

Internet usage and gender digital divide in a Romanian students' sample

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ABSTRACT

Little data is available about East-European countries on Internet adoption and gender digital divide issues. Romania is a good case study given its past communist history and current developments, as well as Internet penetration. Students are the focus of the present research as they might provide the basis for further evolution trends. The results of a 275-subject research questionnaire indicate a complex situation as regards Internet adoption and usage: the digital divide is present as regards knowledge, ability and experience. Based on the data, other indicators and demographic information are evaluated and discussed. Gender differences seem limited for general access, but are significant for aspects such as time spent on-line/per week and knowledge ($p < 0,01$). An overall impression of the positive impact of Internet in various aspects of daily life is characteristic of the sample. Similarities and divergences with studies from different realities are discussed, indicating the qualitative differences of the divide.

Keywords: *Internet adoption, Gender digital divide, Romanian students, East-European countries, Research questionnaire, Divide indicators*

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1. Spread of the Internet and the East European countries

The spread of the Internet has become a common fact in academic and business environments; it is no longer a surprise. Although there are no reliable data on the size of the world's on-line population, estimates suggest that the number of Internet users around the globe has surged from 4.4 million in 1991 to 10 million in 1993, to 40 million in 1995, to 117 million in 1997, to 277 million in 1999, to 502 million in 2001, and to more than 600 million in 2002. Thus, the global penetration rate of the Internet has increased from less than 0.1 percent in 1991 to 2 percent in 1997, 7 percent in 2000, to over 10 percent of the total world population in 2002. (Wellman and Hogan, 2004)

The percentage of individuals regularly using the Internet in the EU is 39%, with 61% of those in the 16-24 year age-group, 53% in the 25-34 year age-group, and 45% in 35-

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44 segment. The percentage of males using the Internet is 44% while that of females is 34%. Among students, a high percentage of frequent users is registered: 74% (Eurostat, accessed 2005). Moreover, the percentage of individuals having ordered/bought goods or services for private use over the Internet in the last three months reaches an overall general figure of 17%, (20% male and 14% female). (Eurostat, accessed 2005)

As we can see, there are abundant data available especially for the North American and Western European countries, and for some of the newcomers to the Internet, such as China (see: Wellman and Hogan, 2004). However, there is a lack of evidence for nations with European culture, which have a different historical background. The Eastern European region includes states with former communist leadership, which have discovered democracy together with the new technologies. Keeping in mind the fact that the iron curtain was removed around the 1990s, and that the spread of the Internet took place following this event, it is easy to understand why this region is an interesting case study as regards the adoption of the Internet and the digital divide. Are there different patterns of adoption and usage? Are the observed differences similar, or is culture determining the variations?

Romania's past communist history impacts its openness to communication and innovation, as well as gender differences. Currently, it is in a transition phase characterised by economical hardship and changes in mentality. Nevertheless, official data indicate that Internet use increased from: 4.6% in 2001 to 16% in 2002 (MCTI, 2003, www.mcti.ro). Even if the percentages are lower than those related to Western Europe, the rise in a one-year period is significant if one is to interpret the future trend. Few detailed indicators were available before the beginning of the present study, as research was still in the early stages.

The University is one of the environments that quickly adopted the Internet; it began to use and promote it as far back as the '70s. The rapid spread of Internet usage in and between Universities was later mirrored by the evolution it had in other environments. This is one of the reasons for choosing students as our target population, as we believe that their behaviour could represent not only the present situation but also future usage trends. We note also that, as mentioned earlier, at a European level, students register higher percentages of usage than other categories of users. Thus, the present paper focuses on a student sample hoping also to highlight the future developments expected in Romania and the Internet through the data obtained.

Apart from demographic characteristics, in the present research we explored Internet usage and experience, the perceived personal-skills for different on-line activities, the impact on communication and on other relevant every-day aspects such as study and work.

1.1 Gender digital divide

The Internet originated in a highly masculine context and under male domination. Females have only lately entered this new space, and research has shown that numerous aspects are not facilitating women's use of the Internet, on the contrary: they encounter many barriers. In fact, the typical Internet user which still represents the major group present "on-line" is the young white male in higher education (see for example Wellman & Haythornthwaite, 2002).

The stratification between those with and without Internet access is creating a digital divide (Katz & Aspden, 1996). 'The rich are going to be getting even richer in terms of information. The information-poor will become more impoverished because government bodies, community organizations, and corporations are displacing resources from their ordinary channels of communication into the Internet' (Katz & Aspden, 1996). Moreover, the Internet offers the possibility of contacting and maintaining relationships with people at a distance with an impact on the extension of social and professional affiliation with people met both on-line or in face-to-face situations (Morahan-Martin, 1998).

Gender-related Internet usage has been an ongoing problem as access, in the beginning, was overwhelmingly masculine. More recently (see for example NITA, 2002), usage data indicates no gender difference in Internet use in the USA. Moreover, the case study on China, as a country with relatively recent Internet adoption, demonstrates that rapid changes occur. In five years, the proportion of female users has risen from 12% to 39% (CNNIC, 2002). In a cross-cultural comparison, Chen and Wellman (2004) underline that gender differences disappear in time only in the case of the USA, but remain strong in other countries. The share of female Internet users is lower than their share in the general population in the countries surveyed. Yet, there is a tendency towards narrowing the gender divide (for example in the UK, Japan, Korea, China, Mexico); Germany and Italy constitute an exception and present marked divides. The gender divide issue is not entirely solved, as is noticed in (Liff & Shepherd, 2004): the problem is no longer quantitative, but rather a qualitative one affecting

quality of access, the ability to use the Internet effectively and the way in which Internet use affects access to goods and services.

In this context we analyse access in a detailed way, starting with defining the relevant sub-categories. Based on the proposal by Liff and Shepherd (2004), in the following research we focus on four major aspects of Internet access:

- Technical access: such as physical access to an Internet-ready device
- Ability to use access: the extent to which men and women perceive the skill levels they have attained
- Take-up of access: whether men and women are Internet users; any variation in length of use; how much use they make of access; and the range of activities they use it for.
- Impact of access: the degree to which Internet use has changed patterns of activities, and the perceived impact of Internet.

The present paper is centred on a research, which focuses on these themes. Specifically, each of these four points is addressed. Internet and PC technical access are evaluated in terms of computer and connection possibilities. With regard to perceived skill-level, self-assessment for the most used functions is explored. PC and Internet mastery is surveyed also with the help of two important indicators: use of the Linux system for PC literacy and Personal Web-page ownership for Internet literacy (used also in prior studies such as Calenda, 2003). Moreover, experience in terms of years of use and frequency of usage as hours/ week spent on-line is investigated. Furthermore, usage patterns are addressed, as well as the perceived impact of Internet on diverse aspects of everyday life such as studies, work and relationships.

The next part of the article addresses the description of the methodology and data presentation, as well as a discussion and conclusions.

2. Methodology

2.1 Questionnaire development

Based on prior study' items and newly theory-formulated ones, a basic pool of possible questions (and possible answers) was formed. These were screened by three domain-experts, reviewing the items, rephrasing them or excluding them if considered not suitable. The questionnaire is part of a research effort currently being carried on in

Italy, Holland and Spain, with the aim, not only of describing and comparing present situations, but, also, of testing new indicators.

A 45-item questionnaire was formulated and a suitable presentation format was chosen. Not all of these items are presented, and, furthermore, some of the themes were excluded from the present analysis. The reasons for this choice were: relevance of subject, research objectives of present paper, time and space limitations, and importance of results. Examples of the themes excluded include: political communication, personalisation technology usage, on-line offline media consumption, political attitudes, etc.

