

# The level of student preparation for active living in the information society: a comparative analysis 2009-2012

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**Abstract:** The preparation of citizens for active living in the information society is important. This not only requires having proper equipment, but also knowledge, skills, and competences. In many sociological and pedagogical analyses, as well as reports from the National Statistical Office, there is no data concerning usage of e-services, ownership of equipment, etc. Furthermore, there are no indexes that extensively present this data. In this paper, the author proposes a synthetic indicator called the involvement index in the information society. In addition, the author presents the results of research conducted in politics, international relations, and internal safety with both full-time students and part-time students at Nicolaus Copernicus University in 2009 and 2012. The author uses the value of the involvement index in the information society in the research. The research results indicate that students do not look at their future through the prism of change in the information society, they do not think about themselves as teleworkers, and they do not perceive themselves as persons who often change job positions or who use the e-learning process upon completion of their studies. Reasons for this situation are surely not attributable to matters of infrastructure, as these parameters reach almost maximum value, but instead can be attributed to a lack of knowledge or habits. Hence, a general conclusion resulting from the study is a call for change in the learning formula for the subject of information technology not only at the primary and secondary school levels, but in higher education as well.

**Keywords:** Students, Information Society, Education

## 1. Characteristic of research

### 1.1. Involvement Index in the Information Society

The involvement index in the information society is an index that describes the involvement level in the information society. It has a synthetic nature and has three components: infrastructural, service, and prospective. Table 1 includes the components and Table 2 has the algorithm for its evaluation. All respondents' answers were converted to numbers, and then summed up, thus resulting in the index involvement in the information society. Upon determining the involvement index in the information society, a rational number is derived in the range [0;28].

Table 1. Components of the involvement index in the information society.

Infrastructural	Service	Prospective
unlimited computer access	online e-services provided by school	interest in telecommuting
having portable computer		interest in e-learning
Unlimited Internet access	priority services for the information society	assumed vocational activity
Broadband Internet access		
place of using Internet	using other online services	
Frequency of using Internet		
Having mobile phone		

References: Own research.

**Table 2.** Algorithm for calculating the involvement index in the information society.

Infrastructural	Service	Prospective
Unlimited computer access yes – 1 no – 0	Using services in the academy for every mentioned service – 1, max. 3 points	Interest in telecommuting preferably and yes – 0.5 definitely yes – 1 remaining answers – 0
Having portable computer yes – 0.5 no – 0	Using priority services for the information society no answer and I do not know answer – 0 I do not use – 0.25 I use it sporadically – 0.5 I use it regularly – 1	Interest in e-learning preferably and yes – 0.5 definitely yes – 1 remaining answers – 0
Broadband Internet access yes – 0.5 no – 0	Using other services provided online no answer and I do not know answer – 0 I do not use – 0.25 I use it sporadically – 0.5 I use it regularly – 1	
Having mobile phone yes – 1 no – 0		
Frequency of using Internet do not use – 0 sporadically – 0.4 regularly – 0.75 every day – 1		

References: Own research.

### 1.2. Description of Research

The described surveys were conducted in the academic years 2009/10 and 2011/2012. The students of the following faculties were surveyed: full-time and part-time students studying international relations, politics, and international safety from the Politics and International Studies Department of Nicolaus Copernicus University in Torun, Poland.<sup>1</sup> A cafeteria-style survey was conducted. The selection of the research sample was non-random and influenced by economic factors, organizational factors, and previous research (the author had been studying this environment since 2002). In the academic year 2009/10, 807 sur-

veys qualified for further analysis; 704 surveys qualified during the next round of studies. Both groups of respondents were autonomous. In the study done during the academic year 2011/12, students who were surveyed in the first stage were not questioned. Table 3 presents the detailed data. Survey results were subject to statistical analysis.

**Table 3.** Amount of qualified surveys in both rounds of studies.

Academic year	Full-time program	Part-time students
2009/10	505	302
2011/12	405	299

References: Own research.

