ISSN 2601-8683 (Print)
ISSN 2601-8675 (Online)
European Journal of
Formal Sciences and Engineering
January - June 2023
Volume 6, Issue 1

Digital Generation - Analysis of the Use of ICT by Young Poles

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Abstract

In the Europe 2020 strategy in area of smart growth one of the flagship initiatives is Digital Agenda for Europe. Implementation of this initiative will lead to wide-availability of ICT solutions to society. Young people belonging to Generation Y most often treat the computer as a natural household equipment. Regular use of the Internet is very popular among them. They increasingly use mobile solutions in the field of ICT. The intelligent use of information technology possibilities will lead to sustainable economic growth. The purpose of the study was to cheque changes in the use of ICT among young Poles, and whether related behavioural patterns are similar in other countries of the European Union. The paper concludes with main reasons differencing generations in Poland due to the using the Internet.

Keywords: digital society, ICT, generations Y, X, BB, digital divide

Introduction

In 2010, were determined actions to smart, sustainable and inclusive growth of the economy and society of the European Union. It was Europe 2020 strategy. Each of the three assigned objectives are highlighted by a number of priorities, the implementation of which is constantly checked with use of selected indicators. "Smart growth means … making full use of information and communication technologies and ensuring that innovative ideas can be turned into new products and services that create growth, quality jobs and help address European and global societal challenges" (European Commission, 2010b, p. 11).

The process of smart growth based on social inclusion is very difficult to achieve considering the very different levels of economic development in the EU member states. For example the use of Information and Communication Technologies (ICT) differs in many countries (European Commission 2010a, p. 9). In addition, in the Member States there are differences in the skills of handling and use of ICT by younger and older residents, at work and private life (in European Commission (2010a, p. 10) can be found that "age and education are the two main factors influencing the way people use internet services"). In a dynamic economy based on modern technologies,

limiting access to ICT is the cause of the digital divide, which results in social exclusion (Wykluczenie cyfrowe ..., 2010).

The aim of the study was to find if the purposes of Europe 2020 strategy are fulfil in Poland and to find differences of use of ICT between adult generations in Poland.

Europe 2020 strategy - smart growth

"EU flagship initiative "A digital agenda for Europe" to speed up the roll-out of high-speed internet and reap the benefits of a digital single market for households and firms" (European Commission 2010b, p. 33). Limitation of the availability of ICT can lead to social exclusion, particularly the digital divide.

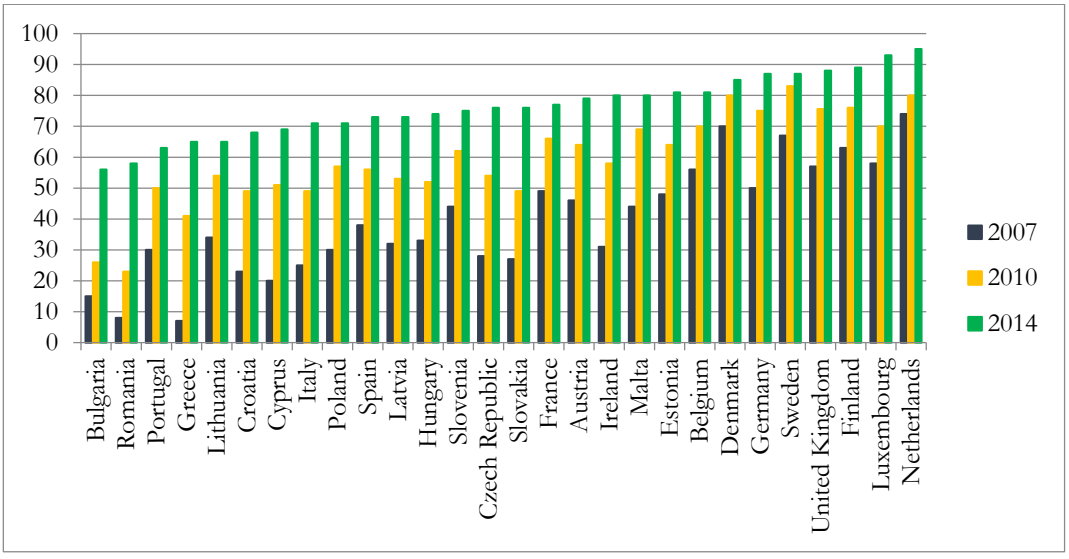
In Wykluczenie cyfrowe (2010) can be found several definitions of the digital divide:

- division of society to having access to ICTs and those who do not have access;
- division due to the possibility of obtaining access to a computer and the Internet and skills of use these technologies in private life and at work;
- complex, global division of individuals, households, countries, regions, businesses, taking into account access, skills and use of ICT.