2.2 Sample and data collection

The target population for the sample was that of Babes-Bolyai University students (Cluj-Napoca, Romania). Subjects were reached during lectures or on the university campus. As regards those reached during lectures, the questionnaire was completed and handed-in voluntarily, assuring anonymity. Those who filled in the questionnaire while on the university campus, were reached in their rooms or study/recreational chambers and asked to take part in the research voluntarily and anonymously. For the main indicators, no significant differences were found between the two data-gathering-type samples.

Because of the data collection procedure described above, the sample is not a representative one either for the Babes-Bolyai University population or for the general (student) population, as there is an over-representation of students enrolled in Psychology and Philosophy specialisation courses (given our easy access to this study-population during lectures).

2.3 Data processing

Almost none of the distributions are normal ones, and many categorical variables have been used, this is why the chi square test was preferred in order to test the hypothesis. General descriptive statistics and graphics were used in order to describe the data. The SPSS processor was used in order to process the data and Excel was used to create graphical representations. The open-ended questions were analysed classifying responses and summarising frequencies.

We present subjects number for each item in order to facilitate understanding, as these numbers could vary in base of the context of the question.

3. Results and analysis

3.1 Internet usage data

Those who filled in the questionnaire are students from Babeş-Bolyai University, Romania (275 students – 56.5% female and 43.5% male – the percentages are very similar with the general gender proportion of attendees for the given faculties). The age interval ranges from 18 to 31 years. The largest category is 18-21 years, representing 47.4 %, with an average of 20 (see figure 1). 52.2% own a PC at home, and 28.1% with an Internet connection.

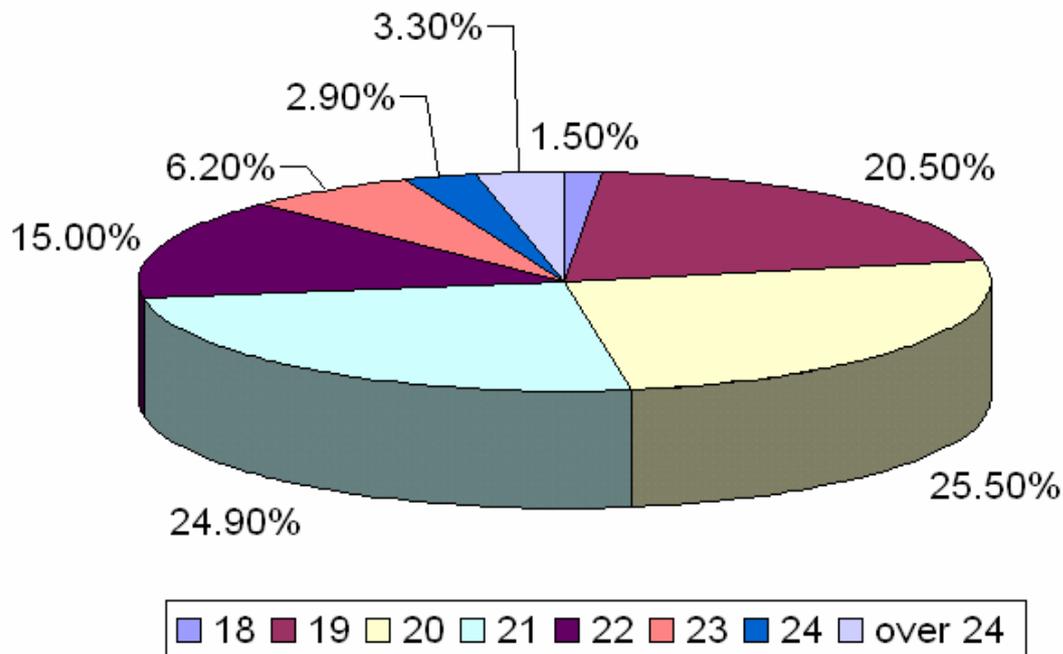


Fig. 1: Sample age-distribution (N: 273).

The students are enrolled in 24 different faculties; most of them are studying psychology (26.7%) and philosophy (12.7%) covering up to 41.2% of the general distribution (N: 275). These faculties are over-represented because of the data collection procedure. This part of the sample represents the questionnaires applied during lectures. Other faculties include: Computer Sciences, Economics, Geology, Biology, Mathematics, Physics, etc. The best represented category is that of the Social Sciences.

In terms of years of Internet usage, the majority of respondents report 2-5 years of experience; this represents 78.1% (see figure 3). Students are used to accessing

Internet for 1-3 hours per week in a proportion of 49.4%, followed by a 24.7% of 4-7 hours of on-line activity (N: 275) (see figure 2).

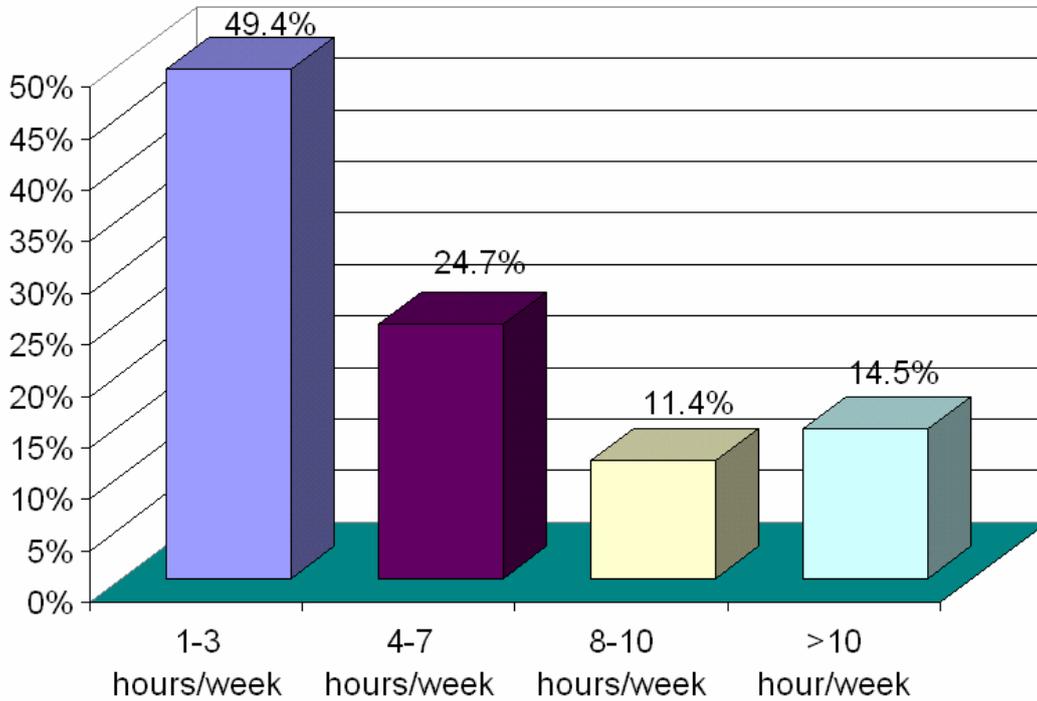


Fig. 2: Hours/week spent in on-line connections (N: 271).

An overwhelming 90.9% of the entire sample speaks English, while 66.9% declare they are familiar with French, 20% with German, and 19.6% respectively 14.2% with Italian and Spanish (N: 273). Other languages are also present, such as Hungarian, Russian and Ukrainian, but, for the present research, we focus on the first group, especially on English as being the most common in Internet usage. The percentage of those who do not speak English (still considered the main language for Internet content) is not high enough in order to permit comparisons or further considerations.

On the basis of the chi square test, no significant difference is noticed as regards a technical option of faculty/specialisation for experience in Internet use. However, the difference is significant ($p < 0.000$) for the time spent in on-line activity.

