, from its first appearance and increasingly in recent years, with the rapid growth of the Internet and associated technologies, eLearning has advanced, matured and begun to break free from any automatic association with distance learning. Contemporary eLearning involves learning content management systems that provide an environment for interaction between students and tutors and also a method for delivering educational content, consisting in written materials and, sometimes, audio and / or video records of the course. A number of other current information technologies, such as social networks, streaming, podcasting, audio / video conferences, forums, blogs, wikis, use of RSS feeds to subscribe to different courses, 3D virtual environments – like Second Life – used to increase the level of students’ involvement in teaching. A number of prestigious universities worldwide have already chosen to integrate some of these technologies in their current web platforms.

2.2. A global view on eLearning environments

It is interesting to remember that only fifteen years ago the field of open learning or distance education or eLearning was for most of the world small and marginal, a particular special area of education into which most people would not want to, nor would have any cause to stray. With the exception of the UK Open
University, most of the other large scale open and distance learning (ODL) systems then in existence had been designed and developed for particular geographical (Australia, Canada) or political (Russia, China) circumstances, and it is generally accepted that it were not seen by many people as role models to be adopted by the rest of the educational world.

Political and technological change during the 1990s has been of enormous importance to the development of ODL. The fall of the Soviet Union and the emergence of independent states in Central and Eastern Europe have opened up interest in forms of education which are different from those promulgated by the old regimes, but which nonetheless have still to take account of half a century of control by a centralised bureaucracy. Open learning in these countries tends to be seen as synonymous with information technology, to distinguish it from the paper-based correspondence school models of the Soviet era (Williams, 2000), even if the faith in IT is occasionally naively over optimistic (Collis and Wende van der, 2002). Nevertheless, the development of IT and in particular, of computer mediated communication both before and after the rise of the Internet has been the second major factor leading to the surge of interest in eLearning. This level of interest has been in part stimulated by and in part a reaction to the importance being attached to eLearning by governments and supra-governmental organisations (the European Commission), (Vasiu et al., 2002) who see it both as an efficient and effective means of remodelling education systems. Changes in South Africa and other parts of the world are also relevant to the equation, although perhaps less central to the development of eLearning.

At the end of 2004, the Centre for Educational Research and Innovation conducted a study (OECD, 2005) that included 19 institutions from 13 countries, which was focused on the use of eLearning as an alternative or complementary method to improve or support university education. The main targeted aspects included institutional strategies and different forms of eLearning, platforms and infrastructure used in education, students’ access to eLearning, available academic staff and materials and eLearning financing by government. Published in 2005, the findings show that, in most campus-based institutions, eLearning does not represent a challenge for the traditional learning process entailing face-
to-face meetings between teachers and students. As for the delivery of educational content to students located in other countries, its status is more of a small-scale experiment conducted by different departments within large universities. In spite of these facts, the adoption and implementation of eLearning technologies is relentlessly developing and adapting to the students’ customised needs. Governmental financing and academic staff’s willingness to experience new methods and platforms are higher and higher from one year to another. ELearning is currently on a visibly rising trend supported and ‘forced’ by the internet permanence and today’s technological advancements (OECD, 2005).

2.2.1. Open Universities

A special place the distance education development in higher education is secured by the open universities.

The starting point of distance learning as a form of eLearning is represented by the establishment of the first successful university offering full distance education -The Open University - in the 1960s, in UK (www.open.ac.uk). The university was built on the principle that communications technologies can offer quality learning to persons who cannot attend the courses of traditional universities. Open Universities deploy a variety of content distribution methods which include printed and audio materials, internet and pedagogical TV programs. In most courses, students are supported by tutors who give them extensive feedback on their written work and, more importantly, tutors make themselves available via phone and/or internet. Some courses require days with compulsory attendance. These are usually one-day sessions which students must attend in order to pass the subject in question. Similarly, there are programs that offer traditional summer schools so that students are given the possibility to focus exclusively on study within a given short time frame.

The concept of the open university has spread rapidly across all continents, developing especially in countries where students encountered difficulties in covering large distances in order to attend the courses of traditional universities (e.g. Australia, Northern European countries) or in areas where students must or prefer to work full-time during university training.
The Open University is the UK’s largest university (www.open.ac.uk), currently having more than 200,000 students recruited from the entire world. Their environment is now based on a learning platform called OpenLearn, built on the basis of the open source platform Moodle. http://www.open.ac.uk/openlearn/home.php - is made up of several modules which include LearningSpace (intended for any learner interested to learn, irrespective of his/her previous education and experience) and LabSpace (community-managed space that supervises the distribution and reuse of educational resources; it offers, free of charge, a space where the members and partners of an organization can collaborate on research and development of open educational resources). The didactic materials can be accessed online or downloaded in different formats: zip, backup for Moodle, XML, RSS. The OU has also developed in partnership with BBC a portal enabling online learning by way of TV and radio programs – www.open2.net. The site contains a guide for TV and radio programs broadcast by BBC, articles written by OU academic staff, interactive learning modules, discussions on topics included in the programs.

Open Universities are included in the Finnish educational system as well, with the main difference being: Open University UK is a single institution, while Finland (and some other) Open University are joint arrangements between existing universities. 19 universities including University of Helsinki, University of Turku, University of Tampere and University of Oulu provide the OU portal with educational materials and courses that students can access from the university site - http://www.avoinyliopisto.fi/en-GB.

Australia is another important distance learning provider by way of Open Universities Australia (OUA). OUA - https://www.open.edu.au/wps/portal - is a consortium constituted from several Australian universities and colleges, seven of which being the owners of the consortium.

Among the most important Australian online higher education course providers, one may single out the following universities:

- Curtin University (http://www.curtin.edu.au/), owning an internet portal for students named OASIS (Online Access to Student Information Services), accessible from the following web address:

- Griffith University ((http://www.griffith.edu.au/), whose portal Griffith is available for students from the following address: https://portal.secure.griffith.edu.au/psp/GP90PD/GUINTRA/GP/h/?cmd=login&errorCode=106&languageCd=ENG ; it offers distinct structures/sections for students, academic staff, general staff, managers and supervisors according to the various job-responsibilities of each category; the presence of Griffith University may be also found on iTunes U, the special section of Apple’s iTunes platform developed for universities to publish educational content;

- Macquarie University (http://www.mq.edu.au/) makes available two portals, one for students and one for academic staff, accessible from the following page: https://my.mq.edu.au/ ;

- Monash University (http://www.monash.edu.au/), with its portal my.monash available at the following address https://my.monash.edu.au/ ;

- RMIT University offers an educational platform developed by adapting the well-known Blackboard platform;

- Swinburne University of Technology (http://www.swinburne.edu.au/) makes available My.Swinburne portal developed by integrating Blackboard and WebCT platforms;

- University of South Australia (http://www.unisa.edu.au/) has integrated in the educational process the use of social software: Facebook, Second Life –UniSA Island, Flickr, YouTube.

LI Yawan, Secretary General of the Asian Association of Open Universities, in her keynote speech “Open Universities and Online Learning in Asia – Issues and Approaches”(Yawan, 2006) , delivered in 2006, at the annual EDEN conference, stated that, after a careful examination of the Asian open universities, it was noticed that they had a common goal, namely offering a wider
access to educational materials by way of a multimedia methodology to learners who cannot attend the traditional courses of the higher education institutions.

Since 1979, China has had the China Central Radio and TV University (CCRTVU), an institution dedicated to distance learning that offers multimedia courses by way of radio, television, printed and/or audio/video materials and computer networks (http://www.edu.cn/20010101/21803.shtml).

In addition to China, there are other Asian countries with good reputations in the field of distance learning, namely: Thailand with Sukhothai Thammathirat Open University and Thailand Cyber University; Singapore with Open and Distance Learning Programs (ODLP); Indonesia with Universitas Terbuka; Korea with Korea National Open University and Seoul Digital University; Sri Lanka with The Open University of Sri Lanka; Iran with Payame Noor University; Vietnam with Hanoi Open University; Malaysia with Open University Malaysia and University Tun Abdul Razak; India with Indira Ghandi National Open University (one of the largest universities in the world) and Japan with GLAD (Gateway to Learning for Ability Development) and NICER (National Information Center for Educational Resources) (Yawan, 2006).

The University of the Philippines Open University (U.P.O.U.) - http://www.upou.edu.ph/ -, by way of myportal@upou portal developed through the adaptation of Moodle, has extended its delivery area beyond the national borders.

Korea National Open University (KNOU) - http://www.knou.ac.kr/engknou2/ - offers a wide range of courses delivered via TV, radio and internet, including video conferences and multimedia courses.

The Open University of Hong Kong (OUHK) www.ouhk.edu.hk/WCM/?FUELAP_TEMPLATENAME=tcSingPage&lang=english makes available for its students didactic materials by way of MyOUHK portal and broadcast materials transmitted by TV.2.

In terms of open universities, Africa deserves attention with the Zimbabwe Open University (ZOU) - http://www.zou.ac.zw/ -, established in 1999, which is the only higher education institution offering distance learning in this country. Given the limited availability of the internet in Zimbabwe, ZOU probably set its goal too high, namely delivering most of the educational content
via web by 2009. The course delivery methods consist of printed materials, audio and video tapes, telephone, e-mail, CDs and radio broadcast.

The University of South Africa (UNISA) - http://www.unisa.ac.za/ - has joined an international initiative to develop the open source learning environment Sakai (http://www.sakaiproject.org/), which is used in the construction of the LCMS myUNISA platform (https://my.unisa.ac.za/portal).

The top open universities of North America include the Canadian Athabasca University, one of the largest distance and online education providers. From the university site available at http://www.athabascau.ca/, students can choose between two fundamental study methods: individual learning or group learning (seminar). Other instructional methods include classroom-based learning, teleconferences, videoconferences via online or computer-mediated course (AU, 2007). Some courses delivered online are accessible via a learning management system (LMS) built on Moodle http://moodle.athabascau.ca/. The portal developed for students to manage their online activity is called myAu and was adapted after uPortal platform, which is now being developed by various higher education institutions.

A leading position is also held by Duke University in North Carolina, USA, which merits attention through the DDI program – Duke Digital Initiative - launched in 2004-2005. Through this program, 1st year students received, free of charge, iPods to access the online educational content. Since the academic year 2007-2008, DDI has supported the audio and video recording of courses, of academic events and activities. Ever since 2007, there has been a keen interest to extend the course delivery area with the help of iTunes U. Tutors and students can access didactic materials through authentication on the web page http://itunes.duke.edu/.

Harvard University, through its Law School-coordinated Berkman Center for Internet & Society, offers a genuinely virtual educational experience through online lectures, the use of Moodle platform for student assignments, interaction between students and tutors via 3D Second Life virtual world, the programming environment Scratch used by students to explore the code in juridical terms, podcasts and other facilities enabled by CyberOne platform: http://blogs.law.harvard.edu/cyberone/.
John Hopkins University - http://www.jhu.edu/ - offers fully online and web-based courses. In the case of fully online courses, the training and interaction are realised via the WebCT platform.

The University of Tennessee Knoxville (UT) - http://www.utk.edu/ - makes available for its students a Virtual Class developed with the help of the Blackboard platform which contains the following components:

- LiveOnline@UT - http://liveonline.utk.edu/ - a registered trade mark owned by UT of the software Centra produced by Seba, which is a software program used to provide free interactive courses via the internet;

- Online@UT – http://online.utk.edu/ - is a site that provides access to the course management system and to the related documentation;

- Volcasting@UT - http://itunesu.utk.edu/ - is a directory of podcasts related to the courses and events organized the university.

Another facility integrated by UT is known as “clickers” - http://itc.utk.edu/classrooms/clickers/. They are remote-controlled devices using radio frequency, which students use to send their answers to true/false questions or multiple-choice questions to a receiver attached to the tutor’s computer. A specific program installed on this computer analyses the data and displays the results, offering both students and university a quick look at the concepts that may need subsequent revisions.

Drexel University Online (SUA) - http://www.drexel.com/index.aspx - offers degrees and certifications online for employed adults. The course management platform is developed using Blackboard.

Unlike Europe, Latin America, and particularly Brazil, has not evolved significantly in the area of flexibility, as its rules are more and more non-negotiable (Porto and Berge, 2008). Nonetheless, recent public initiatives, such as the establishment of Brazil’s Open University (Universidade Aberta do Brasil - UAB) in 2005, are clear signs of the increasing use and development of distance learning. UAB is a joint project developed by the Ministry of Education, several governmental institutions and federal universities to allow Brazilians complete their education using a hybrid distance learning model supported by a network of local learning centres. In spite of the hybrid education-supporting
initiatives, distance learning in Brazil is still dominated by the use of printed materials (Porto and Berge, 2008).

The strategies adopted by Latin America in the field of eLearning are discussed by Bates (Bates, 2001) who mentions Mexico’s private university Tec de Monterrey which has integrated, in partnership with Canada’s University of British Columbia (UBC), five online courses, developed by UBC, within its own master program, gaining the right to deliver them across Latin America. Another example of eLearning mentioned by Bates is the Virtual Library of Brazil, developed within the Escolo do Futuro project carried out by the University of Sao Paulo. This library offers an archive of online educational materials in Portuguese that can be used in the secondary and university education systems of Brazil (Bates, 2001).

Summary

This comprehensive study was carried out in 2004-2007 with the aim of analysing the current stage of development of eLearning in strict correlation with the different conditions generated by the geographical positioning and the evolution of education throughout history. The study included universities at different stages of adoption of eLearning as a delivery method of didactic materials and implied mentioning and detailing the methods adopted by different universities from the following continents: Europe, Asia, Australia, North America, South America and Africa.

Although it is still far behind North America in some aspects of eLearning provision, Europe can be viewed as the cradle of distance higher education thanks to the establishment, in UK, in the 1960s, of the first successful open university offering full distance education - The Open University (OU) - . The concept of the OU has gradually extended across all continents.

Australia is also well represented on the eLearning ‘market’, its eLearning system being born and developed as a result of a pressing need to find a solution to the long distances students had to cover in order to attend courses. This problem was solved by developing a solid infrastructure to substitute physical course attendance through the creation of the Open Universities Australia consortium (OUA consortium) by important Australian universities and
colleges. The courses published on the OUA portal are provided by the very universities owning the consortium.

North America is the largest eLearning provider thanks to Canada’s open university - Athabasca University – and other internationally-recognized universities: Duke University, Harvard University, John Hopkins University, The University of Tennessee Knoxville, etc.

Asia’s visible position in the controversial field of eLearning is primarily ensured by TV/Radio-delivered distance learning within China Central Radio and TV University (CCRTVU). Other Asian countries such as Korea, Philippines, Thailand or Singapore are characterised by various stages of adoption of the OU concept within their higher education institutions.

South America and Africa, in particular, feature a fairly reduced level of eLearning development. Although many countries from these continents are still struggling to extend internet coverage, one may remark the relatively isolated attempts to adopt certain educational technologies characteristic of distance learning.

### 2.2.2. Learning Content Management Systems

The description of the eLearning systems implemented in various worldwide-spread universities requires first the presentation of the systems that constitute the backbone supporting learning content delivery by way of online methods.

These Content Management Systems (CMS), Learning Management Systems (LMS) or Learning Content Management Systems (LCMS) are available in various versions, both open-source and commercial. Every higher education institution chooses the version that best fits the ratio between demands and financial resources.

Paulsen (Paulsen, 2002) has provided the following definition of LMS: the learning management system is a comprehensive term used to describe a wide range of systems that organize and ensure access to online learning services for students, teachers and administrators. These services typically include access control, learning content provision, communication tools and organizations of user groups. Another term synonymous with LMS is learning platform.
(Mason and Rennie, 2006) (p 71) define a LMS as follows: a software program that provides an access system as well as a tracking system for student progress. The LMS records users, keeps record of courses, records data from students and provides reports to the management. A LMS is usually designed so as to treat courses issued by different editors and providers. It doesn’t usually contain its own authoring tools but it focuses on the management of courses developed by a variety of other sources.

In Mason and Rennie’s key concepts (Mason and Rennie, 2006) (pp 28-29) LCMS or Learning Content Management System is a software application that enables tutors to manage both administrative and content aspects of the training process. A LCMS combines the LMS capabilities of content management with the CMS capabilities of content creation and storage.

VLE or Virtual Learning Environment (Mason and Rennie, 2006) (p. 124) is a term interchangeable with LMS to a certain extent. The two terms have more or less the same meaning although a VLE is less focused on the learning management-related characteristics. A learning environment is a program conceived as a complete solution enabling online learning.

The current educational market is penetrated by a wide variety of such systems, be they institutions’ own products or adaptations of open-source or commercial versions.

The next section mentions and describes briefly some examples:

Moodle - http://moodle.org/ - is among the most widely-used virtual learning environments. It is a cost-free technology that enables faculties to create their own online courses easily and free of charge. The program can be downloaded and used on any computer and, equally important, it is adaptable to various requirements from one tutor-managed sites to university sites managing thousands of students. Still it is not cost free as several human resources need to be considered for a operable environment (adaptation, installation, training, etc)

ATutor - http://www.atutor.ca/ - is an open source, web-based learning content management system, whose design has been realised prioritising accessibility and adaptability aspects. Administrators can install and update ATutor in a few minutes, can develop customised assignments and extend easily the platform functionality by adding new modules. Tutors can easily assemble, pack and redistribute learning content, can import pre-packed content and deliver
online courses. An adaptive pedagogical system is available for students to learn (Gay, 2002).

**Claroline** - http://www.claroline.net/ - is an open-source eLearning and eWorking platform that enables teachers to develop useful online courses and to manage web-based learning and collaborative activities. It offers a set of tools for each course that enables tutors to write a short course description, to publish documents in any format (text, PDF, HTML, video, etc.), to manage private and public forums, to develop learning paths, to create and manage group work, to develop online exercises, to manage and organize the course agenda, to publish announcements, to assign exercises/tasks with online solution, to supervise user-related statistics, to use wikis to produce collaborative documents.

**Blackboard** - http://www.blackboard.com/ - is a commercial eLearning solution provider for primary and secondary education, universities, corporations and governmental agencies. The Blackboard Learning system comprises software applications that improve and enhance the teaching and learning process and also enable tutors to develop online didactic materials and interact with students.

Owned by Blackboard since 2006, **WebCT** is a virtual learning system that enables tutors to add to their WebCT courses tools such as mail systems, live discussions, discussion boards and to include documents and web pages. WebCT is noteworthy primarily because it was the first virtual learning environment. In its first four/five years of operation, it claimed to be a de facto standard in higher education in that it was available in 14 languages and served the largest audience, larger than any of its competitors (Burgess, 2003).

**Sakai** - http://sakaiproject.org/ – is a collaboration and learning environment developed in the academic environment for the academic environment. It features a core part and various modules for learning management, delivery and assessment. It is designed to create an environment where tutors and students meet to discuss and share knowledge.

**uPortal** - http://www.uportal.org/ - is an open-source portal developed by and for higher education institutions using such technologies as Java, XML, JSP and J2EE. uPortal offers, among other facilities, web-based content and campus applications.
**Elluminate** - [http://www.elluminate.com/](http://www.elluminate.com/) - (including Elluminate Learning Suite, Elluminate Live!, Elluminate Plan! and Elluminate Publish!), also covered now by BlackBoard, provides solutions for real-time online learning, increasing thus the retention percentage and pass rate. It has been used mainly because it allows telepresence (Schullo et al., 2007).

**Wimba** - [http://www.wimba.com/about/](http://www.wimba.com/about/) - provides software applications for collaborative learning. Tutors can use Wimba to transform online Word documents into online courses and to create and administer tests and exams.

**ANGEL Learning** - [http://www.angellearning.com/](http://www.angellearning.com/) - is a set of learning management tools used to create virtual learning environments for online learning and hybrid classes in K-12 schools. In May 2007, ANGEL Learning launched, in a joint effort with Second Life educators, the ANGEL Learning Isle, an island created and maintained in the popular application to offer a virtual world for educational experimentation (Second Life, 2007).

The previously-described LMS examples are only a few of the numerous systems used by institutions or in the course of development, be they open-source or commercial. The list is longer and includes Dokeos, eFront, Fle3, ILIAS, OLAT (Online Learning And Training), KEWL, LON-CAPA, eCollege, it’s learning, Desire2Learn, etc.

Distance learning essentially relies on the creation of virtual communities that offer different means of interaction between tutors and students, on the one hand, and among students, on the other hand. For this purpose, in addition to the use of open source platforms of the Moodle ([moodle.org](http://moodle.org)) type or implementation of platforms of their own, universities are migrating to 3D platforms simulating virtual reality such as **Second Life** ([secondlife.com](http://secondlife.com)) (a virtual internet-based world that became internationally-known at the end of 2006). This platform offers its users almost infinite freedom to create their own virtual spaces, to build activity-hosting environments, avatars and to develop various actions (Antonacci and Modaress, 2005). Both companies and universities are currently attempting to create their own community to promote their business and attract customers and/or students. Time and space are no longer inconveniences in the educational process (OECD, 2005). The platform „Second Life Grid” enables organizations...
to create public or private virtual spaces using 3D online technologies. A large community of universities involved in Grid already exists. Universities of international repute such as Harvard University and Stanford University have created their own virtual campuses where students can meet, attend classes and jointly create educational content (Second Life, 2007). Currently, there are over 200 tutors that use this platform to deliver courses, to develop learning activities, research or project work with students (Kemp and Livingstone, 2006).

Apple (www.apple.com) offers its users the possibility to access via its site numerous educational materials provided by universities, museums and public mass-media organizations from the entire world. iTunes U is a part of the iTunes shop and offers language lessons, courses, audiobooks, downloadable materials that can be played on mobile devices [49]. Universities of international repute such as Yale, Berkeley, Carnegie Mellon, Stanford, Duke, MIT, UCLA, OU have deployed the program launched by Apple to provide free educational material to this type of education consumer (Apple, 2008).

In summary, I have generated a study that focuses on the analysis of the use of learning management systems or learning content management systems in distance learning-providing universities functioning on different continents. The table below shows the findings of my study with reference to the current status of 2008 learning management systems in internationally - recognised universities. My analysis includes the world’s best-known systems, both open-source (Moodle, uPortal, Sakai) and commercial (Blackboard, Elluminate), or the on-house developed systems.

Table 2.1. The Use of learning management systems in universities as of January 2008

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The findings displayed in the above table represent the current status of worldwide-spread e-learning platforms on a small scale. There is a clear predisposition towards open-source systems (Moodle, uPortal, Sakai) against commercial versions. Given that more and more open-source LCMSs are available, universities are becoming visibly reluctant to developing their own platforms and prefer to adapt and implement one of the already-existing systems. The interpretation of the displayed findings has generated the chart below which renders visually the relation between open-source and commercial as applied to education:

![Figure 2.1 The distribution of LCMS in universities world-wide](image)

The red shades are used to represent the commercial e-learning systems, whereas the blue ones indicate open-source systems. From this pie chart, one can easily notice that there is a significant difference between the two colours in that open-source systems share approximately 70% of the CMS market targeted at higher education institutions. Moodle itself shares 36% of the total market, quite
ahead of the commercial Blackboard, which is ranked second, at least in the analysed universities. This situation is in continuous change and the future will probably bring an increase of the use of open online environments (Vasiu et al., 2006a).

The study outlined above has been carried out by testing the platforms of some of the best-known universities in the world in order to assess the degree of integration of such technologies as podcasting, audio and video streaming, audio or video conferencing, Second Life, social software and networks, blog, wiki, RSS, television and radio. The table below reproduces the findings of the platform testing:

Table 2.2. Information tools integrated in the learning process in universities around the world as of January 2008

<table>
<thead>
<tr>
<th>Online courses</th>
<th>Podcasting (iTunes U)</th>
<th>Streaming</th>
<th>Conf (audio, video)</th>
<th>Second Life</th>
<th>Softw Social</th>
<th>Blog, Wiki</th>
<th>RSS</th>
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It may be noticed that all of the above universities provide online-delivered courses. Additionally, the most widely used tools to enhance the
educational process are RSS and podcasting technologies. 3D virtual environments, more precisely Second Life, seem to appeal to a significant number of internationally recognised universities such as Harvard University, Princeton University and Stanford University. Blogs, forums and wikis are useful enablers of a certain level of interaction between tutors and students, which would be fairly diminished with alternative teaching methods such as podcasting. They also constitute convenient tools for task/assignment accomplishment and submission. Universities such as Princeton University, University of Cambridge and University of South Australia have integrated audio/video conferences as teaching methods as well. Streaming and radio/TV broadcast are technologies quite infrequently used in the universities under analysis.

2.3. eLearning in Romania

If for USA or other educational systems in Europe several status studies of distance education have been done the last years, little interest existed in Romania for similar studies. As a large part of my research took place in Romania, to analyse of how eLearning occurred and developed in Romania was considered necessary.

The history of higher technical education in Romania actually begins in 1920, when two institutions were founded by royal decree, the Polytechnical Schools in Timisoara and Bucharest. Technical Universities were, at that time, an extension of existing technical schools. The development continued for some decades, influenced - but not entirely determined - by the communist regime in Romania. In the late '80s, most Romanian students enrolled in higher education were studying technical subjects. Specifically, the Polytechnical Institute "Traian Vuia” from Timisoara (now the “Politehnica” University of Timisoara) was considered the most prestigious institute of higher education in Eastern Europe, its degrees (bachelor - 5 years, Masters and PhD) being recognised directly in most countries in Europe and in the USA (Vasiu et al., 2004).

Reforms in higher technical education started in 1990, with changes in curriculum, field specialisation, number of students enrolled, registration methods, and has continued since 1995 with a growing interest in new
educational methods, particularly through European PHARE programs. The European Union has offered support through the PHARE TEMPUS (Trans-European mobility programs for universities) and SOCRATES (Higher Education mobility system). The general legal framework for the development of distance education in Romania has been set-up through the 1995 Education Law and the 1993 Law for the Accreditation of the Higher Education Institutions and for Diploma Recognition. New legislation on distance education was promulgated in 1998 and adapted in 2000 (Vasiu et al., 2002).

Currently, the higher education system in Romania is again in the process of reform, in order to become compatible with the Bologna Declaration. Since 2005, higher education has been organised into three levels: bachelor, master and doctoral studies. It should be noted that the “Politehnica” University of Timisoara adopted a system based on credits transfer (ECTS) long before that date, in 1998 (Vasiu et al., 2004).

According to the data published by the European Union Commission (Information database on education systems in Europe) (Commission, 2008, 2010), within the national education system - public and private - educational alternatives may be initiated and organised, with the consent of the Ministry of Education and Research, which conducts their assessment and accreditation, according to the Education Law (Law 84/1995).

According to the Government Decision in 2005, (2005) the duration of bachelor studies (organized as daily or reduced frequency, or as distance education) is the same as in traditional education, leading to the same degree and qualifications.

According to another Government decision, no. 1011/08.10.2001, (CNEEA and Accreditation, 2004) regarding the organisation and operation of distance learning and part-time teaching in higher education institutions, these flexible forms of education can provide:

- academic qualifications, completed by graduation examinations, according to the short-term higher education programs,
- academic qualifications, completed by license or diploma exams, according to the long-term higher education programs,
- postgraduate, masters and academic studies, completed through postgraduate diplomas,
• postgraduate training, completed by graduation certificates, conversion higher professional diplomas or certificates (Vasiu et al., 2006b).

The basic idea behind the changes taking place in higher education is the education centered on students’ needs, a better adaptation of their competences and skills to social and economic needs, offering them growing opportunities in the global labor market (Vasiu et al., 2002).

In higher education, the level of implementation of the new educational technologies is quite high, mainly due to the involvement of the Romanian educational institutions in various European and international projects in the field of eLearning. In addition to transferring know-how, higher education institutions took the benefit of large funding through these programs, which have substantially increased financing received from the Romanian Government under various national programs. Almost all higher education institutions have now established departments for distance education and some of them are dealing with the implementation of new educational technologies into traditional teaching, and this is a consequence of those major investments in higher education (Istrate, 2007).

If one is to outline a brief history of the development for the eLearning market in Romania, among the first programs that should be be mentioned is SEI – Information Educational System, a project initiated in 2001 by the Ministry of Education and Research. The aim was to support teaching and learning in the pre-university system with cutting-edge technologies. The SEI educational portal uses AEL (Advanced E-Learning) as an eLearning platform. This platform has been developed by SIVECO and it already had 61,400 registered users in 2006, while the number of messages posted on the forum was 271,198 (Istrate, 2007).

SIVECO (www.siveco.ro) is one of the largest integrators of eLearning solutions in Romania with AEL (Advanced eLearning) as a comprehensive platform for teaching and learning, testing and evaluation, content management and monitoring of the educational process. It can be used for tutor assisted learning or for independent learning. There are implementations of AEL in pre-university education, university education and in corporations, for internal training needs (Commission, 2008).
SOFTWIN (www.softwin.ro) is another company involved since 1993 in the field of education and concerned with providing innovative solutions for electronic content designed to improve the educational process. Its eLearning Department is called INTUITEXT (http://www.intuitem.com/) and is responsible for carrying out various projects aimed at introducing interactive learning tools in all areas of training. Among the projects developed by this department one should mention the portals www.didactic.ro or the "national teachers’ office” and www.olimpiade.ro, an educational portal for the education Olympics and other educational competitions in Romania. Intuitext is the first organisation in Romania to develop software products according to the virtual education standard SCORM 2004 (Istrate, 2007).

TEHNE – the Center for Development and Innovation in Education (http://www.tehne.ro/) is an organisation working in education that supports, among other things, programs and projects for eLearning, lifelong learning and continuing training for teachers. Their main project running in 2003-2006 is the Project Elearning. Romania (http://www.elearning.ro/), which currently involves over 2,000 members, aiming to create a virtual space for interaction between researchers, practitioners, specialists and opinion leaders in eLearning, business support by presenting their theoretical and methodological resources available nationally and globally. In this way, the online Elearning Romania community contributes to the Ministry’s of Education and Ministry’s of Communications and Information initiatives, as well as to other institutions’ activities in decision making, design, implementation and evaluation of national eLearning programs, by providing suggestions for improvements, by signalling appropriate directions for the development, and by reporting concrete results and practical benefits (Istrate, 2007, Vasiu et al., 2005).

The first Romanian educational portal, www.1educat.ro, was the initiative of the Association for Career Excellence in 2001. Over the time, the structure of the portal has been enhanced by adding career advice offered online, by implementing online courses and by creating a database of education providers on the Romanian market. The positive response received from the users of electronic education has led to the development of the eLearning system called Online Academy, launched in 2003 (www.academiaonline.ro) with online courses in Romanian language (Vasiu et al., 2005).
Another company that offers platform/eLearning solutions is Timsoft (www.timsoft.ro) which promotes online courses, development/hosting courses and online workshops, and focuses mainly on eLearning consultancy in the use of blogs and development of integrated eLearning systems (Vasiu et al., 2005).

### 2.3.1 Romanian Universities active in eLearning and their educational content management systems

The number of universities offering distance education, so reducing the number of meetings between students and teachers to every few weeks, is constantly growing in Romania (Vasiu et al., 2006b).

One such center offering distance learning is CREDIS (http://www.credis.ro/), a Department of the University of Bucharest, that uses Virtual Campus UniBuc as educational platform and includes the CREDIS Academy, the largest Cisco Academy in the country and Microsoft CREDIS IT Academy, the first academy established by Microsoft in Romania.

“Politehnica” University of Bucharest uses the Moodle platform in several faculties in order to deliver online courses: the Faculty of Automation and Computers (https://www.cpru.pub.ro/moodle/), the Faculty of Engineering with teaching in foreign languages (http://fils.curs.ncit.pub.ro/), the Faculty of Engineering and Technological Systems Management (http://www.ctanm.pub.ro/dev/moodle/) and the Faculty of Mechanical Engineering (http://193.254.231.39/moodle/).

The National Defense University "Carol I", through the Department of Distributed Distance Learning (http://adl.unap.ro/modules/news/) makes available to its students some online courses in English on the PfP LMS platform, achieved by customizing the RunCMS system (http://runcms.org/modules/news/+).

The Faculty of Communication and Public Relations "David Ogilvy" in Bucharest launched in 2004, for the first time in Romania an online masters degree. Students have access from the faculty homepage to teachers’ blogs and they can co-operate online through a package of communication and collaboration applications, Google Apps (Istrate, 2007).
The University of West "Vasile Goldi" from Arad uses a Moodle platform to build a virtual learning environment for students and to deliver online courses, (http://bb.uvvg.ro/online/index.php).