## 2. Infrastructural Component – Results Of Studies

Active living in the information society is not possible without appropriate equipment and Internet access; thus, the infrastructural component is significant. The results of the studies indicate that respondents from both student groups in the academic year 2009/10 were already well anchored in the information society as far as infrastructure was concerned. Table 4 presents percentage indexes in selected categories. It indicates that almost all students had access to a computer – in both groups it was at the level of 97% to 99%. Full saturation was noted for having mobile phones, and slightly lower but very high indexes as far as unlimited Internet access was concerned. As for full-time students, the index of positive answers was 88%; it was 92% for part-time students. Between these two groups, there were no statistically significant differences. This was confirmed by test results of the chi-square statistic for two independent samples. See Table 4 for details. The category is presented for differences in having portable computers: the amount of positive indications among full-time students was 73%; for part-time students, it was only 52%. Analysis of the results revealed one more surprising fact: female students who were full-time declared having a laptop more often (value of the chi-square statistic 10.19 in the study chi-square statistic for two independent samples with critical value 3.841) than male students. A similar regularity was presented by the author in research done with student groups from Germany and Czech Republic [1]. As for full-time students, such dependents were not presented (value chi-square statistic 0.05 in the test chi-square statistic for two independent samples with critical value 3.841). The definitely higher index among full-time students for having a laptop is connected with the fact that students who do not live at their family's home have a better situation when having a portable computer.

**Table 4.** Results of students survey in academic year 2009/10.

<sup>1</sup> Full-time program students have classes for 5 days a week. If they work, it is usually part-time work. Part-time students have classes every two weeks on Saturday and Sunday. The time of their studies is approximately 2/3 of full-time studies.

Comparison category	Full-time program	Part-time program	Remarks
Unlimited computer access	97%	97%	No statistically significant difference. Value $\chi^2=0.73$ with critical value 3.841.
Having portable computer	73%	52%	A statistically significant difference. Value $\chi^2=29.63$ with critical value 3.841.
Unlimited Internet access	88%	92%	No statistically significant difference. Value $\chi^2=3.42$ with critical value 3.841.
Having mobile phone	100%	100%	No statistically significant differences

References: Own research.

Table 5 presents data obtained in 2011/12. The data did not indicate any changes except in the category of having a portable computer. The improvement was observed in both groups of respondents: an increase in 20 percentage points. These changes are statistically significant. Gender remained the factor that determined laptop ownership. The surveyed population became mobile; this fact shall also translate directly to the frequency and to a map for Internet use by respondents.

Table 5. Results of students survey in academic year 2011/12.

Comparison category	Full-time program	Part-time program	Remarks
Unlimited Internet access	99%	98%	No statistically significant difference. Value $\chi^2=0.67$ with critical value 3.841.
Having portable computer	91%	70%	A statistically significant difference. Value $\chi^2=91.97$ with critical value 3.841.
Unlimited Internet access	89%	95%	A statistically significant difference. Value $\chi^2=8.19$ with critical value 3.841.
Having mobile phone	100%	100%	A statistically significant difference.

References: Own research.

The results obtained with frequency studies are presented in Figure 1. The changes in the surveyed groups are not significant. A different situation is observed in the case of declared places where Internet is most often used. The group of people using the Internet at the university increased: for full-time students the increase was from 37% to 47%; for part-time students, from 9% to 15%. The participation of respondents also increased: those who declared using Internet at friends from 18% up to 41% (full-time students); from 18% up to 22% (part-time students). The increase from 94% to 98% for Internet use at place of living is quite an interesting result. The explanation can be in the fact that the computer performs the role of a social meeting participant, as the television set was for

the previous generation. Part-time students more often declared using of Internet at work. In this category, there was a 10% increase: from 45% to 55%. There is still small rate of responses in the category of hot spot use, as the mobility of respondents can be questioned. Only 8% of full-time students indicated hotspots as one of the two places most often used for connecting to a network. For part-time students, however, it had even less indications: in the first round of the survey, it was a slight 1%; in second round, 3%.

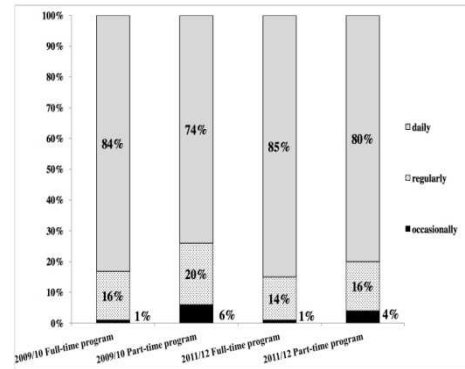


Figure 1. Frequency of Internet use in each group of respondents. References: Own research.

The results, which translated directly into a value of the infrastructural component of the involvement index in the information society, are presented in Table 6. Its increase occurred due to the increase of people having portable computers and indicating the use of the Internet at work or at the university. Surveyed groups varied in statistically significant ways with regard to the component, but the variation coefficient is at the level 12%. This can indicate that in the next round of surveys, this variation will not be noticed.