As seen above division of social exclusion can lead to many difficulties in job search and social acceptance, and in extreme cases to discrimination of individuals.

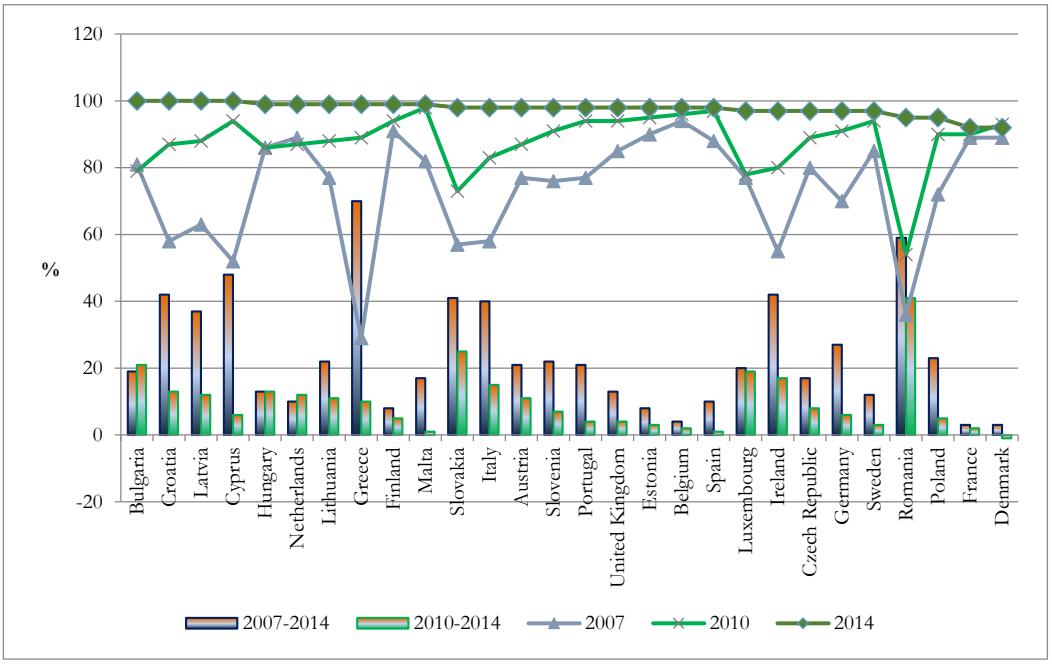
Information society in Poland in 2010 was rated significantly worse than in most member states of the EU (Figure 1). This situation has changed in 2014 years.

Fig 1: Percentage of households with broadband Internet connection



Source: Own elabration on EUROSTAT data (isoc_pibi_hba).

Fig 2: Percentage of households with broadband Internet connection at home[3]



Source: Own elabration on EUROSTAT data (isoc_pibi_hba).

Figure 1 shows the changing number of households with access to broadband Internet. In Poland in 2007, such access was available in 30% of households (20th place among the current 28 Member States of the EU), in 2010 - 57% (ranked 15th), in 2014 -71% of households (20th place). Since 2007 until 2014 the percentage of households with access to a broad band Internet increased by 41 percentage points. This is the 11th result of EU Member States.

The situation is better given access at home of households to broadband Internet (Figure 2). Since 2007 up to 2010 the percentage of households with broadband Internet access increased by 23 percentage points, from 72% in 2007 to 90% in 2010 and then 95% in 2014). By 2014, four countries have 100% of households access to broadband Internet at home, households from six countries have access in 99%, 98% of households in 9 countries, from 5 countries 97% of households, from 2 countries 95% of households (including Poland), from 2 countries 92% of households have broadband Internet access at home. In 2007 the lowest access at home of households to broadband Internet were observed in Greece and in Romania. Both of these

[3] With bar chart are shown increases of access at home of households to broadband Internet (2007-2014 and 2010-2014), with lines are shown Percentages of households with broadband Internet connection at home in 2007, 2010, 2014.

countries made great progress in access to the Internet. In 2014 in Greece 99% of households have access at home to broadband Internet, and in Romania - 95%.

