The future is wireless in Romanian's education?

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Abstract :- mLearning, the idea of using advances in modern wireless technology and the Internet to make education more effective and more widely available than ever before, has attracted much recent discussion. Many universities seem to have already perceived the advantages of the mLearning and higher distance learning centers are beginning to take advantage of them. On the basis of the questionnaire (presented in this paper) used to collect in the more representative way new experiences of mLearning the case studies analyzed are referring to the following: why mLearning now, analysis of the opportunity and the possibility of implementing some mlearning components in eLearning platform (that exist) at FSEGA, Romania; next works.
In this paper we try: to examine what phase have other faculties with similar profile - using an mLearning platform – reached; to estimate what is the level for participating in such m-learning project for the students enrolled in the long-distance education program; to evaluate the level of acceptance of this new challenge for the didactic personnel from FSEGA.

Key-Words: - e-Learning, m-Learning, Mobile Solutions, Wireless Technology

1 Introduction

We live in an era in which any activity field requires continuous preparation in order to be permanently updated with what is new on the market of products and services or in research. As the competition grows, the winner will be the one who knows better the supply in order to show all the benefits to the user. All over the world education is undergoing major transformations and the Internet is an important part of these transformations. The majority of universities in the world have on-line courses and master degrees, as well as traditional universities from Europe and other parts of the world.
There will certainly be a step forward. The scientists speak already about mLearning (Mobile learning). MLearning: this is facilitated via a wireless device such as a PDA, a smart phone or laptop [1].
MLearning "represents an educational offer [2] for those students who are on permanent movement, an offer they will have access to through the mobile and portable technology, through different mobile devices such as the phones, PDA-s, Notebook computers, Smart phones or Tablet PC. At present, there are several types of communication technologies, which are used for mobile equipments: GSM, WAP, GPRS, Bluetooth, and WiFi".
Thus it is necessary to use new methods which will enable the assimilation of new things in a shorter and more efficient time. Such a method consists of "Teaching (instruction) systems" based on computer respectively IT&C. These vary according to: [9]:

- the receivers: individuals (managers, clients, execution staff, students, IT specialists, e-business instructors) or groups (a given company, an economic sector);
- the level of knowledge: beginners, advanced
- modules/the content offered: e-business models, e-business strategies, value creation, legislation, Internet technologies, web-site building, data and network

security;
- the teaching forms and methods: course/lessons, off-line individual study, discussion groups, practical exercises, virtual classes, interactive dialogue, interactive tests, and simulations on case studies;
- the delivery and payment forms for the teaching products and services;
- granting copyright to the content providers,
- the technologies used.

For creating such systems there contributed on one side the academic environment, on the other side the specialized companies (including here the research firms).

From here we see a series of online teaching and testing products culminating with serious e-learning platforms.

In this paragraph, we present an overview on the platforms used in the Romanian Universities. Successively, a simple evaluation tool is proposed and used for the evaluation and comparison of some platforms. E-Learning means the access to the most recent information, gain of new knowledge, continuous learning, new and efficient learning methods [25].

E-Learning includes traditional or modern methods and techniques. Using IT&C technologies (multimedia processing and asynchronous or synchronous communication), it leads to the subject by which it is used, to experiencing the understanding and controlling knowledge and skills in a certain field. EU definition: the use of new multimedia technologies [26] and the Internet to improve the quality of learning. [25].

Other researchers think that, generally speaking, e-Learning means all the educational situations that use significantly the means of information and communication technology. Strictly speaking, e-Learning represents a type of distance education, as the planned experience of teaching – learning organized by an institution that mediates materials in a sequential and logic order to be assimilated by students in their own manner. The mediation is achieved by means of new information and communication technologies – especially through Internet.

The Internet is both the distribution environment of materials and the communication channel of the parts involved.

Other definitions of e-Learning combine efficiently the face – to – face approaches and the distance learning, fundamentally changing the role of the trainer, especially of the person involved in the on-line training. This is the result of evolution. It is not an educational revolution.

In presentation of "m-learning: The Cutting Edge, Ericsson Education, Dun Laoghaire 22 November 2002. From e-learning to m-learning, Desmond Keegan, Distance Education, International Ireland" we find a very clearly representation of :

- e-learning named "virtual learning environment of today".

