The Use of ICT
in Students' Learning Activities

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Abstract. *There is no doubt that new communication technologies are shaping our interaction patterns and technology adoption will continue to grow in the future, creating gaps between people with different levels of expertise. Particularly in the educational area, new technologies will challenge traditional approaches in learning and interacting with students and will give more opportunities for students on the labor market. This research focuses on technology adoption and use in class and strategies to learn, taking the case of students from a public university in Romania. We conducted a sociological survey based on questionnaire (N=553) to investigate the way students use ICT to prepare for different subjects, and attitudes they have on technology use in class. The findings suggest that students with lower grades and non-traditional ones use ICT for academic purposes to a lower extent. Furthermore, students expect from teachers to use and handle Power Point presentations, to provide electronic books, chapters, articles or links to scientific journals. Generally speaking, there are significant differences between students' expectations and teachers' behavior regarding the use information and communication technologies in class.*

Keywords: *ICT use in students' learning activities, teachers ICT use; traditional and non-traditional students.*

Introduction

Using new technologies in daily interactions including teaching and learning activities has become ubiquitous in current society. Still there is a difference between those who have grown up with the new technologies, often called "digital natives" (see Prensky, 2001), and those who got familiar with the ICT later in life. Particularly in the academic settings, the use of technology has increased in recent years, from course management software to social network sites used for educational purposes and different applications to collect, analyze, and present research data (Gilardi & Guglielmetti, 2011). When looking to the educational process today, one can notice that several activities are conducted online and require basic or advanced computer skills: from posting grades and feedback for students' assignments, to testing, online courses and seminars, looking for university scholarships and career advice, everything is using more and more computer applications and starts from the assumption that students often enroll in university with the proper skills to handle the online world effectively.

At the same time, the expansion of information and communication technology (ICT) in schools is expected to facilitate the learning process and to create a bridge between students' needs and expectations and labor market demands (Hsu, 2011). It has been argued for more that 10 years now (Bartholomew, 2004; Johnson, Bartholomew & Miller, 2006; Velasco, 2012) that employers mentioned technology skills as important in the hiring decisions. Consequently, educational institutions, including universities have introduced several courses to increase students' computer skills. In addition, teachers are supposed to encourage students to develop their technological skills and there is a continuous pressure on teachers to introduce new technologies in their courses, seminars and their evaluation criteria (Hsu, 2011). However, few research studies that we know about focused on students' perceptions regarding their computer skills and their expectations on teachers' ICT use in class. *In the current study we investigate students' level of satisfaction with their computer skills, the actual use of ICT in learning activities, and expectations regarding teachers' ICT use in class and also students' estimations about how important technological skills are for the employers in the hiring process. In addition, we consider group differences between traditional and non-traditional students.*

Traditional and non-traditional students

For the past 20 years, university students in Europe showed an increased internal diversity (Moissidis *et al.*, 2011). Especially after institutional reform of the Bologna Declaration (1999), large number of non-traditional students entered in universities. The non-traditional students are usually defined (see art new) as opposed to traditional ones (19 years of age, newly graduated from high school,