The latest report on the implementation of new Digital Economy and Society Index - DESI (European Commision 2014) shows compressed information about Internet skills, the use of online activities, digital technologies and digital public services. Table 1 and Figure 3 shows ranks[4] calculated of three indices: DESI, percentage of households in 2014 with access at home to broadband Internet (R2014), increase since 2007 to 2014 of access of households with access at home to broadband Internet (R2007-2014). The pair correlations were measured with use of Spearman Index.

Figure 3 presents the rank allocated in three variables for each country. Poland is ordered in the far position for DESI and R2014, but for R2007-2014 Poland is ranked much better. This means that across five main dimensions (Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, Digital Public Services) the Poles are a lot worse evaluated in comparison to people in most other Member States of EU. In 95% of Polish households at home have access to broadband Internet, it is only the result lower of 4 percentage points than the best countries, but it shows that in this matter in Poland there is still need for further development. The last indicator R2007-2014, shows a large increase in the number of Polish households having access at home to broadband Internet. Figure 4 presents the correlations between analyzed variables. Highest relationship is found between DESI and R2007-2014. The correlation is inversely proportional. This means that an increase in access to broadband Internet not directly cause an increase, but a decrease in its ability to operate and use. An analogous conclusion can be found in Krajowy Program Reform (2014). There is indicated the need to "improve the quality of education, . . . , make full use of ICT, as well as ensuring that the innovative ideas can be turned into new products and services that contribute to the increasing economic growth, creating new work places and solving social problems" (Krajowy Program Reform 2014, p. 22).

Since the widely used characteristic of Gen Y is constant and natural use of ICT in everyday life and work, so it becomes increasingly important question if there are significant differences in the use of the Internet and other modern technologies for Generation Y and Generation X, Baby Boomers (BB). Combes (2009, p. 31) writes that because " they have never known a world without the Internet and technological change", so their skills in use of technology are almost intuitive. Therefore, the chapter 3 presents an analysis of the use of the Internet in Poland.

[4] The indices were ranked after ordering values from best to worst. The indices were ranked after ordering values from best to worst. After ordering the indices from best to worst ranked. Rank 1 represents the best country, rank 28 - the worst. In the case of variable R2014 occurs many countries with identical values of the indices. In this situation were used linked ranks.

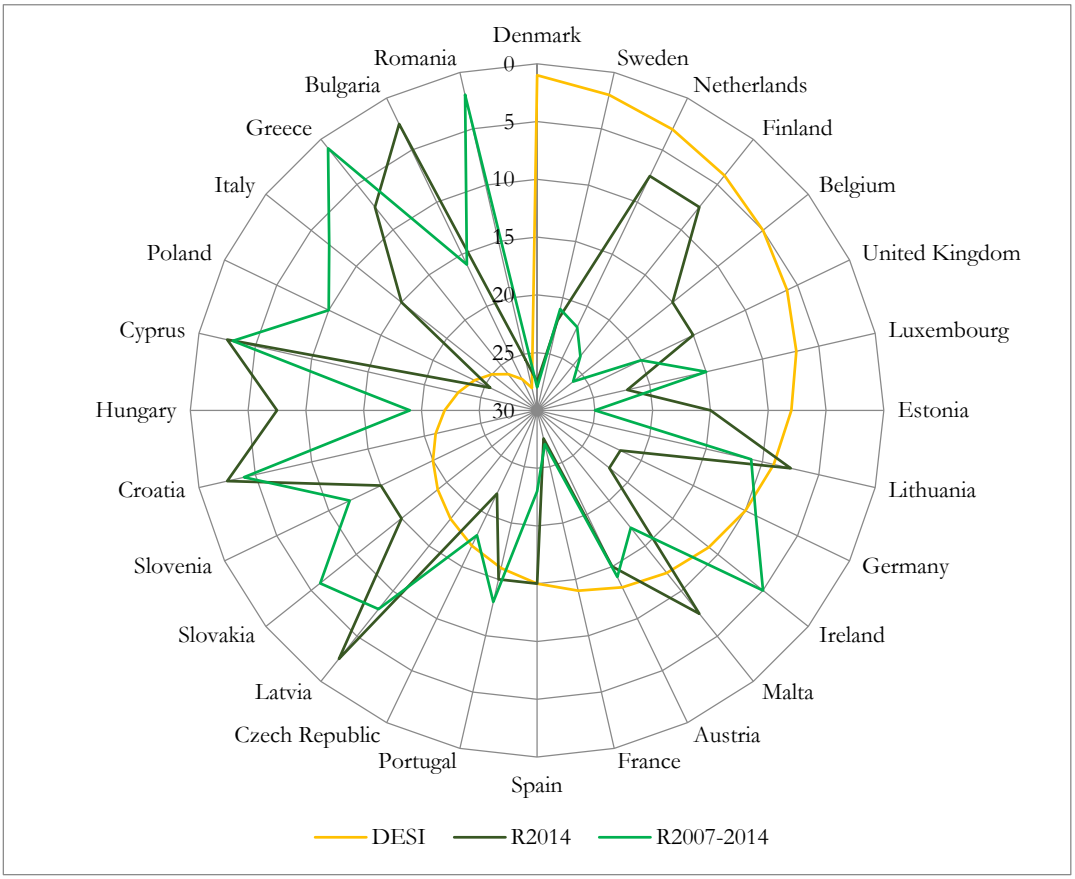
Table1. Ranks of three indexes: DESI, R2014, R2007-2014