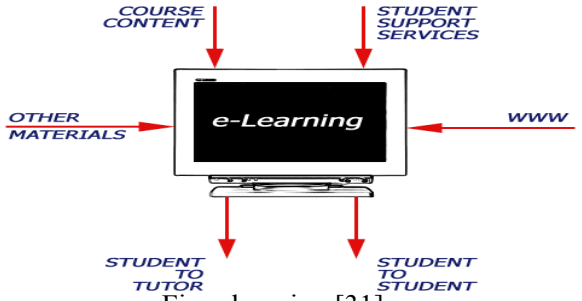

Fig.e-learning [31]

And mLearning named "wireless learning environment of to-morrow"

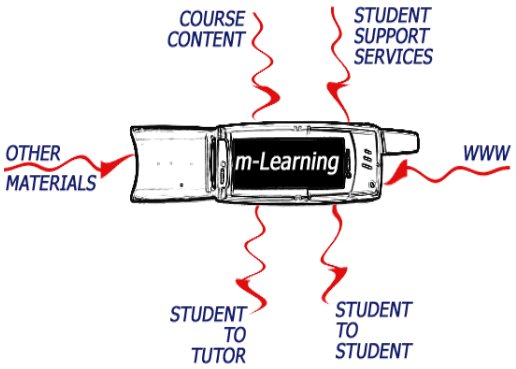

Fig. mlearning [31]

But we think that mlearning is only one of the e-learning components, mlearning can't replace e-learning systems.

In the specialty literature, in the description of this learning, there are mentioned terminology innovations. A term like "mixed – mode" describes this mixture between the face – to – face approach and the distance approach, without necessarily involving the access to the highest technology. Other specialists prefer the phrase "resource – based learning" or "blended learning", a term used especially in the vocational training.

In this context we have tried to analyze the application of the main characteristics of the e-Learning, mentioned above in the Romanian universities. At a national level, several university centers have developed departments for distance learning.. We have taken into consideration only the traditional university centers in Romania (Craiova, Dunărea de Jos Galati, Transilvania Brasov, Iasi,

Cluj-Napoca, Oradea, Bucharest ASE, Constanta, Ploiesti and Timisoara University).
Of the existing definitions, we may mention the following characteristics of e-learning:

- a link on the main page to eLearning (or a similar name – distance learning);
- asynchronous or synchronous communication;
- presentation material organized on subjects or themes (unlike the traditional education organized on age groups / classes);
- the presentation material has a static and a dynamic element;
- own learning rhythm;
- possibility of group discussions under the form of forum;
- assessment simulations;
- free online courses;
- unlimited access to courses;
- other features (which reflect the university's originality).

We have some conclusions:
1. In the Romanian literature, there is no unit for the use and definition of eLearning (a fact also mentioned in the by the international bibliography; see the concepts Online Learning, Web Based Learning - WBT, Distance Learning).

2. Being functional at the level of higher education and adult education, the Internet training system, as some name the e-Learning, offered by universities and companies specializing in training services, is a replication in present Romania. It tries to adapt the elements of the traditional / face – to – face didactic process: planning, specific content and methodology, interaction, support and assessment.

3. Of this analysis it results that each university is preoccupied to with the developing of an eLearning section, beginning with offering free courses on a webpage (in word or PDF format), until the achievement of an e-Learning platform (which means students' administration, students' access to courses on the basis of user and password, tutors, self assessment simulations, etc.

4. As underlined in other researches, because there is a rather generous online training material, it is necessary to have "a clear assessment and testing methodology for the online courses" [3] and to use the e-Learning standards [4].

Retaining the idea that e-Learning systems have already found their place in the context of universities in Romania and not only (there is a series of Romanian companies which are already offering e-learning solutions even for foreign universities (AEL, iveco), we'll make a step in order to study the new concept, now commonly abbreviated to "mLearning".