Table 6. The value of infrastructural component of the involvement index in the information society.

Academic year	Full-time program	Part-time program
2009/2010	5.67	5.50
2011/2011	6.03	5.91

References: Own research.

### 3. Service and Future Component: Results of Studies

Living as a human being in society also means using services provided online. The study considers a division into the following services: priority provided by the university and characteristic for the information society. Detailed data on the services component in 2009-2012 are included in Tables 7 and 8. A minimal decrease of the scope of priority services for full-time students was noticed. This results, first of all, from less interest in online access to public libraries:

there is a decrease from 75% to 53% of indications of people regularly using the service. However, as with part-time students, there was a slight increase that resulted from greater participation of people who pay their taxes online: from 6% to 30% in the category sporadically; from 7% to 12% for people who use it regularly.

**Table 7.** The value of service component for studies in the academic year 2009/10.

Specification	Full-time program	Part-time program
Priority services	2.15	2.03
Services provided by university	2.56	2.20
Services characteristic for the information society	5.24	4.82
Service component total	9.95	9.05

*References: Own research.*

A slight improvement was also noticed for services provided electronically by the university: more and more people indicated three services. Beyond a doubt, this indicates that students are more familiar with the services, and more and more matters are processed online at the university. In comparing the academic years 2009/10 in 2011/12, students less and less frequently indicate using online libraries, a trend which can be noticed in both student groups. For example, for full-time students this factor decreased from 74% to 26%; for part-time students, it decreased from 47% to 40%. This fact is worrying and points indirectly to the decline of reading among students.

Types of services included in the survey were services determined to be characteristic for the information society. In this category an increase was noticed, but it was not as high as expected in the survey's hypothesis. The increase in the value of this component was noticed due to the increase in the number of people using Internet banking: for full-time students, this figure rose from 55% to 62%. However, the change results from increased interest in social portals. As for full-time students, the rate of people using social portals regularly changed from 49% to 82%; for part-time students, from 36% to 50%. The increase in the e-learning category can be noticed, but it is mainly in the category sporadically; radio and Internet television were slightly more popular. Some negative phenomena, such as the decrease in the interest in online newspapers and digital libraries, were noticed. In a group of full-time students that regularly use this category, a decrease from 39% to 24% in the online category was noticed.

**Table 8.** The value of service component for survey in the academic year 2011/12.

Specification	Full-time program	Part-time program
Priority services	2.10	2.10
Services provided by university	2.56	2.20
Services characteristic for the information society	5.72	5.10
Service component total	10.48	9.60

*References: Own research.*

These changes were the result of university activity, including implementing obligatory e-learning training in the scope of occupational health and safety and library training; bank marketing and the promoting Internet banking; and advertisements on Facebook. However, the increase for services was not as high as expected. It confirms the author's thesis presented in previous publications that it is easier to make change as far as infrastructure is concerned as compared to changing the attitudes of users. The slight differences between full-time and part-time students are noticeable. The differences resulting from age are slight. However, work is the factor that differentiates the groups, which is why there is less interest in social portals. As for the service component, the surveyed population is also varied in a statistically significant way.

The survey also includes a future component with regard to attitudes toward e-learning and telecommuting in the future. The values of this component from 2009-2012 are included in Table 9. The maximum value of this component could reach two, but the obtained results indicate that respondents were not interested in such forms of work and education in the future.

**Table 9.** The value of future component for survey from the academic year 2009/10 and 2011/12.

Academic year	Full-time program	Part-time program
2009/2010	0.34	0.29
2011/2011	0.40	0.32

*References: Own research.*

#### 4. The Involvement Index in the Information Society and Students Self-Esteem

After adding the infrastructural, service and future components, the involvement index in the information society was obtained. Table 10 includes its value for some groups of respondents. For full-time students, the value of this index is slightly higher. The involvement index in the information society is at a satisfactory level. During the interval between tests it did not increase at the expected levels. The values of the involvement level in the information society point to the

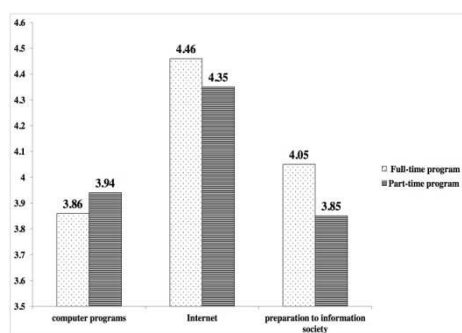
fact that students are anchored in the information society. While this is not at good level, it is definitely at a satisfactory level, which is sufficient. The situation is best presented as far as the equipment is concerned; lower results were obtained by students as far as the service component is concerned, and the lowest as for future component. The results of the survey indicate that respondents perceive their attitude toward the information society through the prism of “here and now.” It is not considered in the category of closer or more distant future.