Country	DESI	R2014	R2007-2014
Austria	13	15	14
Belgium	5	15	26
Bulgaria	27	2,5	16
Croatia	24	2,5	4
Cyprus	22	2,5	3
Czech Republic	17	22	18
Denmark	1	27,5	27
Estonia	12	15	25
Finland	4	7,5	24
France	14	27,5	27
Germany	10	22	9
Greece	26	7,5	1
Hungary	20	7,5	19
Ireland	9	22	5
Italy	25	15	7
Latvia	18	2,5	8
Lithuania	11	7,5	11
Luxembourg	8	22	15
Malta	15	7,5	17
Netherlands	3	7,5	22
Poland	23	25,5	10
Portugal	16	15	13
Romania	28	25,5	2
Slovakia	21	15	6

Slovenia	19	15	12
Spain	7	15	23
Sweden	2	22	21
UK	6	15	20

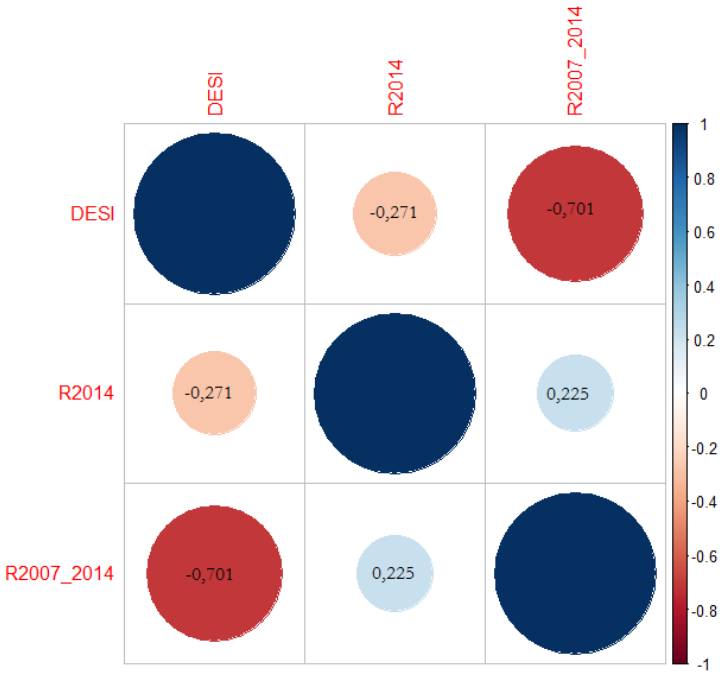
Source: Own elaboration on EUROSTAT data (isoc_pibi_hba) and European Commission (2014).

Fig 3: Ranks of three indices: DESI, R2014, R2007-2014



Source: Source: Own elaboration on EUROSTAT data (isoc_pibi_hba) and European Commission (2014).