no previous work experience, coming from families with medium socio-economic background). Usually the distinction between traditional and non-traditional students is base on age (non-traditional students are often older 25 years of age); ethnicity and socio-economic background (non-traditional students are coming from ethnic minorities, from social and economic disparities regions or low socio-economic background) and on the level of dependability (non-traditional students are financialy independent and already experienced on the labor market, but also taking care of dependant others – as children, parents or siblings) – an aspect that is normally associated with higher social and family responsibility and also higher risks of dropping out, comparing to traditional students (Bowl, 2001; Kim, 2007; Gordon, Ludlum & Hoey, 2008). Numerous studies stressed on the importance of analyzing the two groups in terms of academic performance and risks of dropping out from university (see Forbus, Newbold & Mehta, 2011). To explain the differences in the academic performance and chances of graduation between the two groups, institutional contexts (as the lack of universities' concern about their particular needs) and also individual factors (as different expectations and involvement in the academic life) are considered (Forbus, Newbold & Mehta, 2011; Yorke & Longden, 2004). Thus, non-traditional students could have lower chances to graduate than traditional ones due to the fact that universities have most of the courses during daytime and non-traditional students have to work to support their families or take care of dependent others. In addition, non-traditional students can have lower chances to graduate compare to traditional ones in universities where the number of online courses that allow non synchronous interactions is scarce and their level of integration in the programs offered by university is low. Most of the studies that stressed on the role of the institutional factors in predicting non-traditional students success in graduating from university or their academic performance are focused on the way university can help them maintain the balance between school, work and family and assist them for a better time management (see Roberts, 2011; Wardley, Bélanger & Leonard, 2013). As individual factors, current research studies emphasise the role of non-traditional students' expectations regarding academic life, their lower interest in social and leisure activities connected to university, their ability to maintain a proper time management and their ability to cope with the stress associated to exams and tests in general (Johnson & Nussbaum, 2012; Richardson, Abraham & Bond, 2012). Some studies (Pierceall & Keim, 2007; Zajacova, Lynch & Espenshade, 2005) proved that non-traditional students experienced higher level of stress in the exam period and also in extracurricular activities than traditional ones. Although such studies implicitly argued that the high level of stress is linked with the pressure to balance family and work with the school demands, other factors could be also important stressors. For example, non-traditional students might encounter more difficulties to integrate the new

technologies in learning activities and school assignments, they could evaluate differently their computer skills compared to traditional students and they could have also different expectation about teachers' use of new technologies in class. In addition, their previous or current work experience can offer them a different perspective on the way employers evaluate technology use in the hiring process.

In the current work, we select a public university in Romania that offers daytime and evening courses and a large number of online courses and seminars for potential non-traditional students. We compare traditional and non-traditional students' expectations regarding the use ICT in classes by students and teachers and also their perceptions on employers' demands on ICT use in communication and public relations domain.

Students' and teachers' computer usage for learning purposes

Surveys conducted on students enrolled in different universities around the world (see Margaryan, Littlejohn & Vojt, 2011 for a review) show that the concepts "digital natives" might be just a myth in the educational settings. Students use a limited range of ICTs both for learning and socialization. Media sharing tools and social networking websites are often used to interact with peers, whereas in the learning process and knowledge creation, they make use of Google, Wikipedia and mobile phones. Furthermore, teachers' educational practices, and teachers approaches in using ICT in class proved to be an important factor that shaped students' computer based behavior in learning. For example, Conole *et al*. (2008) found that although students use, outside the class, a variety of tools to meet their individuals needs, their behavior changes in class, in conformity with the peda-gogical requirements. Often, they feel frustrated about the misuse of ICT in the educational settings. Other studies (e.g. Bullen, Morgan, Belfer & Qayyum, 2009) reveal that even students are aware of the functional value of new technologies; they use a relatively limited range of applications to fulfill class requirements. Studies conducted on large scale samples (Kennedy *et al*. 2008; Kvavik & Caruso, 2009) show that students rather pose basic skills to use ICT for different profes-sional and social purposes, they not use technologies in class as often as one might expect, and moving from basic to more advanced computer skills, students' proved lower competence and less frequency in use. They were very familiar with using You Tube, Wikipedia and Google to search for information and less familiar with using online academic tools, as journals' sites, academic data bases and so on. Researchers (see Margaryan, Littlejohn & Vojt, 2011) suggest that one explanatory factor of these findings is students' expectation regarding the learning process in university and how teachers' approach the learning tasks.

We investigate what is the frequency of students' ICT use for learning process, at a public university in Romania (RQ1) and what is the interaction between students' ICT adoption

and expectations regarding their own teachers (RQ2).We provide also comparisons between traditional and no-traditional students.

Students' expectations on employers' ICT demands

Numerous studies indicate that nowadays employers are searching more for computer skills in the recruitment process (see Fernandez & Friedrich, 2011; Velasco, 2012). Some studies (e.g. Hagan, 2004) seem to indicate a gap between graduates ICT skills and labor market demands. A large scale survey in Australia using a sample on employers (Hagan, 2004) showed that graduates tend to be seen as generally deficient, also in the ICT area. In this particular study creativity, flair and enthusiasm and also the capacity for independent and critical thinking were the qualities that employers' valued the most to the new university graduates. In addition, when using a qualitative approach the same study revealed that employers were looking to students' academic achievement as an indicator for their motivation and ability to solve problems. Employers tended to evaluate better graduates that had more computer based skilled (also more ICT courses in the curriculum) regardless of their grades. Those students were rated by the employers as: better in time management skills and in understanding of business practice. However, students with high computer based skills were also evaluated as less competent in oral and written communication, communication skills and leadership, initiative and personal presentation.