The West University of Timisoara founded in 1999 the Center for Continuing Education and Open Distance Learning that provides, in addition to the university courses, some postgraduate courses and specializations. The platform used is Lotus LearningSpace, an IBM Lotus Software product.

In 1998, the “Politehnica” University of Timisoara established the Distance Education Study Center – CSID, which added two new specialisations: Audio-Video and Multimedia Technologies and Applied Informatics, in 1999(Andone and Vasiu, 2002). The educational materials are provided both through the Internet and through traditional media such as printed books. The platform is developed internally and the access is via the following address: www.csid.upt.ro and www.cm.upt.ro. Also, at the “Politehnica” University of Timisoara, there is a Microsoft Student Partners program (http://ms.upt.ro/elearning/), that organises online courses primarily intended for UPT students. The Virtual community used for the interaction between students is developed using the commercial Community Server platform.

The Faculty of Veterinary Medicine in Timisoara offers its students a virtual environment where they can interact and can access the materials available online through the Moodle platform (http://193.230.235.21/moodle/).

“Transilvania” University of Brasov has its own portal (http://portal.unitbv.ro/), which intends to unify all university’s services offered to the students and teachers, namely: courses, forums, notes, "on demand applications", etc. There is also an implementation of the Moodle platform at the Faculty of Economic Sciences (http://econ.unitbv.ro/elearning/).

The Technical University of Cluj-Napoca is another example of institution choosing to implement an open source platform for online course delivery, ie Moodle (http://moodle.utcluj.ro/).

The “Spiru Haret” University of Bucharest and “Alexandru Ioan Cuza” University of Iasi - Faculty of Chemistry - opted, unlike universities listed above, for a commercial version of LMS: Blackboard (http://spiruharet.blackboard.com/ and http://www.chem.uaic.ro/ro/resurse/blackboard.html, respectively).
Romania is turning attention and efforts towards the adoption of new technologies in education, whether integration into mainstream traditional teaching, either completely new and independent methods of approach. In this regard should be noted a number of initiatives seeking to establish new directions in the light of international climate, involvement in international projects and adapting or implementing eLearning platforms to support distance education in different faculties (Vasiu et al., 2008).

I noticed a tendency towards open source educational platforms. Of these, the most popular platform is Moodle. The main reason for this phenomenon is the high cost of licensing the commercial systems, combined with the relatively underdeveloped state of eLearning in Romanian universities. The third approach is the internal development of platforms that support eLearning, but this method too is quite low compared with adaptations of open source methods. I also noticed a combination of different forms for each institution, in order to obtain adequate educational results.

The figure below presents a chart made regarding the use of open-source (represented in majority by Moodle), commercial (in majority Blackboard) and internal platforms within higher education institutions in Romania:

![Figure 2.2. LMS in Romania](image)

It may be noted that, similar to the international study, preferred systems are the open source (predominantly Moodle) with about 65% of the LMS market.
in Romania, followed at a considerable distance by the commercial systems - 24% - and the internally platforms developed by the universities - 12%.

Despite the progress seen over the years in the adoption and development of eLearning in Romania, there are a number of shortcomings that should be mentioned. Among these, special attention should be given to the following two: there is no methodology for recognition of certificates obtained through online courses, and there is no defined framework to legitimise the status of those who work as tutors in eLearning, as virtual teachers or as online trainers (Vasiu et al., 2008).

2.3. My research context

We are in an era in which eLearning is becoming a reality, allowing access to educational content at any time and at any place, for anyone wanting to learn. We rather aspire to a "learning culture" than a "knowledge era", at a time when people are constantly surrounded and absorbed in different learning experiences (Dron, 2007) (pp 312-318).

Garrison and Anderson (Garrison and Anderson, 2003, pp 115-117) argue that teaching in an electronic or cyberspace requires more than taking the traditional teaching models and transferring them into a different environment; the use of online distance learning involves general changes in the way the education is distributed. The development of online courses should be focused primarily on the level of support that the students can get during the different phases of the learning process and on the interaction between tutors and students - this is the "meeting place" where learning occurs for online students.

The approach differs in that the focus for the providers of education is directed towards increasing the freedom of the students in self-managing their learning, unlike the simple management of the content (Laurillard, 1999, p.215-236) The idea is to first offer students a variety of tools for work, reflection and collaboration that are able to help them in activities aimed at problem solving and self-management. Such circumstances imposed the seek of new methods of characteristics of eLearning environment - the term „usability” („web functionality”) is defined as the effectiveness, efficiency and satisfaction with which a certain user can achieve the goals identified in different media (Kruse,
Lately, the main point of interest has been the evolution of the initial eLearning methods in which each user had access to the same content, displayed in the same order (Kukulska-Hulme, 2002). Professionals are more and more prone to use approaches that take into consideration each user’s learning goal and previous knowledge. They are developing systems that can adapt to each student’s customised needs. Such systems are known as adaptive hypermedia systems. Brusilovsky points out that a distinctive property of adaptive systems is an explicit user model that encompasses the user’s knowledge, goals and interests as well as other features that enable the system to distinguish among different users (Brusilovsky et al., 1998). The user model is deployed to provide an adaptation effect that enables interaction with different users in the same context. An adaptive system automatically adapts to the model-user whereas an adaptable system requires that each user give his/her data in order to adapt itself (Brusilovski, 2001).

The adoption of the LOM (Learning Object Metadata) elements and migration to systems that offer an ever-increasing adaptability to the student’s customised needs are only a few of the progressive steps that started to bring electronic learning in the eLearning 2.0 era. There are several articles attempting to explain what eLearning 2.0 really means, yet, the most quoted article is probably Stephen Downes’ “ELearning 2.0”, published in eLearn Magazine in 2005 (Downes, 2005). In this article, Downes starts from the definition of Learning Objects as Lego blocks or atoms, small content pieces that can be organized and put together to create courses, which are subsequently packed and distributed as if they were books or training manuals. In conventional eLearning systems, the virtual community was usually made up of a limited number of students, similarly with academic groups, communication taking place via e-mails. A few years ago, teachers started to show interest in the use of tools such as wikis and blogs in the didactic process (Wheeler, 2006). This was just the first step towards innovation, shortly followed by the integration of games (Prensky, 2003) and podcasts (Campbell, 2005). The targeted goal was to give students the possibility to create their own portfolio and tool-based space to show their assignments and achievements. This new approach in education supports the creation and distribution of educational content in a very distinct manner, quite
different from the previous approach which involved content creation, packaging and distribution. Conversely, content syndication is preferred just like in the case of students’ blog posting. Content is aggregated by students using their own RSS reader so that other students can use the result in their own projects (Brusilovsky, 2001).


"ecology is basically an open, complex adaptive system comprising elements that are dynamic and interdependent. One of the things that make ecology so powerful and adaptable to new contexts is its diversity."

Brown further describes a learning ecology as

"a collection of overlapping communities of interest (virtual), cross-pollinating with each other, constantly evolving, and largely self-organizing."

In a broader concept of learning ecology (Seely Brown and Duguid, 2000) it is impossible to have a limited environment to a software or tools which are run on a server and supported online. The people, the interaction, the content, the infrastructure and administration are part of that environment and they coexist in a pedagogical context.

Based on this, the ecology concept requires the creation and delivery of a learning environment that presents a diversity of learning options to the student. This environment must offer students opportunities to receive learning through methods and models that best support their needs, interests, and personal situations. As Clarke remarks, history is littered with attempts to revolutionise education with innovative technologies. Fortunately, the efforts have taught us an important lesson: in order for technology to improve education, it must "fit" to the students’ lives, not vice versa (Clarke, 2002).

My research will address the relative absence of ‘ecological’ eLearning environments and the study of their relevance to actual young adult learners – the digital students. The further development of the eLearning matrix with new
adaptable elements is the base of a new methodology for eLearning environments for digital students. eLearning materials that help students learn, maintain their motivation, and adjust to their individual learning preferences, and motivational incentives in eLearning environments are some of the situations studied.

This chapter began with an overview of eLearning, of the definitions and most influential theories present eLearning. This was not intended to be an exhaustive study, just to discuss the most important aspects from my research point of view and to summarise the motivation that led to this research. It continues then with a global view on eLearning environments, on how they are used in different university settings. As this entire research focuses on higher education, just those environments were taken into consideration. The chapter then moves into presenting the situation of eLearning in Romania. This analyse was considered necessary as the majority of the studies are performed in Romania and the major technical development was implemented in a Romanian university.

As this research relates to eLearning environments but also to digital students, the next chapter will present the digital students characteristics.
Chapter 3

Digital Students Characteristics

In the previous chapter I analysed the status of integration of the eLearning environments. In this chapter I present the actual ideas around the characteristics of the new student generation. Unfortunately, to this date (autumn of 2007) there is very little evidence on the characteristics of the new generation, especially on a large scale, and almost all of them are related to studies performed in the United States of America. More research, with mixed opinions, has been done in the last 3 years, when the impact of technology over the new generation has been analysed.

3.1. General characteristics

In the last quarter-century the digitisation of virtually all aspects of life - something Negroponte has called the “change of atoms into bits and pixels” (Negroponte, 1996) has had an impact on us all. However, for the generation born after 1980, the digital world is even more present and pervasive than for the rest of us, for it is the only world they know. They are the “digital ones” or the “N-Gen – Net Generation” (Tapscott, 1998). They are also described as Millenials, the Internet Generation, Echo Boomers, the Boomlet, Nexters, Generation Y, The Nintendo Generation and the Digital Generation (Raines, 2002).

One of the first to identify this new generation was Marc Prensky who used the terms “digital natives” and “digital immigrants” (Prensky, 2001). Prensky considers the "digital natives" as the net generation for whom everything digital is natural, and "digital immigrants” as those who have had to
learn the language of these technologies as mature adults. Prensky holds that
digital natives are different in kind from digital immigrants and that the
distinction is based on age. He bases his research on the neuroplasticity of the
brain and that there are actual changes in the brains of young people who have
spent their young age gaming and interacting online. I consider this a simplistic
approach, although a courageous one, but it is not backed by any medical or
anthropological studies.

The majority of the digital students are still children or teenagers, who
have lived all their lives in a changing but (from their perspective) predominantly
digital world (Oblinger, 2003). Significantly, most students in higher education
now belong to this group. Several studies and surveys, performed mainly in
United States, tried to identify their characteristics and how they will learn.

How have computer games, mobile phones, the Internet, and online
communication affected learners who have grown up with these as an integral
part of their environment?

### 3.2. Digital students and the use of technology

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. Email and instant messaging are natural
communication and socialisation mechanisms for teenagers today (Livingstone et
al., 2005). 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)
(p. 148) from which they develop understanding by synthesis. They tend to learn
visually and socially (Livingstone and Bovill, 2001). Using technology to
organize and integrate knowledge feels normal to them, as well as “doing rather
than knowing” (Frand, 2000). Born in the 1990s the young people or children
are “the first who cannot remember when they first used a computer” (Greene
and Hannon, 2007).

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 are 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 define one of their characteristics as a continuous need for instant feedback, which is also found in their learning attitudes.

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 (Tapscott, 1998).

In a more recent publication Prensky (Prensky, 2006) (pp. 28) summarises this as:

_Today's students - kindergarten through college - are the first generations to grow up with this new, digital, technology. They have spent their entire lives surrounded by and using computers, videogames, DVD players, video cams, eBay, cell phones, iPods, and all the other toys and tools of the digital age. Today's average grads have spent fewer than 5,000 hours of their lives reading, but often more than 10,000 hours playing video games, another 10,000 on their cell phones, and more than 20,000 watching TV. They download 2 billion ring tones per year, 2 billion songs per month, and exchange 6 billion text messages every day. Add in a total of over 250,000 emails and instant messages sent and received and over 500,000 commercials seen before age 21 and you've got a good digital profile of today's youth._

The Selwyn’s (2006) studies (p.5) indicate also that students, which had an extensive use of technology, were also frustrated that their freedom of use was diminished in the educational environment and “were well aware of a digital disconnect but displayed a pragmatic acceptance rather than the outright alienation from the school that some commentators would suggest”.

There are several voices that indicate that even if several studies indicate that the technology is very much embedded in young generation life their “use and skills are not uniform. There is no evidence of widespread and universal
disaffection, or of a distinctly different learning style the like of which has never been seen before.” (Bennett et al., 2008).

To generalise that young generation use extensively the technology for everything in their life, it can be too simplistic or counterfactual. Several studies indicate that there is a "relation to the links between social disadvantage and digital disengagement”, “technological and social disadvantages are inextricably linked” (Helsper, 2008).

### 3.3. Digital students and learning

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).

The same study talks about the Millennials, born after 1982, who can have different learning characteristics (Oblinger and Oblinger, 2005):

- Ability to multitask
- Preference to learn from pictures, sounds and video rather than text
- Interactive and networked activities are their first choice

They describe these learners as having “hypertext minds” and that they will prefer to learn in teams by engaging with others, but always through technological means.

A previous study (Raines, 2002) points to similar characteristics of the new learners, young teenagers, as techno-savvy, social and leaning to perform team activities, collaborative.
In Europe research have been carried out mainly in Germany (Veen, 2003) and in the UK (Livingstone and Bovill, 2001).

The German study defines the new generation as “Homo Zappiens” because of their extensive habit of using the remote control and mentions similar characteristics: multi-tasking, non-linear learning and reading, browsing and information scanning skills (Veen, 2003). Veen describes them as:

“Homo Zappiens communicates using tools such as MSN, chat rooms and cell phones. The average number of MSN windows children use while communicating is 10. And at the same time they listen to their favorite play list”

An extensive study in the UK of children (younger pre-school ages) (Livingstone and Bovill, 2001) reaches different conclusions. While noting the extensive use of technology from a very early age, Livingstone and Bovill indicates that young people lack key skills in evaluating adequately online content and they are inclined to use it as their own without knowing or understanding the skill of paraphrasing (Livingstone et al., 2005).

Their learning expectations are different due to new patterns of behaviour developed during 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.”

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 (Oblinger and Oblinger, 2005).

It is now considered that this community has different learning habits from students of previous generations, learning mainly online (Prensky, 2003). Or as he affirms (Prensky, 2001):

*It is now clear that as a result of this ubiquitous environment and the sheer volume of their interaction with it, today's students think and*
process information fundamentally differently from their predecessors. These differences go far further and deeper than most educators suspect or realize.

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 that 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”.

A current research trend (Oblinger, 2005) indicates that the educational system may need to change as to respond to the new student generation. Current students have been described as disappointed (Oblinger, 2003), or disengaged (Prensky, 2005). But for others this “debate about digital natives represents an academic form of moral panic” (Bennett et al., 2008) as justification for the divide, in some cases, between students and their teachers, between systems that are technologically influenced and other that are so advanced.

Even if several studies indicate that there is a connection between the use of technology and age several others indicates that “learning and technology has nothing to do with generational divides.” (Ponterfact, 2010). Similar, Vaidhyanathan states “there is no such thing as a digital generation”, as he mentions that in every generation there is a similar bell curve for accepting technology (Vaidhyanathan, 2008).

This evidence points to differences in perceptions or methods in which young people use technology inside and outside of standard educational settings, and suggests that use of the Internet in education can be frustrating, but there is little basis to conclude that these differences are causing deep and clear disengagement in learning.

I also consider that to ground the characteristics of the “digital natives” simply on age basis is simplistic. There are several other criteria to be taken into account and which the following research will try to present. Accesses to technology, education level, society implications, media exposure, etc are just some of the criteria which can influence the way of how the young generation mix technology in learning.
To further clarify this analysis, and based on these previous results, the following table of digital students characteristics may be helpful:

Table 3.1. Digital students characteristics

<table>
<thead>
<tr>
<th>Technology</th>
<th>Characteristics</th>
<th>Learning</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>Confident Tech-savvy</td>
<td>Constant use of technology</td>
<td>Write electronically (type)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games</td>
<td>Strategic thinking</td>
<td>Learn from images, audio, videos</td>
<td>Goal focused</td>
</tr>
<tr>
<td></td>
<td>Evaluation and ‘reputation systems’</td>
<td>Doing rather then knowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motivated for achieving (winning)</td>
<td></td>
</tr>
<tr>
<td>Internet &amp; Web</td>
<td>Search and browsing for information</td>
<td>Rely on the online data</td>
<td>Permanently online</td>
</tr>
<tr>
<td></td>
<td>Networking</td>
<td>Data</td>
<td>Immediate response</td>
</tr>
<tr>
<td></td>
<td>Non-linear</td>
<td>Danger of plagiarism</td>
<td></td>
</tr>
<tr>
<td>Mobiles</td>
<td>Use of multiple tools and media</td>
<td>Share and exchange ‘Push’ information and knowledge</td>
<td>Instant communication</td>
</tr>
<tr>
<td></td>
<td>‘Texting thumb’</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meet and connect instantly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this table I tried to identify the relation between the use of a certain technology and the respective digital students characteristics. The introduction of these characteristics had an influence on the requisite the students will require from learning and communication.

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.

In the following chapter, I will try to complete this definition of digital students and to identify their characteristics, by running several studies in different European countries.
Chapter 4

Research methodology

This chapter outlines the overall research methodology used in this project. The main aim of this research project is to investigate how adaptable and adaptive eLearning spaces influence and are influenced by digital students’ learning attitudes. To accomplish this research aims several methods have been introduced into the research.

4.1. Research assumptions and ideas

As my research is developed within the education and computer science research, it consists of a set of assumptions or generalisations that are consistent within this research. As this is the general case of a software program this supposition need to be able to predict new data. In my case, the assumptions are not summaries or categories for previously existing data and observations, and they need to pass the test for accounting for new data. It is quite difficult if not impossible to achieve this in software development, especially for an online learning environment. The methodology involved looking for supporting evidence, with the aim of identifying enough supporting evidence to answer the research questions. Even when supporting evidence is found, or when the assumption makes the correct prediction, a critic can always say that you have not found “enough”. Thus, a scientist, professionally speaking, is never able to state that anything has been “proven”. All the scientist can do is to have a current supposition that he or she is interested in testing (Phillips and Pugh, 2000, p. 47).

With this in mind, I focused on a series of assumptions that investigated how adaptive and adaptable e-learning spaces influence and are influenced by digital students’ learning attitudes. As described in the previous
chapter, “Digital students” are defined here as young adult students who grew up with an everyday use of technology and are accustomed to use technology. The research will show that these assumptions are consistent enough with existing data to be worthy of consideration, and that they appear to capture the data better than other existing generalisations (Phillips and Pugh, 2000, p. 50).

4.2. Research methodologies

As the research methods in information technology are recent they come from a number of different research approaches and methods, usually adapted from other disciplines such as sociology, natural science and business studies. So, the multi-methods research which I use has both qualitative and quantitative aspects. Each will be used for gathering a certain type of data, for analysing and critically examining the gathered data using a cross-sectional approach, for testing the software platform or finally for “generalising and finding the researched subject boundaries” (Phillips and Pugh, 2000, p. 52).

In information technology, as well as in other fields, quantitative research is concerned with the collection and analysis of data in numerical form. Qualitative research is concerned with collecting and analysing information in as many forms, usually non-numerical, as possible. It will focus on exploring small numbers of situations or examples which are seen as interesting and to achieve ‘depth’ rather than ‘breadth’ (Blaxter et al., 1998, p. 70). Quantitative research is usually based directly on the original plans and the results are immediately available to read and to analyse. Qualitative research is more open and responsive to the subject or situation.

Kahn & Best (Kahn, 1989) suggest “both types of research are valid and useful, they are not mutually exclusive.” In this case it is very possible that a single investigation will use both methods and modern research creates the framework for this.

Often, one specific method that can be used to strengthen another specific method. For example, Silverman (Silvermann, 2004, pp 348-351) describes the use of focus groups to improve survey questionnaires, and (Lindlof and Taylor,
2002, p18) describe a similar use for a variety of kinds of qualitative interviewing. Others works (Brannen, 1992) discuss many issues (epistemological, political, and practical) that arise when attempting a multi-method project, as well as discussing a variety of ways qualitative and quantitative methods can improve each other. Yet other works (Tharp and Gallimore, 1988) give examples of mixed method projects and the ways that a variety of methods (including guesswork, observation, qualitative interviewing, and experimentation) can work together in a synergistic relationship.

4.3. Socio-cognitive engineering

As the research methods in information technology are recent they come from a number of different research approaches and methods, usually adapted from other disciplines such as sociology, natural science and business studies. Mindful of this observation, within this research we are using a combination of the socio-cognitive engineering approach (Sharples et al., 2002) and the multi-methods research (Creswell, 2002).

Thus, the multi-methods research which I use has both qualitative and quantitative aspects. Each is used for gathering a certain type of data, for analysing and critically examining the gathered data using different methods as cross-section research, testing the software platform and finally generalising and establishing the researched subject boundaries (Creswell, 2002, Phillips and Pugh, 2000).

Multi-methods research uses surveys, in-depth interviews and focus groups, statistical data analysis, analysis of case studies and observational studies. The method is to look for supporting evidence (Phillips and Pugh, 2000) (p.54). The software development is backed by a constant evaluation of its features, as well as of the user interface design (Usability Net, 2006a). The evaluation will try to find out if the creation of such an environment could add any value to learning. However, evaluation of the effectiveness of an eLearning environment is a difficult and lengthy process, not well defined by former research. The evaluation will consist therefore mainly of observation and
interviews with the focus groups and will be done at an international level in different countries.

The research method adopted in this research comes from the dialectical version of user-centred design, called socio-cognitive engineering, proposed first by Sharples and colleagues (Sharples et al., 2002) for designing human-centred technology, and used by several others (Vavoula, 2004), (Fallahkhair et al., 2005) in recent years, especially in learner-centered language learning.

Socio-cognitive engineering aims to involve the potential users by incorporating their knowledge in the design process and has a number of interrelated design stages. It mainly consists of two stages: a stage of analysis which will set up the constraints of the second stage, which is the design of the new technology. The entire process is based on the idea that “users are important sources of design information and may be partners in the design process” (Sharples et al., 2002). Very often users will express their preferences for the use of a system of technology, but some of these preferences can be idealised. This is why the socio-cognitive engineering methodology requires hierarchy interdependence of the different stages of analysis and of design or development. According to this methodology, users are continuously consulted during the development stage not only as a prerequisite for the design but as a necessity for
evaluation. The results will then blend theory, study analysis and design engineering. The result can be a human-centred system that is based on a sound understanding of how people think, learn, perceive, work and interact. The result can be evaluated against its initial requirements, but also for its usability, usefulness, desirability, elegance, and acceptance by the user groups. The continuous involvement of users in the analysis and design stages is also part of the rapid application development theory (Koehler, 1992).

The rapid software development was based on agile methods, defined as “incremental development methods that focus on rapid development, frequent releases of the software, reducing process overheads, and producing high-quality code...[that] involves the customer directly” (Sommerville, 2006, pp. 396-397). Applying the agile methods involved the processes of specification, design, implementation being interleaved and constantly evaluated with real users. The DIMPLE system was planned to be developed in a series of versions, with each modification based on the previous evaluation. The main agile method used for implementation in this research methodology is ‘extreme programming’ (XP) – “by pushing recognised good practice, such as iterative development, to [an] extreme level” (Sommerville, 2006, pp. 398). It is often the case with extreme programming that the specifications are expressed as scenarios, and the same method was used in this research methodology. As the principles also required a very short time between different versions and for each version to be evaluated by real users, this too had to be built into the process. The extreme programming release cycle is an agile method that integrates frequent releases of the software, continuous software improvement and user participation as a part of the development concept.

As a result, we adapted the Sharples, Sommerville and Koehler methodology with the multi-methods approach and with the agile methods and we arrived at the project methodology, which is represented in Figure 4.2. The design process is mainly represented by the analysis stage and design stage.
The first stage, the analysis and the establishment of the environment model, is mainly based on field studies which borrow the methodology from the social sciences, e.g. through interviews, questionnaires, focus groups studies etc.

We investigated and tried to understand if digital students existed in our groups – what were their characteristics, and the theories and technologies in use in adaptable and adaptive learning environments. This was done via theoretical investigation and empirical studies to see how technology is used and its cognitive, instructional and social implications. The result leads to the creation of a task model – the learning environment model. This model then led to a cycle of iterative design and evaluation in order to give us the specification of an environment which answers our research hypotheses. In the design stage, the methodology is more technology oriented and gives us the first prototype – a
study with some technical developments performed on one student group in Romania. The evaluation of this study allows us to map the affordances and specification of DIMPLE as well as proceed to a final development. Finally, DIMPLE will be evaluated according to the digital students’ characteristics and requirements. Each of the steps from this methodology will constitute the basis of the following chapters. This methodology can provide a sound instructional, organisational and technical framework for the design of an adaptable and adaptive eLearning environment.

The Evaluation strategy is part of the socio-cognitive engineering and is a continuing process. In this context DIMPLE is an alive environment in continuous change and adaptation with several prototypes and tools developed which are constantly evaluated and improved. The evaluation has been done through questionnaires and focus groups that focused on the usability and desirability of the new tools implemented.

4.4. Questionnaires

As part of our socio-engineering research methodology we use several techniques, I will concentrate here on surveys. Generally, the use of questionnaires as a research technique might be seen as a quantitative strategy, while interviews and observation are considered to be qualitative techniques. As (Blaxter et al., 1998, p. 81) argues “in practice is often more complicated than that”; interviews can be structured and analysed in a quantitative way, e.g. when numeric data is collected or when non-numerical answers are categorised in a numerical form; surveys can have open-ended responses which lead to the in-depth study of individual cases. This is why multi-methods research uses both research categories simultaneously in many situations.

As survey research is seen as a method of collecting information by asking a series of pre-formulated questions in a predetermined sequence in a structured questionnaire (Kumar, 2005, pp 123-126) an online questionnaire needs to be set within these rules. As my survey is on Technology in Education, it collects information from members of different groups of students and is based
on a random sample of a specific target population group – young students – at whom my research interest is directed.

Questionnaires are one of the most widely used quantitative research techniques. The idea of formulating precise questions for the target group is an obvious strategy for finding the answers to the questions that interest me. But to design a good and useful questionnaire and to interpret the results is not that simple. The method of delivery needs to be carefully chosen as it can influence the answers. The data collected can be also qualitative and quantitative and alternative strategies may be used for analysing the results. (Kumar, 2005, pp 93-110) describes different levels of quantitative analysis: descriptive statistics (averages, range), inferential statistics (assessing the significance of data), simple interrelationship (cross-tabulation) and multi-variate analysis (studying more variables). This is why my questionnaire was conducted online (as it studying digital students), was designed (as questions and as software) especially for this purpose and all results were analysed in 2 ways: a statistical results (done automatically online by the software) for numerical results using all four levels of analysis described before, and each students’ answers for in depth interpretation.

Questionnaires are often used in conjunction with interviews. They can be set up separately or as part of an action research or case studies. A questionnaire can be designed to encourage a reflective approach (from the sequence of questions) so that respondents reflect on the way they answer. A survey (questionnaire and interviews) can also be part of qualitative research, as it may use open-end questions, or the methods of analysis may be qualitative. If results are analysed in conjunction with other data (gathered from other research methods, or from literature) they can be considered part of a qualitative study.

(Blaxter et al., 1998, p. 193) argue that “the researcher often wishes to generalize the results obtained from the samples to the population from which the samples were drawn.” But in this case, a survey will be conducted on a very-large scale and using multiple methods of sampling, with statistical analysis of the results. In my case, it is just supporting evidence for creating a digital student profile and for highlighting the need for further research.
4.4.1 Traditional questionnaires

Until recently, surveys and questionnaires have been always administered either by an interviewer and/or in paper-and-pencil form. These types of questionnaires have advantages and disadvantages.

The human interviewer has the advantage that a knowledgeable individual assists the interviewee with (a) the sequencing of items, (b) the interpretation of items, (c) the recording of the responses, and (d) the editing of errors. The disadvantage is that a human interviewer (a) must be trained, (b) is not always conveniently available, (c) is expensive, (d) makes errors, and (e) can introduce bias into the interviewee's responses (Brannen, 1992, Dillman, 2000).

The paper-and-pencil form has the advantage of being inexpensive. The disadvantages are that (a) items may be confusing without the aid of interpretation, (b) forms may be hard to follow from question to question and from page to page, (c) omissions and errors of various types can go without detection until it is too late to fix them, and (d) respondents may be less likely to start or once started to finish the questionnaire on paper than they would be under the personal persuasion of a human interviewer.

4.4.2 Online questionnaires

Recently, computerised self-administered questionnaires have become an attractive alternative to human interviewers and paper-and-pencil forms. This is particularly true as computerised self-administered questionnaires can be run on the World Wide Web (WWW) and become more and more pervasive, accessible, and easy to use.

As a new medium for questionnaire delivery, the Internet has the potential to revolutionise the survey process. Online questionnaires provide several advantages over traditional survey methods in terms of cost, speed, appearance, flexibility, functionality, and usability (Dillman, 2000). For instance, delivery is faster, responses are received more quickly, and data collection can be automated or accelerated. Online questionnaires can also provide many capabilities not found in traditional paper-based questionnaires: they can include pop-up instructions and error messages; they can incorporate links; and it is possible to encode complex skip patterns making such patterns virtually invisible.
to respondents. Moreover, it can be written in a number of interactive ways to assist in (a) sequencing of items and navigation of the forms, (b) providing definitions and clarification of terms, (c) recording responses, and (d) helping to avoid, detect, and correct errors at the point of entry or on completion of sets of items (Lazar and Preece, 1999).

Like many new technologies, however, and despite their advantages, online questionnaires face criticism. Typically, such criticisms focus on the vulnerability of online questionnaires to the four standard survey error types: coverage, non-response, sampling, and measurement errors (Dillman, 2000). Although, like all survey errors, coverage error - “the result of not allowing all members of the survey population to have an equal or nonzero chance of being sampled for participation in a survey” (Dillman, 2000) - also affects traditional survey methods, it is currently exacerbated in online-questionnaires as a result of the digital divide. But at the same time, several developed countries have reported substantial increases in computer and internet access (Boitos, 2004). This is the case with Romania and Hungary that will be part of the following studies. As familiarity with information technologies is increasing, these trends suggest that coverage error will rapidly diminish to an acceptable level (for the developed world at least) in the near future, and in so doing, positively reinforce the advantages of online questionnaire delivery.

The second error type – the non-response error – occurs when individuals fail to respond to the invitation to participate in a survey or abandon a questionnaire before it is completed (Dillman, 2000). Given today’s societal trend towards self-administration the former is inevitable, irrespective of delivery mechanism. Similar, non-response as a consequence of questionnaire abandonment can be relatively easily addressed. By incorporating a range of features into the design of an online questionnaire, it is possible to optimise the time estimate for completion – and indeed, to provide respondents with context sensitive assistance during the response process – and thereby reduce abandonment while eliciting feelings of accomplishment.

For online-questionnaires, sampling error “the result of attempting to survey only some, and not all, of the units in the survey population” (Dillman, 2000) can arise when all but a small portion of the anticipated respondent set is alienated (and so fails to respond) as a result of, for example, disregard for
varying connection speeds, bandwidth limitations, browser configurations, monitors, hardware, and user requirements during the questionnaire design process. Similarly, measurement errors “the result of poor question wording or questions being presented in such a way that inaccurate or un-interpretable answers are obtained” (Dillman, 2000) will lead to respondents becoming confused and frustrated.

Although online-questionnaires reduce traditional delivery costs (e.g. paper, mail out, and data entry), set up costs can be high given the need to either adopt and acquire training in questionnaire development software or secure the services of a web developer. Neither approach, however, guarantees a good questionnaire often because the person designing the questionnaire lacks relevant knowledge in questionnaire design (Lumsden and Morgan, 2005b).

Sampling, measurement, and non-response errors are likely to occur when an online-questionnaire is poorly designed. Individuals will answer questions incorrectly, abandon questionnaires, and may ultimately refuse to participate in future surveys; thus, the benefit of online-questionnaire delivery ill not be fully realized.

The online questionnaire tool can set up different types of questions: multiple choices with one choice or with several choices, selection questions, rating questions and open questions.