Fig 4: Correlations between ranks of three indexes: DESI, R2014, R2007-2014



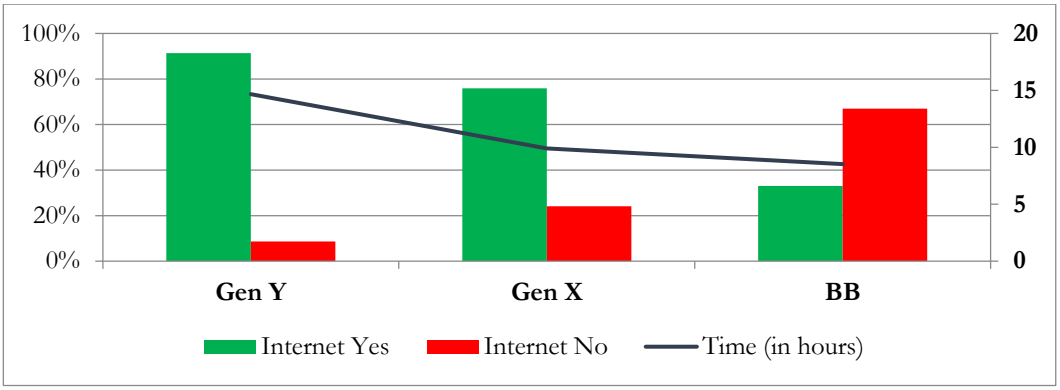
Source: Source: Own elaboration on EUROSTAT data (isoc_pibi_hba) and European Commission (2014).

Use of the Internet – differences between Generations Y, X and BB

Use of the Internet by the Poles were checked on the basis of data from the Diagnoza Społeczna 2013 (ang. Social Diagnosis [Rada Monitoringu Społecznego, 2013]). Analysed age groups were as follow: Gen Y (aged 18-33), Gen X (aged 34-48), BB generation (age 49-67). Firstly, from the respondents were taken only Internet users, because subsequently was checked for what purpose they use the Internet[5]. Figure 1 presents rate of Internet users of three generations and average time spend on the Internet in last week (last week before date of interview). 91% of Gen Y were Internet users and spent in 2013 almost 15 hours per week on the Internet. Among Generation X the rate of Internet users is lower – 76% (10 hours per week spent on Internet). The rate for BB Generation is the lowest. Only 33% used the Internet, but the time spent on the Internet was almost the same as for Gen X - 9 hours per week.

[5] Literal questions: Do you use a computer? and Do you use the Internet?

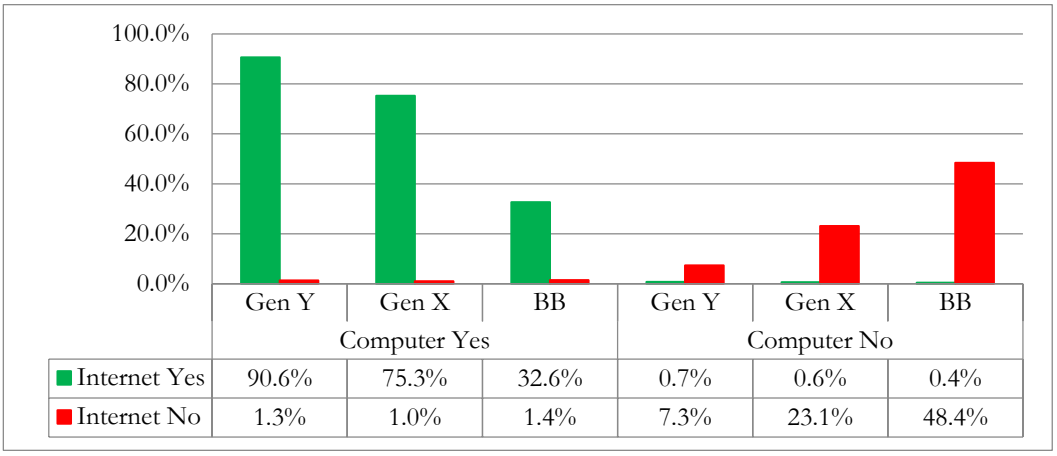
Fig 5: Rate of Internet users and average time on Internet in last week (in hours) in 2013



Source: Own elaboration on Diagnoza Społeczna [Rada Monitoringu Społecznego, 2013].

Figure 6 show the rate of computer and Internet user. Rates of persons who didn't used computer are lower than for users. Some of persons who used computers in 2013 didn't used the Internet: 1,3% of Gen Y, 1% of Gen X, 1,4% of BB.