2 mLearning – the new natural extension of e-Learning

2.1 Introduction

We start from the assertion that mLearning has different meanings for different communities, although related to e-learning and distance education.
The point is to have a handle of the high-level capabilities: a device that can interactively deliver information wherever the user happens to be. There may be details about which connection method, what form of input and output, and how portable and how fast it can access and gain data, but the real issue is how we use that capability to provide learning [21]. Mlearning has the benefits of mobility and its supporting platform, which can be summarized as being ubiquity, convenience, localization and personalization [22].
The vision of mobile learning presented by the majority of authors currently writing in the field is that it seeks to enable 'anywhere, anytime, and any device' portable and personalized learning; it will facilitate communication, collaboration, and creativity among participants in authentic and appropriate contexts of use. In some respects, this is perceived as a revolution of 'just-in-time' and 'just-forme'information delivery; however, the employment of mobile devices will be far from a panacea for the problems currently faced in education unless implementations of m-learning take heed of lessons 'e-learned'[24].
The mobile solutions are the solutions based on wireless technology. The wireless technology offers opportunities and benefits to businesses through certain devices (for example: Pocket PC-s, laptops, printers, digital projectors, IRV/voice portals, smart phones, tablet PC) which stand a variety of interfaces and specific accessories (mouse interfaces, keyboards, small text screens, voice recognition[26].
The use of wireless technology has led to the increase of mobile solutions demand and their integration in business processes, in general and in education, in particular.

In other words, mobile learning supports are: PDA (Palm, Franklin, etc), e-book (Gemstar, Cytale, etc), and portable computer (laptop, tablet PC), the mobile phone, electronic ink (E-Ink), GPS. These satisfy the need for information access any time and any place, the need for updated information in real time, the need for interaction taking the minimum of space.

E-book is a digital document (electronic document), the electronic version of a printed book which can be read on the computer, laptop, on portable reading devices, on Palm/PDA devices, on the mobile phone screen or Internet Terminals. E-books are execution files based mainly on HTML files. To these we can add other files, for example graphic files. They are completely interactive on the Internet and may contain links, images, tables, video files, forms, Java scripts. Due to the massive spreading lately, they represent one of the most effective online promotion methods, because they can be read all the time by thousands of readers.

Like any new achievement, there is a series of disadvantages very well-summarized in [6]:

- the diversity of external factors which can distract, interrupt or disturb the didactical activity;
- we cannot create a very correct evaluation method because the student is always next to any information source that can affect the result of the test (also the memory tests are excluded as checking method)
- mlearning cannot be extended too much at present because of limited individual resources (not everyone has a laptop or PDA or internet mobile connection)
- there are disadvantages in choosing the mobile communication devices as learning support, the most important disadvantages being linked to display space, processing speed and limited input possibilities for these devices.

At the moment there is an incompatibility between the software available for PC-s - (e-learning) and the one for mobile devices, the two types of soft having different structures (because the display, surfing and storage possibilities in the two cases are extremely different). Of course, the analyzed field is very complex, it can be analyzed from different perspectives as it is underlined very well: "mobile learning necessitates examination of pervasive philosophies and practices of education, interpersonal communication, technological implementations, as well as what it is to be 'mobile'. Vavoula and Sharples suggest three ways in which mobility may be conceived: in terms of space, in relation to different pursuits in life, and with respect to time. 'Effective mobile learning programs will require new digital communication skills, new pedagogies, and new practices"[27].

2.2. Related works

There are a number of ways you need to think different to get your mind around mLearning.

The first step, research into mobile learning [25] will bring the rewards of placing institutions at the forefront of pedagogical practice, answering student requirements for flexibility and ubiquity: 'anywhere, anytime, and any device' access to information. The question of how prepared institutions are to address the changing landscape is widely pondered (Alexander, 2004a; Wagner, 2005; Naismith, Lonsdale, Vavoula & Sharples, 2004); providing a series of apposite debates and considerations on the issues involved will be a timely contribution to the discipline, and assuredly well received. [25]

The second step is the capabilities, the easy way to talk about devices, prototypical devices, [22]:

- cell phones: portable, have audio input and output, and a keypad, and some sort of screen;
- media player: have audio or video output, some form of control (e.g. the click wheel), and typically a screen;
- GPS: for tracking one's location and providing navigation directions, increasingly they're coupled with other systems;
- PSP, in particular, supports the internet as well as a variety of media and is a more open system, providing potential adaptability to learning needs;
- PDA, such as Palm made successful (after Apple
- pioneered with the Newton): have a touch-sensitive screen, though they can have a Keyboard;
- iPhone, can also connect to the Internet for email and web browsing through the phone connection.