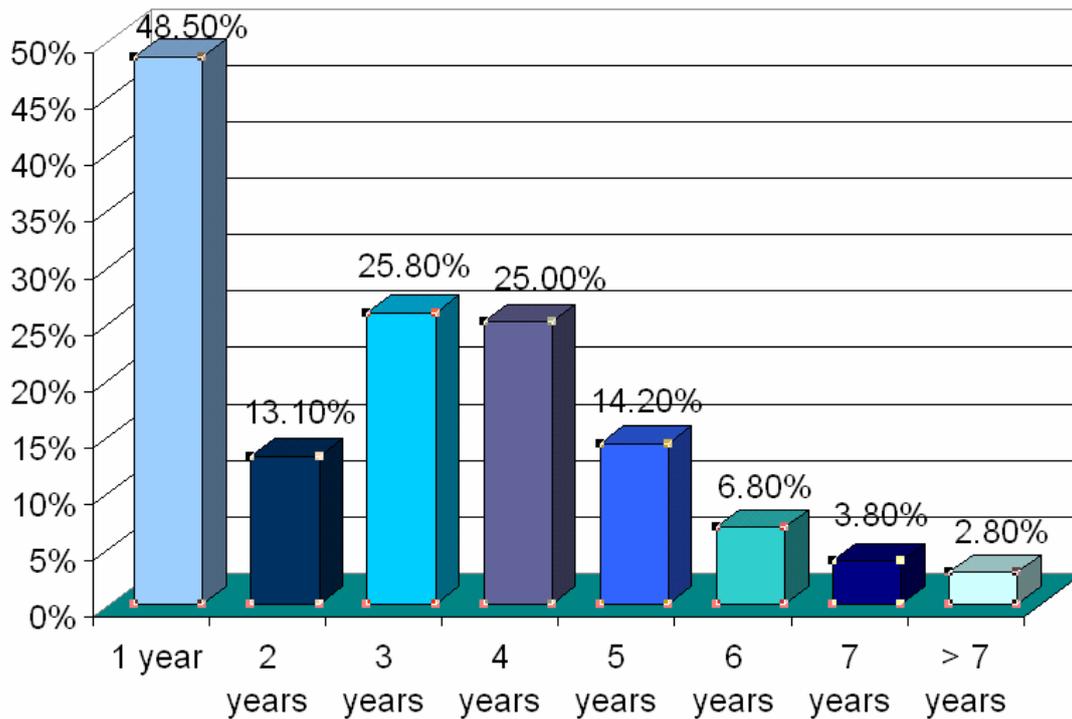


Fig. 3: Years of experience with Internet (N: 260).

3.1.1 Internet functions

Few people declare they do not use e-mail (13 of the total number of subjects), while 181 consider themselves to have a high level of ability in using it. Also, 80 of the total do not use chat, while 38 report a high level experience.

Few subjects use on-line shopping opportunities given that some 205 individuals declare they have never used it.

By far the most popular activity seems to be information search, as 253 (92%) respondents declare they have an average to high ability in doing so, while only 4 subjects do not use it at all. The reasons for searching for information on-line usually reside in the fact that these contents cannot be found in other sources (44.6%), and because the Internet offers the most comfortable access to information (45.3%) (N: 267) (see figure 4).

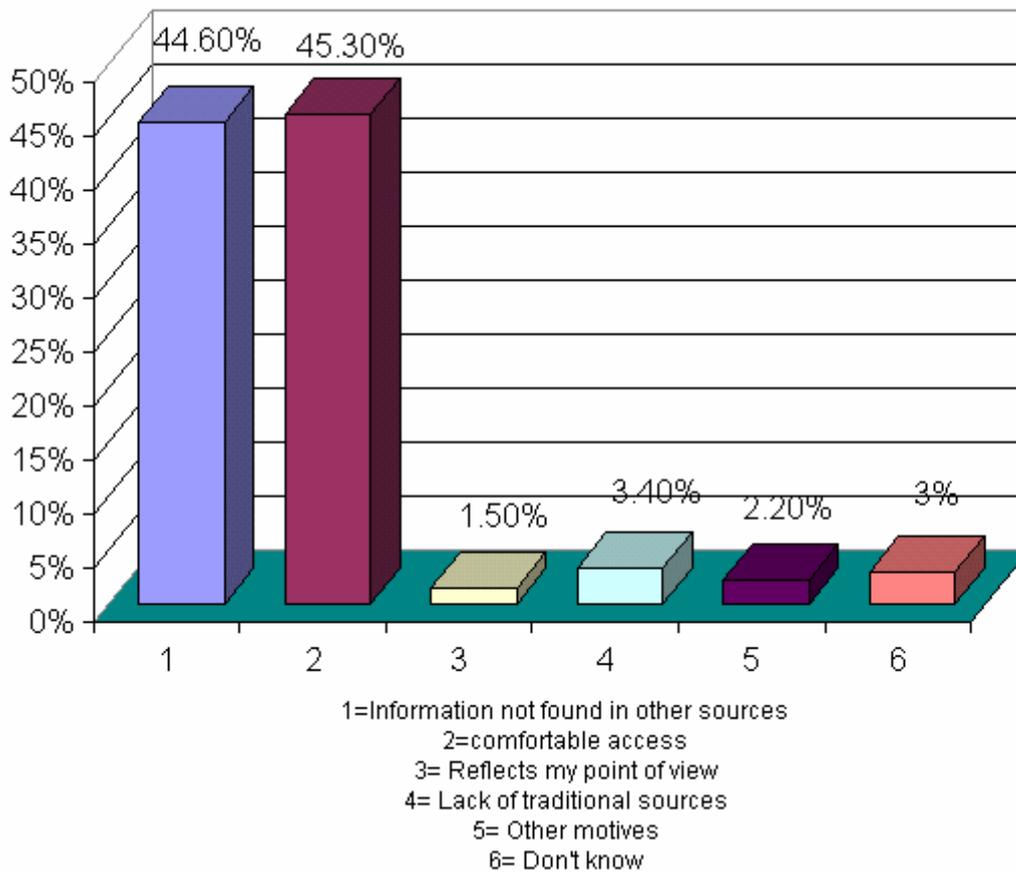


Fig. 4: Reasons for searching for information on the Internet (N: 267)

Only 34 subjects declare that they share their email account with others (such as: family members 12, friends 15, partner 3, colleague 1, other 3), while 230 have an independent e-mail account.

Those who own a web page number 19 while 248 declare they have not one. The data are too low to carry out further comparisons.

Some 83.6% of the subjects say they are not familiar with the Linux system. Only 2.2% use it, while 14.1% knows of it but do not use it. Interestingly, 31.9% are willing to learn it and would like to use it in the future.

3.1.2 Communication

The Internet impact on socialisation spaces is perceived as a positive one, increasing opportunities, for 47.6% of respondents, while 42.1% consider it has remained the same, and 1.1% maintain it has worsened, and the remaining 9.2% do not know (see figure 5).