4.4.3. Online questionnaire Design

As a first step in the development of the tool, it was extremely important that practical, comprehensive guidelines to be established for the design of online questionnaires. Many design guidelines exist for paper-based questionnaire design; the same is not true for the design of online questionnaires. We attempt to present some comprehensive guidelines which draw upon current theory and research in human/computer interaction and cognitive psychology ((Lazar and Preece, 1999, Norman, 1991, Norman et al., 2001, Shneiderman, 1998), techniques of task analysis (Card et al., 1983), and finally, empirical research on online questionnaires.
Online surveys and questionnaires can be implemented in many different ways (Lazar and Preece, 1999), and the possibilities of design space are enormous. The current design of computer interaction is focused on the graphical user interface (Seely Brown and Duguid, 2000). This interface is characterised by buttons, fields, windows, and use of a mouse. When surveys and questionnaires are implemented in GUIs, they must be designed around the functions, facilities, and limitations of these tools. For example, windows that present surveys must be either scrolled or paged. The mouse can be used to select options to answer questions and buttons and scroll bars can be used to navigate through the questionnaire, etc.

In essence, an online questionnaire combines questionnaire-based survey functionality with that of a webpage/site. As such, the design of an online-questionnaire should incorporate principles from both contributing fields. Online questionnaire standard design requires an implementation of a database with several critical areas which needs to be defined for different levels of access:

![Diagram of the design process](image)

**Figure 4.3.** The design process adapted from (Lumsden and Morgan, 2005a)
All online questionnaires that are based on the design process from Figure 4.3 will provide at least 2 levels of access as in Figure 4.4. a), b). One level of access will be for the user – the person who fills the questionnaire– and the administrator – the person who can access the statistical results and analyse the data.

*a) organisational structure for user, b) organisational structure for administrator
(arrows shows progression, double barred arrow indicates choice)*

**Figure 4.4.** Online questionnaire
This type of survey that is implemented using Internet tools or environments will provide access worldwide, not dependent upon the time or location of the survey, and most importantly will provide instant results, with statistics available continuously during the survey process. Our online questionnaire model also allows access to the individual responses that can be qualitatively analysed in conjunction with the statistical results. Comments from open questions are also gathered in the result session and can be identified by user.

Based on our model, the online questionnaire provides an easy to access environment for quantitative and qualitative data analysis. By viewing individual results simultaneously with the statistics, complex data retrieval favours a better interpretation process.

Various strategies can be used for analysing the results (Loraine Blaxter, 1998) (pp. 175-178): descriptive statistics (averages, numbers), inferential statistics (assessing the significance of data), simple interrelationship (cross-tabulation), multi-variate analysis (studying more variables) and in depth interpretation by analysing each user’s answers and comments. Qualitative research can be carried out in conjunction with analysis of other data (gathered from other research methods, or from literature) to form part of a qualitative study.

4.4.4. Design guidelines

These guidelines advise on the process which can be followed when designing a questionnaire (the sequence of steps is shown in Figure 4.3). The guidelines focus on supporting the design and implementation of questionnaire content (step shown shaded in Figure 4.4 a).

To this end, we identify the general organisational structure that online-questionnaires should adopt (see Figure 4.4 a) and b), provide assistance at this level, and then progressively refine the guidance according to the issues identified in Table 4.1 which relates to the formatting of text in online questionnaires.
Table 4.1: Questionnaire Methodology and Topics

<table>
<thead>
<tr>
<th>GENERAL ORGANIZATION</th>
<th>FORMATTING</th>
<th>QUESTION TYPE &amp; PHRASING</th>
<th>GENERAL TECHNICAL ISSUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome Pace</td>
<td>Text</td>
<td>General Guidance</td>
<td>Privacy &amp; Protection</td>
</tr>
<tr>
<td>Registration/Login</td>
<td>Color</td>
<td>Sensitive</td>
<td>Computer Protection</td>
</tr>
<tr>
<td>Page</td>
<td>Graphics</td>
<td>Questions</td>
<td>Literacy</td>
</tr>
<tr>
<td>Introduction Page</td>
<td>Flash</td>
<td>Attitude</td>
<td>Automation</td>
</tr>
<tr>
<td>Screening Test Page</td>
<td>Tables&amp;Frames</td>
<td>Statements</td>
<td>Platforms &amp; Browsers</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Feedback</td>
<td>Phraseology</td>
<td>Devices</td>
</tr>
<tr>
<td>Questions</td>
<td>Miscellaneous</td>
<td>Types of Question</td>
<td>Assistive Technology</td>
</tr>
<tr>
<td>Additional</td>
<td>Response Formats</td>
<td>Open-Ended</td>
<td></td>
</tr>
<tr>
<td>Information Links</td>
<td>Multiple choice</td>
<td>Closed-Ended</td>
<td></td>
</tr>
<tr>
<td>Thank You</td>
<td>Questions</td>
<td>Rank-Order</td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td>Drop-Down Boxes</td>
<td>Categorical or Nominal</td>
<td></td>
</tr>
<tr>
<td>Frames</td>
<td>Radio Buttons</td>
<td>Magnitude</td>
<td></td>
</tr>
<tr>
<td>Forms&amp;Fields</td>
<td>Check Boxes</td>
<td>Estimate</td>
<td></td>
</tr>
<tr>
<td>Navigation</td>
<td>Open Questions</td>
<td>Ordinal</td>
<td></td>
</tr>
<tr>
<td>Buttons</td>
<td></td>
<td>Questions</td>
<td></td>
</tr>
<tr>
<td>Links</td>
<td></td>
<td>Likert Scale</td>
<td></td>
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<tr>
<td>Site Maps</td>
<td></td>
<td>Skip</td>
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</tr>
<tr>
<td>Scrolling</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

There are a number of issues of importance which I took into consideration when designing the textual content of an online-questionnaire:

a) Fonts used should be readable and familiar, and text should be presented in mixed case or standard sentence formatting; upper case (or all capitals) should only be used for emphasis;

b) Sentences should not exceed 20 words, and should be presented with no more than 75 characters per line. Paragraphs should not exceed 5 sentences in length;

c) Technical instructions (instructions relating to the basic technical operation of the website delivering the questionnaire) should be written in such a way that non-technical people can understand them;

d) Questions should be easily distinguishable, in terms of formatting, from instructions and answers;

e) Each question type should be consistent in terms of the visual appearance of all instances of that type and the associated instructions concerning how they are to be answered. In particular, the relative position of the question and answer must be consistent throughout the questionnaire. Where
different types of questions are to be included in the same questionnaire, each question type should have a unique visual appearance;

   f) When designing for access by users with disabilities and the elderly, a minimum font size of 12pt should be used and the font colour should contrast significantly with the background colouring. Text should be discernable even without the use of colour. It is advisable to test font colours and size with a screen magnifier to ensure usability prior to release;

   g) Text should be readable (by screen readers) in a logical order. Specifically, set the tab order on the pages. This is especially true for actual questions in the questionnaire – think carefully about the order in which a visually impaired user will hear the elements of a question, including the instructions and response options.

4.4.5. The implemented surveys

On the first part of my PhD research I used surveys which were conducted online in UK (University of Brighton), Romania (“Politehnica” University of Timisoara), Hungary (Godollo University) and Finland (Oulu Polytechnic) during September and October 2004 (Andone et al., 2005b) and then repeated in October 2005, October 2006 and October 2008. Each questionnaire was also translated in the national language for a correct interpretation by the respondents (Figure 4.5. b).

The questionnaire was completely online with different sets of questions: multiple choice with single response or multiple responses, rating questions and open questions. The development was based on the OQ tool which is a database within PHP MySQL technology. The results can be seen as statistics (Figure. 4.5 a) or as the answers of each individual user (Figure 4.5 c)), and comments and answers to open questions (Figure 4.5. d) are summarised in a table. This allows a complex data analysis based on qualitative and quantitative methods, which can be conveyed in a single graph.
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a) general statistics
b) general statistics in RO, HU, Fi
A comparison between statistics and comments from different users was used to study the efficacy of the technology. (Andone et al., 2005a)

4.5. Scenario based design

This approach was to use scenario-based design methods (Carroll, 2000b) as a mean of defining suitable eLearning environments for digital students. Using scenarios can help achieve the goal of creating truly useful and usable products by encouraging designers “to explore the larger design space of many possible design challenges, to review the technical feasibility and likely payoffs of the different approaches and only then begin considering the normal design issues” (Carroll, 2000a). Scenario building is one design technique used to explore new forms of interaction in which the physical environment is able to react to human
behaviour using technologies as a mediator, for identifying, refining and verifying what digital students need and then managing the development of the environment to meet those needs by constantly determining how it can be refined to meet them better. This task scenario (Carroll, 2000b) was developed to determine what environment functions would be required to allow the described actions and activities to take place at the performance level the digital students require.

Based on a conceptual meta-model, the scenario proposes a description of learning situations with the use of different technologies. As a method my scenario is a learning scenario (a description of the progress of the learning situation with a goal to ensure the appropriation of a precise set of knowledge (Lejeune and Pernin, 2004) which was formulated a priori as an abstract scenario. Built as an adaptable scenario it is an open scenario, which allowed modification or completion by the students that were involved in the focus groups.

In order to reflect reality, the scenario needs to be grounded in the results of the observational studies, surveys and focus groups. This allows researchers to have confidence in their assumptions and provides access to real-life models allowing personas to be richly represented (Agostinho et al., 2005). As a consecutive research exercise, the results from the surveys generated this scenario which was then evaluated in a two focus group study to finally provide a rich scenario for the creation of an adaptable and adaptive eLearning environment for digital students via a combination of two technologies: Internet and mobile phone.

Based on a conceptual meta-model fed by the results of our initial surveys, we developed a scenario that we have called DIMPLE (Digital Internet and Mobile Phone eLearning Environment). This allows defining relationships between (1) learning objectives, (2) roles of staff and learners in the learning process, (3) performed activities and (4) environment and resources necessary to the educational situation installation (Lejeune and Pernin, 2004). DIMPLE is a learning scenario, a description of the progress of the learning situation intended to ensure the appropriation of a precise set of knowledge,
formulated a priori as an abstract scenario. It is an open, adaptable scenario which allowed modification or completion by the students who were involved in the focus groups.

4.6. Focus groups

In the field study, we used the focus group technique to gather information about adult language learners mainly to discover how they go about their language learning, their learning approaches, what techniques and technologies they found useful and what problems and obstacles they encountered. Focus groups are useful techniques to gather user requirements and can help to investigate “user needs and feeling both before interface design and long after implementation” (Nielsen, 1997).

Focus groups as a well-respected means of gathering in-depth, qualitative information such as opinions and attitudes, can provide deeper understanding of learners’ perceptions, feelings, motivations and desires. Focus Groups bring six to twelve participants together for an informal discussion lasting from one to two hours. The interviewees generally are of similar demographic or other predefined characteristics. The interviewer moderates the discussion based on an outline provided or approved by the client. Focus group sessions are usually recorded by video or audio tape for further analysis (Krueger and Casey, 2000).

A focus group is a highly efficient and relatively inexpensive method of collecting information; in one hour you can get the opinions of six or more people. However, the information gained from focus groups is not objective, precise, definitive, or diagnostic. Rather, focus group interviews can offer descriptive, exploratory, subjective, and approximate insights (Greenbaum, 1993).

While focus groups can offer insight during the research process, there are a few pitfalls which I tried to avoid when conducting group interviews.

Limited number of questions: Only a limited number of questions can be used – so an analysis of the data which I was looking for needed to be constantly reviewed.
Dominant individual - an outspoken person can often dominate a group interview giving others few opportunities to express their views. A moderator can encourage others to speak, but the dominant individual might be difficult to suppress (Greenbaum, 1993).

Group dynamics - groups often develop positive or negative attitudes towards a product or concept. For this I used multiple group interviews to gain a broad range of responses.

Questioning interviewees instead of discussion – I provided the focus group with the scenario and some topics and left them talk about them.

Order effect - the order in which concepts are presented to the group will affect the way the group members react. I alternated the way information was presented to different groups to gain a more balanced result.

Based on these assumptions I considered focus groups as part of multi-method studies that combined “two or more means of gathering data in which no one primary method determines the use of others” (Krueger and Casey, 2000). The main benefits for which I chose focus groups were their ability to:

- Produce concentrated amounts of data on precisely the topic of interest.
- Allow respondents to express detailed feelings, opinions and attitudes.
- Discover hidden feelings and motives.
- Enable participants to give immediate reactions.

Two focus groups were run in March 2005 to gather in-depth, qualitative information, opinions and attitudes about the digital students’ characteristics and the proposed DIMPLE scenario, as part of the analysis stage. Fourteen participants took part in the study, in two groups, of six in the UK and eight in the Romania. Participants were self-selecting, all having previously completed the survey. The three female and eleven male participants were aged between 18 to 24, five nationalities (English, Greek, Indian, Romanian and Hungarian), studying ICT-related subjects, but of varying degrees of ICT competence. The interviewer moderated the discussion using an outline based on the same topics as the survey (digital literacy, Internet use, mobile phone use, learning attitudes,
visual use, and IT expectations) and on the proposed scenario. The informal discussion lasted two hours and was recorded for further analysis.

In January 2006 three focus groups were run in UK and Romania (2) to seek the evaluation of the DIMPLE prototype and ideas, as part of the design stage of the socio-cognitive engineering methodology. The nineteen participants were selected from the students that took part in the evaluation of the DIMPLE prototype and of the UK study. They were all studying ICT and were aged between 18 and 36, seven females and twelve males. The interviewer moderated the discussion using an outline based on the topics used in the DIMPLE prototype and on the proposed scenario. The informal discussion lasted each one-hour and was recorded for further analysis.

4.7. Evaluation

The DIMPLE idea and prototype was evaluated against the general requirements, and for desirability and learning effectiveness.

DIMPLE is developed around a set of requirements that were derived from a theoretical framework grounded in field study, digital student theories and affordances of Internet and mobile technologies. DIMPLE is also a multimedia system that is accessible across dual platforms: Internet and mobile phones. So, the evaluation of DIMPLE will take into account all of these dimensions: general requirements, its desirability for the digital students, i.e. “technology should also be useful, elegant and desirable” (Nielsen, 1999), and the effectiveness of the learning it enables.

4.7.1. Usability

Usability is defined in ISO 9241 part (ISO, 1998) as “the extent to which a product can be used by specified users to achieve goals with effectiveness, efficiency, and satisfaction in a specified context of use.” Those terms are defined as: “Effectiveness: how well the user achieves the goals they set out to achieve using the system. Efficiency: the resource consumed in order to achieve their goal. Satisfaction: how the user feels about their use of the system.” (Navalkar, 2000)
The usability evaluation process is based on a combination of usability tests: critical incident techniques (to collect and analyse data of specific incidents which had an impact on the final use of the tool) and heuristic evaluation (a form of usability inspection where it is checked whether each element of the interface follows a list of established usability heuristics) (Usability Net, 2006b).

To implement the usability evaluation I used an adapted version of the IsoMetrics Method (Gediga et al., 1998) based on the ISO 9241/11. IsoMetrics is based on a series of questionnaires which aim to identify any shortcomings of a piece of software with the aim of enhancing its user-friendliness. The questionnaire is based on statements to which the respondent agrees or disagrees making use of the Lickert scale (Trochim, 2000) provided in each case. The IsoMetric Method (also the long questionnaire and the short, summative one) was widely used for scientific purposes by several universities and research centers to evaluate interfaces based on a reliable but inexpensive method.

4.7.2. Desirability

The usability techniques will be enforced by the desirability evaluation which follows a model proposed by Microsoft Usability Lab (Benedek, 2002) and has been used in evaluating the user ‘pleasure’ and the market value of the tool (Usability Net, 2006b).

The ‘product reaction card’ was developed as a toolkit to measure “desirability” (Benedek, 2002). This method has also been used for the evaluation of a lifelong learning support system at the University of Birmingham (Vavoula, 2004) and for a dual-device language learning environment at University of Brighton (Fallahkhair et al., 2005). A number of cards with words and short phrases describing different characteristics printed on them (i.e. useful, elegant, novel, boring, etc.) are used. The participants are asked to follow three phases in evaluating the software:

- go through all the cards and select those that best describe the software.
- go through shortlisted cards and chose the five most representative of the software to convey their view
- write down their explanations of why they selected them
In this way, the evaluator was able to evaluate not only the desirability of the software environment, but also other attributes and ways it has been perceived by intended users, such as its usefulness, acceptability, effectiveness. Then the data collected was used in the context and the quantitative (statistical) and qualitative result of evaluations was provided.

Using this method, I evaluated the DIMPLE environment (idea, prototype and the study) for its desirability to the study group of students (digital and non-digital). I developed a large set of word cards that formed the basis for a sorting exercise and more importantly a discussion about the use of the environment. Since there is a bias towards giving positive feedback in the university relations already established I made sure that at least 40% of the set consisted of negative words and phrases and tried to make the set cover a wide variety of dimensions. Each word was placed on a separate card and the set was given to the students at the end of the course module.

4.8. Research ethics

Performing this research several ethical issues were raised and approached. The ethical issues stem from the different situations, problems and methods used in this research, in the pursuit of valid and reliable data.

The main part of research was conducted in 2 universities (University of Brighton, UK and “Politehnica” University of Timisoara, Romania) involving mainly students and myself as a tutor. In two cases the research involved two other tutors who were also made aware of the sensitive issues and of the research ethics.

There are a set of considerations for ethics in research in education which I planned during the research as based on (Cohen et al., 2007, pag 51-54):

1. Informed consent

Before any research step information about the process and how and for what the data will be used was given in writing or wording to the users. Before completing any questionnaire all users were informed also about its purpose, the method for data collection, the privacy guarantee and the duration. Any participation to any of the studies or evaluation was done on voluntary basis.
2. Access

Before conducting the research and the DIMPLE development in the “Politehnica” University of Timisoara formal request and a project presentation was done for the university administration. The research was approved and it was later deployed thorough ViCaDiS to other universities that were also informed and consent to take part largely in the research.

3. Ethics

As the research was conducted in real life education settings, with real students that were not in a confined situation, but in a situation where they took classes using the developed DIMPLE environment. This raised a note of caution over the research deployment and of data collection, which was planned to be non-maleficence (do not harm) (Cohen et al., 2007, pag. 60) - not to influence or damaged the students fair access to educational resources. The studies evaluation, which involved students, were all planned and done after the course ended, after the students sat in their exam.

4. Privacy, anonymity, confidentiality

At the end of the studies, users were informed that, anonymously, some of their answers in DIMPLE, chats, focus groups or interviews will be made public in this thesis. This was done as a standard message sent to all users. No other names of any student or professor, or other personal means of identification (chat id or email addresses) were used in this research, all data been treated in full anonymity. The statistical data use for traffic and usage was also respecting users privacy and anonymity. To identify the digital students characteristics micro-aggregation was introduced and used (the construction of ‘average person’ from data on individuals and the release of these data, rather than data on individuals (Cohen et al., 2007, pag. 65)).

During the research, which spread across some years, I took responsibility for maintaining confidentiality for all data but also I retained the right to report on my work in papers or in this thesis, by informing all those involved (in a general confidential and rights statement at the beginning of any questionnaire or evaluation).
4.9. Summary

My research addresses the relative absence of adaptive eLearning environments and will study of their relevance to actual young adult learners – the digital students.

The exploration starts from the John Seely Brown learning ecology concept which requires the creation and delivery of a learning environment that presents a diversity of learning options to the student (Seely Brown and Duguid, 2000). This environment must offer students opportunities to receive learning through methods and models that best support their needs, interests, and personal situations. The further development of the eLearning matrix with new adaptable elements is the base of a new methodology for eLearning environments for digital students. Elearning materials that help students learn, maintain their motivation, and adjust to their individual learning preferences, and motivational incentives in eLearning environments are some of the situations studied.

Adaptable elements will be implemented with software development and studied on an open source e-learning platform from the perspective of their impact on learning of the new student generation. The software will be developed using a rapid application development methodology (Koehler, 1992). In general, rapid application development describes an environment that puts much more emphasis on analysis and design, and user involvement in development phases is critical to its success. This methodology characterises the new software development which involves an “always beta” deployment.

Setting up a conceptual and methodological basis to assess the impact of changes in e-learning spaces, conducting a systematic online research and review of existing applications and expected developments, and carrying out systematic analysis of a significant number of case studies at different levels are the core methodologies of my research activity. The multi-methods research will use international online surveys, in-depth interviews and focus groups with digital students, statistical data analysis, analysis of case studies and observation studies (Creswell, 2002). The results of this studies are presented in the following chapter.
This chapter presents the research methodology used in this research project for defining digital students and for finding their preferences for a learning environment. In my approach to the use of multi-methods research in the analysis and stage design of the socio-cognitive engineering methodology I took into consideration the advantages of these two methodologies. The results of the multi-methods research in the analysis phase led to a list of general requirements for DIMPLE. The questionnaires and focus groups used were complemented by the usability and desirability methods in the evaluation phases of the DIMPLE environment (the study cases). A note of caution should however be raised – they are all based on opinions of individuals which may not necessarily represent the views of the whole student population. It merely offered us a glimpse into the insights of the digital student groups we had defined and their attitudes.
Chapter 5

Studies

Based on research methodology and analysis described in the previous chapter I integrated several studies run in UK, Romania, Hungary and Finland. These studies and their results are presented in this chapter.

5.1. Investigation

The topic of this research, due to its interdisciplinary nature, touches a series of areas, which are synthesized: web development technologies, mobile technologies, learning theory, eLearning theory and technology, cultural aspect of eLearning. Several researches are now under way to establish characteristics of the net generation and of the digital students. These are analysed and compared with our results. The purpose of this step is therefore to record the state of the art and the current trends in these areas.

In the next step I intended to create the profile of the digital student through online surveys, focus groups, and qualitative analysis of the case studies.

As there are just a few studies to report the characteristics of a digital student, a model of what it means to be a digital student need to be established prior to the development of an eLearning platform to meet their needs. As part of this process an online survey was created to investigate the level of e-literacy of young adult students in an attempt to identify the unique features of ‘digital students’, as a move towards building a customized model of an eLearning environment. This online survey was applied to students in the UK, Romania, Hungary and Finland. The survey’s focus was on ‘Technology in Education’, it attempted to collect information from a relatively random sample of a specific target population of young students and was conducted during September-November 2004. Themes covered were digital literacy, Internet use, mobile
phone use, learning attitudes, visual use, and IT expectations. The initial target group was young students 18-21 years old in universities from Great Britain, Romania, Hungary, and Finland (Andone et al., 2005a, Andone et al., 2005b, Andone et al., 2006b). In fact, the sample included some older students and was not entirely 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. For that reason, we prefer to think of this study as an investigation for digital students which not always have grown up with ubiquitous internet and mobile phone use. Finally, the surveys exhibited different gender, age and specialisations distributions.

Various strategies were used for analysing the results. Qualitative research was analyzed in conjunction with other data (gathered from other research methods, or from literature) to form part of a qualitative study. This was an exploratory survey, not an experiment, and the results should only be considered as indicative and they are found in (Andone et al., 2005a, Andone et al., 2005b, Andone et al., 2006a, Andone et al., 2006b). Later, we ran focus groups, interviews, and scenario analysis based on the issues the survey identified.

### 5.2. UK study in 2004

#### 5.2.1. 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 (Blaxter et al., 1998, Creswell, 2002, Lazar and Preece, 1999, Lumsden and Morgan, 2005) and as described on Chapter 4. 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. 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 Computing subjects at the University of Brighton, UK for a three-week period during September/October 2004 and to all students of the University in a similar period in October/November. Access was provided through the university’s online learning management system. Analysis revealed the following information about the sample group:

The first survey had 86 respondents - 69 males and 17 females. 71% were aged 20 or under and 29% were over 20. 71% were in their first year of study, 15% in the second year and 14% on their third year or beyond, their specialisation areas varying between Computer Science and Information Systems. Their results we will note here as CS results.

216 students answered the second survey - 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. Their results we will note here as Uni results.

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 two 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 two 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 (Lindlof and Taylor, 2002): 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.

This was an exploratory survey, not an experiment, and the results should only be considered as indicative. These results are further correlated with the results from the surveys from Romania, Hungary, Finland, with the results from the focus group and interviews, and with the scenario analysis run in UK and Romania.

5.2.2. 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). (Figure 5.1).
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 (Figure 5.2).

These results appear to be consonant with official Eurostat (Eurostat, 2003, 2004, 2009, 2009 #40) results in 2003 and with EDUCASE results (Livingstone and Bovill, 2001). 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 (Eurostat). This result shows that the use of multiple media and technologies is directly connected to their use in education, home and entertainment. (Figure 5.2, 5.3)
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 (Figure 5.2 and Figure 5.4).
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 results (Livingstone et al., 2005, Livingstone and Bovill, 2001) 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 (Figure 5.5). 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.
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 (Figure 5.6).
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 (Beasley).

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).

5.3. UK, RO, FI, HU studies

5.3.1. Methodology

To continue the identification of the digital students characteristics and how they use technology and learn we carried out a second survey ‘Technology in Education’ on four different countries and universities. We attempted to collect information from a sample of a specific target population of young students. The target group initially was young students 18-21 years old in universities from Great Britain (302 respondents), Romania (285 respondents), Hungary (95 respondents), and Finland (50 respondents). In fact, within the student population we found respondents from a wider range of age groups than planned (see Figure 5.7), including people who had not necessarily grown up with ubiquitous internet and mobile phone use. We ran the questionnaire in one West European country, a Scandinavian one and two Central and East European countries in an attempt to identify possible cultural differences. 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 a range of different types of question: multiple choices with one or several choices, rating questions and open questions, and run in the national language of the student groups. It also gathered identification data about the questioned students. These data (Figure 5.7) aids us in our tentative attempt to identify different cultural and gender characteristics of the digital students (Andone et al., 2006b).

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. In addition, the answers were often expressions of preference and there was some latitude for different interpretation of what the questions meant (Andone et al., 2006a). At the same time, the advertising of the survey in
some universities (from Finland and Hungary) was done in an obscure web location, which led to the low response rate. The results from these two countries were therefore only considered for qualitative analysis. This was an exploratory survey, not an experiment, and the results should only be considered as indicative.

5.3.2. General results

The first results and analysis of the UK survey are presented in (Andone et al., 2005a) and the partial results of all the surveys in (Andone et al., 2006b). Here we try to identify the general characteristics of digital students and the differences and similarities between the different countries. The results were analysed following four main themes: the use of technology, communication, the need for control and the use of eLearning environments.

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 (Figure 5.8). These results appear to be consonant with official Eurostat results in 2003 (Eurostat, 2003, 2004, 2009, 2009 #40) and with EDUCASE results (Oblinger, 2003, Oblinger and Oblinger, 2005) and also with a major UK survey of young people's use of media (Livingstone and Bovill, 2001).

These students can be considered early adopters as their starting point for the computer use and the Internet (Figure. 5.9, 5.11) matches the time period of the high global boom on computer and Internet use (Eurostat, 2003, 2004, 2009, 2009). Their use of computers and Internet began at a much earlier age then their predecessors, who used the new technology of their days (the generation of the ‘60s started using the telephone much later in life (Negroponte, 1996) and there are almost no differences between the Western and the East European students.
These results show that the use of multiple media and technologies is directly connected to their use in education, home and entertainment.

The students’ strategic thinking and level of e-literacy may differ from one country to another as the UK and FI students declare an intensive and for longer use of computers and of electronic games (Figure 5.8, 5.10).
It is also clear that the CEE students are becoming stronger in their ICT use and understanding and they also have jumped several technological steps. They started using the computer, the Internet and the mobile phone at the same time and in just a few years they are using similar tools (SMS, Instant messaging, search engines, online playing) at the same level as their Western colleagues (Figure 5.12).
The results indicate that the students from the Western countries have a higher, more constant use of computers and the Internet than their colleagues from Central and Eastern Europe, which is in accordance with the country statistics of ICT penetration (Eurostat, 2003, 2004, 2009, 2009). However, the Romanian and Hungarian participants use the mobile phone at the same level, even if they tend to use it more for sending text messages (SMS) or playing games (Figure 5.12, 5.13). The large cost differences in the mobile phone use (Boitos, 2004, Vasiu et al., 2002), and a quick acceptance of new digital devices, confirms that in the last years the digital gap between the East and West of Europe have been bridged by young people (Boitos, 2004).

The results indicate a high level of technology use and that technology is firmly embedded in the students’ lives, and is part of their education and also of their social life, at both individual and group level.

**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 (Figure 5.8 and 5.13). 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. This conforms with Livingstone’s results which show the same high use and acceptance of the new communication tools by girls (Livingstone and Bovill, 2001). The students’ claimed online access to learning and training varies from daily to weekly. The high daily use of web search (Figure 5.13) indicates a strong emphasis on search methods, which can be expected to modify the students’ approaches to learning and also their expectations about the learning environment – which should include powerful search engines, not just indices or glossaries.

The survey reveals that the Hungarian and Romanian students tend to use the Internet in cafés as part of their social activity. One reason is that it is common for these groups to meet friends at an Internet Café but it is also due to the continuing high cost of broadband Internet in these countries. Students from the UK and Finland ‘score’ higher in their use of the online communication tools but the gap between them and their Eastern colleagues is smaller than expected, with one tool (chat) being more used by the latter.
It seems an anomaly that, according to Figure 5.13, 5.14, the daily use of mobile phones is lower than the amount of calling or texting daily from the mobile phone. One of the Romanian student’s commented: ‘texting and playing is not mobile phone use as you do not call somebody you just text,’ indicating a clear distinction in perception of the different uses of the facilities of the same device. All the students perceive the mobile phone as a familiar and informal tool. An obvious question then is whether students will accept this tool for educational purposes?

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 teachers the asynchronous model is preferred. As text messaging sits to some extent between synchronous and asynchronous communication, SMS is increasingly becoming the preferred communication tool because of its users’ need for instant response and feedback. But SMS will permit both users to control the message, time, and response method, more than a simple phone call (the instantaneous method of communication), which shows their strong need to control also their virtual space. 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. Even if their social skills have decreased over the years (Livingstone et al., 2005) it is obvious that their level of technology based communication is high, which will influence how they learn and live as found also by Rettie (Rettie, 2002).

Control

Our results suggest that digital students’ need 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 (Figure 5.15). Our surveys also lead us to suspect that their level of control is also dependent on their strategic thinking, developed by their experience in playing games (55 -69% -as an average from all countries surveys- often played computer games). Their need for control is better seen in the answers regarding their perception of eLearning environments.

Students showed some enthusiasm for direct participation and control over certain aspects of the educational process (Figure 5.16). The need for personalized delivery, the need for instant feedback, and the lack of interest in writing or control over content delivery, suggest that digital students want information fast but they want it presented visually and interactively. However, this is far from consistent across the different student groups.
Here we wanted to look at how our subjects’ perceive eLearning and find out how they might react to an online learning environment. We wanted to know
which adaptable and adaptive features are preferred, the learning styles of the new digital students, how they approach text, image, links, and how they think about adaptability.

The results (Figure 5.17) 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 (Beasley, 2004). There is, however, a surprising disparity between the preferences of students from different countries, which shows a completely different pattern from our questions about the need for control.

It would seem that, of the options we presented, students preferred to receive information by email. However, this may reflect their experience in higher education so far, rather than a genuine preference, and this question was examined further in the focus groups. The FI, RO and HU students have spent longer in HE (they are usually from the last years of study) so we suppose that this will reflect their experience more, which perhaps accounts for the more even distribution than in some other graphs.
Figure 5.18: The preferred communication method for receiving information in eLearning

There is little difference between the preferences illustrated in figure 5.19. Slightly higher preferences were expressed for directive activities and information needed to complete tasks. This reflects the students’ attitudes to institutional learning as something directed by teachers.

Figure 5.19: The preferred eLearning services to be received online
Figure 5.20: The preferred eLearning services to be received via the mobile phone

Given the students’ extensive use of mobile phones, it is perhaps surprising that few expressed any interest at all in receiving course information or communications (this is one of the biases of our survey: the question being towards the end of the questionnaire, only around half of the students answered to it). This may be due to two main factors. On the one hand, mobile phones are seen as personal and informal communication tools. On the other, this perhaps tells us more about student expectations of higher education than about their preferences for technology. A traditional university education, especially in the science disciplines studied by the majority of the subjects, is often perceived by both tutors and students as an instructivist activity, involving the passage of information from experts to learners. Mobile phones are typically a poor medium for transmission of large amounts of information, and their role as communication tools may be seen as peripheral in an institutional learning context.
They prefer being involved in subject-related activity, problem solving and simulation, (Figure 5.22) so they have an interest in developing real projects and learning by doing, discovering or from practice. However, the preference is not marked. Again, this perhaps tells us as much about expectations of university learning as it does about the students’ preferred learning style. The results
virtually point to the belief that their preference for experiential learning is a distinguishing characteristic, similar with that of Oblinger’ findings (2005).