An overview of the handheld device resource and the steps involved in its use are illustrated and described very well in [30]:

- users login to the site using their personal logon permissions;
- if a user is not registered then they will fill in their personal details;
- a user then selects a site that would like to

be inducted in;
- induction information is then displayed; as many pages as are needed by the site to display relevant OH&S and other safety information;
- a final form is displayed allowing the user to agree with the site induction conditions.

Based on previous assumptions, we consider that mlearning must be in the attention of those who take care of education in Romania. Another very serious argument would be the one according to which „Romania has lost ground in comparison with other European countries since 2005 when certain officials of the Ministry for Research and Education ignored completely certain educational programmers financed from decentralized European funds" as it is shown in Edo Car release.

Thus according to "eLearning - DG EAC/23/05, adopted through the decision no. 2318/2003 of the European Parliament and The Council of Europe the programmed finances themes such as: digital content, virtual university campuses and transversal actions for schools ...The Romanian universities lose contact with modern from of computer-assisted education and the opportunity to develop on this topics long-lasting partnerships in the European space".

However the university environment from Romania has tried to achieve individual partnerships with a series of universities in order to be prepared to offer specialists who will be able to face the challenges which appear on the labor market under the globalization conditions and the mobile technology expansion.

3 Problem Solution

In order to demonstrate the assertion made in the previous paragraph, that m-learning is needed in the Romanian academic environment we used a work methodology described below.
The research methodology consists of, on one side, a quantitative research of the field (definition, characteristics, advantages, disadvantages, case studies) and on the other hand a quality study made on the answers at a questionnaire distribute to the students from UBB campus, Cluj-Napoca, Romania.
Through the questions from the questionnaire we tried to identify the need and opportunity of introducing in the traditional educational system the m-learning systems the interaction capacity student-teacher respectively student-student, a capacity which we considered to be defined through:
We made a questionnaire with 24 items. Its purpose was to find out if in Romania there is interest for the transition of the educational system towards distance learning respectively m-learning. With a database of 1000 potential students, we established for the beginning a sample of 189 interviewed persons.
We used $\chi 2$ tests (Chi-square) for comparing two distributions; following two modules will be dependence or independence, levels and fields. Based on the table, we used the $\chi 2$ test and we determined if the two variables are dependent in the sense that the need for courses is higher for the people with superior studies.
We used the statistical toolbox from MATLAB because it has the following facilities: Matricial and vectorial way of working; toolbox statistics; the code is compact, smart and easy to implement.

The questions were directed towards the identification of capacity for student-professor interaction, as well as student-student interaction. We considered that this interaction capacity could be defined through:
A. The student profile: age, sex, the type and profile of high school or faculty graduated.
B. The level of information about m-technologies they had, do they know what mLearning means, where did they find out about mLearning and why did they choose it.
C. Opinion of Professor about mLearning.

Below we present some results of applying the test, processed with matlab.

For the question „Do you consider that you need training courses (master courses)? We can notice that from 189, 91%, (that is 74 persons) consider that they would need these courses.

Do you consider that you need training courses (master courses)?	Absolute numbers	Perceptual Numbers
Yes	174	91%
No	7	4%
Undecided	8	5%
Total	189	100%

Table 1. The need for training courses

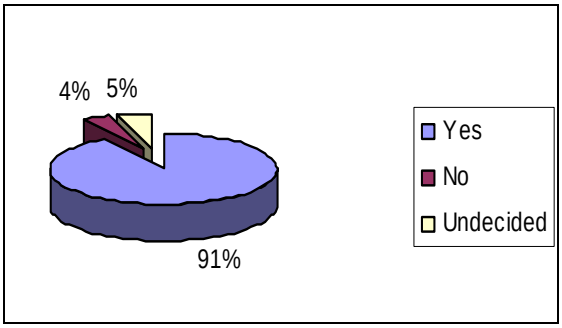

Fig. 3 Solutions for the need for training courses

We can accept the idea that at least 91%need training courses.