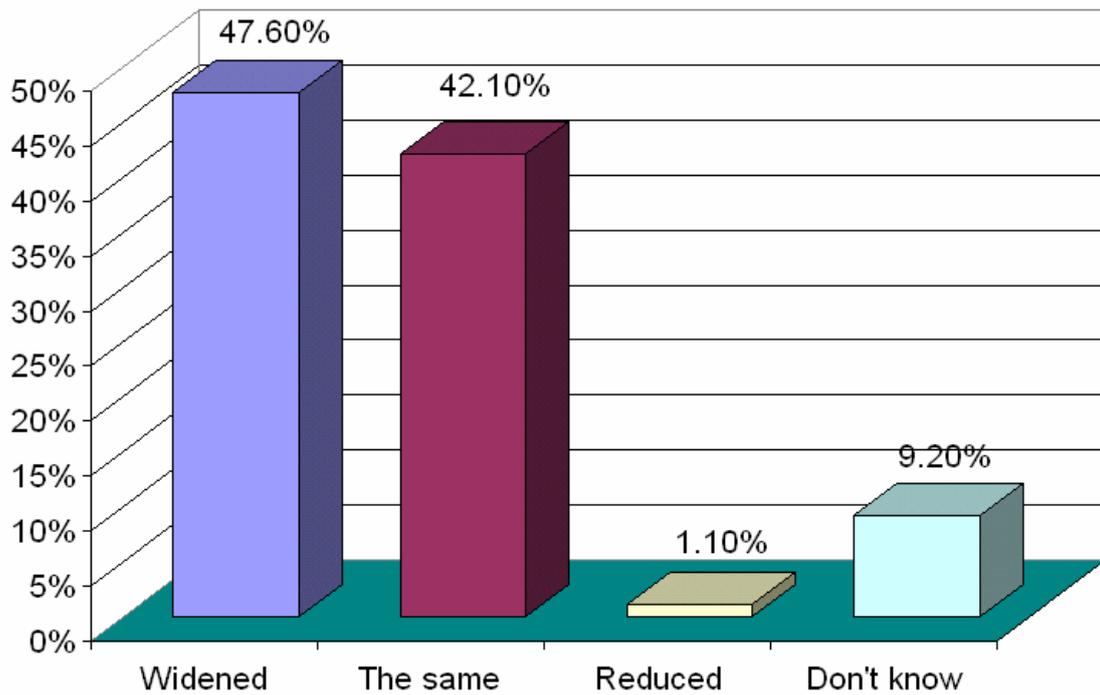


Fig. 5: Perceived impact of the Internet on socialisation spaces (N: 273).

Moreover, 44.4% consider that the qualitative impact is positive, 48.5% remains neutral and 2.6% considers that quality has been reduced (see figure 6).

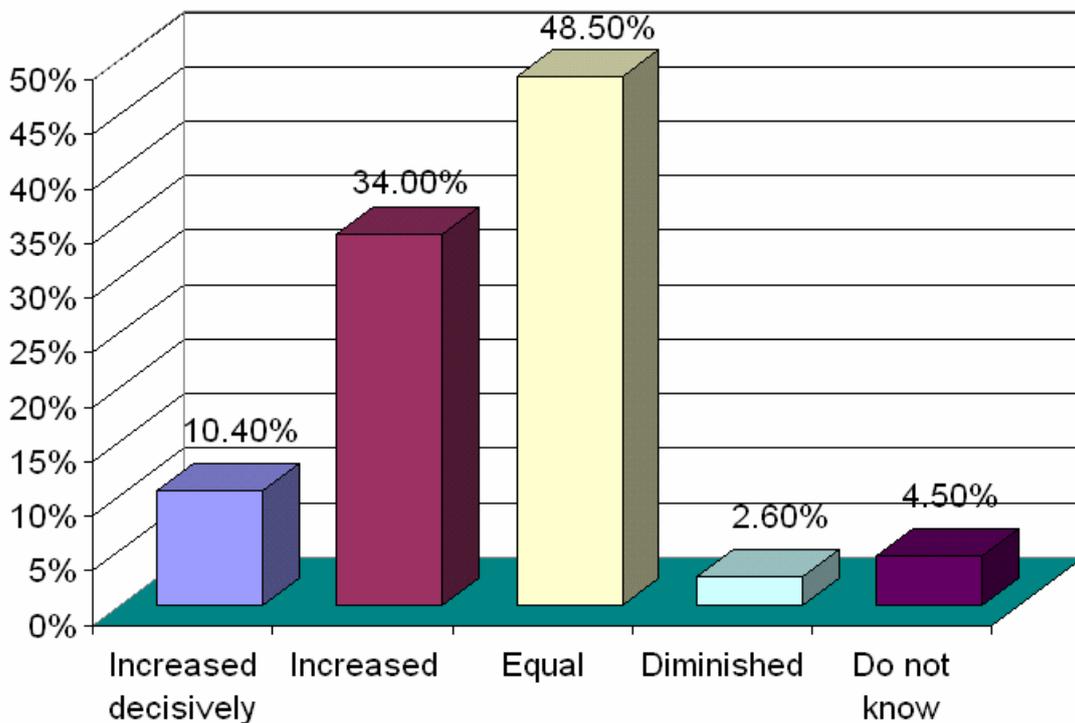


Fig. 6: Impact of Internet on the quality of socialisation spaces (275 answers)

74.2% of the subjects communicate via Internet with persons living in the same country but in different cities, while the next group (37.8%) communicate with friends and relatives abroad, followed by those communicating with persons living in the same city (30.9%), and, lastly, by persons communicating with persons of different nationalities (29.5) (multiple answer).

Most of the subjects communicate with persons known before using the Internet and with whom they frequently meet face-to-face (40.7%). Persons known before, but rarely met in real situations, form the second largest category of communication partners via Internet (32,6%). 11,9% is the percentage of students talking with strangers met on the Internet and never seen face-to-face, while 14,8% met in a virtual context and then face-to-face (see figure 7).

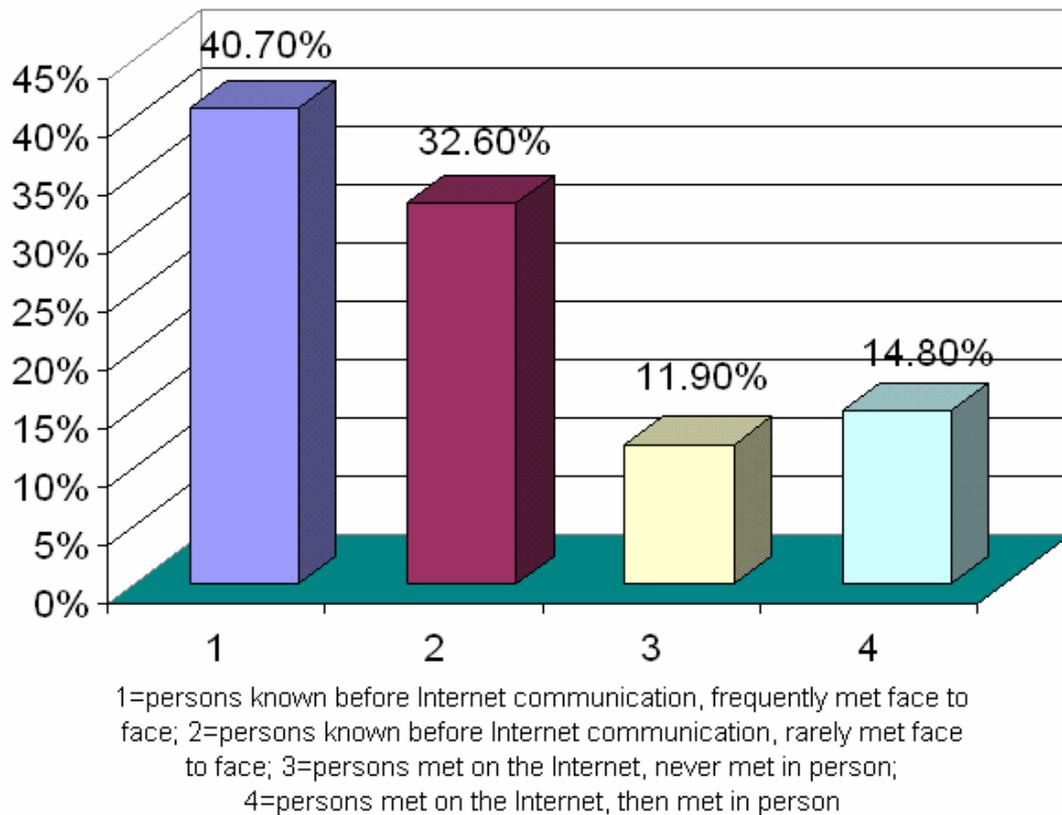


Fig. 7: On-line communication partners (N:270)

The main way of meeting a new person for a total of 119 subjects is: through chat (declared by 78 of the respondents), participating in a discussion-group is another possibility (15 subjects), while 26 respondents met new persons in Internet intermediate by a friend.