As might be expected, students greatly prefer the richness of face to face interaction to any other alternative. Perhaps more interestingly, the fact that they express almost as strong preference for the use of text shows that they are comfortable with text-based technologies, and recognize that complex and intimate communication is possible through these media.

5.4. Focus groups

For an exploratory research, two focus groups were run in March 2005 to gather in-depth, qualitative information, opinions and attitudes about the digital students characteristics. We used them in our broader research as a multi-method study (Greenbaum, 1993) to combine two or more means of gathering data (surveys, observation and focus groups) with none acting as a primary method. 14 participants took part in the study, in two groups, six in the UK focus group and 8 in the Romanian one. Participants were a self-selecting group, recruited amongst the student population of a UK and Romanian university, all of them from the students which previously answered to the survey. The three
female and eleven male participants were of ages 18 to 24, 5 nationalities (English, Greek, Indian, Romanian and Hungarian) and IT backgrounds. They had reached different levels of ICT competence, but the majority studied at different levels subjects in ICT. The interviewer rated the discussion based on an outline drew to follow the same topics as the survey (digital literacy, Internet use, mobile phone use, learning attitudes, visual use, and IT expectations). The informal discussion lasted two hours and was recorded on video and audio for further analysis.

**Focus group results**

A large number of desirable attributes for an eLearning environment emerged, 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 eLearning environment for the digital student will need to use complementary methods and technology and leave the power of choice of the ‘right one’ to the student.

Similar results with the questionnaire results and very relevant are reflected by the usage patterns of technology and of learning attitudes. All the students from both focus groups reported a high use of different technologies for different purposes. They tend to use the Internet search both for educational purposes and also for finding information about their hobbies, they use extensively SMS (mobile text messaging) for contacting their friends and colleagues, as well as IM - instant messaging, and they perceive email as an ‘official thing, for which you contact professors or other people’. As one of the UK students said ‘I do not like email as I never know when people read it and when they receive it’ completed by one of the Romanian’s ‘to read my email I need to get to my computer at home or university when my mobile is always with me and it is open also during classes’. As they all learn in a traditional university with little technological support they found ways to develop their own supporting network: they contact each other via SMS and IM to get assignments done, to support each other in finding resources (mainly on the Web), to meet face-to-face as well as to have last minute information about timetables, classes or university activities; one UK student established a Yahoo briefcase and a
mailing group for his group so they can all share the same resources during working on a project. In the same time, several technical attributes are used less, not all the students used to synchronise their mobile phones with their computers ‘it’s a class differentiation, just us the techies we are doing it’ (said one student from Romania).

Their critical view over the university eLearning environment (the students from the UK focus group use one) about several redundant services and ‘things which you never use’ pointed again to their strong need of control and independence. Their control over the eLearning environment is still limited to the functionality and less over the visual aspects: ‘I want tools as IM and SMS and to see when my colleagues are online, to choose the length of text of a course, to have interactive activities, less interested to change colours more interested to change the text size and the links’ several students expressed. They also express a large desire to have recorded lectures so they will be able to re-listen classes or to ‘catch up missed classes’. More multimedia tools in learning and especially in problem-based activities were requested (‘to have a video to explain how to use a software, just text and screen captures is so, so outdated’).

5.5. Digital students characteristics

The main characteristics of the digital student were identified as a result of this research.

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. The characteristics of the technologically confident digital students were found to include a strong need for instantaneity, a desire to control their environment and to channel their social life via extensive use of technology.
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. They use SMS (mobile text messaging) extensively for contacting their friends and colleagues, as well as IM - instant messaging. They started using computers at a very early age and they are very familiar with the use of Internet or mobile phones. These results show that the use of multiple media and technologies is directly connected to their use in education, home and entertainment.

Treating the Internet and mobile phones as everyday tools means that collaboration is an area of great potential for digital students and they make extensive use of “virtual study groups”. 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. 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. The students’ strategic thinking and level of e-literacy may differ from one country to another as the UK and Finnish students claim a more intensive and prolonged use of computers and of electronic games. They expect to try things rather than hear about them. They want to learn by doing.

The mobile phone is perceived by all the students as a familiar and informal tool. An obvious question then is whether this tool will be accepted by students for educational purposes. Synchronous communication is preferred when students contact one another, while for educational contacts with their teachers the asynchronous model is preferred. As text messaging sits to some extent between synchronous and asynchronous communication, SMS is increasingly becoming the preferred communication tool because of its users’ need for instant response and feedback. Students’ ability to select the ‘right’
communication tool for different purposes also shows their need for control and the development of independent skills.

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.

As a result of their ‘digitalness’, they will have very specific needs and expectations from their learning environments. They will enjoy enhanced interactivity and connections with others and to learn in groups based either in the physical or digital world. They perceive their learning environment 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.

They simply ‘think differently’.

This is a major outcome of the study. It has direct implications for the design of an eLearning environment which ought to include several adaptable elements under direct student control.

The study results played a key role in directing the overall eLearning strategy and influenced some major decisions for designing an eLearning environment for the digital students. The idea, concept and development of the DIMPLE eLearning environment, based on these studies, are presented in the following chapter.
Chapter 6

Shaping and Implementation of the DIMPLE Environment

6.1. Shaping the DIMPLE environment

In the previous chapters I identified digital students and their characteristics, especially those which involve a learning situation. To keep with the adapted socio-engineering methodology, presented in Chapter 4, in the design and development phase, the eLearning environment is designed and developed.

Following the survey and associated interviews, we used scenario-based design methods (Carroll, 2000) as a means of defining suitable e-learning environments for digital students. Based on a conceptual meta-model fed by the results of our initial surveys, we developed the DIMPLE scenario (Digital Internet and Mobile Phone eLearning Environment). DIMPLE was a learning scenario, a description of the progress of the learning situation intended to ensure the appropriation of a precise set of knowledge, formulated a priori as an abstract scenario. It was an open, adaptable scenario which allowed modification or completion by the students who were involved in the focus groups. DIMPLE was continually refined through interviews and focus groups, following our methodology structure presented in Chapter 4. The scenario and the results of evaluation of these scenarios were published (Andone et al., 2006, Andone et al., 2007).
All of these previous results led us to the creation of a scenario for an eLearning environment adapted to digital students. The essence of this scenario contains a blend of Internet and mobile technologies which enhance the student-tutor communication (by instant messaging, mobile phone text messaging), the quick response of the environment to the student needs (by setting up individual settings and accessing information using this system) and the environment’s flexibility (by using a powerful internal search engine).

6.1. DIMPLE Scenario 1

David, 19 years old, is a student in computer science in a European university. He started to use computers when he was 8 and was actively online from 12, and now he owns his own laptop, mobile phone and iPod. In his first days at the university he took photos using the built-in camera of his mobile phone of all the interesting adverts, location of the buildings, labs and of some of his colleagues. At home he transfer it into text/images which he post on his own study area of the eLearning university environment (DIMPLE), at the same time as setting reminders of all important dates on his mobile phone. He transferred from the DIMPLE into his mobile phone, his specific calendar, assignments dates and contact info of his peers and tutors. All of these are mirrored on his laptop, updated several times when he connects his mobile to his laptop, and he gets any changes in calendar and assignments he receives directly from his DIMPLE as a text message to his mobile phone.

When he logged into the DIMPLE he establish his preferred environment by setting up the colours palette, the font types and size; he chose that his preferred links (e.g. his courses) should always come up first, his group working (colleagues) links to come second, and then the links for other areas (e.g. library). He chose what he wanted to be sent to him via SMS regularly (schedule, major announcements, major communication with his tutor/colleagues) and via email (announcements, assignments, group work projects). He also set all major announcements to be sent both via SMS to his mobile and as emails, and the less important ones just as email. He customised his profile in the Instant Messaging section so he can easily get in touch with his colleagues and tutors. Out of his customised profile DIMPLE will recognize which is the most important
information to him, and will adapt to this pattern. David knows that if his preferences change or he doesn’t feel comfortable with some of the initial choices he can change them anytime, and the DIMPLE will re-adapt.

He is able to search DIMPLE among all the courses which are inside the environment by using the internal search engine which allows him advanced search using different variables of words, time and date of the published material and subject area. He can find out about examples of other students work.

When accessing a course he can choose between 3 levels: the general view of the lessons (course module), those lessons which are important for a quick overview of the curriculum, and those lessons which exceed the basic curriculum. During his lesson he can take notes in a separate file (and save it), make comments and see also where exactly he is and how much he has to do in order to finish the course. He chooses to share some of these notes which he consider relevant with his colleagues.

As his first assignment was a group work project, he established the first meeting with his colleagues via SMS and they split the work between them. Everybody is posting his own research results in the common working group area so that everybody can see them and comment via instant messaging. They will start writing the first draft of their project online, sharing the same file and be in constant touch via the instant messaging service. At the end the DIMPLE will email each of them the final result of their work. During the last face-to-face meeting they will agree on the final content.

They are pleased that they can all have now the same work that they have done it in a short time and they enjoyed getting in touch and working with each other. Now even on Friday evening when they want to meet socially they will know which is the best way of getting in touch and which communication method each prefers.

6.2. DIMPLE Scenario 2

Maria, twenty years old, is a student in computer science in a Romanian university. She started to use computers when she was eleven and has been actively online since she was twelve. Now she owns her own desktop computer in her parents house, mobile phone and a mpeg player. In her first days at the
university she took photos using the built-in camera of her mobile phone of all the interesting adverts, location of the buildings, labs and of some of her colleagues. At home she posted these on her own study area of the eLearning environment (DIMPLE). She also set up reminders of all important dates on her mobile phone.

From DIMPLE she transfers into her mobile phone her specific calendar, assignments dates and contact details of her peers and tutors. She would like to mirror these so she has all the date in one place, but multiplied in all her devices. She gets any changes in calendar and assignments she receives directly from DIMPLE as a text message to his mobile phone.

When logged into DIMPLE she establishes her preferred environment by setting up the colours palette, the font types and size. She orders her links (e.g. her courses), her colleagues’ links, and the links for other areas (e.g. library) according to her needs. She chooses what she wants to be sent to her via SMS regularly (schedule, major announcements, major communication with her tutor/colleagues) and via email (announcements, assignments, group work projects). She also sets up all the major announcements to be sent via SMS to her mobile and also as emails, and the less important ones just as email. She customizes her profile in the Instant Messaging section so she can easily get in touch with her colleagues and tutors. Out of her customized profile, DIMPLE will recognize which is the most important information to her, and will adapt to this pattern. Maria knows that if her preferences change or she doesn’t feel comfortable with some of the initial choices she can change them anytime, and the DIMPLE will re-adapt.

She can search DIMPLE for all the information inside the environment by using its search engine, which allows her advanced search using different variables of words, time and date of the published material and subject area. She can find out about examples of other students work.

When accessing a course she can choose between 3 levels: the general view of the lessons (course module), those lessons which are important for the quick overview of the curriculum, and those lessons which exceed the basic curriculum. During her lesson she can take notes in a separate file (and save it), make comments and see also where exactly she is and how much she has to do in
order to finish the course. Some of these notes, which she considers relevant for her colleagues, she chooses to share with them.

As her first assignment was a group work project, she established the first meeting with his colleagues via SMS and during the first meeting they split the work between them. Everybody posted their research results on the common working group area so that all could see it and comment on it via instant messaging. They started writing the first draft of their project online, sharing the same file and were in constant touch via the instant messaging service. At the end, DIMPLE emailed each of them the final result of their work. During the last face-to-face meeting they just agreed on the final content.

They were pleased that they could share the same work and that they have done it in a short time. They enjoyed getting in touch and knowing each others. Now, on Friday evening, when they want to meet socially they know which is the best way of getting in touch and which communication method each prefers.

6.3. Scenario Comments

In previous chapters I have refined the commonly held concept of the digital student to include the need for control and independence in the use of eLearning environments. What technology can we identify as the most digital so the use of it will determine the “digitalness” of our students? Is it instant messaging, sending text/multimedia messages on mobile phones, playing games online or on the phone, learning online, searching for information mainly online, or socialising with the support of technology? Based on scenario and focus group evaluation, I think that is a combination of all of these and that the perceived common benefits of these technologies are a) instantaneity and b) control over the environment. Students want to be able to choose what to do and when and they are demanding it ‘now’.

The scenario was run in two different focus groups with students from UK and with students from Romania. Both focus groups expresses a positive opinion on the scenario and provided information about their habits, which were later included in the scenario (the versions presented here are the improved
ones). From these focus groups results that even though in Eastern Europe students had less access to technology, they were using it now at a similar level as their Western counterparts and their digital characteristics tend to blend.

The study results influenced the overall eLearning strategy of our development. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services. Many scenarios for this type of learning have concentrated on formal learning, presented in a traditional university setting, possibly even in the context of an undergraduate curriculum or class (Beasley, 2004, Tretiakov and Kinshuk, 2005).

Our scenario evaluation suggests that DIMPLE may be more suitable for a blend of face-to-face and eLearning delivery strategies (students’ first preference of contact is the face-to-face, and they still prefer to ‘know’, after meeting in person, their colleagues and then to interact by using technology). Scenarios respond to many of the requirements of the focus groups, as students can choose to take advantage of one device without the other, and scaffold learning opportunities can be provided to suit learner motivation and knowledge level.

### 6.4. The DIMPLE Environment

As a result of previous studies based on the idea of learning ecology an eLearning environment was designed: DIMPLE - Digital Internet and Mobile Phone eLearning Environment. DIMPLE is, in essence, an adapted eLearning environment that contains a blend of Internet and mobile technologies to enhance student-tutor communication (by instant messaging, audio-video conferencing, mobile phone text messaging), rapid response of the environment to students’ needs (by setting up their own settings and accessing information using this system, transferring course objects to mobile) and the environment’s flexibility (by using learning objects other than the traditional text, images and animations, using new educational resources: blogs, podcasting, wikis).

Our design idea for the DIMPLE prototype has six aims:

- to use the specialised device most suitable for the each specific learning task
to use the appropriate physical characteristics and learning affordances of each device both alone and in combination (online and mobile)

to support individuals as well as groups of learners who are or not digital

to allocate learning content to a device that will be most suitable for providing a particular mode of presentation or communication

to provide consistency in terms of look (navigations, icons, words) and feel (learning tasks, activities and contents) across dual devices

to ease the learnability of the overall system

In particular, I will discuss the design issues of the mobile part in the context of interaction with the whole environment.

6.4.1. Dual device architecture

To define the DIMPLE architecture I investigated two possible end-to-end solutions based on a multi-tier client/server architecture consisting of the publish-end tier, the back-end tier and front-end tier for developing the learning support service.

One solution is to develop a learning management system that can be located in the publish-end or back-end tier. This learning management system provides content to both the online environment and mobile devices and also holds learning content or learning objects in a database on the back-end tier (MySQL). In the front-end tier we have the online environment and smart mobile devices. Two way communications can be established between the online environment and back-end tier through the Internet, while mobile phone devices communicate with the back-end tier through the GSM network protocol. For interactive SMS messaging, we use SMS gateway providers. This solution includes a full development, which can be difficult in the existing university learning management systems, which are predefined and already in use.

An alternative solution is to use the existing university online environment, and to complement it with other applications, which are already easily available (yahoo messaging, Skype, etc). The learning content will be
retrieved by the client-based application located in the environment that also provides the API required for content retrieval and presentation to the mobile devices.

As a dual device architecture (online and mobile), mobile phones could play in DIMPLE the role of a companion device that has some specialised features, which may offer more personalised learning materials or communication. Technically both Internet and mobile are capable of displaying and manipulating learning materials. However, each device is different in terms of its strength. It becomes clear that we need to study the capability of each device for supporting a learning task. For example, Internet is more appropriate for delivering course information, picture, videos and audio materials, especially in combination. Mobile phones are suitable for displaying text, information updates, some graphics and some audio files. There are other issues concerning the physical characteristics and limitations of mobile devices, such as screen size, resolution and memory capabilities, which constrain the user interaction possibilities. Interaction styles with mobile phones are limited in various ways: small screens (i.e. amount of data that can be displayed on one screen, as well as the size and placement of graphical, textual elements and navigations), soft key use (soft keys for selection and navigations are different in many phones) and memory constraints.

This is why I designed a dual device architecture (Figure 6.1). To improve the usability and learnability of the overall system we need to take into consideration all aspects of the devices which the students might use.

The DIMPLE dual device architecture includes a number of learning and communication tools, using a dual device interface (online and mobile phone), some of the new features being considered as web 2.0 tools.

Web 2.0, first coined by Tim O’Reilly in 2004 (O’Reilly, 2005) for collaborative, user-centric content production and interactive content access, helps the typical user to contribute. “The user is the content” is the slogan of the Read/Write Web task force. The popularity of Web 2.0 grows within all its applications: the use of Weblogs, Wikis, Podcasts, Social Bookmarking is summarized as Social Network.
In literature Web 2.0 includes (1) social phenomena such as the Web for participation, (2) technology for significant change in web usage, and (3) design guidelines for loosely coupled services. As in many other application domains, Web 2.0 has also merged into the eLearning domain (Alexander, 2006). The application of the Web 2.0 idea in both e-learning technology and methodology is denoted as E-Learning 2.0 by Stephen Downes (Downes, 2005). He mentioned in his article “For all this technology, what is important to recognize is that the emergence of the Web 2.0 is not a technological revolution, it is a social revolution”. This statement means that nowadays the usability of the technology gets simpler and simpler so that we are not forced to learn to use them in a
technological way, but in a social one. These features are part of the DIMPLE ecology.

The DIMPLE ecology combines several features of an existing eLearning platform with newly designed adaptable (layout settings, tailored navigation, selection of communication tools) and adaptive features (personalised calendar and news), enhanced with new social communication tools (Web2SMS, wiki, blog, podcasting, video and audio streaming) and access to external resources for communication (instant messaging and VoIP – Voice over Internet Protocol). As a social, adaptable and adaptive eLearning environment, it is intended that DIMPLE offers students opportunities to learn through methods and models that best support their needs, interests, and personal situations, based on the assumption of an ‘ecology’ of learning. Adaptive eLearning spaces are characterized by the capability of dynamically customising environment features according to the characteristics of each user or of a user model (Brusilovski, 2001) but we should note that, although it is our intention to employ such a system in the longer term, in the short term, until we have a clearer notion of which components would benefit most from this approach, we have opted to make a system that is adaptable rather than adaptive: students control which parts they use and how they use them.

The DIMPLE plan was to be developed and evaluated in an international environment, to be used by students from different universities so I planned a development for University of Brighton, UK and also a development as an eLearning environment for students of the “Politehnica” University of Timisoara, Romania.

6.5. The DIMPLE environment in University of Brighton

To instantiate the new DIMPLE environment we used features of the University of Brighton’s Blackboard®-centred learning management system (Studentcentral), augmented with an Elgg-based blog, wiki and resource-sharing area (Community@brighton), combined with instant messaging and voice-over-IP (VoIP) tools. Technological limitations prevented us from using mobile
phones in this implementation, despite a strong demand from students. Also, as Blackboard is a large commercially licensed LMS, it wasn’t possible to change code, to adapt and to implement new elements. But in the autumn of 2006 the University of Brighton has acquired Elgg (Campbell et al., 2005) which allows for a certain level of customisation and development.

Studentcentral is a student intranet for the university and has links to the online library, the local student webmail service and many other facilities. In October 2006 the University launched its new Community@brighton area of studentcentral which is implemented using Elgg, with a range of custom extensions. Community@brighton is primarily a social networking and blog service for all students and staff at the University. It might be thought of as an ‘online school playground’. Elgg provides a rich authorisation model that allows the owners/creators of almost any object on the system, be it a podcast, a whole community, a blog posting or a comment, to control that has access to it. Whether staff or student, every user has the right to create communities that others may join, which may be moderated or not, and the system is bound together by rich folksonomic navigation tools and tag clouds. Community@brighton is effectively designed as social software in permanent beta.

![DIMPLE interface for the CI131 course at University of Brighton](image)

Figure 6.2. DIMPLE interface for the CI131 course at University of Brighton
I redesigned the CI131 Introduction to Web Design course area in studentcentral by (Figure 6.2):

- Creating a common area for communication sharing (students and tutors to introduce their instant messaging and Skype identification, to send direct messages from the environment)
- Creating a group workspace for each project student group
- Creating a Community@brighton area for CI131 Community which included a blog, wiki, and a resource sharing area (Figure 6.3)

https://studentcentral.brighton.ac.uk/webapps/portal/frameset.jsp?tab_tab_group_id=ci131

Figure 6.3. DIMPLE Community for the CI131 course at University of Brighton

6.6. The DIMPLE environment at “Politehnica” University of Timisoara DIMPLE-CSID

DIMPLE - Digital Internet and Mobile Phone eLearning Environment is mainly a concept built as an ecology of educational resources and technologies, which blend into an learning environment that can be created inside or outside an institutional framework. This concept is based around four main approaches:
communication, adaptive, adaptable and collaborative web (Figure 6.4.). Each of these approaches can be developed or integrated in a university learning environment, either at once or gradually and their existence is always dependent on the use of the students or tutors. Some approaches or tools can be used in some academic moments or learning situations and these can vary in time and instances.

Adaptable and adaptive elements are implemented with software development, and studied on an open source eLearning platform from the perspective of their impact on learning of the new student generation. The DIMPLE environment comprises a selection of adaptable and adaptive features, enforced by the use of new communication methods (Figure 6.4). The environment is now under development and final refinement.
Figure 6.4. DIMPLE concept map
6.6.1. The CSID-DIMPLE development

The DIMPLE development in the “Politehnica” University of Timisoara, Romania was created as the university learning environment for distance education students. Student support is a very important part of a successful eLearning programme (Rowntree, 1998). The support which the “Politehnica” University of Timisoara (UPT) Centre 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 based on (COEDU, 2002), access to the university computers, general information on-site and online notice boards, etc. But recent years have proved that our students need more personal support, which could be tailored, based on DIMPLE concept of providing a learning ecology in the same time with assuring the quality of the education process.

Increased students’ expectations, as well as an increase in the number of online courses, have led to an upgrade of the CSID learning management system. The system integrated web tools are

- progress monitoring;
- communication;
- participants’ administration;
- resource management;
- content development.

The application was based on MySQL, PHP, Apache Web Server, all software used being Open Source software.

The developed system (http://www.csid.upt.ro) was based on:

- an administration system;
- a collaborative system;
- tutor’s and students’ private areas;
- public information area.

The core of the portal was the administration system, which allows creation of new courses and adding new users. The administrator can visualise the course list, and can edit fields such as: course name, course objectives, course content, applications and references.
The collaborative system was based on three asynchronous communication tools: discussion forum, blog and wiki. All communication facilities can be accessed publicly, for information visualisation, or privately through the user account. The tutor’s private area is only accessible after validating the data for a tutor account. Inside his or her private area, the tutor is able to administer courses, to communicate with students and to edit user account data.

CSID-DIMPLE was created in two stages, some features added in a second development phase. The second version of the CSID-DIMPLE portal allows the following options for the tutor in its private area: account editing, message posting, password change, send SMS, course list, course edit, resource depository, students’ information. The student’s private area is accessible through a valid student account, the main options being: account editing, message posting, password change, course list, resource depository, colleagues information.

The second phase of development for CSID-DIMPLE 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 (Andone and Vasiu, 2002)
- Course advice and information
- Collection and distribution of marks
- Student counselling - Forum and mailing list.
- Communication –Forum, email, news (Vasiu et al., 2004)
- We 2.0 tools – blogs, wikis, RSS, file / photos/ videos upload
- Mobile SMS messaging from tutors to students (Vasiu et al., 2008)
- Mobile phone accessibility.

We designed the application as a database to store different kind of data, separated in 12 tables: curricula, courses, exams, planning, presence, meeting, homework, ratings, marks, student, teacher, and communication. (Figure 6.5) 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. Access to the database is personalised for each student, professor, and tutor through a secured password interface. We grant privileges to users only for the database and tables they need to use. The script used to connect on database through PHP was developed in connect_db function:

```php
function connect_db() {
    $db = mysql_connect("localhost", "username", "password");
    mysql_select_db("database"); }
```

![Figure 6.5. CSID-DIMPLE database structure](image)

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 to easily track a user during each single session on the web portal. This variables are transfered through POST
method to a validation page. If the authentication variables fail, a login page is presented.

If these parameters are correct, a session variable `valid_user` will be registered, and will be assigned a value of `$row->user`

```php
<? if ($user&&$pass ){
    connect_db();
    $query = "select * from teacher where username="$user') and (password="$pass"陈述);"
    $result = mysql_query ($query) or die ("Query failed"陈述);
    if (mysql_num_rows($result)>0) {
        $row = mysql_fetch_object ($result);
        session_register("valid_user"陈述);
        $HTTP_SESSION_VARS["valid_user"]=$row->username;
    } ?>
```

To use session variables, at the beginning of each web page (before HTTP headers are sent) the application call session_start() and session_is_registered ("valid_user") functions. When the user is logged in, each time he tries to access a restricted area, the script recognises a session variable and allows him to access sensitive and adaptable data. The application offers the possibility to terminates the session if the user wants to change its parameters or its adaptive features.

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The CSID-DIMPLE design also implied some adaptable features (Figure 6.6):

- Colour: every user could change the colours of the headings, background and text colour from a selection of 6 colours: green, red, blue, yellow, magenta and black.
6.6.2. The CSID-DIMPLE second development

Some of the new features of CSID-DIMPLE, presented in Figure 6.4, could be synthesized as:

- Students make contributions to content creation;
- Students are collaborating with their colleagues through blog, wiki, RSS feeds, etc, in order to create an educational network based on distributed content creation and shared responsibilities;
- The educational process uses a multitude of content sources (course materials, web pages, audio, video), combined into a coherent learning experience.

In other words, the student is brought to the centre of the learning process. He is no longer simply a receiver for the information given by the tutor, but can control and contribute through simulation, application testing, making associations, etc. His experience is used in creating new content, that might be used for training new generations of students. These could be considered as characteristics of the new learning ecology (Dron, 2007, Mason and Rennie, 2006) or the eLearning 2.0 (Downes, 2005).

The blog is probably the most common form of content creation, becoming the most frequent form of self-expression in online media. In education, the blog can be used both as a non-formal socialising tool and a learning tool, for example by providing posting tasks in order to solve a problem (Mason and Rennie, 2008). Comments received can be used for measuring students’ reaction, adding in this way a collaborative dimension to a tool that is normally used individually (Wheeler, 2006).

The wiki concept was for a long time the embodiment of online collaboration. In education, the wiki has the same role, by making available a collaborative, asynchronous tool, through which the students are learning to collaborate in order to fulfil a task – usually set by the tutor (Ebner et al., 2008).
The chat (or the Instant Message – IM) is the solution used when synchronous communication is needed in order to provide effective learning (Kirkpatrick, 2005). Due to the mainly asynchronous character of distance education (at the same time one of its main advantages), it is important to plan a chat session well in advance, or with the new features of user status, it can happen ad-hoc, at any user’s instigation. The communication is usually done through text messages, through a web platform accessed through the browser, or by using a dedicated software tool (such as MSN Messenger, iChat, Yahoo Messenger, GTalk, Skype, etc.).

The CSID-DIMPLE blog had four different areas (Figure 6.7):

- **Personal** – all users have full rights (commenting, posting, creating new subcategories); the purpose is to create an area for sharing personal thoughts and for discussing subjects not necessarily linked to education;

- **Courses** – area predefined by the administrator, where the categories / subcategories are linked to the CSID learning activities; users are allowed to post articles on the categories corresponding to each course;

- **Administrative** – aimed at posting general information, usually announcements;

- **Projects** – area accessible only for tutors, to share and discuss ideas on the projects they are involved in.

The blog area allows published article enrichment by text formatting using an interface such as Rich Text Editor (RTE) or "What You See Is What You Get" (WYSIWYG) (Barrett et al., 1994). Each visualised item can be marked by the user as "favourite", for faster future updates. The blog tool had been implemented on the existing CSID, based on the PHP/MySQL technology, the resulting pages containing HTML code, CSS and JavaScript elements. The mechanisms for ensuring an access based on authentication, for the creation of new articles and comments, and for adding new categories and subcategories inside the predefined sections had to be designed.

The existing database had to be modified by adding five new tables:

- A table for maintaining the structure of categories and subcategories (respectively as belonging to a certain section);
- A table for managing the categories aimed at courses;
- A table for storing the articles themselves (with reference to category, author, creation date, etc);
- A table for the comments archive;
- A table for registering articles marked as favourites by the users.

Each category from the arborescent structure, for the blog, represents a link towards a list that contains all articles in that category (Figure 6.7). The subcategories are created dynamically, according to the privileges allocated to each type of user.

Once the articles’ organisational structure had been created, the interface for posting new interventions in the blog was designed and developed, according to Figure 6.8.

The requirement to allow enriched text creation (with lists, images, etc.) has been fulfilled by integrating a free RTE, widgEditor. The facility to add /
remove articles form the “favourite” list was also implemented. Figure 6.9.
shows an example of article, along with an already existing comment, the editing
area for adding a new comment, the list of available categories (left) and the list
of Favourite articles (right).

6.6.3. The CSID-DIMPLE podcasting development

The previous studies reflected an increased use of podcasting devices by
students, as well as a significantly growing need for mobility by digital students.
A development was initiated in CSID for publishing learning content on mobile
deVICES using the podcatching technology. This way, students would have the
possibility to access, re-listen, re-watch courses and / or learning material
directly from a mobile device of their choice (smart phone, mp3 player, PDA, iPod). (Vasiu et al., 2008). In the podcasting module tutors can upload, modify
and delete learning content (audio, video, doc, PDF), add and/or restrict access of
specific groups to a course; students can subscribe through a RSS feed to the
tutors’ channel so that they would be notified with every new update – Figure 6.10.

Students receive a username and a password and they have automatic access to the courses corresponding to their year of study. There is also the possibility to attend other courses, if the tutor allows it. So far they cannot upload their own material or modify the existing material. They can only visualise the audio video content, download it or subscribe to a course channel.

6.6.4. The CSID-DIMPLE mobile development

Two extensions for adapting the CSID-DIMPLE to mobile technologies have been developed in order to increase the speed and flexibility of accessing the information needed for both students and tutors.

CSID-WAP

The first extension, known as CSID-WAP, offers to users the possibility to access the CSID site information through their WAP (Wireless Application Protocol) compatible mobile devices (Figure 6.11). CSID-WAP uses the same database as the main application, using WML (Wireless Markup Language) files (Dornan, 2002) and connects the gateway to the Apache server. The CSID-WAP
allows multiple connections in different mobile standards and it has two modules, according to the type of users: tutors and students (Figure 6.12). The access is not public, being conditioned by a valid user account.

The tutor type of user is allowed to access:

- list of courses (including info on the number of students enrolled to each course module and other course details);
- course depository (including info on exams, activities, marks);
- information on tutors (contact data);
- user account information (including password change, contact data update).

The student type of user is allowed to access:

- list of courses on which he’s enrolled (including info on tutors’ name and contact data, number of ECTS associated to each course);
- info on activities and exams (including day, time and location);
- academic record (grades, etc);
- colleagues contact data;
- user account information (including password change, contact data update).
The second extension is known as CSID-Web2SMS and offers for tutors the possibility to use SMS (Short Message Service) services, especially for managing urgent communications (change of the time schedule, submission deadlines reminder, test results announcements, etc). Tutors are allowed to send text messages to students that have provided a mobile telephone number for contact, by using the Web interface. The CSID-Web2SMS extension has two main roles: SMS traffic administration (including receivers’ contact data) and linking to the SMS gateway management.

Messages can be sent to a group of students (usually based on course enrolment groups) or to individual students. The tutor can select how he wants the message to be sent. Each student introduce his own mobile phone number voluntarily, being warned that he will receive text messages from the university; the tutor can not see the student’s phone number, as the tutor selects just the
student name (Figure 6.13). The university has acquired a number of SMS from a third party provider and via the SMS gateway management interface connects directly to the company gateway. Each tutor was allocated a number of $n \times 10$ text messages, where $n$ represents the number of students enrolled in each class.

![Figure 6.13. CSID-DIMPLE Web2SMS](image)

6.7. Observation on DIMPLE

The DIMPLE environment developed in this research was intended solely to demonstrate the feasibility of DIMPLE ideas and concepts described in this thesis concerning the use of dual device architecture as a way towards a learning ecology. There were several technical restrictions in the development:

- Proprietary, commercial LMS as Blackboard with very limited access to customisation or adaptation
- The vast IT development required by such an environment
- Software or hardware limitations in each university in term of resources available to myself.
As all of this development needed to be done in time for the academic year and because of the need to be precise and well developed, to assure the standard IT quality required by both universities, at several stages in the development the author had the technical support of the Multimedia Centre team in Timisoara.