For the question „Do you consider m-learning necessary for increasing the activity productivity? The synthesis of the answers to this question is to be seen in table 2.

Do you consider m-L necessary for increasing	Absolute number	Perceptual figures
Yes	148	78%
No	37	20%
Undecided	4	2%
Total	189	100%

Table 2. The utility of distance learning for increasing activity productivity

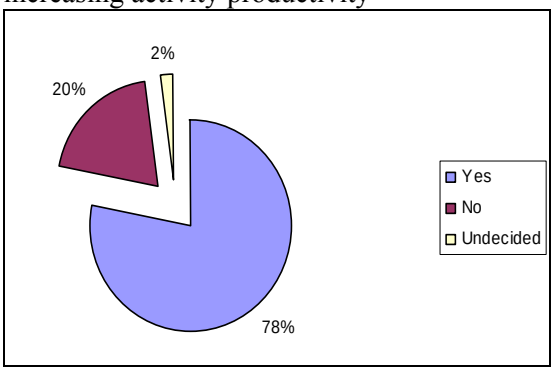

Fig.4 The graphic for the utility of distance learning

It can be noticed that out of 189, 78%, that is 148 persons consider mlearning useful for increasing the activity productivity.

For the question „Do you prefer courses instead of m-learning? It can be noticed that out of 189, 78%, that is 148 persons consider mlearning useful for increasing the activity productivity.

For the question „Do you prefer courses instead of m-learning? From 189, 75 prefer classical courses, and 114 prefer mlearning courses. Almost all want to get education, but there is a certain lack of confidence.

We want to see if there is dependence between the studies undertaken and the need for training courses (master courses). („Studies" and „Do you consider that you need training courses (master courses)?" (See table 3.)

	Undergraduate studies	Superior studies	Total
YES	72	91	163
NO	5	2	7
Total	77	93	170

Table 3. The link between the level of studies and the need for training courses

We wish to see if there is dependence between the need for courses and the use of wireless technologies (Table 4)

	YES	NO	Total
YES	134	25	159
NO	5	6	11
Total	139	31	170

Table 4. The link between the need for training courses and the use of wireless technologies

The conclusion we reached is that the need for courses depends on the use of wireless technologies. We wish to see if there is dependence between the need for courses and the sex of the subjects (Table 5).

	Women	Men	Total
YES	109	5	114
NO	50	2	52
Total	159	7	166

Table 5 The link between the need for courses and the sex of the subjects

The conclusion we reached is that the need for courses is independent of sex.

We wish to see if there is dependence between studies and utility. The contingency table will look like Table 6.

	Undergraduat studies	Superior studies	Total
YES	61	77	138
NO	17	19	36
Total	78	96	174

Table 6. The link between studies and the perception on utility

The conclusion we reached is that there is dependence between studies and utility.

We wish to see if there is dependence between background and the need for m-learning courses (Table 7).

	Urban	Rural	Total
YES	130	32	162
NO	5	1	6
Total	135	33	168

Table 7. The link between the need for training courses and the background

The conclusion we reached is that there is dependence between the background and the need for m-learning courses.

We wish to see if there is dependence between the usage time of the mobile phone &PDA and the need for courses (Table 8).

	Daily >3 hours	D<3	1/2	1/8	Total
Yes	106	4	89	23	222
No	26	1	26	3	56
Total	132	5	115	26	278

Table 8. The link between the need for courses and the frequency of using the computer

The conclusion we reached is that there is dependence between the usage time of the computer and the need for courses.

We wish to see if there is dependence between the types of course and the background. (Table 9).

	Urban	Rural	Total
Yes	114	25	139
No	30	9	39
Total	144	34	178

Table 9. The link between the type of course and the background

The conclusion we reached is that the type of course chosen is independent of the background.

We wish to see if there is dependence between the background and the need for courses (Table 10.)

	Urban	Rural	Total
YES	110	28	138
NO	27	7	34
Total	137	35	172

Table 10. The link between background and the type of course

The conclusion we reached is there is independence between the background and the utility of education.

For the question "Which fields do you think are suitable for distance learning?" the synthesis of the answers to this question is to be seen in table 11.

