Types of Internet Usage among Higher Education Students in the Romanian-Hungarian Cross-border Area

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Abstract: *The present study aims to fill the existing gaps in the Eastern European empirical analyses, providing a descriptive and explanatory image of the university students' Internet usage patterns. We used the data collected within an international research project on higher education students in the Romanian (n=1,323) – Hungarians (n=1,295) cross-border area. Overall, Hungarian students spend more time online daily (a median of 120 minutes/day) than their Romanian counterparts from the same region (a median of 100 minutes/day). We found that university students' Internet consumption patterns are differently affected at country level by gender, residence, financial situation and parents' education level. Based on a factorial analysis, we differentiate three types of online activities of the students: for* academic purpose*, for* entertainment and consumption, and for information and communication*. Subsequently we examined the socio-demographical correlates of the amount of these types of activities. Overall, we found that Hungarian students use more the Internet for academic purpose than Romanian students. For the last subsample, the academic usage of the Internet is the less frequent online activity. Romanian students tend to be involved in entertainment, communication and leisure online activities in a larger measure than the Hungarian in the investigated area. This was explained by students' residence, marital status, and by their parents' educational level and financial situation.*

Keywords: Internet usage; students; online activities; socio-demographic determinants; educational determinants.
Cuvinte-cheie: consum de Internet; studenți; activități online; determinanți socio-demografici; determinanți educaționali.

Introduction

People worldwide are permanently connected to Internet, gathering information, transacting, interacting, communicating or solving professional issues online. At 31 December 2011 Internet World Stats shows that the percentage of Internet penetration in European society was of 61.3%; 39.2% of Romanian citizens were Internet users at that time, while Hungary registered a penetration rate of

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65.3% (Miniwatts Marketing Group, 2012). Pew Internet & American Life Project (2009) defines young adults aged between 18 and 32 years as the "Net Generation". They represent 30% of the American Internet-using population.

University students present specific Internet consumption patterns due to their sociocultural and economic background. Kim and Kim (as cited in Park, 2009) showed that their online behavior is heavily influenced by gender, income and education level. Female college students prefer to use Internet more for social interactions, academic purposes (Li and Kirkup, 2007; Jones, Johnson-Yale and Millermaier, 2009) or for seeking health and beauty related information (Park, Kim and Na as cited in Park, 2009). Few research found contrary results: university students' Internet consumption patterns change only according to previous computer experience, regardless of gender, age, family income or parental education (Silku, 2009).

Online activities are defined as the Internet-based processes undertaken by individuals who invest a lot of time and resources in this sense (Rodogno, 2011), covering a wide range of activities: human interaction, entertainment, academic, professional or commercial usage or just information seeking.

In close relationship with online activities stands out the concept of *digital divide.* Initially it was used only to differentiate between various social sections in relation to computer and Internet access (van Deursen and van Dijk, 2010). Afterward the theoretical framework of the term was then expanded. Now, digital divide refers to the social inequalities determined by what people do online (Livingstone and Helsper, 2007; Ono and Zavodny, 2007).

The term of "socioeconomic status" (SES) was designed as a complex index for measuring the social position of an individual taking into consideration a wide range of determinants including educational level, occupation, income, prestige of professions; accordingly, the socioeconomic status of individuals is categorized as low, medium and high (Kraus and Keltner, 2009).

Although European researchers are concerned about investigating the frequency and the quality of youth online activities, they overlook topics regarding students' online consumption patterns. Research gaps can especially be found within Eastern European literature, which lacks empirical exploration of university students' online activities in relation to their socio-cultural and family background. In Romania, Macarie et al. (2012) conducted a study in this sense, but using a sample of adolescents aged between 15 and 16 years.

We believe that the present research will add to the knowledge in this field and will fill the existing empirical gap within the Romanian and Hungarian academic frame. Specifically, we try to answer to the following questions: which are the quantities and types of students' Internet consumption in Romania and Hungary, and what are the socio-demographic and educational determinants of these types of consumption?

Conducting a secondary analysis on the data collected during an international research project among higher education students in Romanian-Hungarian cross-border region (HERD), we will analyze students-Internet relationship and youngsters' predisposition to undertake different online activities due to socio-cultural, economic and academic features. Similarities and differences between the two national samples will be discussed.

The formation of the cross-border region (CBR) at the Romanian-Hungarian frontier took place after the socio-political transition in 1989. Since 2002, this geographical area was referred to as Bihar-

Bihor Euroregion, organized as a metropolitan area, with two large cities on each side: Oradea for Romania and Debrecen in Hungary. Cross-border areas, although based on different social services and legal frameworks, are considered to be similar in what regards their culture and value systems (Kozma, Teperics, Tőzsér and Kovács, 2012). Due to this, research conducted in this particular cross-border region suggests that the values outlined for the two national subsamples do not register significant differences (Bocsi, 2012).

The first part of the present paper creates the theoretical framework by providing a synthesis of the reviewed literature in the field. After explaining the methodological issues, we will present the research results. First, we will point out the personal characteristics of the respondents: gender, age, residence, course of study and family background (parents' education and economic situation). Afterwards, we will analyze the quantitative aspects of internet consumption correlating the time spent daily online with respondents' country, gender, age, marital status and family background. We will categorize the types of online activities undertaken by students and examine them in correlation with the background variables mentioned before. Furthermore, we will discuss the results in order to emphasize the main findings of the research. Empirical limitations of the present study will be debated in the final section of the paper.

Literature review

Higher-education context in Romania and Hungary

During 1999-2006, in Romania the Gross Enrollment Rate (GER) in higher education was of 30%, 5% lower in comparison to Hungary (35%) (Usher, 2009). An upward trend of the newly enrolled university students generated changes at the level of higher-education systems. As a consequence, new public and private universities were established in the Romanian-Hungarian cross-border area (Hatos, 2012). The ethno-cultural pluralism of the Romanian-Hungarian cross-border area is outlined at educational level: a Romanian higher-education institution (Partium Christian University from Oradea) offers Hungarian ethnics students professional training in their mother-tongue, acting as a focal vector for people who wish to study in Hungarian (Flòra, 2012).

Recently (since 2009 in Romania and even earlier in Hungary), the number of enrolled students in higher-education system registered a downward trend in both countries, which reflects the saturation at this educational level. Hungarian institutions turn out to be more selective (status-seekers), while Romanian universities are student-seekers, even if this fact is related to a lower educational and social status (Hatos, 2012).