Fig 6: Rate of computer and Internet users in 2013



	Computer Yes			Computer No		
	Gen Y	Gen X	BB	Gen Y	Gen X	BB
Internet Yes	90.6%	75.3%	32.6%	0.7%	0.6%	0.4%
Internet No	1.3%	1.0%	1.4%	7.3%	23.1%	48.4%

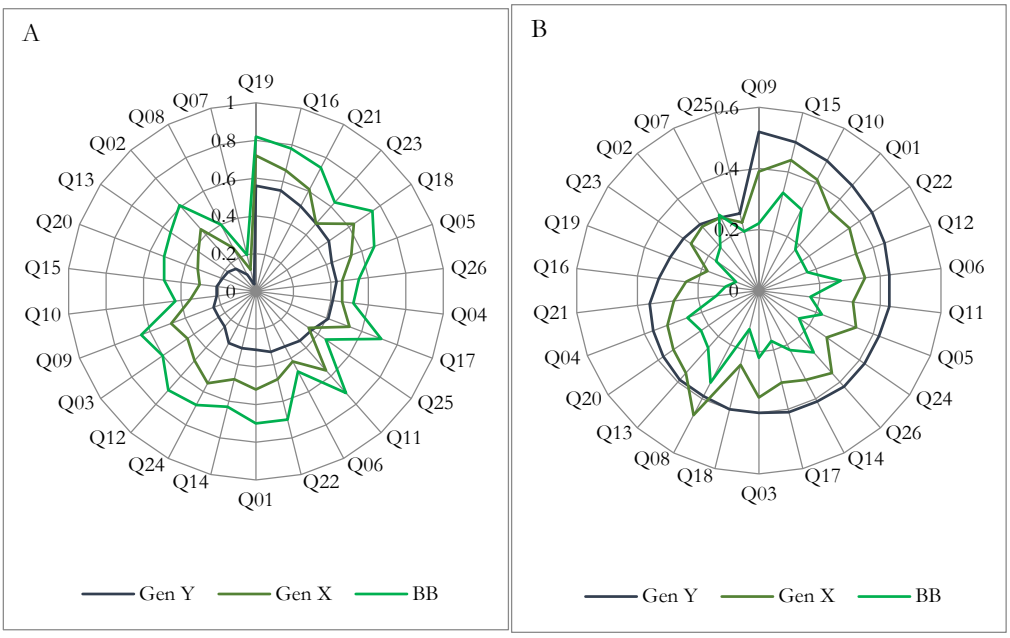
Source: Own elaboration on Diagnoza Społeczna [Rada Monitoringu Społecznego, 2013].

Next analysis was conducted for reasons to use the Internet and frequency of use of the Internet for all reason.

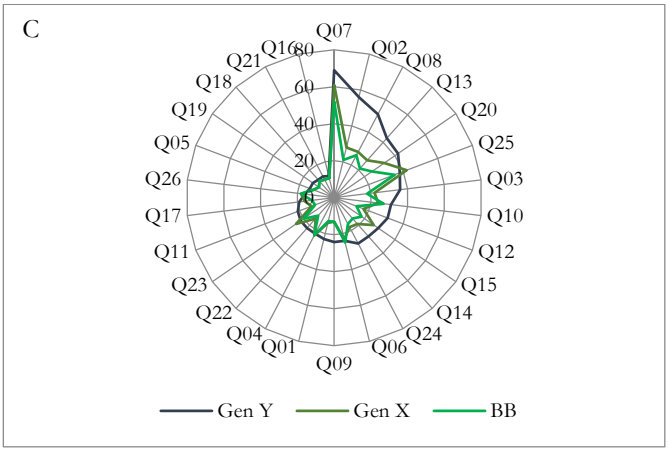
Analysed reasons were grouped in 10 subjects:

- social networking (Q1 participating in discussion groups or forums; Q2 Facebook; Q3 social network);
- searches (Q4 obtaining information from websites of public institutions, Q5 ticket reservation);
- reading (Q6 reading newspapers or books on the Internet);
- communication (Q7 e-mail, Q8 the use of instant messaging, Q9 chats, Q10 phone calls (VoIP, Skype));
- multimedia sites (Q11 free software downloading, Q12 free music and movies downloading, Q13 listening to music or the radio, Q14 watching TV)
- shopping (Q15 purchases of products and services in Poland, Q16 purchase products and services from abroad, Q17 participating in online auctions);
- own creativity (Q18 creating or modifying a web pages, Q19 creating or modifying own texts (eg. a blog, twitter), graphics, music or others);
- learning and working (Q20 collection of materials needed for study or work, Q21 participation in courses or trainings, Q22 job search, sending offers for employment , Q23 home use of the Internet and e-mail for professional purposes);
- online games (Q24 online games);
- official matters (Q25 Internet banking, Q26 downloading or filling official forms).