"Which fields do you think are suitable for distance learning?"	Absolute figures (number of people)	Perceptual figures
Management	135	40%
Mathematic	38	11%
Marketing	114	33%
Accounting	55	16%
Total	189	100%

Table 11. The preferences for the education field

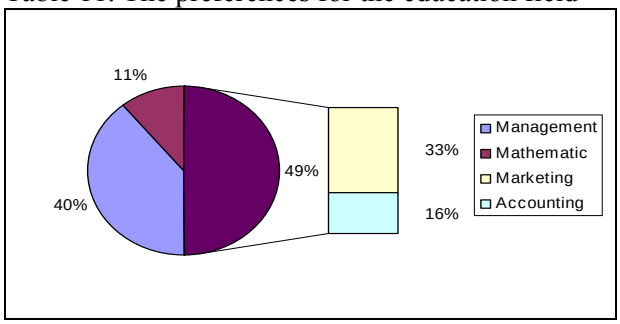

Fig. 5 The graphic of fields which are suitable for distance learning

For the question „Which are your expectations concerning the distance educational system: to have teachers with whom you can communicate all the time, the reinforcement of theoretical aspects or others." Out of 189 responders, 64% (120 persons) prefer communication, 17% (32persons) prefer reinforcement, 14% both and 5% didn't answer.

And not last for the questions "Do you have a mobile phone?" and "Do you often use the mobile phone?" all the people interviewed answered that they have a mobile phone and they use it.
From the statistical analysis of the questionnaire results that is a real need for m-learning courses which increases the preparation level. The attitude of the potential beneficiaries is a positive one.

At the question "Do you have a mobile phones and PDA?" 79 % (149) answered YES "we have mobile&PDA" and 21% (40) answered that they have only mobile phone.

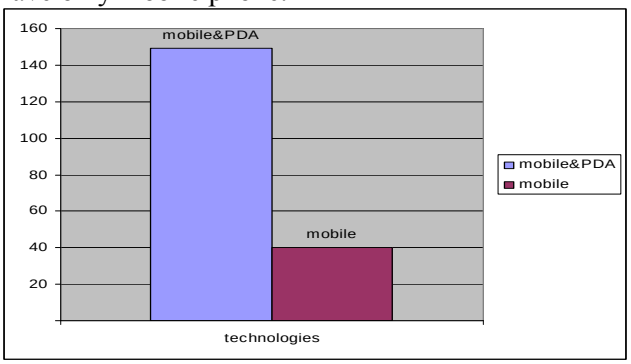

Fig. 6 The graphic of fields mobile&PDA

The Faculty of Economics and Business Administration from Cluj-Napoca has didactic personnel of 153 who have answered our questionnaire.

For the question „How much of what you teach as a professor is currently based on technology?" the answer we received, show that 8% of them are not using any technology, 37% of them are using a technological support only for a maximum of 15 % of what they teach, 34% of them are using technological support for 25% of their teaching, 9% of them are using technological support for around 50% of their teaching and only 12% are teaching using more than 50% the technological support.

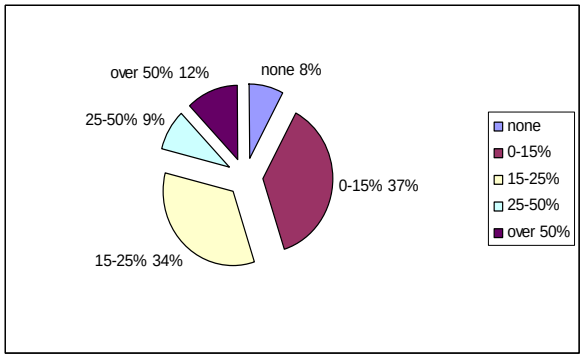

Fig. 7 The graphic of currently based on technology

Regarding the opinion about successfully integrating the mLearning system into higher economic education in Romania, the results illustrate that 17% of the professors do not agree with introducing the eLearning for the time being, 20% consider that it could be easily integrated, 38% believe that some difficulties must be overcome, while 25% think it is too early to express an opinion.