To evaluate DIMPLE as an environment and concept several studies have been performed in both universities, University of Brighton, UK and “Politehnica” University of Timisoara, Romania. The results of these studies are presented in the following chapter.
Chapter 7

Results from the DIMPLE Implementation

7.1. Using DIMPLE

In the previous chapters I analysed the need for a DIMPLE environment to be developed and also the development structure. As DIMPLE (Digital Internet and Mobile Phone eLearning Environment) is a dual device interface (online and mobile phone) which needed to be tested and evaluated in real academic situations it was developed not as a single technology but an ecology of complementary technologies and furnished with a number of learning and communication tools.

In this chapter I will present the results of three different studies implemented in two universities in two countries which will involve different structures of DIMPLE.

To be able to evaluate DIMPLE ideas and principles I needed to introduce DIMPLE in normal university courses and have it used by both “digital” and “non-digital” students. This proved to be challenging from three different aspects, all of which were apparent from the initial planning:

- Management: it is very difficult to obtain university approval to change the online academic environment for a number of students, and to be able to plan large technical implementations which will require changes in ICT policy, deployment and management
- Technical: in 2005, the vast majority of universities used (Johnson and Smith, 2006) large commercially licensed LMS (Learning
Management Systems) which are difficult to adapt or change as there is limited access to their source code

- Academic or Instructional: to introduce students to tools and methods which may impact on their methods of learning and may not provide fair access to all university facilities is contrary to some universities’ policies. To have a control group that will not have full access to all tools, may also be unfair for all students and not within the universities’ policies of fair access to all academic resources.

To overcome these problems, small technical changes and phased deployment to small numbers of students was planned.

In this situation DIMPLE was evaluated in three different studies:

- using DIMPLE in the studentcentral environment: this is a UK study where some features were used and evaluated
- using DIMPLE in the CSID environment: this is a Romanian study with several features evaluated
- using an improved version of DIMPLE as a new CSID environment: a custom-developed DIMPLE environment combining most of the features into a single platform; this is a Romanian study where the environment is analysed in full and the study has also a control group (students who used DIMPLE but without the tutor control of the author)

In conclusion, these results are examined in conjunction as similar tests of DIMPLE as a concept environment.

As part of the research methodology described in Chapter 4 the evaluation of DIMPLE was carried out through questionnaires and focus groups that focused on the usability and desirability of the new tools implemented.

7.2. Using the DIMPLE – the studentcentral environment (UK study)

To create the new DIMPLE environment we used features of studentcentral, the University of Brighton Blackboard®-centred learning management system, augmented with an Elgg-based blog, wiki and resource-
sharing area, combined with instant messaging and voice-over-IP tools. Our main aim was to observe how students use these tools in an institutional educational environment and to evaluate their desirability and effectiveness.

Studentcentral is a student intranet for the university and has links to the online library, the local student webmail service and many other facilities. In October 2006 the University launched its new Community@brighton area of studentcentral which is implemented using Elgg (Campbell et al., 2005). Community@brighton is a social networking and blog service for all students and staff at the University, described by some as an ‘online school playground’. Elgg provides a rich authorisation model that allows owner/creators of almost any object on the system, be it a podcast, a whole community, a blog posting or a comment, to control who has access to it. Whether staff or student, every user has the right to create communities that others may join, which may be moderated or not, and the system is bound together by rich folksonomic navigation tools and tag clouds. Community@brighton is social software in permanent beta that is constantly evolving. How it will develop depends upon how people use it. It is the users who shape this technology.

This study looked at seven level one computing students attempting a group project for the course Introduction to Web Design. We established a course community (blog, wiki and a resource sharing area) on Community@brighton, and enhanced it with synchronous communication tools as students and the tutor shared IDs for instant messaging (MSN) and audio-conferencing (Skype) (Andone, 2008). The Community tools were available for all the 146 students who took part in the course. The communication tools were restricted to the study group (see Figure 7.1.). This study results are fully reported in (Andone et al., 2009).

The Community area was very active. The blog proved a popular place for students to ask questions (to which the tutor or other colleagues answered), and to share thoughts and reflections over the course subject and their work in the project. Over 40% of students took part in the blog discussions and 6 other students’ established independent blogs for the same subject, restricting access to this community alone.
Figure 7.1. The CI131 Community Blog

For 3 weeks in late November- early December 2006 the CI131 community (with the blog, wiki and resources area) was among the top five most-used communities on Community@brighton (Figure 7.2).
Figure 7.2. The ‘hot’ communities in studentcentral in November-December 2006

For this study, the evaluation of DIMPLE was done through observation and record of activities, interviews and a focus group that focused on the usability and desirability of the new tools experimented here. We studied the impact of the various features on the experience of the new student generation. The environment was used in the normal University CI131 course by groups of both “digital” and “non-digital” students. The usage made of the environment was measured, and qualitative evaluation (interviews) were carried out to establish attitudes and preferences.

7.2.1. Findings from the study group

The usage study followed seven level one computing students attempting a group project for the course. From the 146 students, which were split in 22 groups of 6-7 students, we drew 2 groups who participated in the study. From those 12 students only 7 remained active in the study up to the end (3 dropped the university and 2 failed to show up for the evaluation part). The group that was finally studied contained heterogeneous students with different cultural background, nationalities, ages between 18 – 24 years old and ICT skills. This group shared IM and VoIP IDs. Interestingly, a further 8 students established direct contact with the tutor (by searching for the tutor’s id and contacting her directly) through Skype towards the end of the course. The students were not chosen after a test to see how digital they are – the group was randomly but I can consider that mainly the last group is a digital one (they had the initiative to contact online directly the tutor, knew how to find his online identity and are heavy and extensive users of ICT and new technologies and tools). The main conversation topics for these students were similar to those belonging to the study group: support on doing their project work, on understanding how to use a software package that was a course requirement.
During the focus group students declared that they perceived email as an ‘official thing, for which you contact professors or other people’. As one of the UK students said ‘I do not like email as I never know when people read it and when they receive it.’ As they all learn in a traditional university with technological support they have also found ways to develop their own supporting network: they contact each other via text-messaging (SMS) and instant messaging (IM) to get course assignments done, to support each other in finding resources (mainly on the Web), to meet face-to-face as well as to get last minute information about deadlines.

The study group used instant messaging and audio-conferencing (Skype), all synchronous communication tools, extensively to communicate between themselves and also to communicate with their tutor. When interviewed they reported a ‘daily usage’ between themselves and ‘when we needed’ with their tutor (weekly). Based on the tutor observation and record of activities, each student contacted the tutor at least once a week and 4 students more than 3 times per week, using these synchronous communication tools, (Figure 7.3.).

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**Figure 7.3.** Tutor records of IM and Skype activities from software archive
The main topics of chat with the tutor were: issues with software, clarification over the project theme, interesting facts on the course subject. Several times, they shared between themselves and with the tutor last-minute information (articles, news, reviews) about the Internet and Web Design with very interesting and mature reflections (Andone et al., 2007a). An interesting fact indicative of their habits is that 80% of their communication with the tutor happened after 22:00 hours and very little during office hours. One student (an international student from Portugal studying for his first year in England) used this communication with his tutor extensively late at night and beside the normal course related topics he was very interested in sharing information about ICT subjects or ‘what’s new on the web’. During evaluation, in the students’ focus group, the tutor availability at different hours was considered a strong point of this type of communication. (figure 7.4). From the tutor perspective, this availability might be different, as this will require extensive and unusual working hours – I discuss this in the conclusions.
The students also had access in the Community to a resource file area, which was intended by the tutor to enable uploading and sharing of files for their project. Only three groups of students (out of 21) used this facility. When asked the reason for not using it, the majority answered that they use the Yahoo briefcase facility with which they are more familiar. One group (group 3) created another Community area in the same online learning environment where they haven’t granted permission to the tutor. Their reasoning, explained in the focus group, was that they wanted to be able to create the project completely independently; but 2 students from this group contacted voluntarily the tutor on Skype, towards the end of the course. Their ability to choose the familiar and ‘right’ tool for undertaking different university assignments is the outside-institution learning environment which they can create, the parallel world in which they learn and work, and one which was almost always created independently of the tools or university facilities. It proves again their preference for independent, strategic and ‘out-of-the-box’ thinking, as digital students.
UK students’ critiques of the university’s centrally-managed e-learning environment highlighted several redundant services and ‘things which you never use,’ pointing again to their strong need for control and independence. They seek control over functionality, not visual aspects: a typical comment was ‘I want tools such as IM and SMS and to see when my colleagues are online, to choose the length of text of a course, to have interactive activities, less interested to change colours more interested to change the text size and the links.’ These comments came more from the students who used the technology daily to gather information, access studentcentral and Community and used different communication tools.

As a general perception the proposed DIMPLE–studentcentral environment was considered ‘very useful’ and its learning functionality ‘is going to be efficient, you are not duplicating information, it is all linked.’ In the interviews, opinions about identification with the digital student were frequently expressed: ‘I’m like this. I think everybody will like this. I do this all the time.’ An adaptable learning environment was seen as very desirable: ‘it’s good to have it personalised’, ‘it’s good to see when you are online’ and collaborative environments are attractive ‘if I find something useful I will like to share it with my colleagues’ (Andone et al., 2007a).

Our results suggest that digital students’ need to control their online and eLearning environment is directly associated with their high use of technology.

7.2.2. The desirability evaluation of UK Study

We also evaluated the environment for its desirability to the study group of students (digital and non-digital). To evaluate the desirability we used a usability methodology developed by the Microsoft Usability Lab (Benedek, 2002) focusing on the ‘product reaction cards’ method. We developed a large set of word cards that formed the basis for a sorting exercise and more importantly a discussion about the use of the environment. Since there is a bias to give positive feedback in the university relations already established, we made sure that at least 40% of the set consisted of negative words and phrases and tried to make the set cover a wide variety of dimensions. Each word was placed on a separate card and the set was given to the students at the end of the course.
On the first round each of the students was asked to pick the words that best describe their “experience in using the studentcentral, the community area, the blog, and the Instant Message and Skype with your tutor”. The results are shown in Figure 7.5.

The words selected by all the students were: ‘accessible’ and ‘useful’, while all but one selected ‘fast’.

Figure 7.5. Words selected in the first round of the desirability test.
The next test asked them to select five words which best described their experience of using all the components of DIMPLE with their tutor, then to rank them on a scale of one to five (one being the best word to describe the experience and five being the least). The results are presented in tag clouds in figure 7.6. The italics marks the words which were selected as those least appropriate to describe the tools:

<table>
<thead>
<tr>
<th>Accessible</th>
<th>Desirable</th>
<th>Gets in the way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appealing</td>
<td>Easy to use</td>
<td>Hard to use</td>
</tr>
<tr>
<td>Attractive</td>
<td>Efficient</td>
<td>High quality</td>
</tr>
<tr>
<td>Efficient</td>
<td>Predictable</td>
<td>Time-saving</td>
</tr>
<tr>
<td>Busily</td>
<td>Empowering</td>
<td>Inconsistent</td>
</tr>
<tr>
<td>Collaborative</td>
<td>Exciting</td>
<td>Intimidating</td>
</tr>
<tr>
<td>Complex</td>
<td>Fast</td>
<td>Motivating</td>
</tr>
<tr>
<td>Comprehensive</td>
<td>Flexible</td>
<td>Not valuable</td>
</tr>
<tr>
<td>Confusing</td>
<td>Fresh</td>
<td>Organized</td>
</tr>
<tr>
<td>Connected</td>
<td>Frustrating</td>
<td>Usable</td>
</tr>
<tr>
<td>Consistent</td>
<td>Fun</td>
<td>Overwhelming</td>
</tr>
<tr>
<td>Customizable</td>
<td>Forward</td>
<td>Valuable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7.6.** The words selected most to describe the general experience

Using the same method we asked them to repeat the exercise for only the Community@Brighton area. The results were somewhat different from their general experience. “Accessible” and “appealing” moved from a positive to a least used experience (figure 7.7.).
The last test asked the students to repeat the exercise for Skype and MSN. Only four students fully answered and wanted to participate. The other two had contacted the tutor using these methods occasionally but did not consider their experience relevant enough for a pertinent answer. Their selections were limited to a smaller number of words than for the other two instances, which may be partially explained by the smaller sample (figure 7.8).
Figure 7.8. The words selected most to describe the use of IM and Skype experience

It appears from this that the instant messaging tools were considered far from easy to use, yet were overwhelmingly thought to be useful. In this study we tried to investigate the use of a DIMPLE environment by digital students. We must emphasise that the study had a small sample (2 groups of 4 students out of the 175 students of that course module, students in ICT area, and using a simple version of DIMPLE - the adaptive features were not present as the University of Brighton student central did not allow these changes). For testing we used different methods: observation, focus group, interview and the desirability test, which gave the results also presented in this paper (Andone et al., 2007a).

The results suggest to us that an eLearning environment which has the described tools and involves student control leads to greater engagement in the learning process and a higher level of satisfaction of the group which we identified as digital students.

The study results played a key role in directing our eLearning environment development strategy and have influenced some major decisions. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services. A further development of DIMPLE included Mobile phone based services (SMS, calendar) which the students in this study also wanted.

7.3. Using the DIMPLE – the CSID environment (RO study)

“Politehnica” University of Timisoara: CSID-UPT is the university Web portal for providing online support for distance education students (Vasiu et al., 2006, Vasiu et al., 2004). It is a combination of regular student management, Learning management system -COEDU (COEDU, 2002), and web 2.0 technologies implemented recently (blogs, wiki, IM, forum, common workspace area) as well as a mobile phone application. It is mobile phone adaptable, and
has a Web2SMS tool available to all tutors for informing students, and allowing voting from mobiles. The environment, as presented in Chapter 6, had also some adaptable features where students can change the view mode, colours, text size, menu position and order of tools.

This software is in constant beta and evolving, and during the last years it was constantly modified and re-evaluated, and enhanced with new features from the DIMPLE concept.

In Romania the study was performed as several studies:

1. A study which involved 36 students from the distance education specialization Multimedia Technologies taught by myself and which used all the features.
2. A study of the same 36 students from the distance education specialization Multimedia Technologies taught by a colleague in a different course and which had access to all features.
3. An analysis of the CSID-DIMPLE used by all students in distance education in UPT (436 students).

The evaluation of this study was also undertaken as part of the methodology through questionnaires and focus groups that concentrated on the usability and desirability of the new tools implemented.

7.3.1. The study findings – CSID-DIMPLE on DAMM course

In Romania the CSID-DIMPLE study involved 36 students from the distance education specialisation Multimedia Technologies taught by myself within the Development of Multimedia Applications course. We established a course blog, wiki and a resource sharing area (figure 7.9) and students and the tutor shared IDs for IM and Skype. The CSID-DIMPLE tools were available for all the 36 students who took part in the course. The course used also the Web2SMS tool developed and the mobile feature of the CSID environment.

Students used the wiki to fulfil their designated assignment – to create course content on up-to-date topics and to share new and relevant information on the course subject. Students used the blog as a reflective tool for analysing
different topics from the course (e.g. how interactive design works on certain websites?). The major course assignment for students was to create a personal website using different ICT tools taught – a resource sharing and project work area was created, for students to share information and to submit HTML files for checks. Before this new development students had had little contact with the tutors during the semester (just two face-to-face meetings) as all the contact was done by exchanging emails, so they needed to manage to do their assignments alone. All of the students were working full-time in different ICT areas and were located in towns around Timisoara (300km area). In the past, the students’ on-time assignment submission level was very low (around 40% submitted on-time and another 30% submitted later in the same academic year, the rest passing the course in the following years).

During the study period students contacted the tutor regularly by using instant messaging tools, shared information and had good statistics track in using the project resource area (80% used it weekly with 87% using it daily in the period before the assignment submission).

The blog and the wiki were very active CSID areas, used by about 90% of the students and 21 students contacted the tutor regularly (2-3 times a week) by using IM or Skype. For example during the first week of study students had an immediate positive reaction to the use of instant messaging and the tutor had 12 chats with 8 students about their project work. The students also used instant messaging to discuss between themselves considering this as a better communication between students (‘I chat with colleagues which I haven’t spoken with before’).
Figure 7.9. The Blog and wiki in CSID-UPT

![Blog and wiki in CSID-UPT](image)

Figure 7.10 Instant messaging and Skype communication between students and tutor in Romania

![Instant messaging and Skype communication](image)
It is worth mentioning that the majority of the instant messaging and Skype connection with the tutor took place in late afternoons or evenings and sometimes at midnight, a similar situation with that from the UK study.

They also sought control over functionality, not visual aspects: a typical comment was ‘I want tools like IM and SMS and to see when my colleagues are online: I want to choose the length of text of a course: I want interactive activities: I am less interested in changing colours and more interested in changing the text size and the links.’ An adaptable learning environment was seen as very desirable: ‘it’s good to have it personalised’, ‘it’s good to see when you are online’ and collaborative environments are attractive ‘if I find something useful I will like to share it with my colleagues’. Our results suggest that digital students’ need to control their online and eLearning environment is directly associated with their high use of technology.

We also evaluated the environment for its desirability to the study group of students (digital and non-digital), based on the usability methodology developed by the Microsoft Usability Lab (Benedek, 2002), similar with the other studies and translated into Romanian.

On the first round each of the students was asked to pick the words that best describe their “experience in using the CSID, Web2SMS, and the Instant Message and Skype with your tutor”. The results are shown in Figure 7.11.

![Figure 7.11](image-url). The words selected most to describe the general experience in Romania
Students considered DIMPLE as ‘accessible’, ‘useful’ and ‘time-saving’ as the most positive words which indicates both their ready acceptance of new features and their desire to use them. But ‘fun’, ‘fast’ and ‘easy to use’ were considered as least apt in describing the experience in the Romanian desirability test, which may relate to their lack of confidence in using these sorts of tools in an educational environment. The Romanians considered the use of these methods as ‘time-saving’ (they are distance education students with little face to face contact) as well as ‘collaborative’ and ‘flexible’ which was encouraging for our study. During interviews all students appreciated the ease of communication between themselves and the tutor, as well as the ease of finding valuable information to fulfil their tasks. I must emphasise that the desirability test involved a relatively small sample - 21 out of 36 students in DAMM course in Romania, and all students in the ICT area.

In Romania we were able to track each student’s access and use of the different facilities (figure 7.12). The most used were Skype and podcasting (they could download audio/video files with lecture recordings, from the resource area), followed by the blog and wiki. Not surprisingly, email lost first position (seen in 2005 questionnaire (Andone et al., 2007b)) to instant messaging and mobile phone texting which became the preferred methods of contact between students as well as with their tutors.

The study also involved the analysis of students’ use of Skype and MSN as well as mobile phones facilities (Andone et al., 2007a). It appears from this that their instant messaging tools were considered far from easy to use, yet were overwhelmingly thought to be useful and time-saving.

![Figure 7.12](image)

**Figure 7.12.** The student’s use of different facilities in Romania during the DAMM course
The use of Web2SMS

The study also involved the use of the Web2SMS facility developed in the CSID_DIMPLE. The tutor had the possibility to send individual or group text messages to students enrolled in her classes (figure 7.13). The tutor could do this without any limits, and it was used as follows:

- 6 times the tutor sent groups SMS to all students enrolled in the DAMM course: to notify about the face-to-face meetings, reminders about the project and assignment deadline and the exam
- 3 messages sent to 6 students who delayed their assignment submission

![Figure 7.13. The use of Web2SMS in Romania during the DAMM course](image)

During the study, good overall results were noticed regarding both students’ grades and their response to this kind of technology. They responded promptly to the requests of the tutor and carried out their duties accordingly (85% of students handed-in assignment on time compared with the 40% normal response). Attendance at face-to-face meetings was also higher as students received a reminder via SMS 3 days before the date.
During the final evaluation, in the focus group when we asked the students their opinion on this service their answer was very positive: “importing dates into the mobile phone, the SMS service, the common working area were great”, “it was very useful that the tutor sent me all the information directly as a text message, especially changes to timetable, what you should do and when, reminders about assignments”, “the SMS is the most important for us and every student use it because we liked to have information coming to us, not to go chasing secretaries or to go to the faculty just to see a date”, “using SMS is simple and we all have our phones with us all the time, it is a very good and practical idea the university to use it with us”, “it is efficient”. The use of this implementation proved to have a high motivational value for students and increased the students academic results and retention, proving to be an important learnability factor of the CISD-DIMPLE.

The use of podcasting

The CSID-DIMPLE had the facility of publishing learning content on mobile devices using the podcatching technology. This way, students would have the possibility to access, re-listen, re-watch courses and/or learning material directly from a mobile device of their choice (smart phone, mp3 player, PDA, iPod) (Vasiu et al., 2008). Only the tutor of the DAMM course recorded course sessions and published this online (Figure 7.14), and out of 8 recordings just 2 included also video.

Figure 7.14. The use of podcasting in Romania during the DAMM course
For evaluation we used the desirability test and we also asked students their opinion (Figure 7.15). All 36 students accessed all the podcasts with 40% accessing them in the week immediately after they were posted, the rest in the week before the exam. All students considered this to be a valuable tool in listening again to course sessions and helping them in studying for the exam. But podcasting was only used by 25% (9 students) on mobile devices, the rest listening to them on computers or directly online. Two students listened to them in their cars.

<table>
<thead>
<tr>
<th>Accessible</th>
<th>Desirable</th>
<th>Gets in the way</th>
<th>Patronizing</th>
<th>Stressful</th>
<th>Appealing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to use</td>
<td>Hard to use</td>
<td>Personal</td>
<td>Time-consuming</td>
<td>Attractive</td>
<td></td>
</tr>
<tr>
<td>Efficient</td>
<td>High quality</td>
<td>Predictable</td>
<td>Time-saving</td>
<td>Busy</td>
<td></td>
</tr>
<tr>
<td>Empowering</td>
<td>Inconsistent</td>
<td>Relevant</td>
<td>Too technical</td>
<td>Collaborative</td>
<td></td>
</tr>
<tr>
<td>Exciting</td>
<td>Intimidating</td>
<td>Reliable</td>
<td>Trustworthy</td>
<td>Complex</td>
<td>Familiar Inviting</td>
</tr>
<tr>
<td>Uncontrollable</td>
<td>Comprehensive</td>
<td>Fast</td>
<td>Motivating</td>
<td>Simplistic</td>
<td>Unconventional</td>
</tr>
<tr>
<td>Confusing</td>
<td>Flexible</td>
<td>Not valuable</td>
<td>Slow</td>
<td>Unpredictable</td>
<td>Connected</td>
</tr>
<tr>
<td>Organized</td>
<td>Sophisticated</td>
<td>Usable</td>
<td>Consistent</td>
<td>Frustrating</td>
<td>Overbearing</td>
</tr>
<tr>
<td>Stimulating</td>
<td>Useful</td>
<td>Customizable</td>
<td>Fun</td>
<td>Overwhelming</td>
<td></td>
</tr>
<tr>
<td>Straight forward</td>
<td>Valuable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7.15.** The words selected most to describe the podcasting experience in Romania

Students considered the podcasting tool positively as: very useful, efficient, valuable, fun, attractive and easy to use; and very few described it as fast, sophisticated, frustrating or hard-to use (negative words). We can consider that students appreciated positively the podcasting tool, with several expressing the need for it to be extended to all courses. The use of this is not difficult from a technical point-of-view (the online tool is already developed) but it is expensive and very time-consuming for the university, requiring extra server storage, multiple filming and recording facilities, and staff to record and edit the material to transform it into usable podcasting learning objects.
7.3.2. The study findings – CSID-DIMPLE

All of the new features of the CSID-DIMPLE were available for all students in distance education in Timisoara. The study implied an analysis of how the same 36 students in the specialisation Multimedia Technologies used similar tools but in a different course with a different tutor, a course in Multimedia Programming (PMM). The tutor was not made aware of this study before the analysis and nor were the students (the permission was asked just after the course finished in order to reduce the bias use of the environment as to please the developer, when all participants were informed about the research purpose and the confidentiality settings), so the evaluation is based on the environment statistics and on the interviews performed at the end of semester.

The results are presented in Figure 7.16 as a comparative graph which also uses the results from Figure 7.12. All of the new features (instant messaging, blog, wiki, SMS, Skype, podcasting, forum) were used more by students during their activities in the DAMM course than in the PMM course. The most used feature during the PMM course was email (both tutor and students can send messages via emails directly from CSID-DIMPLE to individuals or groups) which was used by tutors to inform students about their homework, projects, deadlines and the students submitted their assignments.

![Figure 7.16. The student’s use of different facilities in Romania](image)

The instant messaging was the next most commonly used feature by the PMM tutor and students for direct questions on technical and programming issues, support for fulfilling the course assignments and the programming project. The Web2SMS feature was used extensively by the tutor to inform
students about the face-to-face meetings, reminders about the assignments deadline.

The tutors used instant messaging with some students who contacted them with questions about assignments; this happened usually during the lunch hour, as the PMM tutor was not online on IM only during office hours. Students declared that they used instant messaging a lot between themselves to share information about the course assignments.

Students considered using CSID-DIMPLE as easy to use, useful: “We had the possibility to communicate with students and tutors at any hour, using usefully our time”, “easy to use, quick and comfortable”. One student declared: “the blog tool is not working really well on CSID, as the information which I entered I couldn’t customise as I want and in wiki it didn’t looked as I wanted”, so for some advanced, digital students the need to control and customise is even higher than the extent to which it is provided for by CSID-DIMPLE.

7.3.3. The study findings – CSID-DIMPLE usability

As part of the CSID-DIMPLE evaluation, for the general use of all 436 students enrolled in CSID, we analysed the statistics on the use of different tools and we performed IsoMetrics, a testing of software usability, based on ISO 9241/10 standard (University of Osnabruck, Germany) (Gediga et al., 1998). The IsoMetrics procedures are relevant for a summative evaluation (for a tool which is in use) and for formative evaluation (for a tool still in the software development cycle), both evaluations being part of the evaluation methodology established in the Chapter 4. As already stated the CSID-DIMPLE environment is in a permanent beta that is constantly evolving, as part of the learning ecology concept, how it will develop depends upon how people use it. It is the users who shape this technology, so the IsoMetrics evaluation is an appropriate and useful evaluation method of usability.

We used IsoMetrics in the CSID-DIMPLE evaluation to investigate the user-friendliness, suitability to task, and suitability for learning attributes of the new implemented tools. As the standard IsoMetrics evaluation package is quite
large and checks some functionalities which are relevant for desktop software we adapted the IsoMetrics questionnaires and created a single, much simpler one. The evaluation took place at the end of the 2006-2007 academic year in the “Politehnica” University of Romania and involved distance education students in two specialisations, Multimedia Technologies and Applied Informatics (a total of 436 students), all of whom had access during that academic year to the new CSID-DIMPLE environment. From this just 57 students returned the IsoMetrics questionnaire completed. (Andone et al., 2008)

At first we investigated the CSID-DIMPLE suitability to task by asking students to evaluate on a scale of 1 to 5 of agreement, based on the following statements: (Figure 7.17)

- The functions implemented in the software support me in performing my work
- I perceive the arrangement of the fields on-screen as sensible for the work I do with the software
- Too many different steps are needed to perform a given task
- The software is suited to performing my student activities
- In a given screen, I find all the information I need in that situation
- The important commands required to perform my work are easy to find
- I’m able to adjust the views and access to my various work requirements

Students predominantly agreed with the statement “the software is suited to perform my student activities” and overall, students agreed with almost all the statements. The only statement with which students disagreed was “too many different steps needed to perform a given task”, at the end making also this a positive reaction. The only statement where students had mixed opinions was “in a given screen, I find all the information I need in that situation”, which indicates that more attention to the information distributions, buttons and explanations is needed in future development
Figure 7.17. The IsoMetrics analyse for suitability to task of the CSDI-DIMPLE

Figure 7.18. The IsoMetrics analyse for controllability of the CSID-DIMPLE
Second we investigated the controllability of CSID-DIMPLE by asking students to evaluate on a scale of 1 to 5 of agreement, based on the following statements: (Figure 7.18):

- the possibilities for navigation within software are adequate
- the software makes it easy for me to switch between different menu levels
- it is always easy for me to evoke those systems procedures that are necessary for my actual work
- when selecting menu items I can speed things up by directly entering a letter or a command line
- the application is designed inconsistently so I can’t use it

The students considered most of the CSID-DIMPLE features to be very controllable, as they mostly agreed with the positive statements and disagreed strongly with the negative one, “the application is designed inconsistently so I can’t use it”.

The general use of CSID-DIMPLE

CSID-DIMPLE was used by 436 students enrolled in distance education courses and 50 % used CSID at least once per week and 49-50% used it daily – results over 2 years of 2006-2008 and recording the whole 9 months of the academic year. They accessed the environment in the early morning, at lunch (a high number accessed from work computers and saved the course resources) and in late evenings (a high number submitted the assignments or performed other activities online) (Figure 7.19).

![Access graphs during the day of CSID-DIMPLE](image)
Based on the online statistics and the final evaluation a large number of students used several of the new features of the environment (Figure 7.20). The blog tool has been used in order to create 176 articles, 71 comments, from which 18 have been marked as favourite. Students mainly used the online emailing tool and the forum, but also considered instant messaging and the Web2SMS facility as very valuable. Some of them considered CSID-DIMPLE to be “quick and reliable”, “efficient”, “more accessible to us and easy to use”, “it is so simple that anybody can use it”, “living at a distance [from university] this is very helpful”, “the courses are more interactive”. It must be stressed that both tutors and students had the ability to use openly all the tools, based on their choice; tutors had a minimum exposure to the tools (one hour at the beginning of the semester) and students received no training or presentation. The environment was just made available to them at the beginning of the semester as I wanted to see how they would react and how/when/why they would use it.

The CSID-DIMPLE was also adaptable: every user could change the colours, font and the block appearance. But this proved to be used by very few (5 tutors and 19 students) and just at the beginning of the semester. It is possible that even if digital students want to control their environment, too many choices are either ignored or seen as excessive.

Figure 7.20. The general use of different tools in the CSID-DIMPLE
Another facility provided by the CSID-DIMPLE was the possibility to access existing information using WAP (Wireless Application Protocol) compatible mobile devices. Some of the students and tutors used the CSID-WAP module, but only a very few (4 tutors and 41 students) and those only seldom. It was clear that mobile access to the environment is still not in demand, mainly because of the lack of WAP enabled mobile phones and the cost of mobile Internet in Romania at that time.

7.4. Study results comparison

If we compare the University of Brighton and the “Politehnica” University of Timisoara study results some interesting ideas emerge. In both studies the students considered DIMPLE to be ‘accessible’, ‘useful’ and ‘efficient’. But while in the UK study positive words were also ‘fun’, ‘fast’ and ‘easy to use’, these were considered as negative in the Romanian study, which may relate to their lack of confidence in using these sorts of tools in an educational environment. The main difference between the two groups of students is perhaps this: the Romanians are less independent, less pro-active and they see education as a compulsory process where the relationship between the student and tutor is constrained and rigid. During interviews all students appreciated the ease of communication between themselves and the tutor, as well as the ease of finding valuable information to fulfil their tasks.

Students got used to contacting tutors when they were online, and this happened at any time or at any place. During the DAMM course, it happened once while the tutor was presenting results from this study at a conference. Tutor availability at extra late hours was appreciated by the students, but this obviously puts extra pressure on the tutors’ working schedules.

During the evaluation of the new version of the CSID-DIMPLE environment which was used over a whole academic year in a Romanian University we explored whether giving digital students what they want will also give them the rich learning experience that they need. The results indicate that some of the new IT tools were used extensively and were considered desirable by the students and some not. The synchronous methods of communication (instant
messaging and audio-conferencing) were among the most used and desired with a clear added value to the learning results. The web2SMS tool was one of the most successful (used by 91% of the tutors) and it proved suitable for learning by the added value in students fulfilling their academic assignments (the overall submission rate increased from 46% to 87% after deadline reminders were sent via SMS).
Chapter 8

New developments of DIMPLE in ViCaDiS

8.1. Why ViCaDiS?

In previous chapters I have analysed the need for development and evaluation of a DIMPLE environment as a Digital Internet and Mobile Phone eLearning Environment. As a result of this research, in March 2007, I submitted a proposal for project funding under the European Union LifeLongLearning call, which was selected for funding in September 2007. Although this project was a partnership, I undertook the main role in shaping the work of ViCaDiS.