The main motives for getting in touch with new people include: curiosity (53.5%), personality match (21.3%), common interest (12.4%) and taking part in the same discussion-group (7.9%) (202 respondents).

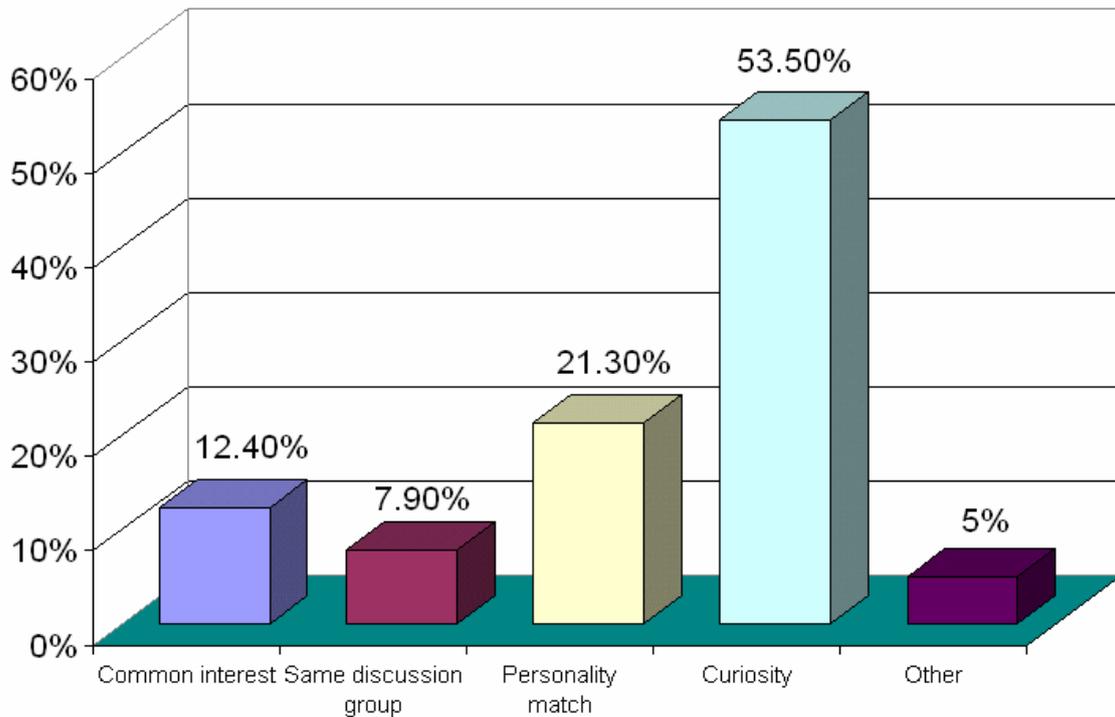


Fig. 8: Main reasons for getting in touch with new persons on-line (N:202)

3.1.3 Virtual communities

Only 34 persons (12.9% of 264 respondents) take part in a virtual community, with 16 taking part in more than one. Moreover, 26 get in touch with the community at least once a week, while 9 communicate daily or almost daily. The main obstacles to participation in a virtual community for 65 respondents are: trust for 19 respondents, of technological nature for 13, 12 students have problems in getting accepted by the old members of the community and 11 have problems with understanding community language. Moreover, 10 subjects do not have a reason or do not care about joining a community.

3.1.4 Impact perception

Opinions about the impact of Internet usage on job opportunities shows that 87.5% of the respondents consider Internet will help them (see figure 9).

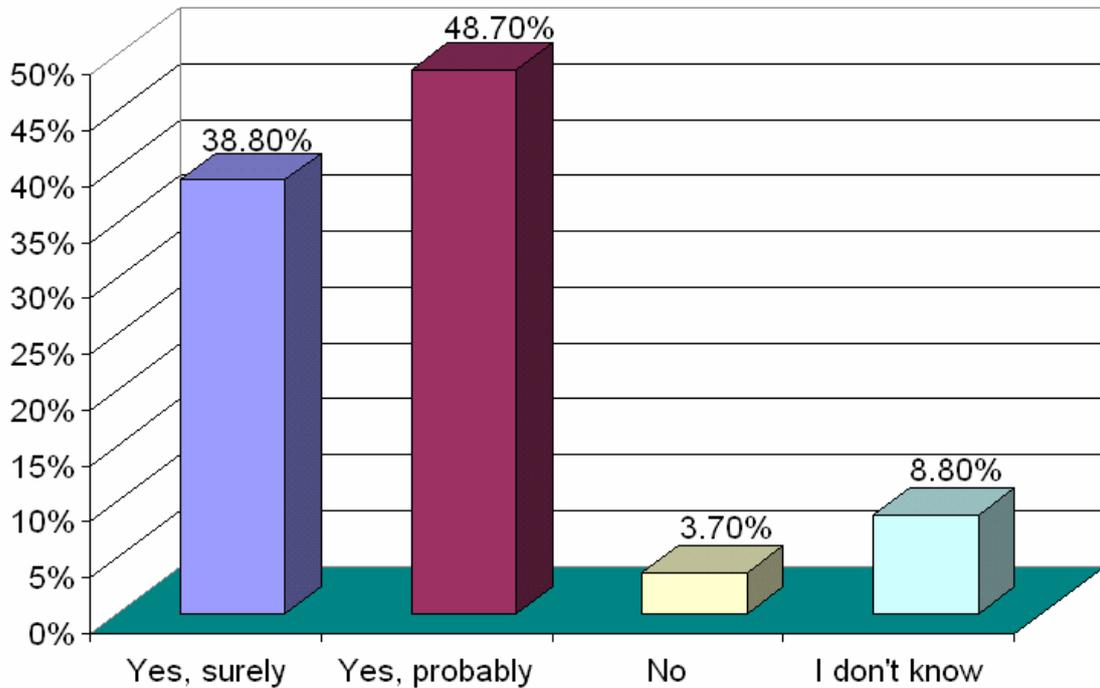


Fig. 9: Opinions about Internet usage impact on job opportunities (N:263)

Moreover, 87.2% consider that Internet will have a positive impact on their work (versus 12% who believe it will have no influence, and 0.8% that consider it will worsen it); furthermore, and 92.8% agree with the positive impact also in the case of studies (versus 6.1% no impact and 1.1% worsen) (see figure 10).