Fig 7: The reasons for using the internet (A – never; B – ever, C – last week[6])



[6] Last week before date of interview in 2013.



Source: Own elaboration on Diagnoza Społeczna [Rada Monitoringu Społecznego, 2013].

Between *never users* (Figure 7A) from three analysed generations were large differences in 2013. The category *I never use the Internet for refered reasons* was most popular for BB generation in 2013. More than 60% of Gen Y never used in 2013 the Internet for buying products and services from abroad (Q16), creating or modifying own texts (eg. a blog, twitter), graphics, music or others (Q19) and participating in courses or trainings (Q21). Most people of ever used the Internet in 2013 (Figure 7B) belongs to the generation Y followed Gen X, and the lower number of persons ever used the Internet was from BB generation. The highest level of the internet use was for buying products and services in Poland (Q15) for all generations. Many people from Gen Y ever used the Internet in order to chats (Q9). Gen X used ever the Internet for instant messaging (Q8), like BB generation.

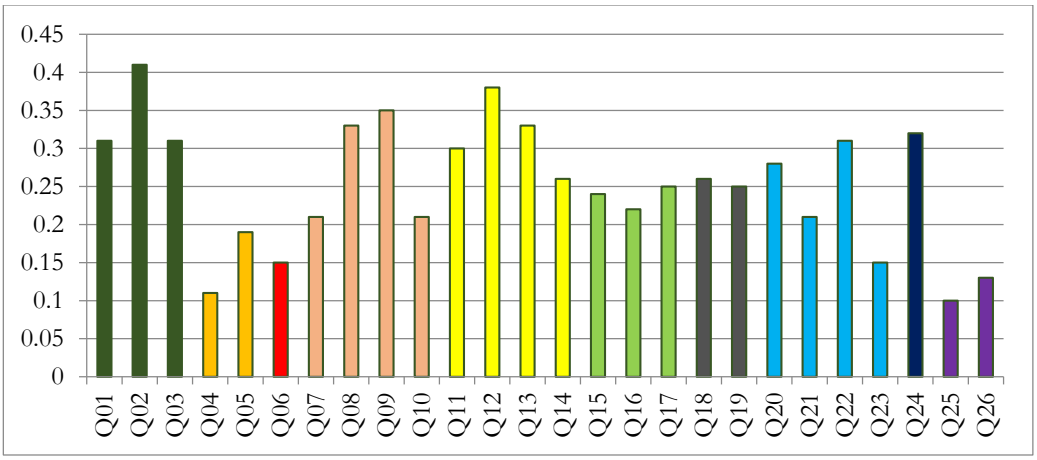
In Figure 7C last week means a few days prior to the interview in 2013. In all age groups in last week very popular reason for using the Internet was communication via e-mail. Almost the same rates of all generations of Internet users in 2013 used the Internet for Internet banking (Q25), reading newspapers or books (Q6), obtaining information from websites of public institutions (Q4), downloading or filling official forms (Q26). The lowest percentage of people in each age group indicated the use of the Internet to ticket reservation (Q5), own creativity (Q19 and Q18), participating in courses or trainings (Q21), buying products and services from abroad (Q16).

Parment (2013, p. 39) wrotes that "Die Generation Y ist daran gewohnt, das Internet als Informationsquelle und Wissensbasis zu nutzen" (Generation Y is accustomed to use the Internet as a source of information and knowledge base). In Poland in 2013 use of the Internet for information searching was quite different: 40% of Gen Y declared that never used the Internet for obtaining information from websites of

public institutions (Q4), 37% used ever the Internet for Q4 reason and only 22% used the Internet for searching information in last week.