This chapter describes the main ideas of a collaborative project between 6 universities from the European Union to develop a common online learning environment enhanced with web 2.0 tools for supporting online international academic co-operation: ViCaDiS – Virtual Campus for Digital Students.

The project is based on all the previous research described in this thesis and the concept that underpins my 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 organise their knowledge outcomes’. This conceptualisation 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-centered 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). We planned to extend this concept by the development of an international virtual campus where several universities would join in creating an open space for formal and informal learning. This campus allows international co-operation between students and tutors in creating common project work, self-assessment exercises, and multiple examples for the improvement of formal learning. Participants are also able to co-operate in creating a common space for sharing information and knowledge about subjects related to academic life and broader EU values (Erasmus mobilities, cities, countries, travelling, studying in EU).

In **ViCaDiS (Virtual Campus for Digital Students)** a wide range of Open and Distance Learning actors from EU countries (Romania, Italy, Finland, Hungary, Lithuania and UK) focussed on developing an innovative approach for enhancing international eLearning by moving the strength from the institutional learning environment to the personal learning environment (PLE) with focus on students. It produced an instructional or pedagogical shift inside university eLearning moving the focus from the education materials and technology to the user-student, and to user-generated content.

The partners in ViCaDiS were:

- „Politehnica” University of Timisoara - RO - co-ordinator,
- Università degli Studi di Palermo - IT,
- Baltijos edukacinių technologijų institutas – LT,
- University of Miskolc – NHRDEC – HU,
- Oulu University of Applied Sciences, School of Engineering – FI,
- University of Brighton – UK,
- Visioni di Caro arch. Ernesta – IT,
- Euro-Contact Business School – HU,
- Bridgeman – RO,
- JME Associates –UK.
8.2. The VICADIS Environment

The results of this evaluation was published in (Vasiu and Andone, 2011). The main scope of ViCaDiS was to provide an accessible and attractive environment for all students within the Member States, using already existing tools enhanced with new tools wanted by the new generation of students. By providing students the tools which they use anyway extensively outside the institutional framework of learning (wiki, blogs, forums, IM, podcasting, RSS) ViCaDiS supported the learning attractiveness of the university curricula, and was intended to improve the quality of the learning process by encouraging the exchange of information/knowledge between students from different universities while reducing university drop-out or student de-motivation for learning. It was also intended to produced a instructional or pedagogical shift inside university eLearning, moving the focus from the education materials and technology to the user-student, and to user-generated content.

ViCaDiS is an interoperable dual-device (Internet and mobile phone) environment which brings together partner universities into one single place as they are already using different eLearning environments for distance education or blended learning which is either open source (Moodle) or large Learning Management Software (LMS) (Blackboard). Some of them are using social software to improve the education level of students and to create an integrated online ‘community’. The virtual campus encompasses the partners’ experience in using or developing these eLearning environments and provides a unique set of Open Educational Resources (OER) (Atkins et al., 2007) desired by the digital students. The OER mainly concentrate on tools that allow a user-content driven environment where students move from being simple users to becoming content providers.

ViCaDiS is in essence a ‘community’, a virtual campus that contains a blend of Internet and mobile technologies to enhance student-tutor communication, the quick response of the environment to students’ needs (by setting up their own settings and accessing information using this system, transferring learning objects to mobile devices) and the environment’s flexibility (by using learning objects other than the traditional text, images and animations: blogs, podcasting, wikis).
The ViCaDiS Campus was based around **four aspects of development**: 

- **Technical**: the development of the virtual campus ViCaDiS, as an OER with an interoperable interface, social software implementation and new tools for mobile learning. The interoperability is defined here by the ViCaDiS capacity to give instant access to students from their own university learning environment (which is in these cases Moodle or Blackboard), without any other log in and by recognising their profiles in ViCaDiS.

- **Pedagogy**: to encourage informal learning as a viable method for Higher Education, to change Virtual Learning Environments (VLE) into Personal Learning Environments (PLE), to envisage possible ideas and solution for student-generated educational materials.

- **Management**: to bring a change in the management of VLE with more distribution of responsibility both at a conceptual level (teachers and students as equal participants) and a practical one, allowing joint participation from different institutions in an open, free educational environment.

- **Social and cultural**: ViCaDiS is an online community space, a meeting room where all users (students and teachers) are equal and contribute freely and actively. It uses all partner languages (English, Italian, Lithuanian, Hungarian, Romanain and Finnish) and brings ‘the outside world’ of social media into the ‘education world’ while extending the real world of the student campus into virtual space.

The ViCaDiS Server was multiplied in all 6 universities as a network with partially mirroring information. All students and tutors accessed the environment from the same place, without taking into consideration from which University online campus they migrate (interoperability of ViCaDiS). They saw similar things but all of their information, data and work are stored in their university server. This network of servers was a project challenge as it needed to
overcome barriers in data protection, in student work or course material copyright, all subject to internal policies of each of the 6 universities involved.

The ViCaDiS content is subject and interest based and is mainly in conjunction with their curricula but it supplements rather than replaces the normal curricula. The students are able to access ViCaDiS free-of-charge just by proof of their student status.

The ViCaDiS core structure is around the ‘groups’ which identifies the objects, projects and tasks in (www.vicadis.net/campus):

- language (English, Italian, Lithuanian, Hungarian, Romanian and Finnish),
- university (each university involved in the project and a user can belong to one university group)
- course (part of the piloting: Web 2.0 Technologies, Multimedia Technologies, Technical English, e-learning, practical placement),
- subject (ICT, Web 2.0, graphics, research, social media & nonprofits),
- interests (countries, cities, Erasmus mobilities, studying in EU),
- life (sport, financial issues, travel).

The piloting and evaluation of the idea is based on the activities run within these groups.

The environment can be used by students to learn and work together in structured projects, or simply to find information on their subjects of interest. ViCaDiS is open and free to all students and teachers within the EU.

8.3. Piloting VICADIS

In the ViCaDiS project the development of social media tools layers have been the starting point (see Figure 8.1). In the core of the ViCaDiS Campus we also have a mobile interface. Social media tools not integrated into the learning environment have been considered by adding social media related IDs in user profiles to facilitate ad-hoc use. Pedagogical paradigms, teaching and learning competences, technology related competences, existing culture and available technology are affecting how mobile technology and social tools are used or will be used.
Students need mobile features that support them to keep on track of the learning process and changes in the learning process. Mobile Tools and Social Tools may be available on three layers. The use of Mobile Tools and Social Media Tools can be pre-planned or ad-hoc by nature. It is beneficial to see educational use of mobile and social technologies as an innovation process which includes: discovery of possibilities in learning, teaching and cooperation, developing related resources and implementation of resources to facilitate learning, teaching and related cooperation.

**Figure 8.1.** Mobile and Social Media Tools.

**ViCaDiS Piloting Activities** can be classified into three levels depending on deployment of the main idea of the ViCaDiS Project – the integration of social media tools for student international co-operation at academic level.

- **Level 1: Inter-university cooperation.** This is the most valuable level for ViCaDiS. On this level, cooperation areas on the ViCaDiS Campus have been agreed between universities. Social media based learning and cooperation is partly designed by educational designers and teachers. Social media based ad-hoc cooperation between students plays an essential role. Students can use preselected or other freely available social media tools in their cooperation.

- **Level 2: Educational use of social media inside one course.** On this level, cooperation is restricted to one university and one course on the ViCaDiS Campus. Students can use preselected or any other social media tools in their cooperation.
- **Level 3: Courses without use of social media.** On this level the ViCaDiS Campus is used as a learning environment, but the use of social media is not included.

  Levels 1 and 2 are relevant for ViCaDiS Piloting and testing. Level 3 is not very relevant for ViCaDiS because it does not have a match to the main idea of the ViCaDiS Project. The research is focused on Level 1 and Level 2 piloting cases.

  The evaluation and piloting was based on the socio-engineering methodology, described in Chapter 4, which aims to involve the potential users by incorporating their knowledge in the design process and has a number of interrelated design stages. It mainly consisted of two stages: a stage of analysis which sets up the constraints of the second stage - the design of the new environment. The entire process was based on the idea that “users are important sources of design information and may be partners in the design process” introduced by Sharples (2002). The results were evaluated against initial requirements, but also for usability, usefulness, desirability, elegance, and acceptance by the user groups. The Evaluation strategy is part of the socio-cognitive engineering and is a continuing process. The evaluation consisted of several different stages:

  - testing ViCaDiS against its own requirements, for usability and desirability by users. Technical testing is being done using accredited methodologies from Isometrics and the Usability Lab of Microsoft (Benedek, Miner, 2002).
  - evaluating the ViCaDiS environment against students’ learning attributes and user satisfaction.

  An evaluation of users’ needs will be repeated to seek new user characteristics using the ZEF method and tool (www.zef.fi) which has grown from creative strategic thinking in a web-based environment, a very new and innovative method.

  ZEF Evaluation Engine® collects data and opinions from individuals, who can be organized into groups, enabling information analysis in an innovative, user-friendly, visual manner, and, additionally, providing a genuinely valuable and helpful assessment report. ZEF or Z-scored Electronic Feedback is a statistical assessment method that eliminates perturbations and improves the
accuracy of the interpreted answers. ZEF method allows, in addition to standard open-ended questions, multiple choice-questions, unique choice-questions, question creation:

- on one line (one axis) that enables a single answer, on an axis shaped against two values or extreme situations, and answer scaling with different steps;
- on two axes or 2D that enable a single answer on two axes, each of them containing a different viewpoint of the question and shaped against two values or extreme situations, and answer scaling with different steps.

The assessment of the 2D answers allows X/Y-axis-based evaluation, with the qualitative cross-answer evaluation according to the positioning in a certain square of the graph. Consequently, the most important/positive answers are located in the top right-hand square, the answers pointing to future development areas are displayed in the top left-hand square, while the answers displayed at the bottom left-hand corner, close to point 0 of the graph, will be negative answers or “I don’t know” answers.

ZEF method has enabled evaluation simulated with the gradual evaluation system of Likert Scale type.

The ZEF tool and method makes it possible to evaluate the most effective ways for the project to progress in areas such as tools, services, content, usability, effectiveness etc. The ZEF method includes the "four-square" table and makes it possible to evaluate each item in two-dimensional ways in real time. ZEF reports will guide the project in concentrating on doing the "Right Things Right".

8.3.1. The Piloting Evaluation

We studied the impact of the various features on the experience of the new student generation. The environment was used in normal University courses (Technical English and Multimedia Technologies) and during Technical Placements in Industry by groups of both “digital” and “non-digital” students. Another use for informal learning was to gain information and share experiences of student mobilities between partner universities in the EU ERASMUS programme. Usage made of the environment was measured, and qualitative
evaluation (interviews) were carried out to establish attitudes and preferences. The evaluation process took place until the end of December 2009, when the academic semester ends and the final evaluation consisted of a questionnaire using the ZEF methodology. A Pre-piloting questionnaire was also run.

The Pre-Piloting Questionnaire was divided into three sets of questions: Background Information, Social Media and Tools and Social Networking and Learning.

![Figure 8.2 a) and b): Results of the pre-pilot questionnaire](image)

1 Blogs,
2 Wikis,
3 Podcasting,
4 Forums,
5 Instant messaging,
6 Audio / video conferences,
7 emails,
8 RSS feeds,
9 Social bookmarking,
10 Shared web based calendar services,
11 sharing of learning materials produced by teachers and students

The results are presented in Figure 8.2.a in normalised form and in Figure 2b. in z-scored form (From the top-right corner of the Z-Scored diagram one can see where the greatest potential is; from the bottom-right corner one can see where better competence is needed; from the bottom-left corner one can identify
features where low competence levels have probably prevented recognition of any potential for learning.

The strong use and potential for learning, as identified by the students, for instant messaging and the sharing of resources influenced the pedagogical patterns for the piloting cases.

**Erasmus Mobility Case – outgoing students at OUAS (INMO)**

The Erasmus Mobility case (INMO) was piloted May-December 2009 in order to support students’ outgoing mobility through the ViCaDiS *virtual learning environment*. It offers various *activities* for outgoing students and international coordinators of the Oulu University of Applied Sciences (OUAS). The VLE activities are structured chronologically, and they facilitate the preparation, documentation and reflection of students’ international mobility periods by means of *social media* (Kurkela, et al, 2009).

Students who have been accepted for studies or a placement abroad join the VLE and *prepare a home country presentation* about Finland, which they share as a PowerPoint-*file* in a *forum*. In addition, they update their VLE profiles and thus indicate their abilities to use further social media (Skype, MSN etc.). Before going abroad, students also *prepare a target country wiki*, which aims at developing students’ language and intercultural competence and orientation towards their target country. Students may use various sources such as *texts, pictures, videos, tables, links, and social bookmarks*. At this stage students also establish a *blog* or *learning diary*. The objective of a blog is to facilitate students’ reflection on their learning process. Students benefit from keeping a blog both individually and collectively, as they document their experiences for themselves, and share them with other students and staff members (Figure 8.3).

The students at OUAS found using the ViCaDiS Blog or OU Blog the most beneficial (clearly apart from any other tools used), and Video Aula (which had some videos about the country of their mobility) least beneficial. The successful implementation of the solutions provided in the INMO case requires, above all, an appropriate pedagogical and organisational paradigm or settings through which staff are enabled to guide and support outgoing students and trainees at various stages of their mobility period. In addition, it requires sufficient technical competence by both staff and students and/or trainees as well as technical devices, facilities and infrastructure such as computers, phones,
mobile or local Internet connection, the ViCaDiS Campus’, integrated and additional social media and networking tools for synchronous and asynchronous online activities, or rooms for face-to-face meetings at the home and/or host organisations/enterprises etc.

Figure 8.3. The use of Vicadis features from OUAS Erasmus students

Based on post-piloting interviews, the blogs have served well as learning diaries for some of the students. Some of the participants in the post-piloting interview mentioned that additional group blogs could be used, dealing with particular topics that come up or need to be dealt with for the purpose of individual and collective learning at certain stages of a mobility period. Students and trainees reported in the post-piloting questionnaire and interviews that the INMO design and chronological approach was well structured, but getting used to it required additional effort and time in the starting phase, as is usually the case with VLE’s in higher education and other contexts.

The Students’ Technical placement – summer practice

Technical placement - Summer Industrial Practice course was piloted 29 June - 7 August 2009 at University of Miskolc, and offered for a group of 11
final year BSc students. According to their official curricula, they had to pass a six-week industrial practice period, while working on their individual project work. These project activities were supervised by lecturers of the Department of Mechanical Technologies and were expected to lead to the Final Project Work (or Diploma thesis) of the students, within a very short period, having a strict deadline of 27 November 2009 for submitting the Diploma work. Students were sent to different industrial firms all over the country, and at each firm a local industrial instructor supported their work as well. Students received detailed instructions on how to prepare the summer practice report, but it was also advised, that these documents should be adequate for integrating them into the Diploma work. The Summer Practice reports were due to the beginning of September and evaluated by the academic supervisor. No credit is given for fulfilling this requirement, although it is compulsory for all of the students. A pre-course training in the use of ViCaDiS was offered.

The ViCaDiS pilot case Technical placement - Summer Industrial Practice course area has been structured according to the individual students and their supporting academic and industrial team (Kurkela, et al, 2009). The social media in the course were expected to be used for collaborative learning, supporting each other in understanding, developing their own project work, using jointly developed resource-lists and motivating each other by keeping in touch and consulting on problems, as students usually do in the classroom. Based on the pre-questionnaire the following social media tools were introduced to students for improving the efficiency of project-based learning activity:

Forums and Chat for communication – although students work on individual tasks, they may support each other in sharing information on resources and methodology.

WIKI documents for developing and publishing project report.

Blog, to make records on working process, diary of practical placement.

Students showed high interest in using the ViCaDiS environment tools at the beginning, when we organised a demonstration about its applications and functions. However when arriving at the venue of their technical placement they faced many more technical problems than we had foreseen: in many industrial firms, the internet cannot be freely used by staff members, because of secure, closed intranet applications. Another technical problem was recognised regarding
the use of wikis. Students were aware of strict requirements that had to be followed when submitting their summer practice report, and even more importantly, when preparing their diploma-work. Regarding the time-pressure they suffered from, they found it repetitive to edit their reports both in wikis and later in the requested MS Word format. From this piloting case we should learn that in a very tight, demanding period of their studies students cannot be expected to invest time and energy in using new methodology and tools – they focus on well-known, routine tools and solutions. Moreover the group which has been invited to join this ViCaDiS pilot is the first group learning in an engineering management course according to the Bologna system, and they therefore suffered from many other uncertainties during their studies and from changing requirements regarding the Diploma-work. The timing of this initiative cannot therefore be considered as an appropriate possibility for innovation.

In the future, Summer Industrial Practice courses should be offered only after introducing the methodology within a mid-semester project-work type course; when students become familiar with the wide range of social media tools, they can be invited to apply these tools in their remote project-based work and practical placements. Another necessary preparatory step is to clarify the IT access-policy of the industrial firms, and to inform industrial instructors about students’ requirements in more detailed pre-training. It might sometimes be feasible to offer tutorials as an introductory training and help service.

Another consideration for the future could be to use the ViCaDiS environment for supporting project-based work of students abroad. Mobility programs may include joint research activities involving students from different countries, which may be realised via networking tools before or after physical mobility and placement; moreover, teachers sending their students abroad may get more insight into the activities and performance of their students by using ViCaDiS as a collaborative working area (Vasiu, Andone, 2009).

**The TalkTech’09 course module**

The TalkTech’09 course module was a second edition of the similar project run in 2008 (Frydenberg, Andone, 2009). **TalkTech’09 – Multimedia Technologies** focuses on how computer mediated communication over the Internet may be used to foster information technology and web 2.0 literacy skills
of students enrolled at business and technical universities, while at the same
time, promoting cross-cultural awareness. It is a partnership between first year
business students in IT 101, an introductory information technology course at
Bentley University in the United States, and Bachelor in Telecommunications
students in the Technologies of Multimedia (TMM) course, in their final year at
the “Politehnica” University of Timisoara in Romania, as well as towards the end
of the study period, students in the second year from the University of Palermo,
Italy studying The Use of technologies in Linguistics. These students partnered
over a period of one semester in 2009, to explore a variety of web-based
collaboration and communication tools to create a multimedia presentation on a
topic related to technology, and culture. Tutors introduced the proposed topics
and at the end they needed to present as a group their project result. Their
activity was marked and they earned credits for it. Approximately 12 American
and 37 Romanian and 22 Italian students participated in the project, with six
students per group. All of the Romanian students, who volunteered out of the 75
students enrolled in the TMM course, spoke English comfortably.

http://www.vicadis.net/campus/course/view.php?id=56

The main aim of this pilot was to generate a familiar context for digital
students in which they had to work effectively with international partners in a
project, and to analyse the implications of such an experiment of international
collaboration on digital students.

During this course the students had different tasks to do: to use
multimedia technologies in new ways and to develop a full, multimedia
interactive website. Prior to this project, students in both classes had
accomplished similar technical tasks: they had made personal web pages, posted
online videos, and created PowerPoint presentations; they were web literate;
theywere familiar with social networking sites, search engines, email, instant
messaging, and other applications. The pre-project survey given to both students
groups made it clear that these students belonged to the category of digital
students (Andone, 2008). This project introduced many of them to the virtual
campus and new collaboration tools that many had not used previously.

The goals of this project were to create a virtual learning environment
which encouraged students to:
work with students from another country (Romania, Italy and the USA) to create a multimedia presentation showcasing research on a topic related to technology and culture

choose and use both synchronous and asynchronous computer-mediated-communication tools to communicate with international partners

choose and use Web 2.0 collaborative tools to facilitate and chronicle group process, progress, and collaboration to produce a tangible work product within a designated period of time.

The students’ goal was to use these different technologies to work together to create a multimedia presentation that shared their understanding of a current issue in technology and culture. Sample topics included “what are the mobile phones of the future and why”, “how does the Internet change the way people communicate,” and “how a green computer can be built?” The format of their final deliverables was left open to the students, but could take the form a web page with images, a video, a PowerPoint, or a combination of any of these. By introducing these principles, both course leaders tried to match the ideas of learning ecology (Seely Brown, & Duguid, 2000) and of virtual campuses and open personal learning environments (Andone, 2007).

Social media related competences (by students and teachers) can be either synergy enablers or synergy disablers. Educational designers, teachers and tutors need competencies and experiences from the use of social media services available in the ViCaDiS Campus and also services available outside the Campus. For this we ran a Pre-piloting questionnaire where the students gave their initial feedback about what social media tools they use and how. As the results showed that students used instant messaging, audio conferencing, blogs, and wikis extensively in their life inside and outside the university campus, we focused mainly on these tools to be used in the TalkTech’09.

TalkTech has a News forum where either students or instructors could post announcements, a home page with a description of the project and related milestones, and a groups modules, where students signed up for groups and selected topics. These modules included a blog, a forum, a wiki and an upload section.
The tutor continuously supported the students online during the project. The uploads are available as a common online repository for students to share images, videos, presentations, and other files that they generated as part of their work on this project (Figure 8.4.). Students used their group’s Forum and Blog to present their findings, include links to references or other resources and to embed multimedia that they created as part of the project. Some groups simply provided hyperlinks to their final documents, which were external files or websites.

1. Skype
2. Google Docs
3. Social bookmarking
4. Blogs
5. Wikis
6. Instant messaging
7. Video discussion
e.g. Skype, Adobe Connect Pro
8. Chat

Figure 8.5. The use of Vicadis social media tools from TalkTech’09 students
Of the 16 groups, 13 described on the blog their methods of communication online, the most preferred being synchronous meeting using instant messaging (IM) (such as AIM, Yahoo messenger or Google Talk) or VoIP (Skype) (Figure 8.5). The use of IM was also reported in the open question as being favoured alongside live VoIP, especially by the Romanian students: “it was easier to write then to talk”, and “writing it gives you time to think a bit what are you saying”. Several students also reported that the most important decisions regarding the project work were taken during live IM chats and not in emails. During the instant messaging communication they discussed the division of tasks, organisational details (when to ‘meet again’ and how), "getting to know you", and "difficulties we were facing". Instant messenger conversations focused on several areas: personal relationship building between partners, project management skills (brainstorming and delegation), consensus building (a student proposes a plan to structure the presentation, but another suggests an alternative approach), and technical difficulties. Their liberal use of smiley faces and terms such as “excellent!” and “great!” suggests they formed a collegial relationship.

By placing them in an environment that both required and supported Web-based collaboration, students were able to conceptually understand and fully participate in a process that linked them with international student partners. As one student observed, “Technology can help you communicate no matter where you are in the world. You don’t need to be face to face in order to do a project together.”

Almost all the students found working across time zones and the process of finding compatible synchronous meeting times on their own to be difficult (all 16 groups listed this). Several students had similar sentiments that it is “hard … to coordinate a meeting schedule with 5 different students with different schedules when two of them are 7 hours ahead. We sometimes didn't meet as a whole group but usually had at least 4 or the 5 people present.” They enjoyed the freedom of using any tools they wanted for communication but, as their project result was graded, they wanted to know exactly how their work would be evaluated. Some complained about their work being more complicated and challenging than that of other groups, with a direct sense of competition between them. One Romanian student mentioned that the most important aspect of this project was the motivation to do it and to “show how good you are… to identify yourself with the work you’ve done and the quality of the final product”. The
biggest impact of this project on students was a tangible lesson in the global reach of the Internet and the global impact of technology. Some students noted the differences in language and reported that they had to be careful when communicating with their international partners to be sure everyone was clear on their tasks (full results of the questionnaires at http://kysy.oamk.fi/zef7/reports/1d4a22bab505d28fea405f61eea41670/).

By placing them in an environment that both required and supported Web-based collaboration, students were able to conceptually understand and fully participate in a process that linked them with international student partners. The course leaders observed that almost half of the groups were not sharing their workload equally. The groups that spent the most reported time communicating with each other, or who were gossiping about different issues online, had the most accomplished, structured and comprehensive final projects. Better communication between partners on the same project (“got new friends”), led to better work results even if they never met face-to-face and their communication was entirely online. They all reported that this project was interesting and that they learned “a lot of new things”. They described the experience of using all the instant communication tools to be fast and efficient, as was the pace of the project: “we learned more things in a month that in a year.” They found the project useful and high quality as trying “to use new tools made the project experience better”; TalkTech2009 was a social environment to share ideas with peers, see what others are doing and, as one student said, it “gave them confidence that they are on the right track” with their studies and understanding of technology.

It is significant that the students placed great value in tools that enabled communication not just between themselves but also with the course leaders, who used the same tools to plan this project. This project entrusted confidence into the students’ online abilities and skills especially for using them in an international context.

Throughout the project, the instructors worked to provide support, and to build a common learning-communication environment through the TalkTech module. Despite these efforts, the fact that students sometime found other alternatives (such as in the use of Yahoo Briefcase for file sharing, or tools to create their own websites, or Wikipedia to show cast their result) shows that,
even within a rigid institutional setting, it is increasingly they and not us who create and control their learning ecologies. In a sense, it may be seen that they are creating their own classrooms and project spaces, using the tools and virtual spaces that work best for them. Rather than expecting students to adapt to the spaces we create for them, it is increasingly clear that we must adapt to the spaces they choose to create and inhabit.

8.4. ViCaDiS project results

A final evaluation of the entire ViCaDiS project was carried out during a post-piloting questionnaire, which was delivered to all 443 participants, from all 6 countries, in the final piloting phase. This was based on the learnability questionnaire developed for DIMPLE as well as in the adapted version of the IsoMetrics (Annex F). The full results are available at:

http://kysy.oamk.fi/zef7/reports/160c019d1a3e132a54f0f7ee8ba923e6/

In the ViCaDiS piloting wiki, blogs and chat/forums were used extensively for fulfilling given academic tasks. The Wiki, OU Blog and Chat/Forums were seen as the most important ViCaDiS features for users, according to the post-piloting analysis. They were also included in pedagogical settings of the piloting cases. (Figure 8.5.).

It is clear that students preferred blogs and chats for communicating their thoughts, reflections or working in groups for the same tasks. According to these answers ViCaDiS was considered particularly good at facilitating international communication between students, which was one of the main goals of the project. In some piloting cases students worked internationally in fulfilling the same tasks (the TalkTech’09 and Technical English). This allowed them to get to know each other better and to interact in ways which were not common in their universities settings.
We asked the students which social tools they used the most, and how they rated them for their applicability, and when we compared the results with the pre-piloting questionnaire (the same students 7 months earlier) we found that emails were no longer considered a preferred method, while instant messaging kept its leading position. Google documents, wikis and Skype also scored more highly as being valuable for learning (Figure 8.6). Most of the piloting students were familiar with social media tools, and they considered them appropriate for interaction in an educational environment.
The students also appreciated the high educational value of online video connection with peers or tutors during a course. This tool was used extensively in 2 piloting cases and better academic results were obtained by the group of students that used it. It is significant that the students placed greater value in tools that enabled communication not just between themselves but also with the course tutors. This project entrusted confidence into the students’ online abilities and skills, and especially the ability to use them in an international context (Vasiu, Andone, 2009).

Only some of the piloting students used ViCaDiS through a mobile interface. None of the piloting cases was specifically based on mobile communication, but about 12% of users connected to ViCaDiS via their mobile phones.

One of the main characteristics of digital students is considered to be the control and freedom they exercise in choosing the tools, path, pace, methods, time for learning. Some very interesting comments resulted from the questions related to freedom, choice of learning methods and their importance to the student. (Figure 8.6.)

1. Skype
2. Google Docs
3. Social bookmarking
4. Blogs
5. Wikis
6. Instant messaging
7. Video discussion
   e.g. Skype, Adobe Connect Pro
8. Chat
This section had the most comments from the students, with a large number agreeing that “I think is very important to have a choice to select tools / It's good that we can choose”; “Many students like blogging, chatting and other social software using. However, many students like just discussing in forums or communicating with teacher by e-mail. Therefore we must have possibility to choose the tools that we want.” “Every individual, has a distinct set of characteristics, thus has different needs and prefer different methods of learning. If the freedom is offered to choose, there are much higher chances that everyone participating will have an opportunity to experience a smooth learning process. “ “can contribute to a closer collaboration between students and teachers” “Every student is knowledgeable in his field. By interacting with other students he may share his knowledge and learn from various opinions and ideas.” From these answers we may consider that the students involved in ViCaDiS enjoyed the power of choice of tools, interaction and methods of learning and that they valued this as a positive and motivational learning experience (full answers in http://kysy.oamk.fi/zef7/reports/160c019d1a3e132a54f0f7ee8ba923e6/). Using the IsoMetrics (Gediga et all, 1998) we analysed the usability and the error tolerance of ViCaDiS as a learning environment (Figure 8.7.). From a technical and usability standpoint, it is gratifying that the ViCaDiS environment was

Figure 8.6. The power of choice in ViCaDiS

1. The freedom to select tools for learning and related communication facilitates learning
2. Students freedom to select social networks facilitates learning
3. Digital campus facilitates learning related social networking of students and teachers
4. Possibility to create social networks with the students studying in various fields enhances learning results.
considered to have a high error tolerance, that users found it easy to use, and that the system could easily back-up information and provide information or help.

![Figure 8.7. ViCaDiS error tolerance](image)

1. No system errors (e.g. crashes) occur when I work with the software.
2. If I make a mistake while performing a task, I can easily undo the last operation.
3. I perceive the error messages as helpful.
4. The software warns me about potential problem situations.
5. When I attempt to perform a destructive operation (e.g. deletion of data etc.), I am always first prompted to confirm the action.
6. The software provides me with useful information on how to recover from error situations.
7. The explanations provided help me understand the software so that I become more and more skilled at using it.
8. I was able to use the software right from the beginning, by myself, without having to ask co-workers for help.

These results of ‘error tolerance’ are important for the validation of a learning environment which needs above all to be easy to use and helpful for students. The answers on the ViCaDiS Error Tolerance and interviews for the piloting suggest that the environment as tested was easy to use and highly reliable. The only problems were related to a couple of virus attacks and electric power interruptions in Timisoara. Romanian partners sorted out the virus problems very quickly, which originated on an entirely separate server on the same network.

The ViCaDiS ideas, concepts and the Campus contain many interesting examples of good pedagogy, good uses of technology and evidence of rich interactions. While there are many ways in which the Campus could be improved in order to better achieve the stated goals, as a research effort it raises many
interesting questions and helps to move knowledge forward in the field of technology-enhanced learning. The ViCaDiS Campus is designed to support blended learning rather than purely distance learning (Vasiu & Andone, 2009). The activities provided, for the most part, are not complete courses or learning activities, but instead rely strongly on other activities, courses and processes that are happening outside the system. It is a toolset for face-to-face teachers rather than a comprehensive online learning environment. This is in keeping with the notion of the digital student, who is expected to not only make use of multiple media and multiple channels of communication, but to prefer that way of working. However, technologies can make things easier to manage this multiplicity, and there are opportunities to take this further to support more collaboration across nations and sites. A good start has been made on this already in some course modules (as described here), where the system itself acts as a communication channel, link space and repository for different teaching and learning activities.

The results indicate that an eLearning environment that has similar tools to those described, and involves student control leads to greater engagement in the learning process and a higher level of satisfaction of the group which we identified as digital students. Inter-university cooperation requires that partners agree on and build using very similar paradigms, settings, abilities and facilities. The ViCaDiS pilot results played a key role in directing our eLearning environment development strategy and influencing some major decisions. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services. For the near future the ViCaDiS consortium intends to approach different universities to take part, as a future possibility for their students and tutors to join and rejoin an open, free, international virtual campus where they can find common interest and develop new and innovative content to add value to the formal and informal learning process.

ACKNOWLEDGMENT

The environment described here is named ViCaDiS – Virtual Campus for Digital Students and is supported by the EU Lifelong Learning Erasmus Virtual Campus Programme www.vicadis.net.
Chapter 9

Conclusion

This research has grown out of my writing and teaching since 1996 when I started my academic, research and development work in the use of information and communication technologies in education. More recently, I became especially interested in how students’ behaviour has changed, how their approach to learning has become more and more ubiquitous and how the omnipresent use of technology has monopolised their life.