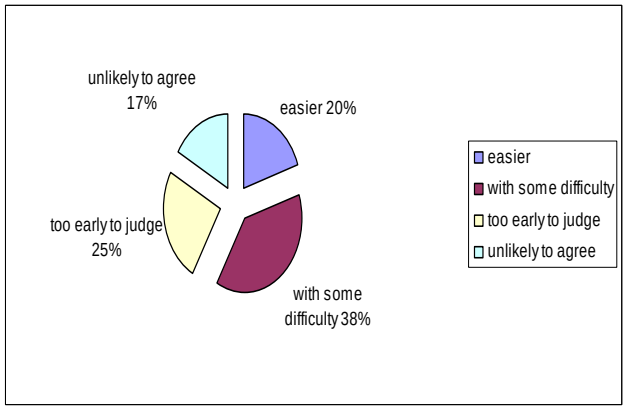

Fig8 The graphic of successfully integrating the eLearning

4. Conclusions

In our study, we wanted to investigate the present factors that affect the attitude and behavior in mlearning.
At the same time, we have found out that the dimension of an educational entity does not influence the use of mLearning; moreover, the smaller the community, the greater efforts it makes to adopt modern technologies in order to become larger and to gain a better position in the community.

From the analyze effectuated still present we can say:
- we have the technologic instrument necessary;
- our student is the capacity to participating in such

mLearning education program;
- mostly from our colleagues accepts this new challenge.

Typically, our learners could be said to have one or more of the following characteristics:
- young people, with average and high education
- dynamic, from town,
- with average and high incomes,
- the majority of them want to have decision positions in private companies
-that women prefer mLearning as an alternative of education

But exist some problems, like:
- the students expressed very different views concerning reading from a small screen;
- we need better solutions for browsing web pages;
- portable keyboard is necessary for efficient use of the PDA as a teaching and learning tool.

Of the analysis made up to present we observe :
- the opportunity of adding a mLearning component in an existing e-Learning platform;
- no legislation necessary for the recognition of sending the educational content and all the more so of the tests made through handheld technologies is in place;
- the necessary infrastructure already exists, as each student has a mobile phone and there are the requisites for the use of PAD;
- the teaching staff of the academic environment may prepare the necessary content.

Organizations must permanently adapt o new technologies in order to obtain a larger market segment or even for staying on the market. In the existing e-learning platform from UBB we can use a didactical strategy, complementary to e-learning which comprises: laptop, PDA/smart phone, cell phones, and accessories.
We proposed the development of an e-learning department with two concrete tasks for the beginning: making a portal for SMS and for managing an on-line library and developing new norms and standards for using m-learning. By comparing the response time of SMS and email, Stone & Briggs have shown that SMS has a quicker response time for interactive activities in education than email on the web [15].
SMS, or text-messaging, is a way to send 140 characters of text, a very brief message, to another phone or to an email address. This may sound limiting, but SMS is being greatly used in the US and many countries worldwide. [32].
MMS [32] is a way to send not only text, but media such as audio, images, and video, from mobile devices (specifically, phones) in a way different than via email (though some may support that as well). Widely used in Europe, it's not as prevalent in the US where we have not conquered differences between providers [32].
In the future, being able to send a media file to share with other individuals may be a powerful support for collaboration [32].

So, in the first stage, already accomplished, we tried the conversion of some study materials in electronic version in order to be consulted on E-book devices (even GPS). The materials will be turned into XML format which will allow the user (the author of the course material) to transform the content easily in other final formats. The future of e-learning evolution in the universities from Romania depends not only on the development of wireless technologies but also on the development of the didactical content which can be distributed through mobile means.
The new digital technologies and recent research in visual design (visual design, screen design, eye tracking etc.) enlarge significantly the sphere of possibilities and foreshadow a future which will definitely leave behind the „written story" of distance learning. This is not the final result of our work; our aim here is to foster further discussions about mlearning.
We are investigating this approach as part of the development of a prototype mlearning system. In this context the role of the university should be to facilitate these processes, to provide access to information and self-learning. This task should be accomplished taking into consideration that deployment of technology is most successful in situations where it is a response to clearly articulated needs or aims, consistent with the mission and positioning of the institution [23].