Quantitative approaches to the Internet consumption

According to the European Youth Trend Report (2009) the Internet is the most preferred medium by youngsters. They register an online time of approximately 22 hours per week. 21% of the young adults use the Internet for entertainment activities such as playing video games. A survey conducted by ECAR (Educause Center for Applied Research) revealed that the average of students' online active time is of 19.6 hours per week.

Eurostat statistics showed significant digital divide between different age groups of EU-27 population: regular Internet users are youngsters, within the range of 16-24 years (Seybert, 2012). A third of the Romanian young people are accessing

daily the Internet, while 20% of them use it only two or three times per week (Plăeşu et al., 2008). At the level of the same year, 60% of Hungarian youngsters aged 15-29 declare a daily use of Internet (Bauer and Szabó, 2009).

Types of online activities

Research show that online activities preferred by students are strongly directed towards maintaining and developing friendships or interacting with family members or colleagues. Thus, youngsters pursue entertainment online activities, such as photo or video sharing, playing online games, downloading web-based music and video or writing comments on blogs (Pew Internet and American Life Project, 2009). American students are seeking entertainment online or searching academic or work-related information (Salaway, Borreson and Nelson, 2008).

A study conducted in Eastern Asia had revealed three major types of adolescents' internet usage: communication/entertainment, expression/participation and information/research (Jung, Lin and Kim, 2012). The Nordic Youth Research report showed that 17% of the adolescents between 16 and 19 years spend almost 30 minutes to 1 hour per day for playing online games. 5.4% of the young people in Greenland use daily online communication channels like Facebook or Twitter, while only 1.8% of Finish young population uses the Internet for this reason (Guðmundsdóttir et al., 2010).

In Romania one third of youngsters tend to use the Internet mostly for communication and gathering information; 52% of the Romanian youth access online information for educational/work purpose at least 2-3 times per week, while a similar percentage value is registered for those who use Internet as an entertainment device (Plăeşu et al., 2008).

Hungarian students are prone to use Internet for social purposes, gathering information (Asztalos, 2011) or for entertainment activities (Bauer and Szabó, 2009; Vas and Gombor, 2009). We didn't manage to find consistent data regarding the academic usage of Internet among Hungarian university students, fact which strengths our idea that the present study can provide substantial data in this sense.

The academic use of the Internet

As the e-reading, e-learning and e-research begin to be more and more common among scholar practices, recently, many research focused on the academic usage of computer and Internet (e.g. Wirth et al., 2007). Brito (2012) showed that the activity of searching and getting information online is the most specific and widely spread Internet attribute. The goal to accomplish academic tasks was significant and positive related to activities of online information/research (Jung et al., 2012). Research suggests the embracing attitude of the Korean students in what regards Internet academic usage: almost one third of the respondents agreed that online lectures have had a positive impact on their learning process and experience (Park, 2012). Another survey conducted by Chang (as cited in Park, 2012) revealed that 96% of post-graduate Singaporean students are frequently using Internet for their academic work and research. Social network sites (SNS) are often used by university students to communicate with each other about academic courses and to interact with their instructors (Salaway, Borreson and Nelson, 2008).

From the surveys conducted during 2003-2008 by ECAR on a sample of American university students, 45.7% declared that the implication of Internet technology in educational courses marks a progress in their learning (Salaway,

Borreson and Nelson, 2008). Duggan et al. (cited in Zhang, 2007) measured undergraduate students' attitude towards the use of the Internet in the educational process. The respondents showed a more open attitude when more Internet programs and components were available for the educational use.

The socio-economic background of the students and the Internet consumption

Research emphasized the determining role of the socioeconomic background in what regards attitudes towards Internet usage, type of online activities and time spent online (Porter and Donthu, 2006; Zillien and Hargittai, 2009).

Gender

The patterns of online behavior and Internet activities are gendered. Male students are more prone to use the Internet for playing multiusers games, downloading music or videos, actions that are not included in the array of female students online practices (Salaway, Borreson and Nelson, 2008). Young women assign more time for social interaction, online entertainment and academic activities. Duggan et al. (cited in Zhang, 2007) showed that attitudes towards the educational usage of Internet do not imply distinctive features according to students' gender. On the other side, Salaway and collaborators (2008) revealed that the preference patterns regarding the introduction of informational technology within classroom instruction is biased towards male students.

Age

At least in USA, the online population is dominated by younger and middle aged generations (between 18 and 44 years old) (Pew Internet and American Life Project, 2009). In Europe, Hakkarainen (2012) found that Finnish elderly people with a non-urban residence refuse to embrace the Internet in their life, considering it useless and risky. Salaway, Borreson and Nelson (2008) show that 85% of university students use SNS, especially Facebook and MySpace, and 95% of them were aged between 18 and 19 years. Age differences do not tend to come forth regarding the patterns of students' Internet consumption. For example, age is no more a determinant demographic factor in shaping preferences for IT as an active process of learning due to the spread of emergent technologies and Internet in the academic life.

Residence

Research does not point out clearly the relation between residence and university students' Internet usage patterns. Adolescents under 18 years old were more systematically evaluated in this sense. Macarie et al., 2012 investigated 15-16 years old adolescents from Iaşi County, categorized by their residence. As expected, the residence is a differentiator factor between the patterns of computer and Internet consumption: students living in urban areas register more time spent for online activities, especially for social networking and interactions or for playing online games. The quantity of school related information which teenagers search online and the aspects regarding online communication through instant messaging are, however, constant when related to the living area.

Ştefănescu (2007) points out the high discrepancy between Romanian urban and rural areas regarding online connection: the Internet access is 4 to 6 times more frequent within urban hoseholds.

Educational background of the parents

There has been little research investigating the role of parental educational level in shaping university students' Internet consumption patterns. The literature in the field reveals many studies that have systematically analyzed this relation on samples constituted by school students and teenagers under 18 years old. Macarie et al. (2012) showed that 49.2% of fathers of the adolescents who undertake various activities using the Internet have secondary education while only 34.9% of mothers are situated on this educational level. The education of the parents might influence scholar performances of the teenagers but does not have a role in the configuration of online activities' patterns, time spent for socializing via SNSs or online gaming.

Family's financial situation

The existing literature does not present relevant studies or theories regarding the relation between students' income or their family income and Internet consumption. Most of the existing research focuses on computer usage patterns (Silku, 2009), not taking into consideration the online environment. The Eastern European research presents the same literature gap.