The research started as an attempt to define digital students, to map their existence and their characteristics. However, the recent research led to the need to define a concept of an eLearning environment responsive to their needs and to evaluate this concept. The research presented here was carried out in several stages. The first was between 2004 - 2007 and represents the core, the main part of the research to define digital students, an eLearning environment and the first step evaluation. The second is part of an international project funded by the European Commission (ViCaDiS), which sought to implement the first research ideas and concept on a larger scale and in a broader range of academic situations.

This chapter discusses the main questions and their possible answers and summarises the outcomes of the research.

9.1. Questions

In Chapter 1 I defined several questions that arose at the beginning and were answered during this research. These questions also generated the research objectives and defined the used methodology.

The main questions and their answers are:

- Have we found digital students within the groups of students that we looked at in different countries, and what are their characteristics?
This was an important question that shaped the entire development and to answer this question a number of questionnaires and focus groups were carried out in the UK, Romania, Hungary and Finland, in 2005, 2006 and 2007.

I have refined the concept of the digital student and therefore (by extension) the digital generation to include the need for control and independence in the use of eLearning environments. My studies revealed that digitally minded students, who have not always grown up with ubiquitous Internet and mobile phone use, but use it extensively now, have similar characteristics to the new digital students. So, age is not definitive for digital students characteristics. This is a major outcome of the study. The main characteristics of the digital student were also identified as a result of this research and are presented to the end of Chapter 5.

I define digital students as young adult students who have grown up with active participation in technology as an everyday feature of their lives. The characteristics of the technologically confident digital students were found to include a strong need for instantaneity, a desire to control their environment and to channel their social life via extensive use of technology.

- What are the digital students’ preferences regarding a higher education eLearning environment and how this can be designed?

This question defines the core of my research as it points directly towards the DIMPLE (Digital Internet and Mobile Phone eLearning Environment) concept and design. The investigation was done from the questionnaire analysis to the scenarios evaluated and scaffolding learning opportunities that were provided to suit learner motivation and knowledge level within the environment. It had direct implications for the design of an eLearning environment that ought to include several new communication and social tools, and adaptable elements wherever possible, under direct student control, rather than those controlled by the tutor or the system. The research results played a key role in directing the overall eLearning strategy and influenced some major decisions. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services.
What kind of learning environment can be developed to the benefit of digital students?

The theoretical framework of the research and of the eLearning and mLearning criteria of DIMPLE was established and then developed and evaluated in the broader stage of higher education. The conceptualisation of the DIMPLE 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), networks and communication (wiki, blogs, SMS, podcasting, etc).

My study suggests that DIMPLE may be more suitable for life long learning than institutional learning, or as part of a blend of face-to-face and eLearning strategies. The DIMPLE concept was developed in several environment phases that took into consideration the whole context in which learning occurs, with discussions leading towards the strategy from instructional, technical and management point of view.

How can a set of features of an eLearning environment be perceived as useful, desirable and effective by the digital students?

DIMPLE was evaluated in different studies of the different stages of the development: in UK as a concept and a use of several tools in and outside the integrated and commercial eLearning environment, in Romania in three studies, each analysing DIMPLE for a different perspective. It was evaluated from the general requirements of an eLearning environment, for its usability, desirability and effectiveness over both students groups (digital and non-digital) in higher
education. The student response was positive and encouraging, setting DIMPLE as a user-friendly, interactive and desirable environment for students.

The main assumption of this research, tested within a multi-layered argument during the whole research was:

*Digital students have different characteristics than simply the ubiquitous use of digital technologies therefore an eLearning environment should favour these characteristics and provide digital technologies for a positive student participation in higher education.*

My results suggest that an eLearning environment that involves student control over the tools and spaces they use might lead to greater engagement in the learning process and a higher level of satisfaction for the group that we have identified as digital students. However, it is important to observe that this is significantly influenced by the tutor’s technological abilities, enthusiasm and commitment to the process and that, were it to be generalised, might lead to a notable increase in workload and engagement on the part of both students and their tutors and it might be an uncomfortable environment for tutors. It is notable that ‘high quality’ in the desirability study was equated with a tutor who cares, and who is willing to answer questions and chat after 10pm. The increasing gap between the technologies and working/teaching patterns used by teachers and those preferred by their students has profound implications for how we teach. If we as teachers are to take advantage of these tools there is a significant need for reskilling in both the technologies and the pedagogies used to take advantage of them. It is a rare teacher who is available for students at midnight and who is willing to use the technologies used by the digital student, yet this seems to be a desirable characteristic to students who are often struggling to fit work, play and education into their busy lives.

This new generation of students is still working within a rigid institutional framework and finding ways to overcome some of its environmental limitations. As they make increasing use of not only the communication tools but also the resources that exist outside the institution’s boundaries it seems likely
that, unless teachers and institutions can adapt, the digital students will come to question the need for an institution at all. By providing an alternative based on a profile of digital students’ interests, I hope to supply technology that provides a better fit to their needs, but also a means to break out of habitual behaviours that may not always be the most effective means of learning available to them. Such small steps, as DIMPLE took in the deployment of the learning environment of two universities, may help to maintain a role for institutions in helping to structure the student learning experience in ways that fit the students’ needs but that do not entirely set them adrift from the safety traditionally provided by educational environments.

As my interest is in broad trends, I believe that technology integrated with methods for communicating knowledge can enhance and stimulate learning. However, I should express a note of caution: it is at least possible that learners’ preferences may be for modes of learning that are ineffective and counter-productive. The trend away from predominantly analytic knowledge towards primarily synthetic knowledge implies a loss as well as a gain.

Developing new applications, considering a good usability and simplicity will be the second precondition for future education and using these tools should help us to rethink the everyday education. Of course, the main problem will be, as the technical issues can be solved very quickly, but to change the thinking about learning and teaching, especially in the Romanian university will be a hard and long way.

9.2. Outcomes and contributions

In this research several outcomes and contributions have resulted:

Digital students

As far as I know I coined the term “digital students”, as a definition of the new students as presented above. Several authors have applied different definitions to the new student generation: the net generation (Negroponte, 1996), millennials, X-Generation (Oblinger, 2003) (Tapscott, 1998) or digital natives
(Prensky, 2001). My definition is different as I introduced the concept of their strong need for instantaneity, a desire to control their environment and to channel their social life via extensive use of technology, and not to use age as the main characteristic.

**DIMPLE (Digital Internet and Mobile Phone eLearning Environment)**

During this research the DIMPLE concept and design was constructed as an idea for an environment within the philosophy of learning ecology (Seely Brown and Duguid, 2000), as a delivery of a learning environment that presents a diversity of learning options to the student. Several technological developments played a key role in this research as part of this eLearning environment development strategy and have influenced some major decisions. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services. A much appreciated development out of DIMPLE has been the Mobile phone based services (SMS, calendar). I contributed and generated from this research ideas of how certain tools used in specific settings are most likely to improve the digital student experience in a university.

DIMPLE has evolved in recent years into **ViCaDiS, a Virtual Campus for Digital Students**, which uses many of the same features as DIMPLE enhanced by the new concept of international virtual student mobility and of Open Educational Resources. Many scenarios presented here have concentrated on formal learning, presented in a traditional university setting, possibly even in the context of an undergraduate curriculum or class in distance education. But the final evaluation results indicate that the most suitable setting for this concept is in the promotion of virtual mobilities at different levels of education, as part of the formal university system. As an environment for international teams of students to explore information and communication technologies, and their applicability to the real world, to increase their digital literacy and control over the interaction with many ICTs it will empower students to discover, create and share knowledge in a number of modalities and media formats.
Methods

For fulfilling this research several methods and tools have been designed or adapted:

The **Digital students’ characteristics questionnaire** (presented in Annex B): this questionnaire was produced from scratch, refined over the years, and used with different student cohorts and produced valuable insights into the students’ new skills and attitudes. It exists in English, Romanian, Hungarian and Finnish. The online implementation of these questionnaires based on the built-in functions on the PHP / MySQL database represents a technical development.

The **desirability method**, based on the idea of desirability measures (Benedek, 2002), was created as a set of 55 words which seek to describe the experience of using the environment or certain tools (presented in Annex C). For better visual representation of desirability, I used tag clouds by assimilating a number of points for each word selection as a weighted list, as a new method of presenting qualitatively quantitative results.

The **usability questionnaire** based on the IsoMetrics (Gediga et al., 1998) was used as a single questionnaire (instead of three) and adapted for the evaluation of online and mobile learning environment (presented in Annex D).

The **ViCaDiS Pre-piloting and Post-Piloting questionnaires** (presented in Annex E) were both developed for the special purpose of evaluating a virtual campus in the context of its learning use by students. The first is a shorter, adapted version of the digital students’ characteristics questionnaire and the second a mix of desirability and usability questionnaires. Both can be used in normal, everyday learning situation, which only require indicative results.

9.3. Future

In recent years DIMPLE has continued to exist and evolve in the “Politehnica” University of Timisoara (UPT) as a new online and mobile learning environment named CVUPT (Virtual Campus of UPT), used in everyday teaching for both distance education students and Master of Science students (a total of over 2700 students). It is constantly evaluated, living up to the idea of software in permanent beta that is constantly evolving, with each new
development dependent upon how people use it. It was students who shaped this technology. Future development will focus more on the social side, on instructional course design and how to include in academic evaluation the student activities, to create methods or tools for the learning analytics.

ViCaDiS continues to grow by attracting several other universities and to provide an environment for virtual mobilities to really happen. New development of ideas and evaluation will take into consideration the new pedagogical and organisational challenges that this implies, as well as the cultural impact on students learning in a global environment.

The main concept that underpins my entire 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 organise their knowledge outcomes. I believe that ‘doing it right’ we can change and even improve how students learn.
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Annex A

List of publications


Annex B

Digital Students Characteristics Questionnaire
(EN, RO, HU)

Questionnaire (EN)

This questionnaire is carried out in students’ attitude and use of technology, especially for education purposes. Your answers will be very useful, and we are grateful for your participation in this survey and this will help us to teach you better. The questionnaire is anonymous and all replies will be kept confidential. You will need about 15 minutes to fill it.

Name: …………………
E-mail: …………………
(* fields are compulsory )

Educational Institute: …………………
Subject / Specialisation: ………………………
Year of study: …………………
Age: …………………
Gender: male female

Do you want to be contacted later for private / group interview with questions related to the same subject, as a further step on this research?

Yes  No

1. Which statement describes you best?
   I use a computer once a week   I use a computer once a day   I use a computer more then once a day

2. Have you attended any computer training (please specify type, and year)?
   Yes   No   year: ………

3. How would you describe your computer competence?
   Beginner   Intermediate   Advanced

4. Have you used Internet services before and where? (if yes, please rank them from one to six, 1- least used, 6- most used)
   Never used   Internet café   Home   Friend   School/University
   Work   Public Library   mobile phone   DTV/iTV   other …………
5. At what age did you start to use a computer, if you use one?
- under 7 years old
- between 7-14 years old
- between 14 – 18 years old
- after 18 years old
- no use

6. At what age did you start to get use the Internet?
- under 7 years old
- between 7-14 years old
- between 14 – 18 years old
- after 18 years old
- never used

7. What sort of devices do you use and how often do you use them:

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Never / do not have</th>
<th>sometimes</th>
<th>monthly</th>
<th>weekly</th>
<th>daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your own desktop computer</td>
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<td></td>
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<td></td>
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<tr>
<td>Your own laptop</td>
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<td></td>
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<tr>
<td>Home computer</td>
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<tr>
<td>Computer in education</td>
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<tr>
<td>Internet at home</td>
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<td></td>
</tr>
<tr>
<td>Internet in education</td>
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</tr>
<tr>
<td>mobile phone</td>
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</tr>
<tr>
<td>PDA – Personal Digital Assistant</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Car computer</td>
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</tr>
</tbody>
</table>

8. At what age did you have your own: (to select in each category between: bought new / bought s/h / gift)

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Never /do not have</th>
<th>under 7 years old</th>
<th>between 7-14 years old</th>
<th>between 14 – 18 years old</th>
<th>after 18 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop computer</td>
<td>Bought new</td>
<td>Bought s/h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptop</td>
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<td></td>
</tr>
<tr>
<td>Internet connection</td>
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<tr>
<td>Mobile phone</td>
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<td></td>
</tr>
<tr>
<td>PDA – Personal Digital Assistant</td>
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<tr>
<td>Game console</td>
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</tr>
</tbody>
</table>

9. For what do you use a mobile phone and how often:

<table>
<thead>
<tr>
<th>Use Type</th>
<th>Never /do not have</th>
<th>sometimes</th>
<th>monthly</th>
<th>weekly</th>
<th>daily</th>
<th>All the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice (calling)</td>
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<tr>
<td>Text messaging</td>
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<tr>
<td>Multimedia</td>
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</tbody>
</table>
10. Do you use the Internet for:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never /do not have</th>
<th>sometimes</th>
<th>monthly</th>
<th>weekly</th>
<th>daily</th>
<th>All the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
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<tr>
<td>Web search</td>
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<tr>
<td>Chat</td>
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<td>Forum</td>
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<td>Audioconference</td>
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<tr>
<td>Videoconference</td>
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<tr>
<td>Learning / training</td>
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<tr>
<td>Playing online</td>
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<tr>
<td>Shopping</td>
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<tr>
<td>Instant messaging</td>
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<td></td>
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<tr>
<td>Others</td>
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</tr>
</tbody>
</table>

11. While browsing the web what things would you like to be in control of?

<table>
<thead>
<tr>
<th>Control Aspect</th>
<th>rarely</th>
<th>often</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of links</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creating new content of webpages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creating new discussion theme / group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Do you have your own homepage?

Yes
No

13. If yes, did you design it?

Yes
No

14. If yes, which best describes your experience with web design: (multiple choice)

I made a simple website
I made interactive website(s)
I made animated website(s)
I made online database(s)
I have considerable web design experience

15. Have you been involved in eLearning / online learning / computer based course?
   Yes    No

16. If no, would you like to take an eLearning / online learning / computer based course?
   Yes    No    please explain your reason ……………………………

17. If yes, at what level was it?
general instruction    further education    professional qualification
initial education    higher education

18. If yes, for how long have you been involved?
less than a week    a week    a month    6 months    one year
more than one year

19. While completing an eLearning course, how do you use hyperlinks? (you can choose more than one)
Do not use (read linearly)    glossary    internal references
external references    examples/activities    animations    graphics

20. During your education process have you been able to choose

<table>
<thead>
<tr>
<th></th>
<th>never</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>The subjects which you learned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The level of your course</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The course modules</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testing time/period</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part of the information (text/images) from your course modules</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The course exercises / activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The project subject / work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication channel with your tutor / professor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your own study time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other………...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
21. Which part of your education process would you like to control yourself?

<table>
<thead>
<tr>
<th></th>
<th>never</th>
<th>maybe</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>The subjects which you learn</td>
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</tr>
<tr>
<td>The level of your course</td>
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<tr>
<td>The course modules</td>
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<tr>
<td>Testing time/period</td>
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<tr>
<td>Part of the information (text/images) from your course modules</td>
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<tr>
<td>The course exercises / activities</td>
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<td></td>
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</tr>
<tr>
<td>The project subject / work</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Communication channel with your tutor / professor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The discussion group / Forum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your study time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others……………</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22. How would you prefer to receive information regarding your learning / training process?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Maybe</th>
<th>I’d prefer it sometimes</th>
<th>I’d prefer it</th>
<th>I’d love it</th>
</tr>
</thead>
<tbody>
<tr>
<td>personal email account</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online in public discussion groups</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Online in private discussion groups</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via text messaging on your mobile phone</td>
<td></td>
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<tr>
<td>Via a voice call</td>
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<tr>
<td>Via your PDA</td>
<td></td>
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</tr>
<tr>
<td>During face-to-face meetings</td>
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<tr>
<td>pager</td>
<td></td>
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<tr>
<td>Other ………………</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
23. If you are a student what learning/training services would you like to receive via your computer:

<table>
<thead>
<tr>
<th>Service</th>
<th>Never</th>
<th>Maybe</th>
<th>I’d prefer it sometimes</th>
<th>I’d always prefer it</th>
<th>I’d love it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your course modules</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about your project work / seminars</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timetable information</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Communication with your tutor / professor</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Meeting planning with tutors / group colleagues</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sending homework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exams / homework grades</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Glossary</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Other ........................................</td>
<td></td>
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</tr>
</tbody>
</table>

24. If you are a student what learning/training services would you like to get online:

<table>
<thead>
<tr>
<th>Service</th>
<th>Never</th>
<th>Maybe</th>
<th>I’d prefer it sometimes</th>
<th>I’d prefer it</th>
<th>I’d love it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your course modules</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about your project work / seminars</td>
<td></td>
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<tr>
<td>Timetable information</td>
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</tr>
<tr>
<td>Communication with your tutor / professor</td>
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<td></td>
</tr>
<tr>
<td>Meeting planning with tutors / group colleagues</td>
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</tr>
<tr>
<td>Sending homework</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Exams / homework grades</td>
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<tr>
<td>Glossary</td>
<td></td>
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</tr>
<tr>
<td>References</td>
<td></td>
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</tr>
<tr>
<td>Feedback</td>
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<tr>
<td>Other ........................................</td>
<td></td>
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</tr>
</tbody>
</table>

25. If you are a student what learning/training services would you like to receive via your mobile phone:
<table>
<thead>
<tr>
<th>Part of your course modules</th>
<th>Never</th>
<th>Maybe</th>
<th>I’d prefer it sometimes</th>
<th>I’d prefer it</th>
<th>I’d love it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about your project work / seminars</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timetable information</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Communication with your tutor / professor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting planning with tutors / group colleagues</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sending homeworks</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Exams / homeworks</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>marks</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Glossary</td>
<td></td>
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<tr>
<td>References</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Feedback</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other ……………</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. If you were to study online, would you:
- like to study alone, without the real-time assistance of an instructor?
  - very much
  - quite a lot
  - don’t mind
  - not much
  - not at all
- like to study online, when an instructor is present and other students are participating in the online class?
  - very much
  - quite a lot
  - don’t mind
  - not much
  - not at all

27. Please rank the methods of learning listed below in order of preferences (rank them from 1-6 as 1 for less and 6 for the most)
- Text based course
- graphics examples
- animation examples
- simulation
- solving problem
- being involved in subject-related activity

28. When you communicate with your fellow students in learning matters would you prefer to use: (rank them from 1-5 as 1 for less and 5 for the most)
- Face-to-face meetings
- mobile phone
- email
- online discussion groups
- group meetings

29. How do you easily express yourself/your thoughts: (rank them from 1-5 as 1 for less and 5 for the most easy)
- text
- graphics
- sounds
- videos
- face to face interaction

30. Please answer the questions subsequent to each of the following three examples of visual style:
Example 1

**E-learning -- background**

The term 'Virtual Learning Environment' describes the use of information technology equipment generally and specifically online technologies, for the purpose of learning. A VLE is the space in which a learner and a tutor can communicate and exchange information but equally it is a space in which a group of learners can collaborate and communicate. The 'Joint Information Systems Committee' (JISC) define a VLE as "the components in which learners and tutors participate in online interactions of various kinds, including online learning." (JISC 2002)

"Online learning is the latest in a line of attempts to use information technology to deliver learning. Starting over thirty years ago with the use of Teletype terminals linked to mini- and mainframe computers, the next evolution was PCs followed by multimedia, and now the current focus is online delivery." (REACT 2002)

How do you rate the **composition** of the content in this example?
- poor
- acceptable
- good

How do you rate the use of **colour** in this example?
- poor
- acceptable
- good

How do you rate the use of **type** in this example?
- poor
- acceptable
- good

Example 2

**E-learning -- background**

The term 'Virtual Learning Environment' describes the use of information technology equipment generally and specifically online technologies, for the purpose of learning. A VLE is the space in which a learner and a tutor can communicate and exchange information but equally it is a space in which a group of learners can collaborate and communicate. The 'Joint Information Systems Committee' (JISC) define a VLE as "the components in which learners and tutors participate in online interactions of various kinds, including online learning." (JISC 2002)

"Online learning is the latest in a line of attempts to use information technology to deliver learning. Starting over thirty years ago with the use of Teletype terminals linked to mini- and mainframe computers, the next evolution was PCs followed by multimedia, and now the current focus is online delivery." (REACT 2002)

How do you rate the **composition** of the content in this example?

How do you rate the use of **colour** in this example?

How do you rate the use of **type** in this example?
Example 3

How do you rate the composition of the content in this example?
- poor
- acceptable
- good

How do you rate the use of colour in this example?
- poor
- acceptable
- good

How do you rate the use of type in this example?
- poor
- acceptable
- good

Please comment generally on the visual style of these three examples: …………………..

31. Which of the following three examples of hyperlink placement do you prefer: (choose one)
please explain your choice ……………………

32. Which explanation from the following 2 examples do you prefer?
please explain your choice ........................

33. Did you feel comfortable completing this questionnaire online?
Yes No

34. Is there anything would you like to tell us .......................... (200 characters).
Chestionar (RO)

Obiectivul acestui chestionar, desfășurat în scop educațional, este înțelegerea atitudinii și percepției studenților asupra utilizării tehnologiilor educaționale. Răspunsurile voastre ne vor fi utile și vă mulțumim pentru completarea acestui chestionar. Chestionarul este anonim și toate răspunsurile vor fi confidențiale. Toți cei care completează chestionarul vor participa la o tragerie la sorți, care are drept premiu o carte de IT de la Editura Teora. Dacă doriți să participați la trageria la sorți, vă rugăm să vă introduceți datele de contact. Nu vom păstra nici o evidență a numelui vostru decât pentru trageria la sorți. Timpul estimat de completare a chestionarului este de 30 de minute.

Nume………………………….
E-mail…………………………
(*următoarele câmpuri sunt obligatorii)

Specializarea …………………
Anul de studii .................
Vârsta .................
Sex masculin feminin

Ca acțiune viitoare a acestei cercetări, doriți să fiți contactați mai târziu pentru un interviu personal sau de grup cu întrebări pe același subiect?
Da  Nu

1. Care afirmație vă descrie cel mai bine:
   Utilizez calculatorul o dată pe săptămână
   Utilizez calculatorul de câteva ori pe zi

2. Ați urmat sau urmați o pregătire sau un curs în domeniul calculatoarelor (vă rog să specificați tipul și anul)?
   Da  Nu  an ....

3. Cum v-ați descrie competența în calculatoare?
   Începător Intermediar Avansat

4. Ați utilizat Internetul până acum și unde? (dacă da, vă rog să listați în ordinea preferințelor, de la 1-6, 1- cel mai puțin utilizat, 6- cel mai utilizat)
   Utilizat niciodată Internet cafetă Acasă La un prieten
   Școală/Universitate Servicii/Bibliotecă Telefon mobil Cablu TV alt loc...

5. La ce vârstă ați început să utilizați calculatorul?
   Sub 7 ani între 7-14 ani între 14 – 18 ani după 18 ani nu utilizez
6. La ce vârstă ați început să utilizați Internetul?
Sub 7 ani     între 7-14 ani     între 14 – 18 ani     după 18 ani     nu utilizez

7. Ce tip de echipament utilizați și cât de des

<table>
<thead>
<tr>
<th></th>
<th>Niciodată/nu am</th>
<th>uneori</th>
<th>lunar</th>
<th>săptămânal</th>
<th>zilnic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propriul calculator</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Propriul laptop</td>
<td></td>
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</tr>
<tr>
<td>Calculatorul familiei</td>
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<tr>
<td>Calculatorul de la școală</td>
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<tr>
<td>Internet acasă</td>
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<tr>
<td>Internet la școală</td>
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</tr>
<tr>
<td>Telefonul mobil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDA – Personal Digital Assistant</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Calculatorul mașinii</td>
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</tbody>
</table>

8. La ce vârstă ați avut primul: (de selectat la fiecare categorie între: cumpărat nou / cumpărat la mâna a doua / cadou)

<table>
<thead>
<tr>
<th></th>
<th>Niciodată/nu am</th>
<th>Sub 7 ani</th>
<th>între 7-14 ani</th>
<th>între 14 – 18 ani</th>
<th>după 18 ani</th>
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</thead>
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<td>cumpărat nou / cumpărat la mâna a doua / cadou</td>
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</tr>
<tr>
<td>conexiune Internet</td>
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</tr>
<tr>
<td>telefon mobil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDA – Personal Digital Assistant</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>consolă de jocuri</td>
<td></td>
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</tr>
</tbody>
</table>

9. Pentru ce utilizați telefonul mobil și cât de des?

<table>
<thead>
<tr>
<th></th>
<th>Niciodată/nu am</th>
<th>uneori</th>
<th>lunar</th>
<th>săptămânal</th>
<th>zilnic</th>
<th>perman</th>
<th>ent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convorbire (apel voce)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mesaje text</td>
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<tr>
<td>Mesaje Multimedia</td>
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<tr>
<td>e-mail</td>
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<tr>
<td>Navigare Web</td>
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<tr>
<td>Chat</td>
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<td></td>
</tr>
<tr>
<td>Jocuri</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Cumpărături
Primire informații
altele ...........

10. Utilizați Internetul pentru:

<table>
<thead>
<tr>
<th></th>
<th>Niciodată /nu am</th>
<th>uneori</th>
<th>lunar</th>
<th>săptămânal</th>
<th>zilnic</th>
<th>permanență</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-mail</td>
<td></td>
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</tr>
<tr>
<td>Navigare Web</td>
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<td></td>
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<tr>
<td>Chat</td>
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<tr>
<td>Forum</td>
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<tr>
<td>Audioconferință</td>
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<tr>
<td>Videoconferință</td>
<td></td>
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<tr>
<td>Educație / training</td>
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<tr>
<td>Jocuri online</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cumpărături</td>
<td></td>
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<tr>
<td>Mesaje (Instant messaging)</td>
<td></td>
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<td></td>
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<tr>
<td>Altele ...............</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

11. Când navigați pe web ce lucruri v-ar place să controlați?

<table>
<thead>
<tr>
<th></th>
<th>uneori</th>
<th>des</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culoreea de fundal (background)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culoreea textului</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animațiile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interacțiunea cu utilizatorul</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numărul de legături (hyperlink)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crearea de conținut nou în paginile web</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crearea de noi grupuri, teme de discuție</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altele ...............</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Aveți propria pagină web?
Da  Nu

13. Dacă da, ați creat-o ?
Da  Nu

14. Dacă da, care afirmație vă descrie cel mai bine experiența în design web:
(multiple alegeri)
Am creat un website simplu
Am creat un website interactiv
Am creat un website animat
Am creat o bază de date online
Am o experiență considerabilă în design web
15. Ați urmat cursuri online sau bazate pe calculator (eLearning)?
**Da**  **Nu**

16. Dacă nu, v-ar place să urmați cursuri online sau bazate pe calculator (eLearning)?
**Da**  **Nu**  motivul …………………………………

17. Dacă da, de ce nivel au fost
- Informare generală
- pregătire continuă
- calificare profesională
- educație inițială
- învățământ superior

18. Dacă da, cât timp a durat
- mai puțin de o săptămână
- o săptămână
- o lună
- 6 luni
- un an
- mai mult de un an

19. Când ați urmat un curs online cum ați folosit legăturile web (hyperlinks)? (alegeri multiple)
- Nu am folosit (citire liniară)
- glosar (bibliografie)
- referințe interne
- referințe externe
- exemple/activități
- animații
- desene

20. De-a lungul educației ați putut să alegeți

<table>
<thead>
<tr>
<th>Subiectele pe care le-ați învățat</th>
<th>niciodată</th>
<th>uneori</th>
<th>des</th>
<th>foarte des</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivelul cursului</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversele cursuri</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perioada de examen / testare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partea de informație (text/imagini) din curs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercițiile / activitățile cursului</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tema / modul de lucru al proiectelor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modul de a comunica cu profesorul</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timpul propriu de studiu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>altele……………</td>
<td></td>
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</tr>
</tbody>
</table>

21. Ce parte a educației v-ar place să controlați?

<table>
<thead>
<tr>
<th>Subiectele pe care le-ați învățat</th>
<th>niciodată</th>
<th>poate</th>
<th>uneori</th>
<th>des</th>
<th>foarte des</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nivelul cursului</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Diversele cursuri</td>
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<td></td>
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<tr>
<td>Perioada de examen / testare</td>
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<tr>
<td>Partea de informație (text/imagini) din curs</td>
<td></td>
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<td>Exercițiile / activitățile cursului</td>
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<td>Tema / modul de lucru al proiectelor</td>
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<tr>
<td>Modul de a comunica cu profesorul</td>
<td></td>
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</tr>
<tr>
<td>Grupul de discuții, forum</td>
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<td></td>
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<tr>
<td>Timpul propriu de studiu</td>
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<tr>
<td>altele ……….</td>
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</tbody>
</table>

22. Cum v-ar place să primiți informația legată de procesul vostru de învățare?

<table>
<thead>
<tr>
<th>Contul personal de email</th>
<th>nicio dată</th>
<th>poate</th>
<th>mi-ar place uneori</th>
<th>mi-ar place</th>
<th>mi-ar place mult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online în grupuri de discuție publice</td>
<td></td>
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<tr>
<td>Online în grupuri de discuție private</td>
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<tr>
<td>Via mesaje text pe telefonul mobil</td>
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<tr>
<td>Via o convorbire telefonică</td>
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<tr>
<td>Via PDA</td>
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<tr>
<td>În timpul unei întâlniri</td>
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<tr>
<td>Pager</td>
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<tr>
<td>altele ……….</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

23. Ca student, ce servicii educaționale v-ar place să primiți prin intermediul calculatorului:

<table>
<thead>
<tr>
<th>Părți din materialul de curs</th>
<th>nicio dată</th>
<th>poate</th>
<th>mi-ar place uneori</th>
<th>mi-ar place</th>
<th>mi-ar place mult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informații despre proiecte, seminarii</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informații despre orar</td>
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<td></td>
</tr>
<tr>
<td>Comunicare cu profesorul</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Planificarea întâlnirilor cu profesorul / colegii</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Trimiterea temelor de casă</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Notele de la examene / proiecte</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
24. Ca student, ce servicii educaționale v-ar place să primiți online:

<table>
<thead>
<tr>
<th>Servicii</th>
<th>Nicio dată</th>
<th>Poate</th>
<th>Mi-ar place uneori</th>
<th>Mi-ar place</th>
<th>Mi-ar place mult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Părți din materialul de curs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informații despre proiecte, seminarii</td>
<td></td>
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<tr>
<td>Informații despre orar</td>
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<tr>
<td>Comunicare cu profesorul</td>
<td></td>
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</tr>
<tr>
<td>Planificarea întâlnirilor cu profesorul / colegii</td>
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<tr>
<td>Trimiterea temelor de casă</td>
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<tr>
<td>Notele de la examene / proiecte</td>
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<tr>
<td>Glosar</td>
<td></td>
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<tr>
<td>Bibliografia</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Răspunsuri la întrebările proprii (feedback)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Altele</td>
<td></td>
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</tbody>
</table>

25. Ca student, ce servicii educaționale v-ar place să primiți prin intermediul telefonului mobil:

<table>
<thead>
<tr>
<th>Servicii</th>
<th>Nicio dată</th>
<th>Poate</th>
<th>Mi-ar place uneori</th>
<th>Mi-ar place</th>
<th>Mi-ar place mult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Părți din materialul de curs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informații despre proiecte, seminarii</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informații despre orar</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Comunicare cu profesorul</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Planificarea întâlnirilor cu profesorul / colegii</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimiterea temelor de casă</td>
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<tr>
<td>Notele de la examene / proiecte</td>
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</tr>
<tr>
<td>Glosar</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bibliografia</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Răspunsuri la întrebările proprii (feedback)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altele</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
26. Dacă ar fi să studiați online
- v-ar plăcea să studiați independent, fără suport în timp real de la un profesor?
  Foarte mult  destul de mult  nu contează  nu prea mult  deloc
- v-ar plăcea să studiați online, când un profesor este prezent şi sunt şi alţi studenţi în cursul online?
  Foarte mult  destul de mult  nu contează  nu prea mult  deloc

27 Listați, în ordinea preferințelor, metodele de învățare de mai jos (de la 1-6, 1 cea mai puțin și 6 pentru cea mai preferată)
curs bazat pe text exemple grafice exemple animate
simulări rezolvare de probleme activități de proiect

28. Ce metodă preferați să folosiți când comunicați cu colegii studenți despre subiecte legate de curs (listați de la 1-5, 1 cea mai puțin și 5 pentru cea mai preferată)
întâlniri față în față telefonul mobil email
grupuri de discuții online întâlniri în grup

29. Prin ce vă exprimați gândurile, ideile, cel mai ușor (listați de la 1-5, 1 cea mai puțin și 5 pentru cea mai preferată)
text imagine sunete video interacțiune față în față

30. Vă rugăm să răspundeți la întrebările care se regăsesc după fiecare dintre următoarele 3 exemple de stil vizual:

Exemplul 1

Cum ați descrie **compoziția** conținutului din acest exemplu?