Further research should address the issues of:
- realized a questionnaire that will follow the four elements developed by Wang: [32] critical elements in the assessment procedure are considered: the learner interface, the course content, the access and interaction with the learning community and the personalization of learning to account for the variety of individual learning styles
- analysis the costs for the preparation and implementation of mLearning elements;
- realized theoretical frameworks for

mlearning
- we could not yet perform the terminology of the curriculum to get the course approved by the department,
- use the standardization terminology (e.g. LOM standard)
- achieve certification for mobile learning courses

Like many descriptive studies, the result of this study were not meant be formally generalized to otheracademic systems, but we think that the future is wireless in Romanian's education, too.

References:

[1] http://www.mcti.ro/*RaporteReadinessRO.pdf*
[2] www.wbtworld.net/ro/project/*pertenership.php*
[3] www.timsoft.ro
[4] D. Stroe, *Standarde şi sisteme de eLearning*, Ed. Edusoft, 2005
[5] M. Guran, *Sistem de indicatori pentru evaluarea stării societăţii informaţionale*, http://www.acad.ro/pro_pri/doc/st_a03.doc
[6] M. Drăgănescu, *Societatea informaţională şi a cunoaşterii. vectorii societăţii cunoaşterii*, http://www.acad.ro/pro_pri/doc/st_a01a.doc
[7] http://www.academiaromana.ro
[8] http://www.ase.ro/site/index.asp
[9] http://steconomice.uoradea.ro/ofertaedu.html
[10] http://www.upg-ploiesti.ro/educatie.htm
[11] http://idd.univ-ovidius.ro
[12] http://www.uvt.ro/
[13] http://econ.unitbv.ro/ed/default.aspx
[14] http://www.uaic.ro/uaic/bin/view/Main/
[15] Y. Awwad and others*, Ubiquitous Information Gathering with SMS Query,* Proceedings of the 5th WSEAS International Conference on Telecommunications and Informatics, Istanbul, Turkey, May 27-29, pp203-206, 2006, www.wseas.org
[16] http://www.econ.ubbcluj.ro
[17] I.Trandafir and others, *Sistem flexibil de instruire a managerilor în domeniul e-business*, www.ici.ro
[18] R. Trîmbiţaş, *Software matematic*, Note de curs, Cluj Napoca, 2006
[19] http://www3.imperial.ac.uk/ict/ /elearning
[20] http://www.up.ac.za/telematic/article.pdf
[21] Implement inter-institutional collaboration; RE2U, 2003, Ed. ROLNET, Romania
[22] C. N. Quinn, mLearning Devices Performance To Go, Quinnovation , www.quinnovation.com/MobileDevices.pdf, 2008
[23] D. Parsons, H Ryu, *A Framework for Assessing the Quality of Mobile Learning*, Institute of Information and Mathematical Sciences, Massey University, Auckland, New Zealand, 2007
[24] M. Mircea, *The Impact of Mobile Solutions in Business*, Revista Informatica Economică, nr. 3(35)/2005, pp 23-28
[25] R. Cobcroft, *Literature review into mobile learning in the university context* http://creativecommons.org/licenses/by-nc-nd
[26] http://fmi.unibuc.ro/ro/pdf/2004/cniv
[27]http://www.spider.ro/ro/elearning
[28] http://www.elearning-forum.ro/resurse
[29] Rong-Jyue Fang1 and other, *Mobile Learning Integrating Elementary Education─ Taiwan Elementary as an example* , Wseas Transactions On, Advances In Engineering Education, Manuscript received Nov. 9, 2007; revised May 7, 2008, www.wseas.org
[30] S. Meredith and others, *New Practices in Flexible Learning Mobile learning: handheld innovations in flexible learning*, flexiblelearning.net.au/projects/media/mlearning_reportpt1.pdf
[31] Desmond Keegan, *From eLearning to mLearning,* learning.ericsson.net/mlearning2/project_one/presentation/des1911.ppt
[32] Charalambos C. Katsidis*, E-learning at the Technological Educational Institute of Crete*: An Evaluation Based on the Student Experience, WSEAS Transactions On Advances In Engineering Education, Manuscript received Mar 26, 2008; revised July 27, 2008, www.wseas.org
[33] Chia-Feng Lin and others, *A transformation tool for adapting SCORM documents into Mobile environment*, Proceedings of the 2nd WSEAS/IASME International Conference on Educational Technologies, Bucharest, Romania, October 16-17, 2006, www.wseas.org