However, we expect our results to outline a positive relation between the financial situation of the families and adolescents' Internet usage: a superior income level could determine a higher daily time spent on the Internet as well as the type of online activities.

Students' marital status

Social research, independently of cultural contexts, is facing a lack of scientific interest regarding the statistically relation between students' Internet usage patterns and their marital status. Very little investigation has been done in this sense. However, we suggest that married people do not have enough spare time in order to navigate very often on the Internet. More than that, Internet consumption is reduced because a various range of other social relationships start to be undertaken within the couple or the family, thus in a non-online form.

Academic characteristics and the Internet usage

The active time spent for online academic activities is correlated with distinctive stages and forms of formal education. Thus, students enrolled in doctoral institutions spend online approximately 21 hours per week followed by master's subjects and bachelor's respondents (19.2 respectively 19.1 hours per week). Silku's (2009) research emphasized, however, that the university students' attitude and computer usage behavior are not affected by their academic specialization.

The context of Internet consumption in Romania and Hungary

In 2011 over 50% of Romanian citizens have never used the Internet, although the rate has decreased from 2009 when the percentage value was over 60%. This rate ranks Romania on the first position among other European countries regarding Internet non-users. At the level of 2011, in Hungary this value was less than 30%. For comparison, in most advanced European countries, non-users are situated below 10% of the total population. European non-users declared that equipment and connection costs are the main reason for not having access to Internet (European Commission – Directorate-General for Communication Networks, Content and

Technology, 2012). Thus, reducing the prices for Internet access as well as adopting special tariffs in this sense, may contribute to a growth of Internet usage rate in less advanced European countries. This situation characterizes mostly our country, where the Gross Domestic Product is lower than the one registered for Hungary, thus a lower living standard in Romania deprives people from certain services, such as access to Internet.

In 2008, 51.5% of Romanian youngsters from the North-Western region had Internet access at home, a value similar with the national penetration rate – 51.3%. The same Youth Report showed that approximately 80% of the urban young people have Internet access from households, while for the rural area, the percentage drops down to only 55% (Plăeşu et al., 2008). At the level of the same year, 49% of the Romanian youth connects online from the place of their educational institutions (Eurostat, 2009).

The access to Internet in the households of Hungarian youngsters had significantly risen from 24% in 2004 to 70% in 2008, due to price reduction and changes in technology (Bauer and Szabó, 2009). Data show that 74% of the Hungarian people aged between 16 and 24 years browse the Internet from home, while 64% of them access Internet from educational institutions (Eurostat, 2009).

Research method

Giving the empirical gaps within the academic Romanian and Hungarian literature, we intend to contribute with data and interpretations on the discussion concerning intensity, contents and the determinants of students Internet activity. Our research tries to answer to the following questions:

- Which are the quantities and types of students' Internet consumption within the Romanian-Hungarian cross-border area?
- What are the socio-demographic and educational determinants of these types of consumption?

In order to answer to these research questions, we performed a secondary analysis using the database of survey of HERD research, conducted during March and June 2012. The sample was collected from the students of Higher Education Institutions of the cross-border area of Hungary, Romania and Ukraine (N=2,728). Giving the small number of cases, respondents from Ukraine were excluded from the analysis, leaving 1,323 Romanian and 1,295 Hungarian respondents. All the selected subjects were bachelor and master students integrated in the regular day-course regime (financed either from the budget or by paying a tax). A combination of stratified cluster sampling methods and stepwise methods was used in order to obtain the definitive sample.

Characteristics of the sample

Romania presents the following distribution of respondents: University of Oradea – 714 students; Partium Christian University Oradea – 407; Emanuel University Oradea – 136 students, and Babeş-Bolyai University, branch Satu Mare – 66 students. The Hungarian students were selected from 3 universities, as follows: Debrecen University – 1,118 students, Nyíregyháza University – 152 students and Reformed Theological University of Debrecen – 25 students. The two national samples are balanced taking into consideration the number of respondents. A total of 1,150 Romanian respondents were bachelor students, having the following distribution by the year of study: 393 were first year students; 358 were attending the second year of study; 288 were third year

students while only 92 students were in the last year of study. Except for the group of students in the fourth year of study (which, according to Bologna regulation, is common only for a few domains such as medicine and architecture), the sample presents an equilibrium regarding the number of the subjects. The rest of 173 Romanian subjects were attending master classes; in this case, the distribution of the students is very balanced – 88 were first year students and 85 were in the terminal year of study.

As showed in Table 1, the Hungarian sample is disproportioned in what regards students' distribution by course and year of study. 1,053 respondents are bachelor students: 416 in the first year, only 76 of them were in the second year, 453 - in the third year and 108 students were in the last year of study. The number of the master students was of 242. We note the lack of balance between the number of first year students (164) and last year students (78).

Table 1: *The distribution of Romanian and Hungarian students by course and year of study*

Course of study	Year of study	Romania	Hungary
Bachelor	First year	393	416
	Second year	358	76
	Third year	288	453
	Fourth year	92	108
Master	First year	88	164
	Second year	85	78
TOTAL		**1,323**	**1,295**

Personal characteristics of the respondents by country

The distribution of the respondents by gender from both Romanian and Hungarian sample is relatively balanced. A particularity of the samples stands in the overwhelming presence of female subjects: 62.8% females from Romania and 68.2% from Hungary. The age of the students integrated in both types of study courses (bachelor and master) is another important personal characteristic. The average age of the Romanian bachelor' students is of 22 years, a value which is comparable with the one registered for the Hungarian students from the same course of study – 21.8 years. In what regards master studies, the samples register a difference of more than 2 years between Romanian and Hungarian students, as shown in Table 3. The urban area as place of residence is predominant for both Romanian (67.1%) and Hungarian students (71.4%). As shown in Table 3, there are strong disparities regarding the marital status of the respondents. 8.3% of the Romanian students declared that they are married compared to a percentage of only 1.1% for the Hungarian sample. Although the Hungarian and the Romanian societies present cultural similarities, Romania tends to be more traditional compared to Hungary. This may explain why the proportion of married students is not as high.