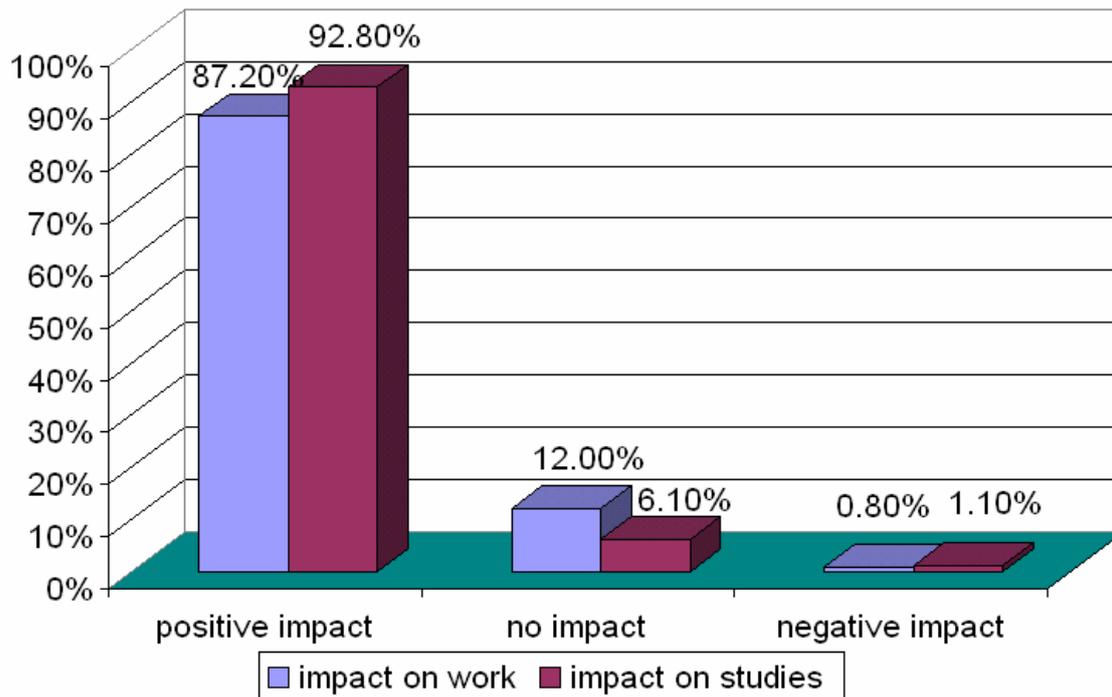


Fig. 10: Perceived Internet impact on work and studies (N: 261)

3.2 Gender digital divide results and analysis

There is a significant difference between the faculty choice of females and males (chi square, $p=0,01$). Females are mostly enrolled in Social and Humanistic faculties, while males choose scientific fields. (N: 259)

The proportion of females and males with a PC at home seems to be quite similar, the difference is not significant and the observed frequencies are quite close to the expected ones (N: 273). The same can be noted in the case of Internet access at home: the difference is not significant (N: 201).

In the case of females vs. males, there is a clear tendency for males to declare more years of experience on the Internet than females, but, in reality, there is not a significant difference (chi square test, N: 259). Gender is a significant factor (N: 269, $p<0.000$) in relation to time spent on-line per week, with males registering more hours than females, dominating the over 8h/week category (47 subjects are males vs. 22 females) (see Figure 11).

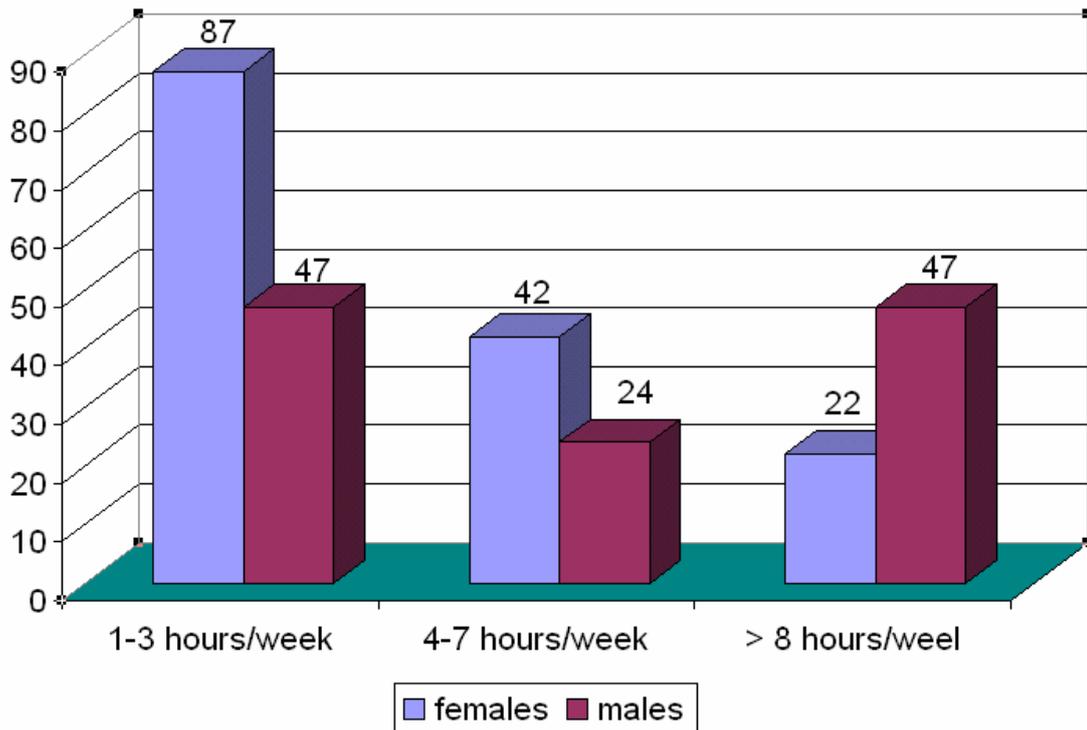


Fig. 11: Male and female time spent on-line per week period (counts) (N: 269)

3.2.1 Gender and Internet functions

E-mail

A total of 4 females vs. 9 males do not use e-mail, with a tendency for females to exceed males with regard to perceived ability in using this functionality. No significant differences were found (using the chi square test) (N: 270). Even if there are few people sharing their e-mail account with somebody (34 out of 264 answers), females present a tendency towards having shared accounts (25 out of 150) in comparison to males (9 out of 114), but this is not a significant difference.

Chat

Some 45 females and 35 males do not use chat, while 21 females and 17 males declare they have a high level of ability. Nevertheless, the data does not exceed expected frequencies, thus there is no significant difference between the two groups. (N: 261)

On-line shopping

Few subjects, from our sample, buy on-line (29 females and 23 males). (N: 253) The data are too low to be able to formulate an opinion about gender differences.

Information search

Females as well as males tend to vote for information searching as the most popular Internet activity. One can note a slight tendency on the part of males to be more prone towards this functionality than females, but there are still no significant differences. (N: 270)

Owning a personal web page is characteristic of 8 females (out of 141) and 11 males (out of 116), the number of subjects owning a webpage is not enough in order to permit a further analysis (N: 265).

A significant difference (chi square, $p=0,01$, N: 267) can be noticed in the case of Linux knowledge and usage. Females clearly do have less knowledge and use it less than males. But this difference is not visible in the willingness to learn how to use it. (chi square, N: 246)

There are no significant (chi square) differences in the way the Internet is perceived to impact on work and studies (impact on work N: 239, impact on studies N: 261). But in the case of the latter, there is a tendency, close to a significance level ($p = 0,077$) for females to be more positive than males in appreciating the Internet's impact on their studies. The same happens with regards to Internet usage impact on job opportunities, where females tend to position themselves in the extreme positive category in comparison to males who are in the moderate one.

3.2.2 Gender and Internet communication

The perception of the socialisation possibility changes is not different for males and females (chi square), of 271 respondents, 129 consider their socialisation spaces have widened, while 114 consider it the same. Moreover, the quality of social contacts is not perceived in a different way by the gender groups (N: 266, chi square test).

From the 268 general answers, there is not a significant difference with regard to the relationships via the Internet (the individuals with whom subjects entertain communication relationships via the Internet are: "known before Internet communication and usually frequented": Females: 62, males: 47; "known before Internet communication but rarely frequented": Females: 48, Males: 39; "Meet in virtual space, never met in person": Females: 16, Males: 16; "Meet in virtual space and currently frequenting": Females: 26, Males: 15; Total number of females: 152 and males: 116 answering).

While 121 females and 83 males communicate with persons living in the same country but in different cities, 46 and 39 respectively keep in touch with persons from the same town. The subjects who have relationships with persons of different nationalities record 47 for females and 33 for males and 64 and 40 respectively maintain contact with friends or relatives abroad. On the whole, there are no significant (chi square test) differences between females and males for these variables.

Females present a significant tendency (chi square, $p=0,05$, N: 265) to communicate also telephonically with the persons communicating through the Internet, while males do so less frequently.