Cum ați descrie utilizarea **culturilor** în acest exemplu?

Cum ați descrie utilizarea **caracterelor** în acest exemplu?

C  slabă  slabă  slabă
Exemplul 2

Cum ați descrie **compoziția** conținutului din acest exemplu?
- slabă
- acceptabilă
- bună

Cum ați descrie utilizarea **cicolorilor** în acest exemplu?
- slabă
- acceptabilă
- bună

Cum ați descrie utilizarea **caracterelor** în acest exemplu?
- slabă
- acceptabilă
- bună

Exemplul 3
Cum ați descrie compoziția conținutului din acest exemplu?
- slabă
- acceptabilă
- bună

Cum ați descrie utilizarea culorilor în acest exemplu?
- slabă
- acceptabilă
- bună

Cum ați descrie utilizarea caracterelor în acest exemplu?
- slabă
- acceptabilă
- bună

Comentați vă rog, la modul general, asupra stilului vizual din aceste 3 exemple:

.........................

31. Pe care dintre următoarele exemple de legături web (hyperlink) o preferați (alegeți una)

**Linking Example**
Further information concerning this questionnaire can be found by clicking here.

**Linking Example**
Further information concerning this questionnaire is available on the 'Design guidelines for effective e-learning materials’ website.

**Linking Example**
Further information concerning this questionnaire is available on the 'Design guidelines for effective e-learning materials' website.

Vă rog justificați pe scurt alegerea făcută .........................

32. Pe care dintre explicațiile următoare o preferați?
Panoramic Imaging

Cylindrical Panoramas
Imagine you are in the centre of a cylindrical image which can be rotated around your fixed point of view. In some panoramas you can move your view up and down relative to the image.

Cubic Panoramas
Like looking outward from the centre of a cube with the scene on its inside. Within cubic panoramas it is possible to spin the view in any direction.

Figure 1. The concept of a cylindrical panorama

Figure 2. The concept of a cubic panorama
Vă rog justificați pe scurt alegerea făcută ........................

33. V-ați simțit confortabil (v-a fost la îndemână) să completați acest chestionar online?
Da Nu

34. Dacă doriți să ne comunicați ceva …. .................................
Kerdoiv (HU)

Az alábbi kerdoiv celja feltársni és megérteni az egyetemistak/tanulók hozzaállását és viszonyait az új tanítási tehnologiákhoz. Valasztó csupán kutatási celokra és statisztikai összegezésre használjuk fel, melyek segítseknekre lesznek az oktatas fejlesztésében. Természetesen a kerdoiv nev nélkuli és a valasztó bizalmasan kezeljük.

A kerdoiv kitoltese korulbelul 20 percet vesz igénybe.
Koszonjuk kozremukodeset!

Ha reszt akar venni egy €20 ertekű ajandékutalvány kisorsolásában az Amazoon online uzleteben, kerjuk adj meg nevet és email cimet. Ezeket a személyi adatokat nem taroljuk és csupán a sorsolashoz használjuk fel.

Nev……………………
E-mail ……………………………
(* ezek az informaciok kotelezoek)
*Oktatasi intezmeny …………………
*Temakor/Szakirany………………………….
*Evfolyam …………………
*Eletkor …………………
*Nem Ferfi No

Szeretne, ha kapcsolatba lepnenk Onnel egy szemelyes/csoportos velemeny kutatassal, további kerdesekkel ugyanezen kutatasi program kereten belul?
Igen Nem

1. Milyen gyakran hasznal szemelyi szamitogepet?
hetente naponta naponta tobszor is

2. Reszt vett mar szamitogep kezelesi kurzuson? (kerjuk tuntesse fel a temakort es az evfolyamot is)
Igen Nem Ev ....

3. Hogyan jellemezne a szamitogephez valo hozzaerteset?
Kezdo Kozepszintu Halado

4. Hol es mennyire hasznalja On az Internet szolgaltatasokat? (kerjuk ertekelje 1-tol 6-ig, 1:keveset hasznalja, 6:sokat hasznalja)
Soha Internet café Otthon Baratoknal
Iskolaban/Egyetemen Munkahelyen Konyvtarban Mobil telefonon
DTV/iTV Mashol ....
5. Milyen eletkorban kezdett személyi számítógépet használni?

<table>
<thead>
<tr>
<th>Kategória</th>
<th>&lt; 7 év elött</th>
<th>7-14 év</th>
<th>14-18 év</th>
<th>&gt;18 év után</th>
<th>Nem hasznalom</th>
</tr>
</thead>
</table>

6. Milyen eletkorban kezdte az Internetet használni?

<table>
<thead>
<tr>
<th>Kategória</th>
<th>&lt; 7 év</th>
<th>7-14 év</th>
<th>14-18 év</th>
<th>&gt;18 év</th>
<th>Nem hasznalom</th>
</tr>
</thead>
</table>

7. Milyen típusú kommunikációs eszközöket használ és milyen gyakran?

<table>
<thead>
<tr>
<th>Eszköz</th>
<th>Soha/Nincs</th>
<th>Ritkan</th>
<th>Havonta</th>
<th>Hetente</th>
<th>Naponta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sajat személyi számítógép</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sajat laptop számítógép</td>
<td></td>
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<tr>
<td>Otthoni személyi számítógép</td>
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<tr>
<td>Iskolai személyi számítógép</td>
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<tr>
<td>Internet othon</td>
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<tr>
<td>Internet az iskolában</td>
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<tr>
<td>Mobil telefon</td>
<td></td>
<td></td>
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<tr>
<td>PDA – Personal Digital Assistant</td>
<td></td>
<td></td>
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<tr>
<td>Személygepkocsiba szerelt számítógép</td>
<td></td>
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</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Eszköz</th>
<th>Soha / Nincs</th>
<th>7 év elött</th>
<th>7-14 év között</th>
<th>14-18 év között</th>
<th>18 év után</th>
</tr>
</thead>
<tbody>
<tr>
<td>Személyi számítógép</td>
<td></td>
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</tr>
<tr>
<td>Laptop számítógép</td>
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<tr>
<td>Internet kapcsolat</td>
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<tr>
<td>Mobil telefon</td>
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<tr>
<td>PDA – Personal Digital Assistant</td>
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<tr>
<td>Jatek konzol</td>
<td></td>
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</tr>
</tbody>
</table>

9. Milyen célokra használja mobil telefonját és milyen gyakran?

<table>
<thead>
<tr>
<th>Cél</th>
<th>Soha / Nincs</th>
<th>Ritkan</th>
<th>Havonta</th>
<th>Hetente</th>
<th>Naponta</th>
<th>Allando an</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beszed (telefon)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Szöveg üzenet</td>
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</tr>
</tbody>
</table>
10. Milyen celra használja az Internetet és milyen gyakran?

<table>
<thead>
<tr>
<th></th>
<th>Soha/Nincs</th>
<th>Ritkan</th>
<th>Havonta</th>
<th>Hetente</th>
<th>Napon</th>
<th>Allandoan</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td></td>
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<tr>
<td>WWW keresés</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Chat beszelgetes</td>
<td></td>
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<tr>
<td>Jatek</td>
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<tr>
<td>Vasarlas</td>
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<td></td>
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<tr>
<td>Információ fogadásra</td>
<td></td>
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<td></td>
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<tr>
<td>Egyéb</td>
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</tbody>
</table>

11. Internet bongészés közben, ha lehetősége lenne rá, melyik szerkesztési elemeken változtatna?

<table>
<thead>
<tr>
<th></th>
<th>Ritkan</th>
<th>Gyakran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hatter szín</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Szöveg szín</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animációk</td>
<td></td>
<td></td>
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<tr>
<td>Interaktiv</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperlinkek száma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uj/Modositott tartalom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Új beszelgetési temakor/csoport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egyéb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Van sajat weboldala?
   - Van
   - Nincs

13. Ha igen, On szerkesztette?
   - Igen
   - Nem
14. Ha igen, hogyan velekedik a webprogramozásban való jartassagarol? (tobb valaszt is adhat)
   Egyszerű weblap(ok)at készítettem.
   Interaktív weblapokat készítettem.
   Animációs weblapokat készítettem.
   On-line adatbázisokat készítettem.
   Tapasztalt weboldal készito vagyok

15. Reszt vett eLearning / on-line / szamitogepes oktatasban/ kurzusban?
   Igen    Nem

16. Ha nem, szeretne reszt venni eLearning / on-line / szamitogepes oktatasban/ kurzusban?
   Igen    Nem    Kerjük írja le, hogy miért ……………………..

17. Ha igen, milyen szintu volt az oktatas/ kurzus?
   Altalános    Továbbkepzes    Szakmai kepzes
   Kezdo szintu    Egyetemi szintu

18. Ha igen, mennyi ideig tartott az oktatas/ kurzus?
   kevesebb egy hetnel    egy het    egy honap    6 honap
   egy év    tobb mint egy év

19. Egy eLearning / on-line kurzus folyaman, hogyan használja On a hyperlinkeket? (tobb valaszt is adhat)
   nem hasznalom (lineárisan olvasok) szogyujtemeny belso irodalomjegyzek kulso irodalomjegyzek peldak/feladatok animacioi grafika

20. A tanulmanyai folyaman, volt lehetosege es milyen gyakran, hogy kivalassza:

<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>ritkan</th>
<th>gyakran</th>
<th>nagyon gyakran</th>
</tr>
</thead>
<tbody>
<tr>
<td>A tantargyakat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A kurzus szintet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A kurzus moduljait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vizsgak/tesztek idopontjait/ periodusat</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Egy reszet a kurzus anyaganak (szoveg/ kep)</td>
<td></td>
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</tr>
<tr>
<td>A kurzus peldait/feladatait</td>
<td></td>
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</tr>
<tr>
<td>A projekt temakoret / feladat</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>A tanarral valo kommunikalas modjat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sajat tanulasi idejét</td>
<td></td>
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<tr>
<td>Egyeb……………</td>
<td></td>
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</tr>
</tbody>
</table>
21. A tanulmanyi folyamatanak melyik reszét szeretne befolyásolni, meghatározni, és milyen gyakran?

<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>lehet</th>
<th>ritkan</th>
<th>gyakran</th>
<th>nagyon gyakran</th>
</tr>
</thead>
<tbody>
<tr>
<td>A tantárgyakat</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>A kurzus szintet</td>
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<td></td>
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<tr>
<td>A kurzus moduljait</td>
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</tr>
<tr>
<td>Vizsgak/tesztek idopontjait/periodusat</td>
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<tr>
<td>Égy reszet a kurzus anyaganak (szöveg/ kép)</td>
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<tr>
<td>A kurzus peldait/feladatait</td>
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<tr>
<td>A projekt temakoret / feladat</td>
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<tr>
<td>A tanarral valo kommunikalas modjat</td>
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<tr>
<td>Sajat tanulasi idejet</td>
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<tr>
<td>Egyeb</td>
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</tbody>
</table>

22. Milyen formaban és milyen gyakran szeretne informacióhoz jutni az eLearning / on-line kurzusok folyaman?

<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>lehet</th>
<th>csak ritkan</th>
<th>szeretnem</th>
<th>nagyon szeretnem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Szemelyes e-mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-line nyilvanos hír es beszélgetes csoportok</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>On-line privat hír es beszélgetes csoportok</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Szöveg üzenetek a mobil telefonjan</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Telefon beszélgetes</td>
<td></td>
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</tr>
<tr>
<td>A PDA-jan</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Személyes talakozas soran</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pager (uzenoe)</td>
<td></td>
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<tr>
<td>Egyeb modszer</td>
<td></td>
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</tbody>
</table>

23. Ha On tanulo/hallgató, milyen tanulmanyi szolgáltatásokat szeretne a személyi számítógépen keresztul igénybe venni és milyen gyakran?
<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>lehet</th>
<th>csak ritkan</th>
<th>szeretnem</th>
<th>nagyon szeretnem</th>
</tr>
</thead>
<tbody>
<tr>
<td>A kurzus moduljait</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informaciokat projekt munkajarol, szeminariumokrol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idobosztasra vonatkozó informaciokat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A tanarral valo kommunikalas modjat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talalkozok megszervezeset tanarokkal, csoporttarsakkal</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hazi feladat elkuldeset</td>
<td></td>
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</tr>
<tr>
<td>Vizsgak / hazifeladat ertekelesenek eredmenyet</td>
<td></td>
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<tr>
<td>Szogyujtemenyt</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Irodalomjegyzeket, referenciakat</td>
<td></td>
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<tr>
<td>Egyeb informaciokat….</td>
<td></td>
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</tbody>
</table>

24. Ha On tanulo, milyen tanulmanyi szolgaltatasokat szeretne kapni on-line es milyen gyakran:

<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>lehet</th>
<th>csak ritkan</th>
<th>szeretnem</th>
<th>nagyon szeretnem</th>
</tr>
</thead>
<tbody>
<tr>
<td>A kurzus moduljait</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Informaciokat projekt munkajarol, szeminariumokrol</td>
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<td></td>
</tr>
<tr>
<td>Idobosztasra vonatkozó informaciokat</td>
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<tr>
<td>A tanarral valo kommunikalast</td>
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<tr>
<td>Talalkozo megszervezeset</td>
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<tr>
<td>Hazi feladat elkuldeset</td>
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<tr>
<td>Vizsgak / hazifeladat ertekelesenek eredmenyet</td>
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<tr>
<td>Szogyujtemenyt</td>
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<tr>
<td>Irodalomjegyzeket</td>
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<tr>
<td>Visszacsatolast (feedback)</td>
<td></td>
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<tr>
<td>Egyeb informaciokat……</td>
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</tbody>
</table>

25. Ha On tanulo, milyen tanulmanyi/kepzesi informaciokat szeretne kapni mobil telefonon es milyen gyakran:
<table>
<thead>
<tr>
<th></th>
<th>soha</th>
<th>lehet</th>
<th>csak ritkan</th>
<th>szeretném</th>
<th>nagyon szeretném</th>
</tr>
</thead>
<tbody>
<tr>
<td>A kurzus egyes moduljainak részeit</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Informaciokat projekt munkájáról / kurzusokról</td>
<td></td>
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</tr>
<tr>
<td>Időbeosztásra vonatkozó informaciokat</td>
<td></td>
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</tr>
<tr>
<td>A tanarral való kommunikáció</td>
<td></td>
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</tr>
<tr>
<td>Talalkozó megyszervezés a tanarokkal, csoporttársakkal</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hazi feladat elküldése</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vizsgák / hazifeladat értekelesenek eredményet</td>
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<td></td>
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<tr>
<td>Szögyujteményt</td>
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<td></td>
<td></td>
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<tr>
<td>Irodalomjegyzéket</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Visszacsatolást (feedback)</td>
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<tr>
<td>Egyéb informaciokat…….</td>
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</tbody>
</table>

26. Ha On az on-line tanulmanyokat valasztana, akkor
- egyedul szeretne tanulni, tanari segítseg/felugyelet nélkül?
  nagyon | elegge | mindegy | nem nagyon | egyaltan nem
- on-line szeretne tanulni, tanari segítseg/felugyelet mellett, ugy, hogy tobb tanulo is reszt vesz az on-line csoportban?
  nagyon | elegge | mindegy | nem nagyon | egyaltan nem

27. Kerjük hogy rangsorolja az alábbi tanulasi modszereket tetszési sorrend szerint (1-tol 6-ig, 1: kevesbe, 6: a leginkább)
Szöveg-alapú kurzus | grafikus példák | animációs példák | szimulációk
problema- megoldás | temakörrel összefüggő tevékenységben | való részvétel

28. Hogyan szeretne tanulmanyi dolgokkal kapcsolatban kommunikálni a csoporttársaival? (rangsorolja 1-tol 6-ig, 1: kevesbe, 6: leginkább)
Személyes beszélgetés | mobil telefon | email | közvetlen (online)
beszélgetés csoportok | csoport talalkozók

29. Hogyan fejezi ki a legjobban magat, gondolatait (rangsorolja 1-tol 6-ig, 1: kevesebe, 6: leginkább)
Szöveg | grafika | hang | video | személyes beszélgetés

30. Kerjük válaszoljon a kerdésekre az alábbi 3 vizuális stílusra vonatkozó példával összefüggésben
Kerjük válaszoljon a kérdésekre az alábbi 3 vizuális stilusra vonatkozó peldával osszefüggésben

Példa 1

Milyenek minosítják a lap tartalmi felelősséget?
- Gyenge
- Elfogadható
- Jo

Milyenek minosítják a színek használatát?
- Gyenge
- Elfogadható
- Jo

Milyenek minosítják a karakterek használatát?
- Gyenge
- Elfogadható
- Jo

2. Példa

Milyenek minosítják a lap tartalmi felelősséget?

Milyenek minosítják a színek használatát?

Milyenek minosítják a karakterek használatát?
3. Pelda

Milyenek minosíti a lap tartalmi felepitését?

- [ ] gyenge
- [ ] elfogadható
- [ ] jo

Milyenek minosíti a színek használatát?

- [ ] gyenge
- [ ] elfogadható
- [ ] jo

Milyenek minosíti karakterek használatát?

- [ ] gyenge
- [ ] elfogadható
- [ ] jo

Kerjük, mondjon általános velemenyt a vizualis stilusrol a fenti 3 peldara vonatkozóan: ..................

31. Melyik hyperlink elhelyezést szereti On-jo ban a kovetkező példákon? (csak egyet valasszon)

**Linking Example**
Further information concerning this questionnaire can be found by clicking [here](#).
Linking Example
Further information concerning this questionnaire is available on the 'Design guidelines for effective e-learning materials' website.

Kerjük, indokolja meg a valasztasat .........................

32. Melyik magyarázatot tartja elfogadhatóbbnak a következő példákban?
33. Kenyelmesen érezte magát a kérdésvonal kitoltsé során?
   Igen  Nem

34. Szeretne meg valami mást megírni nekünk? (max. 200 karakter)..................
Annex C

Desirability Questionnaire (EN, RO)
Name…………………………………………………………... Age ........ Gender M / F

1. Please select the words that best describe your experience in using the studentcentral, the community area, the blog, and the Instant Message and Skype with your tutor – circle them. You can select as many as you want.

<table>
<thead>
<tr>
<th>Accessible</th>
<th>Desirable</th>
<th>Gets in the way</th>
<th>Patronizing</th>
<th>Stressful</th>
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<tbody>
<tr>
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<td>Hard to use</td>
<td>Personal</td>
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<tr>
<td>Customizable</td>
<td>Fun</td>
<td>Overwhelming</td>
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<td>Valuable</td>
</tr>
</tbody>
</table>
2. Please select 5 words that best describe your experience in using the studentcentral, the community area, the blog, and the Instant Message and Skype with your tutor – circle them. And then please rank them from 1 to 5 as 1 the best word that describe the experience and 5 the less word that describe the experience.

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</table>
3. Please select 5 words that best describe your experience in using just the community area and the blog – circle them. And then please rank them from 1 to 5 as 1 the best word that describe the experience and 5 the less word that describe the experience.

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</table>
4. Please select 5 words that best describe your experience in using just the Instant Message and Skype with your tutor as part of your learning process – circle them. And then please rank them from 1 to 5 as 1 the best word that describe the experience and 5 the less word that describe the experience.

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</tr>
</tbody>
</table>
5. Please rank from 1-8 the tools that you use (for private or professional matters), as 1 the tool that you use the most and 8 the tool that you use the less. The tools that you do not use you do not include in the ranking.

- [ ] Instant message
- [ ] Blog
- [ ] Wiki
- [ ] SMS (on mobile)
- [ ] Skype
- [ ] ipod
- [ ] email
- [ ] forum

Thank you.
Nume................................................................. Varsta ....... Sex  M / F

1. Va rugam sa selectati **acele cuvinte care descriu cel mai bine experienta Dvs. in utilizarea** site CSID, a materialului de cours, a forumului, a blog, wiki, a Mesajelor Instant (Yahoo), Skype cu tutorul Dvs. **Va rugam sa le incercuiti si puteti sa selectati cat de multe doriti.**

<table>
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</table>
2. Va rugăm să selectați 5 cuvinte care descriu cel mai bine experiența Dvs în utilizarea site CSID, a materialului de curs, a forumului, a blog, wiki, a Mesajelor Instant (Yahoo), Skype cu tutorul Dvs. Va rugăm să le încercuiți și apoi în casuta alăturată cuvântului să le ordonați de la 1 la 5, astfel încât 1 să fie pentru cuvântul care descrie cel mai bine, iar 5 pentru cuvântul care descrie cel mai puțin experiența Dvs.

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3. Va rugăm să selectați 5 cuvinte care descriu cel mai bine experiența Dvs in utilizarea site CSID cu blog, wiki si forum. Va rugăm să le încercuiți și apoi în casuta alăturată cuvântului sa le ordonati de la 1 la 5, astfel încât 1 să fie pentru cuvântul care descrie cel mai bine, iar 5 pentru cuvântul care descrie cel mai puțin experiența Dvs.

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</table>
4. Va rugăm sa selectați 5 cuvinte care descriu cel mai bine experiența Dvs în folosirea Mesajelor Instant (Yahoo) și Skype cu tutorul Dvs pe durata procesului educational. Va rugăm să le încercuiți și apoi în casuta alăturată cuvântului să le ordonați de la 1 la 5, astfel încât 1 să fie pentru cuvântul care descrie cel mai bine, iar 5 pentru cuvântul care descrie cel mai puțin experiența Dvs.

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</table>
5. Va rugam să ordonați din punctul de vedere al experienței pe care v-o ofera, de la 1 la 8, uneltele pe care le utilizati (in probleme personale sau profesionale), astfel încat 1 să fie pentru unealta cu cea mai buna experiența, iar 8 pentru cea mai slaba experiența. Uneltele pe care nu le utilizati nu le includeti in ordonare.

- Mesaje Instant
- Blog
- Wiki
- SMS (cu mobilul)
- Skype
- ipod
- email
- forum

Multumim.
Annex D

Usability Questionnaire (RO)

CHESTIONAR ISOMETRICS

Nume ………………………………
Varsta ………………………………

Va rugam sa completati acest chestionar care se refera la modalitatea de utilizare a CSID.
In casutele din dreapta va rugam sa indicati gradul in care agreati sau nu cu afirmatia facuta in fiecare rand.

Iata un exemplu:

<table>
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<tr>
<th>Index</th>
<th>Cat este de potrivit pentru scop ?</th>
<th>Predominant – nu sunt de acord</th>
<th>Nede cis</th>
<th>Predominant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Computerele sunt unelte folositoare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In aceasta situatie eu cred ca afirmatia “Computerele sunt unelte folositoare” este adevarata si deci sunt de acord cu ea. Daca nu as fi de acord cu ea, dar nu in totalitate, atunci as marca la nivelul 2.
<table>
<thead>
<tr>
<th>Index</th>
<th><strong>Cat este de potrivit pentru scop?</strong></th>
<th>Predominant – nu sunt de acord</th>
<th>Nedicis</th>
<th>Predominant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1</td>
<td>Aplicatia ma forteaza sa realizez sarcini care nu sunt legate de activitatea mea.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.3</td>
<td>Aplicatia imi permite sa realizez toate sarcinile de rutina legate de activitatea ce vreau sa o desfasor</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.4</td>
<td>Functiile implementate in aplicatie ma ajuta sa-mi realizez activitatea</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.7</td>
<td>Percep aranjarea campurilor pe ecran ca fiind potrivita cu munca realizata prin aplicatie</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.8</td>
<td>Trebuie efectuati prea multi pasi pentru a realiza o anumita sarcina</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.10</td>
<td>Aplicatia este potrivita pentru cerintele activitatii mele de student</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.11</td>
<td>Intr-un anumit ecran gasesc toate informatiile necesare in situatia respectiva</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.15</td>
<td>Pot adapta usor aplicatia pentru realizarea de noi sarcini</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.17</td>
<td>Sunt capabil sa adaptez prezentarea rezultatelor (pe ecran, imprimanta, etc) la cerintele diferite ale activitatii mele</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index</td>
<td>Auto-descrierea aplicatiei</td>
<td>Predominant – nu sunt de acord</td>
<td>Nede cis</td>
<td>Predominant – de acord</td>
<td>Nici o opinie</td>
</tr>
<tr>
<td>-------</td>
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<td>------------</td>
</tr>
<tr>
<td>S.2</td>
<td>Pot apela usor la explicații specifice de utilizare a aplicatiei, dacă este necesar</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>S.3</td>
<td>Inteleg imediat despre ce este vorba în mesajele furnizate de aplicatie</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.10</td>
<td>Aplicatia imi furnizeaza suficiente informatii cu privire la intrarile permise in-o situatie particulara</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.12</td>
<td>Termenii si conceptele utilizate in aplicatie sunt clare si lipsite de ambiguitate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.13</td>
<td>Aplicatia marcheaza intotdeauna vizual locatia intrarii curente (de ex. prin subliniere, culoare contrastanta, cursor, etc)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.14</td>
<td>Pot sesiza usor diferența dintre diferite mesaje de raspuns, cereri de confirmare a intrarilor sau comenzilor, attentionarilor sau mesajelor de eroare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index</th>
<th>Controlabilitatea</th>
<th>Predominant – nu sunt de acord</th>
<th>Nede cis</th>
<th>Predominant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.2</td>
<td>Posibilitatile de navigare in cadrul aplicatiei sunt adecvate</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>T.3</td>
<td>Aplicatia imi permite sa treac usor de la un nivel de meniu la altul</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.4</td>
<td>Aplicatia imi permite sa reven direct la meniul principal din orice ecran</td>
<td></td>
<td></td>
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<tr>
<td>-----</td>
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<td></td>
</tr>
<tr>
<td>T.6</td>
<td>Imi este usor sa accesez procedurile care imi sunt necesare in munca actuala</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.7</td>
<td>Imi este usor sa ma misc inapoi si inainte intre diferite ecrane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.12</td>
<td>Pentru a-mi indeplini sarcinile, aplicatia imi cere sa realizez o secventa fixa de pasi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.13</td>
<td>Cand selectez elementele de meniu, pot grabi lucrurile prin introducerea directa a unei litere sau a unui cod de comanda</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index</th>
<th>Conformitatea cu asteptarile utilizatorului</th>
<th>Predomina nt – nu sunt de acord</th>
<th>Nede cis</th>
<th>Predomin nant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.8</td>
<td>Aplicatia este proiectata inconsistent, facandu-mi si mai dificila indeplinirea sarcinilor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.3</td>
<td>Denumirile sunt utilizate la fel in toate partile aplicatiei pe care le-am parcurs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.5</td>
<td>Cand execut anumite comenzi, am senzatia ca rezultatele sunt predictibile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.7</td>
<td>Mesajele furnizate de aplicatie apar intotdeauna in aceeasi locatie pe ecran</td>
<td></td>
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</table>
### Toleranta la erori

<table>
<thead>
<tr>
<th>Index</th>
<th>Toleranta la erori</th>
<th>Predominant – nu sunt de acord</th>
<th>Nedicis</th>
<th>Predominant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.3</td>
<td>Cand fac o eroare la completarea unui formular, pot reface usor starea anterioara</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.5</td>
<td>Impresia mea este ca aplicatia nu este proiectata pentru a permite corectarea erorilor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.7</td>
<td>Nu apar erori de system (de ex. intreruperi) cand lucrez cu aplicatia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.8</td>
<td>Cand fac o eroare in indeplinirea unei sarcini, pot anula usor ultima operatie (prin <em>undo</em>)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.13</td>
<td>Mesajele de eroare implementate mi se par utile</td>
<td></td>
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</tbody>
</table>

### Posibilitatile de individualizare

<table>
<thead>
<tr>
<th>Index</th>
<th>Posibilitatile de individualizare</th>
<th>Predominant – nu sunt de acord</th>
<th>Nedicis</th>
<th>Predominant – de acord</th>
<th>Nici o opinie</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.1</td>
<td>Aplicatia imi permite sa adaptez formulare, ecrane sau meniuri pentru a se potrivi cu preferintele mele</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.4</td>
<td>Aplicatia se poate usor adapta pentru a se potrivi cu nivelul meu personal de cunostinte si aptitudini</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.6</td>
<td>Pot adapta cantitatea de informatie (date, text, grafica, etc) afisata pe ecran, conform cu nevoile mele</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index</td>
<td><strong>Possibilitatea de invatare</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>L.1</td>
<td>Am avut nevoie de timp indelungat pentru a invata cum sa utilizez aplicatia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.2</td>
<td>Imi este usor sa ma reobisnuiesc cu utilizarea aplicatiei dupa o intrerupere indelungata</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.3</td>
<td>Explicatiile furnizate imi permit sa inteleg aplicatia, incat devin tot mai performant in utilizarea acesteia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.4</td>
<td>Pana acum nu am avut probleme in a invata regulile de comunicare cu aplicatia (de ex. introducerea de date)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.5</td>
<td>Am putut utiliza aplicatia de unul singur inca de la inceput, fara a fi nevoie sa cer ajutor de la alți utilizatori</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.7</td>
<td>Pentru a utiliza aplicatia este nevoie sa-mi amintesc un numar mare de detalii</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.8</td>
<td>Mi se pare usor sa utilizez comenzile aplicatiei</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multumim.
Annex E

ViCaDiS Questionnaires

ViCaDiS Pre-piloting Questionnaire

Background

1. Your role
   - I am a student
   - I am a teacher/tutor

2. Where are you from?
   - Finland
   - Hungary
   - Italy
   - Lithuania
   - Romania
   - UK
   - USA

3. Gender
   - Female
   - Male

4. Your age (years)

5. My communication skills in English are:
   Four competence areas: 1) listening skills, 2) writing (composition) skills, 3) reading comprehension skills, 4) speaking skills
   - Level A: 300-350 hours of intensive language learning
   - Level B: Basic knowledge in English language
   - Level C: Intermediate knowledge in English language
   - Level D: Proficiency competence in English language
   - Native English speaker

6. My Information and Communication Technology (ICT) related skills are:
   ICT also includes Web 2.0 features!
   - Level A: Beginner
   - Level B: Basic skills
• Level C: Intermediate skills
• Level D: Expert

Social Media and Tools

1. Blogs

2. Wikis

3. Podcasting

4. Forums
   To facilitate text, audio or video based cooperation. More info: <a href="http://en.wikipedia.org/wiki/Internet_forum" target="_new">Internet Forums</a>

5. Instant messaging

6. Audio / video conferencies

7. Email

8. RSS feeds

9. Social bookmarking

10. Shared web based calendar services
    To facilitate international cooperation between students from different countries and time zones.

11. Sharing of learning materials produced by teachers and students
    Documents, audio and video clips etc.
ViCaDiS Post-piloting Questionnaire

Background Information

1. Where are you from?
   • Finland
   • Hungary
   • Italy
   • Lithuania
   • Romania
   • UK
   • USA
   • Other. Please specify.

2. Age
   • -17
   • 18-23
   • 24-27
   • 28-35
   • 36-45
   • 46-55
   • 56-65
   • 66-

3. Gender
   • Female
   • Male

4. Role related to eLearning
   • Graduate student
   • Post-graduate student
   • I have been just testing…
   • Other?

5. Learning activities on ViCaDiS Campus could include several working methods. Which of these types of learning did you experience in Vicadis?
   • Lessons
   • Discussions
   • Learner presentations (as a presenter or listener)
   • Formal debates
   • Group exercises
   • Questionnaires related to course
6. The Vicadis environment includes many different features and services. Which have you been using during the course(s)?
   • ViCaDis Assignments
   • ViCaDis Chat
   • ViCaDis Choice
   • ViCaDis Embedded or Linked Audio
   • ViCaDis Embedded or Linked Video
   • ViCaDis Flashcard Trainer
   • ViCaDis Forums
   • ViCaDis Glossary
   • ViCaDis Lesson
   • ViCaDis Media
   • ViCaDis Mobile Learning Object
   • ViCaDis Mobile Tag
   • ViCaDis OU Blog
   • ViCaDis Quiz
   • ViCaDis Survey
   • ViCaDis Video Aula
   • ViCaDis Web Pages
   • ViCaDis Wiki
   • ViCaDis Workshop