Variables regarding students' family background have been also taken into consideration. The mean of their father's education is the same for Romania and Hungary. Most of the students' fathers are at least high-school graduates. The same explanation is also valid for the mothers, but Hungarian students' mothers (13.2 years of education) tend to be a little bit more educated than the Romanian ones (12.6 years of education). The respondents were asked to evaluate their family material situation com-

pared to other families in the country. In this sense, subjects from both countries ranged their families as being on average compared to others. The differences between the responses given by Romanian and Hungarian students are not significant (Table 2).

Table 2: *Personal characteristics of the respondents by country*

		Romania	Hungary
Gender	Male	37.2%	31.8%
	Female	62.8%	68.2%
The average age by course of study	Bachelor	22.0	21.8
	Master	26.5	24.3
Father's education in years (mean)		12.7	12.7
Mother's education in years (mean)		12.6	13.2
Residence under 14 years	Urban	67.1%	71.4%
	Rural	32.9%	28.6%
Evaluation of one's family material situation compared to other families in the country		5.7	5.5
Students' marital status	Married	8.3%	1.1%
	Not married	86.4%	90.9%
	Divorced	0.6%	0.6%
	Other situation	4.7%	7.4%

Research results

Internet consumption: quantitative evaluations

Giving that we found a series of extreme cases (respondents who declare they use Internet more than 12-14 hours a day), we chose to use the median values in comparisons, which can elude the extremes and focus on the main patterns of usage. Overall, from Table 4 we observe that the Hungarian students tend to spend more time online (120 minutes) than do Romanian students (100 minutes). The explanation can be given by a correlation of various factors, among which a higher Internet infrastructure in Hungary. In the last years, Hungary implemented economic policies that facilitated the access to Internet and to its services: the significantly lower price for IT equipment determined a higher percentage of households having a PC and Internet connection. Alongside, technological changes were made, so that most households in Hungary benefit from the widest-band Internet access (Bauer and Szabó, 2009). Among other explaining factors, we suggest: students' interest for online navigation and their necessity to browse the Internet because of academic requirements and tasks.

In what regards the estimated daily Internet consumption by university, only two of the Romanian academic institutions from the mentioned cross-border area (University of Oradea and Partium Christian University Oradea) present a high amount of time spent online by the students (100 and 120 minutes per day). The other two universities register only half of the mentioned time. In Hungary, except for the Reformed Theological University of Debrecen where the daily estimated Internet usage by the students is only of 80 minutes, the other two universities in the sample present higher amount of time spent online – 120 minutes. The data from the Reformed Theological University of Debrecen should, however, be taken with precaution giving the very low subsample.

Table 3: *Median of the estimated daily Internet consumption, by country, university, course of study and year of study*

		Romania	**Hungary**
Bachelor	First year	80	120
	Second year	100	120
	Third year	120	120
	Fourth year	120	100
Master	First year	100	113
	Second year	90	120
University	Babeş-Bolyai University - Satu Mare	60	
	University of Oradea	100	
	Partium Christian University of Oradea	120	
	Emanuel University of Oradea	60	
	University of Debrecen		120
	University of Nyíregyháza		120
	Reformed Theological University of Debrecen		80
Median by country		**100**	**120**

The analysis between the personal characteristics of the respondents and the daily Internet consumption outlines a detailed image of their online behavior. At the first look, Hungarian subjects have a constant daily time spent for online activities (120 minutes) with only one exception identified for married students (30 minutes daily).

As showed in Table 4, the gender of the respondents generates differences in what regards the daily Internet usage but only for Romania; regardless of gender, Hungarian students estimated the same amount of time spent for online activities. The Romanian female students (80 minutes daily) do not tend to have such a pro-active online attitude as male students do (120 minutes per day).

The Hungarian students included in the sample do not register differences in the amount of daily Internet consumption by their age. The dissimilarities appear in the case of Romanian students. The students ranged between 22 and 23 years old register the highest time spent online – 120 minutes per day. Starting with the age of 24, the daily Internet consumption decreases up to 90 minutes daily, which is the amount of time estimated also for the students having 21 years old or less.

The family background affects Romanian students' Internet usage patterns. Higher amounts of estimated daily Internet consumption are registered if the father's and mother's educational level exceeds 11 years of school. The students' estimated daily Internet consumption tends to increase as parents are more educated, but only up to 14 years of school, when the values do not continue to grow significantly. The Hungarian students spend with at least 20 minutes per day more time online than their Romanian counterparts, regardless of the parents' educational level.

We registered no differences in Internet use time linked with the financial situation of the students' family. The minutes spend daily online by Hungarian students is not determined by their residence until 14 years old. But the residence of the Romanian respondents makes a difference in the amount of time spent on the Internet: students living in urban areas until 14 years old allocate almost twice as much time for online activities compared to those in rural

regions. The larger rural-urban Internet infrastructure gap in Romania could be an explanatory factor for this behavior. The digital gap is noticeable at territorial, social and also family level (Ştefănescu, 2007).

An interesting situation comes out when analyzing the marital status of the respondents. For both countries, a legally married civil status affects in a significant way the Internet consumption patterns regarding the time spent online. We registered a strong decrease: 100 minutes per day for unmarried Romanian students compared to 60 minutes daily for married ones, while in Hungary, unmarried respondents spend 120 minutes per day online compared to only 30 minutes daily allocated by married students. This variation could be explained by the specificity of the family life which implies more responsibilities and various other activities that reduce the time assigned for Internet navigation.

Table 4: *Median of the estimated daily Internet consumption by personal characteristics and by country*

		Romania	**Hungary**
Gender	male	120	120
	female	80	120
Age (Binned)	<= 21	90	120
	22	120	120
	23	120	120
	24+	90	120
Father's years of school	11 years or less	90	120
	12-13 years	100	120
	14 years or more	100	120
Mother's years of school	11 years or less	80	120
	12-13 years	100	120
	14 years or more	115	120
Residence under 14 years old	urban	100	120
	rural	60	120
Financial situation of own family compared with other families from the country	below average	100	120
	on average	100	120
	above average	100	120
Married	no	100	120
	yes	60	30

Types of Internet use

An important part of the analysis regards the types of students' online activities. The most present daily or weekly activities undertaken by the Romanian students included in the sample are e-mailing and communicating with others through instant messaging (Figure 1). Communicating via e-mail is the most present online activity also for the Hungarian students, but navigating on newspaper or magazine sites is the next activity in range. The difference between the percentage of Romanian (85%) and Hungarian students (79%) in the sample in what regards using the e-mail daily or at least once a week is not significant. The less present online activities are:

- web storage services – 26% of Romanian students and 23% of Hungarian respondents;
- searching for specialized materials using scientific databases – 24% in Romania and 28% in Hungary.