There are no significant differences with regard to how new persons are met in virtual space or the main reason for this meeting.

3.2.3 Virtual communities

There are not enough data in order to provide relevant information for this category (only 34 subjects declare they take part in a virtual community).

4. General discussion

There were more females than males in our sample, a possible explanation is the over-representation of Social and Humanistic faculties, which present a higher rate of females, but also the general tendency of over-representation of females in the general student population. However, the proportion is similar to the percentages registered for the given faculties. The subjects are mainly young, in their first year of studies, as already stated, the major background is in Social and Humanistic sciences (mainly students from Psychology and Philosophy specialisation, due to data-gathering procedure and subject availability).

A vast majority speaks English (90.9%, N: 275), but also other foreign languages are well represented, among which: French, German and Italian (we considered these languages for their importance in regards to the Internet content languages; other well represented languages were: Hungarian and Russian).

The percentage of persons owning a PC is quite high 52.2%, if we consider that in Tuscany, Italy (one of the most developed regions of this western country), only 45% of the families have a PC at home (Regione Toscana, Area Statistica, Servizio Servizi Telematici, 2003). But the Internet connection is more problematic as only 28.1% have one at home in Romania, while 36.6% families have one in Italy (Regione Toscana, Area Statistica, Servizio Servizi Telematici, 2003). Considering the economic situation

of Romania, it can be argued that the values for physical access to technology (PC and Internet connection) are quite high. Also, we have not compared the type of Internet access, this could be one of the explorative points for future research.

The spread of personal web pages is an indicator for Internet familiarity. As the data shows, there are few individuals in our sample that have a personal web page. This might be due to the fact that Internet has a short history in Romania, and the subjects did not have the time to come to know it in depth. It is also indicative of the novelty this technology represents in Romania, in comparison with other countries. Even if the young people on whom this research is centred, accept and adopt Internet usage, its depth of influence still has to be achieved, we have not yet reached the full impact. In fact, Web-site creation was used in other researches (see Liff and Shepherd, 2004) as a relatively more sophisticated indicator of Internet usage to identify the subjects with more knowledge and experience with this new media.

Linux is an indicator of "computer literacy" as it reflects in-depth knowledge about operating systems. As in the case of the above-mentioned spread of webpages, this indicator points out the fact that this technology is still new for Romanians, and we have still to achieve the profound changes other countries are facing at the present moment. The difference between this indicator and personal web pages resides in the fact that web pages refer strictly to Internet technology impact, while the use of Linux is more general, reflecting computer literacy on a broad spectrum.

Future tendencies reflected in the desire to learn and use Linux show that the participants want to further develop their abilities in the technical field, moreover they are willing to try new systems and face new challenges. Extrapolating, we can say this is a reflection of optimism and importance of technology in daily life, as persons are ready to invest time and other resources in order to improve their technology interaction and usage.

Internet information searching proves to be the main activity in our sample, followed by e-mails. The need for information can be explained by the lack of other sources and by the facility of access (for example low cost). The majority of subjects searches for information on-line because they do not have access to it in other ways, this reflects the Romanian reality of information access. Even in the university system there is still a lack of critical educational contents. The reaction of searching novel as well as relevant information on-line is an answer to the lack of printed information, but also a sign for the need to reform the educational system, in terms of access to information, and of the general information system. The second main reason for choosing the Internet as an

information base is the facilitated access in terms of comfort: having a world encyclopaedia on your home desk - with no need to move and use transportation, or loose time - is something to be appreciated.

Communication is also important, especially asynchronous communication (e-mails), probably also as a means to overcome the costs of a continuous connection (connecting just for receiving and sending e-mail is a frequent behaviour meant to lower line costs).

Few students share their e-mail account with others, demonstrating the perception of privacy and intimacy of Internet communication.

Chatting is not that widespread in our sample, students demonstrate a rather critical attitude towards it. Nevertheless, chat is mentioned as the main modality for meeting new persons.

Very few subjects do their shopping on-line. Explanations can reside in the economic situation of Romania, the critical view of service providers towards eastern buyers on the basis of negative past experiences, and the credit card services provided by banks in this East-European country, which are fairly scarce. Of course, these are possible explanations that might need further research and data in order to be understood and generalised.

As the data on e-mail usage abilities show, most of the students use the Internet for communication purposes. The general positive attitude is reflected also in this field as most of the respondents appreciate the Internet's impact on socialisation possibilities and on the quality of on-line relationships as a positive factor. The Internet's impact on other communication channels, in this case telephone communication, should be further investigated. Current data show that 50% of our subjects communicate by phone with the persons they communicate with via Internet, but this data should be compared with other phone usage data in order to provide an adequate interpretation.

Most of the subjects communicate with known persons who they meet often or little in face-to-face situations, persons residing in the same country but also in other cities, as well as friends and family living abroad. But the percentages for other categories (persons living in the same city and persons of different nationalities) are also quite high, demonstrating that the Internet is opening-up communication and socialisation possibilities, extending the prior "action scale", and thus improving personal communication. This affirmation is sustained also by the fact that many of the relationships formed on-line tend to become also relationships in face-to-face contexts. Katz and Aspden (1997) report similar findings that encourage us to argue that new

individuals are often met on-line and some of these relationships are carried on offline as well, reciprocally confirming the fact that the Internet is a new medium for intermediation.

The majority of new Internet acquaintances is met via chat, and the main reason is curiosity, the data underlining again the widening socialisation and social exploration spaces supported by technology. Personality match and common interests are other reasons for meeting new people, and the possibilities are offered by on-line discussion groups (or communities) and common friends.

Little participation in virtual communities seems not to be due to technological knowledge problems, as only 13 persons fear them, but the reduced level of response to this question is another indicator of the level achieved by Internet adoption and skills, which is shallow.

Optimism about the Internet's impact regards job opportunities, work and studies. The majority of our respondents think that the Internet will bring improvements in these areas, while very few people consider it will worsen the situation. These data raise the question if the novelty of such technology is the only reason in determining this line of thought, or if there is a real perceived-need for more knowledge and usage experience. The working environment is suffering critical transformations as a result of the impact of IC technologies. Just taking into account the modifications in communication, we can say that organisations are revolutionising themselves in the light of new possibilities. Critical as well as positive opinions about this effect have been presented, but practical reasons overcome scepticism, as the Internet is more and more used in common work settings. Maybe this reason is strong enough in order to give students a positive impression of Internet knowledge and usage impact on future job opportunities and work in general. The tendency here highlighted should be understood as a suggestion for education authorities towards focusing efforts on giving the needed information and experience for the better preparation of students for the field of work. Such educational system changes would bring real competitiveness not only for educational institutions but also for the work force as well.

4.1 Gender Digital Divide discussion

More men than women are enrolled in the technical-scientific faculties, confirming the trend observed in the literature (see for example Cukier et al., 2002). This confirmation is another sign, which highlights the importance of offering an equal advantage educational system, and promoting females' entry into technical-scientific fields.

Technical access

The data shows that we are not dealing with a physical access problem to technology, as females and males own PCs and have Internet connections in a proportional measure. This underlines the fact that the causes of the gender digital divide are mainly located at a psychological-social level and that interventions to reduce them should be centred at these levels.

On the contrary, Liff and Shepherd's study (2004) indicates significantly less access points for women in comparison with men in the UK. Thus, the Romanian gender divide is different from this perspective.

Ability to use access

There are no significant differences in Internet usage skills, as reported by the respondents. These data are contradictory with other research studies, such as Jackson et al. (2001), that have noted a marked difference, with females communicating via Internet and males searching for information. Culture differences might be a cause, but more data is needed in order to better understand the given relationships. A tendency for self-underrating has been noted in women with regard to Internet abilities (Liff & Shepherd, 2004); this is not the case with the Romanian student sample. Nonetheless, there are no reasons to think of a divide at this level of Internet usage in Romania, in spite of its existence in other countries.