In Figure 8 are shown values of Phi correlation coefficient between generations and reasons for using the Internet. The most influencing reasons differencing generations was in 2013 Q2, i. e. using the Internet for connecting with Facebook. Next, very important reasons for using the Internet which differ among generations were free music and movies downloading (Q12), the use of instant messaging (Q8), chats (Q9), online games (Q24).

Fig 8: Phi coefficient of generations versus reasons for using the Internet



Source: Own elaboration on Diagnoza Społeczna [Rada Monitoringu Społecznego, 2013].

Conclusions

The conducted analysis showed that between EU countries are differences in the use of the Internet. During the analysis of the behavior of Poles using the Internet also were indicated differences that reflect the generational change.

Poland has one of the highest indexes of increase since 2007 to 2014 of households with access at home to broadband Internet R2007-2014 and the lowest index of DESI. As Punie, Zinnbauer and Cabrera (2008. p. 7) wrote that between Member States in 2006 were "three clusters of countries: A cluster of “high performing countries” …; A cluster of “average performing countries”…, A cluster of so-called “delayed countries” …". This statement was made for educational system, but may be that the situation in education in 2006 influencing the situation in use of new digital technologies in 2014. In explanation of DESI indices for 2014 may be find the same information about countries and digital society in EU: "According to their performance, countries were grouped in high, medium and low performance clusters" (Digital Agenda, 2015) – Poland is in the last group.

Analysis of reasons for using the Internet (in last week) among constantly Internet users pointed out that there is no generational differences in the use of the Internet to Internet banking (Q25), reading newspapers or books on the Internet (Q6), obtaining information from websites of public Institutions (Q4), downloading or filling official forms (Q26). The biggest differences are in the use of Facebook (Q2), instant messaging (Q8), listening to music or the radio (Q13) – the young Poles use for these purposes the Internet more frequently than older.

The least frequent reason given for not using the Internet is email (Q7). Other causes are arranged in order of priority in the same way for all generations. The share of people never using the Internet for the specified purposes is the highest among BB generation.

The most differentiating generations reasons for using the Internet is a social networking (especially use of Facebook), communication (specially chats), multimedia sites (the most free music and movies downloading). Between generations in Poland there is no difference due to the following reasons for the use of Internet: searches, reading and official matters.

Acknowledgements

This study was done as a part of the project "Non-metric multivariate data analysis as a tool for study of adults situation in the context of demographic changes" financed by Narodowe Centrum Nauki (National Science Centre) in Poland. Project number: 2012/05/B/HS4/02499.

References

[1] Combes B. (2009). Generation Y: Are they really digital natives or more like digital refugees? Synergy, vol. 7, nr. 1, 31-40.

[2] Digital Agenda for Europe (2015). The Digital Economy and Society Index (DESI). [Online] Available http: //ec. europa. eu/digital-agenda/en/digital-economy-and-society-index-desi (March 1, 2015).

[3] European Commission (2010a). *Europe's Digital Competitiveness Report 2010*. Publications Office of the European Union, Luxembourg, doi: 10. 2759/32382.

[4] European Commission (2010b). *Communication from the Commission - Europe 2020. A strategy for smart, sustainable and inclusive growth.* European Commission, COM (2010) 2020 final.

[5] European Commission (2014). How digital is your country? New figures reveal progress needed towards a digital Europe. European Commission - Press release, Brussels. [Online] Available http: //europa. eu/rapid/press-release_IP-15-4475_en. htm (February 26, 2015).

[6] Krajowy Program Reform. Europa 2020 (2014) Rada Ministrów, Aktualizacja 20-14/2015, Warszawa. [Online] Available http: //www. mg. gov. pl/files/upload/8413/KPR_2014-2015. pdf (February 27, 2015).

[7] Parment A. (2013). Die Generation Y Mitarbeiter der Zukunft motivieren, integrieren, führen, Springer Fachmedien Wiesbaden.

[8] Punie Y. , Zinnbauer D. , Cabrera M. (2008). A Review of the Impact of ICT on Learning. Joint Research Centre. Office for Official Publications of the European Communities, Luxembourg.

[9] Rada Monitoringu Społecznego ([2013]). Diagnoza społeczna: zintegrowana baza danych. www. diagnoza. com [retrieved 2014/07/18].

[10] *Wykluczenie cyfrowe na rynku pracy* [2010], red. E. Kryńska, Ł. Arendt, IPiSS, Warszawa.