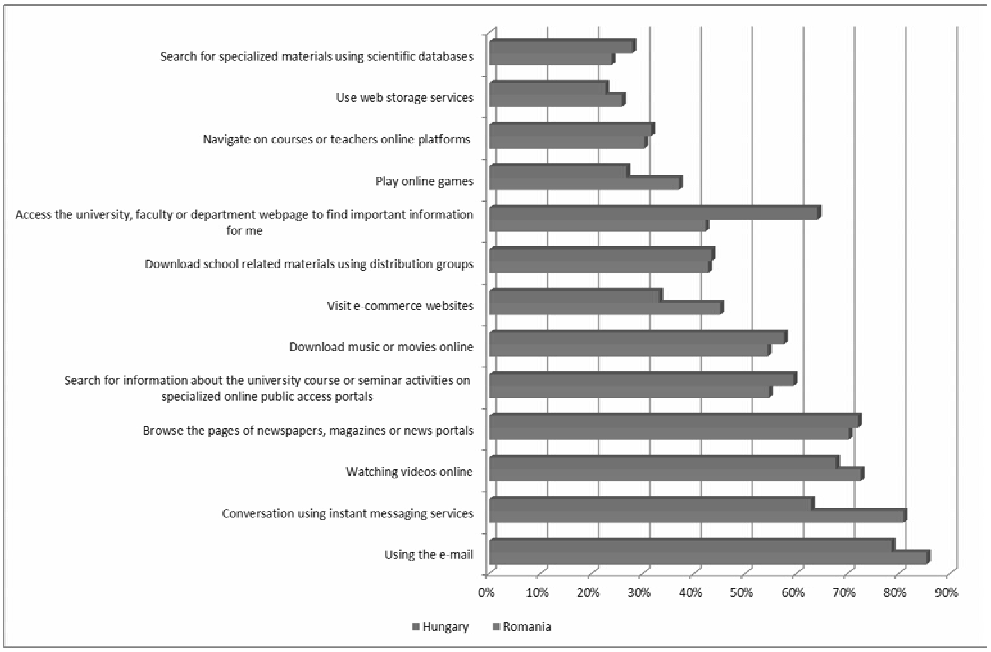

Figure 1: *The categories of Internet use – daily or at least once a week*

Figure 2 presents online activities undertaken by the respondents less than once a month or never. Romanian students from the cross-border area tend to develop more entertainment or leisure activities on the Internet than the Hungarian counterparts in the same geographic region. The percentages of Hungarian respondents who communicate via instant messaging, visit e-commerce sites and play online less than once a month or never is higher than the values registered for Romania. Thus, Hungarian students included in the sample are more inclined to access their university page for gathering information, access the websites of their university professors or classes, search for specialized materials using scientific academic databases and search for academic information on specialized public access sites. Thus, we suggest that Hungarian students belonging to the mentioned cross-border area tend to be more prone in using Internet in meeting their academic tasks than Romanian students do.

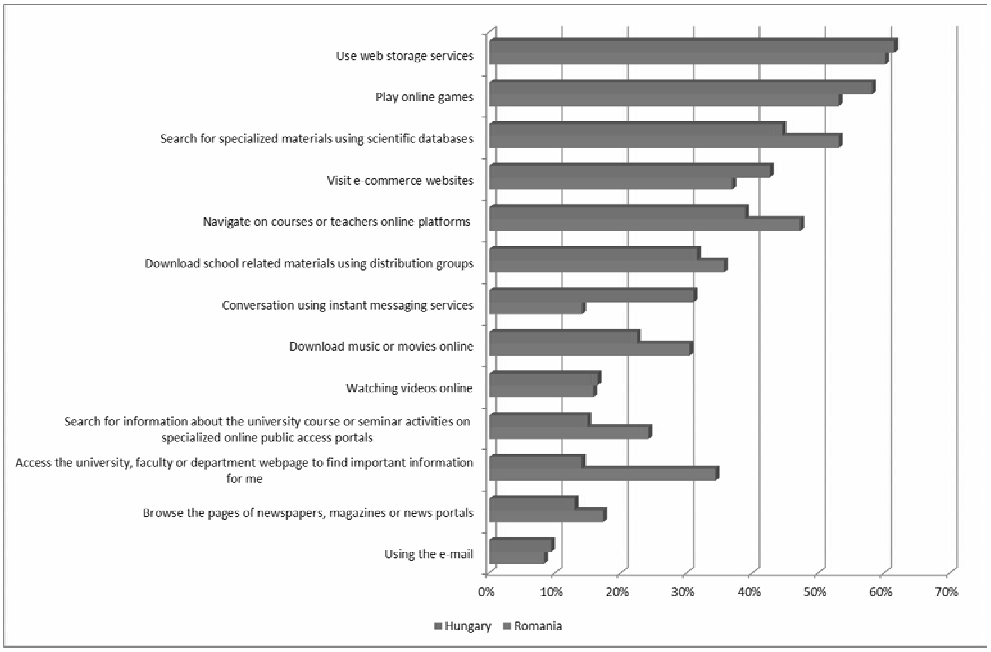

Figure 2: *The categories of Internet use – less than once a month or never*

When entering all these items in a principal component analysis, we find that three latent variables determined their variations. The structure is stable across the two countries, and comprises three factors which reflect online uses for *information and communication* (e.g. Use the e-mail), *entertainment and consumption* (e.g. Watching online videos, Visit e-commerce websites), and for *academic purpose* (e.g. Search for specialized materials on scientific databases). All the three factors explain in total more than 57% of the variation of these items (see Table 5).

In order to compute summative scales corresponding to these three factors, we computed Crombach Alpha's, which range from the less satisfactory 0.592 for *information and communication,* to the very satisfying 0.738 (for *entertainment and consumption*) and 0.832 (for *academic purpose*). All the scales were transformed to a range from one to five, in order to be compared.

We identified some significant differences between the types of online activities undertaken by Romanian and Hungarian students in the sample. By comparing the means, we can conclude with 99% probability ($t=5.50$ $p<0.01$) that Romanian students develop more online information and communication activities than Hungarian students do. With the same probability ($t=3.17$ $p<0.01$) we can say that Romanian students tend to spend more time online undertaking different entertainment and consumption activities. The scientific literature shows that Romanian young people tend to access daily the Internet in order to be informed and to communicate (Plăeşu et al., 2008), finding which was confirmed also by the present research. Generally speaking, students' Internet usage patterns are biased towards online interaction and leisure activities (Pew Internet and American Life Project, 2009).