Take-up of access

Males spend more time on-line than females, who tend to classify themselves in the medium-low Internet frequency usage categories. As the results show, males are more "computer literate" than females, this fact that does not surprise as more males can be found in the technical-scientific faculties, thus, they are better prepared and more knowledgeable. But the fact that the differences disappear when we examine the willingness to learn and use Linux, shows the tendency towards bridging the digital gap between the two groups. More data are needed in order to be sure about this developmental direction, but if data are confirmed this represents good news with regard to the gender digital divide.

In addition, more males own a personal web page. We can say that males are clearly advantaged by their background, since they are more computer and Internet knowledgeable. Future studies should try to identify if the differences are due to

interests or disadvantages, and, if the first is the case, understand what creates the differences and if they really are a handicap for females; in the latter case, it would be necessary to provide adequate intervention measures at a social level.

Similar, Internet use in Britain is still significantly divided by gender, reflected also in creating Websites while males spend more time on-line than females (Liff & Shepherd, 2004). This aspect indicates common points in the gender digital divide across cultures.

Impact of access

Although the Internet impact perception data is not significantly different (chi square test), the females' tendency to have a more positive opinion than males with regard to impact on their studies could be related to an involvement desire in this new media. Certainly, this is just a hypothetical explanation that needs further research in order to be proved or rejected. Keeping in mind also the second results, on Internet usage impact on job finding possibilities, we can say that a pattern of more female positive-thinking can be supposed. Of course, more evidence and in-depth data should clarify the situation also because the international situation indicates that females are usually less positive than males with regard to the Internet's impact. (Liff and Shepherd, 2004)

Returning to the discussion about interests or disadvantages that cause gender digital divide, the data about female positive opinions suggests rather an interest in women for technology and an understanding of its importance. Should this be the case (the need for further data is to be underlined), the problems should be located in the disadvantages category and, thus, represent a failure of the system.

Moreover, there are no perception differences as regards the positive impact the Internet has on socialisation spaces and quality of social contacts, for females and males. This means that the Internet is equally perceived as opening-up new possibilities (or not intruding and worsening present ones) in communication, socialisation and general relationship formation.

With regard to the integration of different communication channels (the Internet and Phone in our case), females clearly tend to integrate. This data needs further support as regards phone usage patterns in females and males, in order to provide a valid explanation. As a hypothesis, we can say that females are probably more prone to phone in general, in comparison to males, and that the present difference might be due to this (based also on the general communication needs of females).

5. Conclusions

The present study has focused on two main objectives:

- Giving a general perspective of Babes-Bolyai University students (Cluj-Napoca, Romania), as an example of the general Romanian student population.
- Analysing gender differences in technology adoption and usage.

The data shows that physical access is limited, the sample owning PCs and Internet connection represents average-level. The most used Internet functionality is the information search, followed by e-mailing. These results confirm other present in the literature, such as Cobb Payton (2003) that indicates the same preferences for Internet functions (most used: search, followed by e-mail, chat and e-shopping in this order).

The information accessed via the Internet is usually information not accessible by other means, but another factor for Internet usage is the comfort the user associates with it.

Keeping in mind European data for e-commerce, with 17% of the entire population using it (Demunter, 2005), on-line shopping is scarcely used by our subjects, and should be closer analysed as e-commerce is an important evolution, critical, at the present moment, for the transition phase.

Communication is one activity that suffers an important impact, but the result is perceived as rather optimistic: socialisation spaces and quality of communication relationships are on the increase. In other countries as well, interpersonal communication is the main motivator of Internet usage, and is perceived as being highly positive (see for example Kraut et al., 1998).

With regard to the digital divide, we can say that the level of technological access, in terms of access to a PC, does not seem to be a problem. However, Internet access is still not common and indices of computer and Internet literacy demonstrate a shallow knowledge by the majority of the sample. In fact, Romania is below the European average with regard to Internet access possibilities (Demuter, 2005). Social access and use seem to be encouraging rather than hindering on-line activities. The optimism and positive attitude shown by the subjects encourages us to argue that the digital divide, for the population under consideration in this research, and from this perspective, is not a problem.

The situation is quite different for the gender digital divide, which seems to be quite strong. Even if females have reported the same physical access opportunities as males, and their skill levels are not so different, the frequency of time spent on the Internet, and the amount of experience and knowledge are clearly in favour of males. Nevertheless, the quality of the divide is different to that of other countries, especially with regard to abilities and impact perception.

In general, it can be concluded that there is still a certain digital divide, present mostly in the in-depth knowledge and experience the subjects have. Males have more computer and Internet knowledge and experience than females, and tend to use these technologies more, so that the gap might be widening. On the other hand, there are aspects in which gender differences are not significant and a demonstrated positive attitude on the part of females - ready to adopt and use new technology, in the case they did not already do so - exists. Other studies (such as Schumacher and Morahan-Martin, 2001) indicate, not only differences in knowledge and usage, but, also, in attitudes towards the Internet and the perception of new technologies. In brief, females are supposed to have lower levels of experience and more negative attitudes than males. Also Liff and Shepherd (2004) report wider divides between genders, especially with regard to the perceived impact and self-assessment of abilities. From this point of view, the present data indicate a rather positive attitude of Romanian female students and no significant differences for perceived abilities. Even if these results can be interpreted as having various causes (for example a lack of the self-underrating female attitudes), it can be concluded that the divide is different to that/those in other European situations. Explanations might be found in the communist past in which there were more female engineers and less gender divide as regards PC usage (Durdell et al., 1997).

Further studies, especially in the form of longitudinal research, are required in order to prove this tendency or to highlight a widening of the digital divide, so that interventions can be planned. In this sense, the scarce participation of females in technical-scientific faculties is to be noted, as a negative evolution in comparison to the past (Durdell et al., 1997) and adequate measures encouraging females and influencing them to choose this career path should be considered and implemented. Such measures have already been taken in developed countries.

The present study not only gives a picture of the situation, but also indicates some relevant variables to be used in future studies, as well as a hypothesis and important points, providing a basis for further research. We underline here the potentialities of the

variables involved in PC and Internet literacy (usage of Linux and owning a personal web page, as well as participating in a virtual community), together with the need for in-depth studies about the problems of e-commerce (as on-line shopping is the for less used functions). Furthermore, more data is needed on the differences between genders and usage groups in order to understand if identified trends (and hypothesised evolutions) are confirmed, if there is a need for -social-level intervention, and how this evolution could be constructed and implemented.

The present data provides the basis for further developments, which can expand current knowledge in more directions. There is a need for more qualitative and in-depth data about computer mediated communication through the Internet, as well as of virtual communities. A study of the current public administration and e-commerce sites in Romania, together with an in-depth study of how people access and use these sites, would help to analyse the impact of e-services.

Universal access should be explored taking into account the critical groups, such as the elderly and those with special disabilities, together with an analysis of the implementation of current standards for accessibility, at least of the public administration services offered on-line on the basis of the recommendations by W3AI.

The digital divide represents a very important issue for modern society. Further studies are needed in order to explore the divide that exists at the general level of the population, for example between rural and urban areas, as well as between individuals with different levels of education. Longitudinal studies exploring the evolution of digital divide patterns and usage group dynamics would clarify better the Romanian picture.

Moreover, in-depth analysis of gender differences should explore the qualitative differences present, as well as their causes, gender attitudes in relation to technology and, especially, the Internet, as well as differences in activities on-line, etc.

As previously mentioned, the present research is just the beginning of a wider and more detailed analysis meant to facilitate understanding of the state-of-the-art of the Romanian Information Society, as well as to delineate future directions for intervention and evolution, in order to facilitate the development of the e-society.

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