**Table 10.** The value of the involvement index in the information society from the academic year 2009/10 and 2011/12.

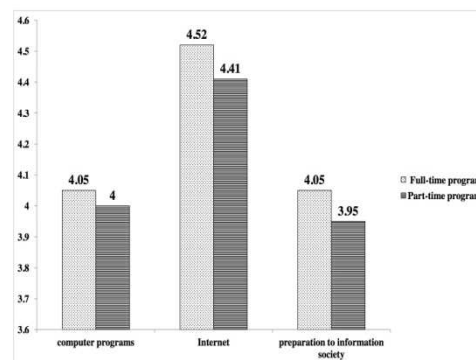
Academic year	Full-time program	Part-time program
2009/2010	15.95	14.84
2011/2011	16.90	15.83

References: Own research.

Students being anchored in the information society is also confirmed in other indexes through self-assessment in the following scope: using computer programs, the Internet, and introduction to living in the information society. Numerical data are presented in Figures 2 and 3. The self-esteem of students can range from 2 to 5, where 2 indicates an unsatisfactory grade, 3 - satisfactory, 4 - good, and 5 - very good. The highest scores both in 2009 and 2012 were obtained in the category of Internet use; slightly lower scores were established in the scope of using computer programs. Students' self-esteem in the scope of the introduction to living in the information society oscillates around the grade of good. The author's experiences from the didactic area confirm these results: students use the Internet well, they are quite good at using text editor, slightly worse with Excel spread sheets, and they do not know databases. The obtained results confirm that students live in the information society, not side by side. Due to this fact, grades given by university professors and lecturers in the area information and communication technologies and living in an information society should be treated seriously.



**Figure 2.** Self-esteem of students in each category in 2009. References: Own research



**Figure 3.** Self-esteem of students in each category in 2012. References: Own research.

## 5. Conclusions from the Study and Recommendations

The study results indicate that respondents in their area of activity on the ICT diverge from students that come from countries with better levels of development for the information society (Denmark, Finland and the United States, for example) through use of online newspapers, priority services, etc.<sup>2</sup> In some ways, this is the result of the development of the services in Poland, yet it is also due to educational methods used in Polish schools. According to the author, it is necessary for universities to focus on areas that cover the perspectives of the development of the information society. The issues concerning the situation “here and now” are important, but it should not be forgotten that universities prepare students to work. Some of the graduates will not continue studying. However, it is necessary to consider the subject of being on a labor market in the information society with the perspective of future years. For this purpose, it is necessary to change the formula of the subject: information technology. Topics that should have a wider implementation include issues of e-services, privacy, dangers to human being in the information society, using ICT in administration and companies, telecommuting, using ICT in teamwork, computer crimes, and safety in the information society. The current configuration of content is based on the conception of ECDL, the so-called European Computer Driving License, which is not sufficient and slightly archaic (!). There should be a redevelopment of the content of shaping the subject: information technology should not only have an educational dimension, but also have an economic dimension. The financial resources invested in the education of information technology should be used as effectively as possible, and not wasted in repeating classes. During the planning of classes, it is necessary to pay attention to persons conducting the classes. It should be academic lecturers, not necessarily just the scientists, who update their knowledge and develop skills. It is postulated that a system of skills certification should be implemented for conducting such classes.

<sup>2</sup> ICT - Information and Communications Technology.

Changes cannot only be limited to information technology, but should also cover other subjects; however, the changes would be minor. First of all, lecturers should use electronic academic resources more often. They should create bibliographies that consider digital publications. They should use blended-learning more often, though only if preparation and facilities are good. An academic lecturer should use ICT while conducting team projects among student. Also, possibilities for using the Internet in e-learning should also be considered. It requires taking action at the university level. Financial resources should be considered.

Preparation for active living in the information society cannot be perceived only through knowledge and use of ICT, though these do play important roles. It is necessary to cover all skills including, for example, a good command of foreign languages, information management, learning skills, etc.

It is necessary to continue to monitor students in terms of index involvement in the information society. Research

should be conducted every two years, as more frequent testing does not make sense. Changes, particularly in the attitudes of students, do not occur so quickly.

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