Table 5: *The factor analysis of Internet consumption items. Results were rotated using Varimax method with Kaiser Normalization*

	Factors		
	Academic purpose	**Entertainment and consumption**	**Information and communication**
Conversation using instant messaging services	0.059	0.194	*0.647*
Use the e-mail	0.176	-0.072	*0.787*
Browse the newspapers and magazines pages or news portals, etc.	0.141	0.262	*0.669*
Visit e-commerce websites	0.133	0.568	0.450
Watching online videos	-0.038	0.508	0.486
Use web storage services	0.231	0.645	0.219
Download music or movies online	0.081	0.709	0.164
Play online games	-0.002	0.765	-0.050
Access the university, faculty or department online page to find important information for me	***0.787***	-0.045	0.102
Search for information about university course or seminar activities using public access specialized internet portals	***0.811***	-0.100	0.134
Search for specialized materials on scientific databases	***0.713***	0.230	0.036
Navigate on online platforms of the teachers or university courses	***0.783***	0.177	0.070
Download school related materials using distribution groups	***0.720***	0.140	0.126
Explained variance:	**31.1%**	**16.9%**	**9.0%**

Based on data from Table 6 we can state that:

- Romanian students in the region tend to undertake less frequently academic online activities than any other type of actions. They are more attracted by entertainment and leisure activities on Internet. Students may not be very interested or aware of the necessity to use Internet for educational purpose or they are not thought enough to embrace the digital technology in the learning process. This is a goal which can be realized based on a cooperation between various social actors – students, teachers, families (Ştefănescu, 2007).
- Although Hungarian students are more prone to communicate and gather information online, the Internet usage for academic purpose is not left behind. Furthermore, they tend to associate more the digital technologies with their educational and professional activities. The Hungarian counterpart of the cross-border region seems to be an area where cyberspace and online services are more integrated in the learning process and students are more encouraged by their teachers to use the Internet in order to complete their academic goals.

Table 6: *The mean of online activities by country*

	Romania	Hungary
Information and communication	4.13	3.93
Entertainment and consumption	3.13	3.01
Academic purpose	2.96	3.20

When analyzing the data (see Table 7) by course of study and by year of study, both countries follow the same patterns: regardless of the year of study, both bachelor and master students use the Internet mostly for information and communication. Except for the bachelor third year Hungarian students, all the other respondents spend more time online for academic purpose than for entertainment or leisure activities. Surprisingly, the Romanian bachelor students present the highest range in this sense. The master Hungarian students present, for both years of study, a higher frequency in using the Internet for academic purposes than for entertainment and consumption. Thus, they are more inclined to integrate the online services in their learning process than Romanian students are. The master Romanian students in the last year of study tend to access more the Internet in order to accomplish their educational activities. On the contrary, Hungarian respondents seem to be interested in online services for their academic activities throughout their entire educational period. The hypothesis that the students following the master courses are more preoccupied in using the Internet in order to meet their academic tasks is sustained also by the other studies (Salaway, Borreson and Nelson, 2008).

Table 7: *The mean of online activities by country, course of study and year of study*

Course of study	Year of study	Internet activity pattern	RO	HU
Bachelor	First year	Information and communication	4.06	3.88
	Second year		4.05	3.97
	Third year		4.17	3.87
	Fourth year		4.34	4.07
Master	First year		4.34	4.01
	Second year		4.14	4.07
Bachelor	First year	Entertainment and consumption	3.09	3.02
	Second year		3.05	3.02
	Third year		3.07	3.06
	Fourth year		3.48	3.16
Master	First year		3.44	2.90
	Second year		3.16	2.71
Bachelor	First year	Academic purpose	2.98	3.24
	Second year		2.93	3.33
	Third year		2.99	3.12
	Fourth year		2.91	3.43
Master	First year		2.98	3.14
	Second year		2.97	3.09

The mean calculated by university shows the highest frequency for *information and communication* online activities for respondents in both countries regardless

of the university (Table 8). Two of the three Hungarian universities register higher values for the academic purpose use of the Internet than for the entertainment activities undertaken by the students. For Romania, the situation is balanced between the two types of Internet usage – academic and leisure activities: students from University of Oradea and from Emanuel University of Oradea spend more time online for academic purposes than their colleagues in the other two universities included in the sample.

Table 8: *The mean of online activities by university*

	Information and communication	**Entertainment and consumption**	**Academic purpose**
Babeş-Bolyai University – branch Satu Mare	3.82	2.75	3.49
University of Debrecen	3.95	3.03	3.23
University of Nyíregyháza	3.86	2.97	3.03
University of Oradea	4.23	3.36	2.92
Partium Christian University of Oradea	4.08	2.95	3.09
Emanuel University of Oradea	3.83	2.53	2.62
Reformed Theological University of Debrecen	3.46	2.66	2.97

We have to mention that a high time spent online was registered also for Babeş-Bolyai University branch Satu Mare mostly regarding the academic use of Internet. Being a branch of a bigger university, presumably uses more online technology by offering e-learning courses can explain the outcome.

The online behavior of the Romanian and Hungarian students from the mentioned cross-border area is determined by students' gender, as follows (Figure 3):

- Female students use more the Internet for academic purpose and for gathering information or interacting with others than male students do. Male students prefer to maintain online contact with others or to undertake leisure activities online.
- The difference between male and female students' behavior regarding the academic usage of the Internet is not significant for Hungary; female and male respondents use approximately the same the online digital services in their learning process. The predisposition for entertainment and leisure online activities can be identified both in Romania and Hungary.

According to the literature, the patterns of online behavior are gendered. Salaway, Borreson and Nelson (2008) suggest that female students have a different array of online usage, compared to male students. Females tend to develop more academic activities on the Internet while males are more preoccupied to undertake entertainment activities online. Our research sustains the theory.

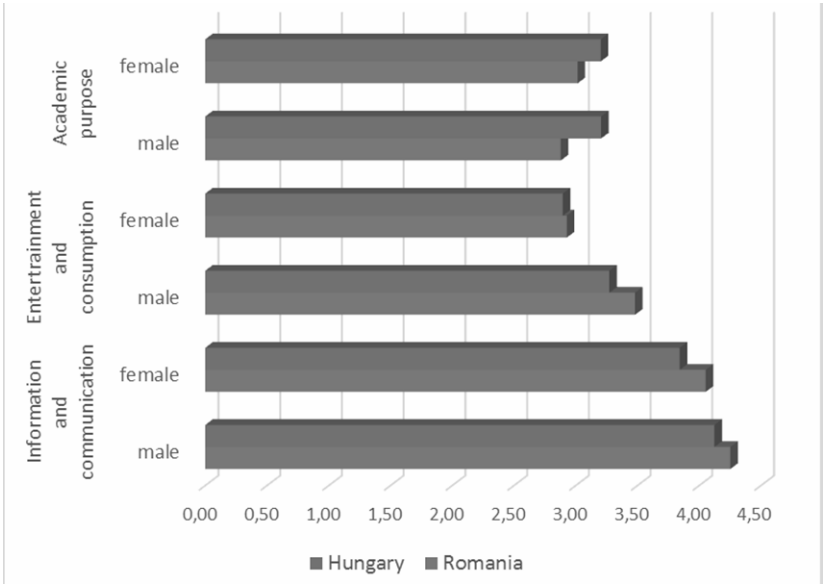

Figure 3: *Types of online activities by gender and country*

As shown in Table 9, both Romanian and Hungarian students included in the sample regardless of their age register the highest scores for information and communication online activities. Furthermore, Romanian students tend to spend more time online for the above mentioned activity than their Hungarian counterparts. Except for the students having over 24 years who tend to spend more time online for educational activities, Romanian respondents register the lowest frequencies for the academic usage of Internet. This situation is not valid for the Hungarian sample, where the lowest frequency for online consumption is identified for entertainment activities for all students but the 22 years old ones (their lowest score is for academic online activities). Again, the statistical analysis reveals the fact that Hungarian students are more involved in including the Internet in the learning processes.

Table 9: *The mean of online activities by country and by age*

	Age	Romania	Hungary
Information and communication	<= 21	4.08	3.87
	22	4.14	3.97
	23	4.20	3.95
	24+	4.17	3.96
Entertainment and consumption	<= 21	3.13	3.04
	22	3.13	3.07
	23	3.19	3.05
	24+	3.11	2.88
Academic purpose	<= 21	2.96	3.24
	22	2.93	3.17
	23	2.90	3.19
	24+	3.05	3.16

Data from Table 10 emphasize the fact that the Romanian students' online behavior is affected by the father's educational level: as father's years of schooling increase, the amount of time spent on the Internet by the students reaches higher scores. In the top of the online activities hierarchy, the information and communication remain the most preferred by Romanian students included in the sample. From the Hungarian data, no significant relation was identified between the father's academic instruction and the quality or quantity of online activities developed by students.

Table 10: *The mean of the online activities by country and by father's years of education*

	Father's years of schooling	**Romania**	**Hungary**
Information and communication	<= 11	4.00	3.90
	12-13	4.15	3.93
	14+	4.25	3.98
Entertainment and consumption	<= 11	2.95	2.98
	12-13	3.20	3.05
	14+	3.23	3.01
Academic purpose	<= 11	2.79	3.22
	12-13	3.01	3.18
	14+	3.08	3.21

In what regards the influence of mother's years of schooling on students' online behavior, Table 11 shows that Romanian students with high educated mothers (over 14 years of school) tend to spend the highest amount of time online regardless of the activity type. But the most undertaken activities regard information and communication. A high level of education identified for the mother affects in a positive manner the frequency of the Internet usage for academic activities; the more years of school the mother has, the higher the time spent online by the Romanian students belonging to the mentioned cross-border area for academic activities. The same as for the father's educational level, the online behavior of the Hungarian students does not shape accordingly to mother's years of school. However, results show that Hungarian respondents prefer mostly Internet activities related to communication and information, regardless of their parents' educational level.

Table 11: *The mean of the online activities by country and mother's years of education*

	Mother 's years of schooling	**Romania**	**Hungary**
Information and communication	<= 11	4.05	3.91
	12-13	4.13	3.90
	14+	4.24	3.97
Entertainment and consumption	<= 11	3.17	3.05
	12-13	3.17	2.99
	14+	3.24	3.04
Academic purpose	<= 11	2.92	3.20
	12-13	2.95	3.23
	14+	3.06	3.18

Regardless of the type of online activity, Romanian students living in the urban area until 14 years old register a higher frequency in using the Internet compared to respondents in rural (see Table 12). For Hungary, the situation is different. The area of residence does not seem to have a significant impact in shaping students' online behavior. The frequency of developing online interaction and information activities by the Hungarian students registers similar values in relation to their residence. We find interesting the fact that entertainment and consumption online activities have a higher frequency related to the rural area. As expected, both Hungarian and Romanian students living in urban areas until they were 14 years old tend to use more the Internet for academic purpose than students who have had rural residence.

Table 12: *The mean of online activities by country and by students' residence until 14 years old*

	Residence until 14 years old	**Romania**	**Hungary**
Information and communication	urban	4.18	3.93
	rural	4.00	3.91
Entertainment and consumption	urban	3.22	3.01
	rural	2.94	3.02
Academic purpose	urban	2.98	3.18
	rural	2.94	3.22

The results of the present research follow the line described in the scientific Romanian literature (Macarie et al., 2012). The residence is a determinant factor shaping the online behavior of the Romanian respondents; the ones with urban residence spend more time on the Internet developing various activities.

Romanian students who estimate their family financial situation as being over the average tend to develop more information, communication and entertainment activities on the Internet than other students do. Independently of the economic situation of the family, Table 13 shows that both Romanian and Hungarian students are prone to use mostly the Internet for information and communication. An interesting situation has been identified in what regards the fact that Hungarian students who estimate their family financial situation as being average, tend to use more the Internet for academic purpose than others. As the scientific literature presents a gap in what regards the relation between the family income or financial situation and students' online behavior, the current research can constitute a starting point in this sense.

Table 13: *The mean of online activities by country and family financial situation*

Online activity types	The family financial situation compared with other regular families in your country	Romania	Hungary
Information and communication	Below the average	4.01	3.77
	On the average	4.12	3.95
	Over the average	4.27	4.01
Entertainment and consumption	Below the average	3.01	2.87
	On the average	3.10	3.02
	Over the average	3.32	3.14
Academic purpose	Below the average	2.86	3.20
	On the average	2.97	3.22
	Over the average	3.03	3.16

The marital status of both Romanian and Hungarian students affects their online behavior in the sense that the frequency of using the Internet is higher for not married students (see Figure 4). Regarding the type of activity undertaken, the information and communication remain the most preferred. However, the marital status influences the usage of the Internet for academic purpose in the case of Romanian students. It is the only type of online activity where the married students register higher scores than the not married respondents. The married Hungarian students report lower scores than not married respondents in what regards the academic Internet consumption.

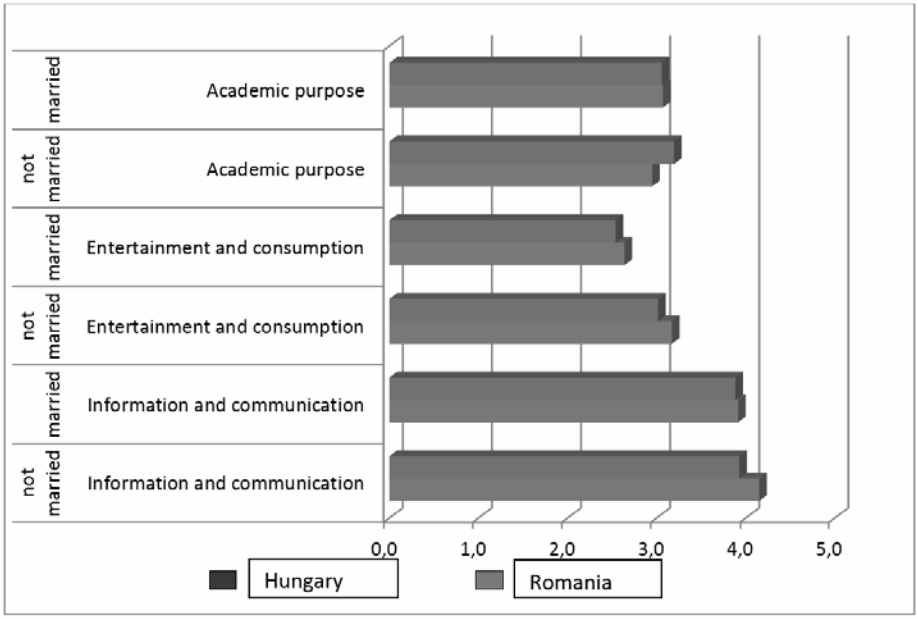

Figure 4: *Types of online activities by country and marital status*

Almost no research has been done at international level investigating the way in which students' marital status affects their online behavior. This is why our research can help filling this scientific gap.

Conclusions

The present paper intends to enrich the Eastern European empirical background regarding university students' Internet consumption. We identified differences between patterns of students' online behavior in the Romanian-Hungarian cross-border area that were sometimes unexpected given the common socio-historical heritage in the region. The most important finding was that Hungarian students from the sample report higher estimated daily Internet consumption than their Romanian counterparts.

The Internet consumption frequencies are gendered only in the case of the Romanian students, where females tend to allocate only half of the time for online activities than male students do. The investigated Romanian female students tend to use the Internet mostly for academic purpose and for information or communication, while both Romanian and Hungarian male students habitually prefer online leisure or communication activities. The present findings follow the line advanced by various studies in the field (e.g. Salaway, Borreson and Nelson, 2008), although there are some scientists pretending the opposite: the academic use of the Internet is not gendered (Duggan et al., cited in Zhang, 2007).

In Romania, residence is an important factor affecting students' Internet consumption patterns: urban residents report spending almost twice more time online for various activities. Other Romanian studies do not support our findings, stating that the use of Internet is not affected by students' residence (Macarie et al., 2012). This can be explained by the low development of Internet infrastructure in the sometimes very isolated rural areas in the Romanian part of the region. In contrast, the data for the Hungarian sample showed that the area of residence does not seem to have a significant impact in shaping students' online behavior.

Students' marital status shapes their Internet consumption patterns: married students register lower frequency of Internet usage in both countries. We suggest that family life implies more responsibilities and reduces the time assigned for Internet navigation. Nevertheless, Romanian married students report higher scores than not married respondents regarding the usage of the Internet for academic purpose. Findings on interrelation between the marital status of university students and their online behavior can fill the existing investigation gap.

Consistent with other research findings (Macarie et al., 2012), parents' educational level is correlated with Romanian students' online behavior at the level of the analyzed cross-border area. The more the years of study parents have, the higher the time spent online by their sons and daughters. However, in the case of the Hungarian sample, this correlation is not reproduced.

By using a principal component analysis method we managed to identify three major categories of online activities: *information and communication*, *entertainment and consumption* and *academic purpose*. In this regard the results from the two countries differ. Romanian students tend to consume more the Internet for entertainment, communication and leisure activities, while their Hungarian counterparts are more prone to use the Internet for academic purposes. Using the Internet in order to accomplish different educational tasks is the online activity with the lowest frequency developed by Romanian respondents. Explanation may reside in the

difference between the academic settings in the two countries. It seems that in Hungary the social actors involved in the educational and learning process – professors and students – are more aware and put a greater accent on the integration of the Internet and digital services in the academic context.

In the Romanian part of the region, the Internet usage is affected in a larger measure than in Hungary by students' social, demographic and economic characteristics. A rural residence, a family financial situation below the average and low educated parents are factors which do not encourage an intensive Internet consumption in the case of Romanian students.

The findings of this study cannot be generalized at national level, nor for every society due to the fact that each demographic and cultural region has its own specificity. Furthermore, the data was only analyzed for two Eastern European countries with specific social, political and cultural backgrounds which cannot be extended to Western European countries. A comparison between Western and Eastern European countries could represent a challenging subject for future research. Further studies should also involve more accurate measures of Internet activity than retrospective self-reports. Another limit of the study resides in its correlational nature. A better approach to Internet consumption determinants should involve a multivariate analysis which would include also other variables, such as academic involvement.

Whatever the limits of this research, the results – lower Internet consumption for the Romanian students in the cross-border region (in some cases it registers very low values) than for their Hungarian counterparts, should alert Romanian decisional factors. Policies and programs for reducing this lack of digitalization should be designed and implemented by Romanian universities and by the Ministry of Education. Embracing the new technologies in the academic and learning process can only enrich the higher education in our country and increase the performances of the students. More emphasis on e-learning may be a starting point.

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