Because our survey was conducted at a College of Communication and Public Relations, we believe that students are aware of the fact that employers expect from them good written and oral communication skills, also personal presentation skills. Still we lack information regarding students' evaluations of employers ICT demands in this domain of activity. *We investigate what ICT applications students from the communication and public relations field perceive to be valued by the labor market and what are the computer based skills an employer is looking for when selecting a graduate student from this academic field (RQ3).*

Method

Sample

A paper-based student survey was conducted on a convenience sample of graduate and undergraduate students (N = 553). The majority of the respondents were women (86%), from the undergraduate level (66%) major in communication and public relations (48%), and in advertising (18%). The sample comprises students from day courses (89%) and students attending evening courses (11%). Students attending evening courses are all enrolled in master programs at the College of Communication and Public Relations, SNSPA, Bucharest. In the further analysis

we will label the students from the day courses "traditional students" and students from the evening courses "non-traditional students".

Measures

Academic performance was measured by asking students about their average grade at the end of the first semester. The scale measuring this variable has 12 equal intervals, two intervals for every point from 4 to 10.

Students' ITC use was measured by asking them to rate on a Likert 5 point scale (from "1" – "never" to "5" – "always") how often they use for class requirements several applications for searching academic information (as Google and Google Scholar), online data bases of journals and academic references (as Sage, EBSCO, JSTOR), online forums and Facebook, different applications to collect reserch data (as online surveys), applications to organise biblographic references, apllications for data analysis (as SPSS) and also tools for presentations (as Power Point and Prezi).

Students evaluations of their teachers' ICT use. Similar items were constructed to measure students' evaluation of their teachers' virtual applications in class and students had to rate first the frequency of ICT use in class by their "favorite teacher" and then by their teachers in general.

Students' expectations on employers' ICT demands. Students were asked to rate on a Likert 5 point scale (from "1" – "not at all important" to "5" – "very important") the importance they estimate employers attributes to different ICT skills, when they graduate in the communication and public relations field.

Context

The undergraduate students from the sample attend, during university years, several ICT courses: Windows and Word courses, in the first semester, Corel and Website Design courses, in second semester, and Excel, PowerPoint, and Publishing courses in the third semester. The graduate students attend, in the second semester, a research methods course where they are introducing in using SPSS to analyse data. In addition, the non-traditional students have online seminars, and acquire computer skills associated with e-learning process (download online materials, upload homework and online projects, working in virtual teams, use online synchronous platforms to communicate with teachers and colleagues, accessing online data bases for the evaluation process and so on).

Results

Students' satisfaction with their computer knowledge

The overall students are rather not satisfied with the level of computer knowledge acquired at the university (Table 1). The level of satisfaction with their computer knowledge is higher at the undergraduate students compared with the graduate

students (t=3.20, p<.01). The fact that undergraduate students compared to graduate students attend more computer-knowledge courses is probably an explanation for our findings. There is no significant difference between traditional students and non-traditional students regarding the level of satisfaction with the computer knowledge acquired at the university (t=1.21, p=.23). Therefore the satisfaction is not determined by the fact that students attend day or evening courses, but by the fact that they attend computer-knowledge courses. Consequently the college have to consider the possibility to offer more courses in order to increase the students' computer knowledge.

Table 1. How satisfied are you with the computer-knowledge acquired at the university (SNSPA)? (%)

	Overall	Undergraduate	Graduate	Traditional	Non-traditional
Not at all satisfied	28.4	22.4	40.7	27.0	42.0
Not satisfied	33.1	35.2	28.8	34.4	20.0
Somehow satisfied	25.1	28.8	17.5	24.6	30.0
Satisfied	11.2	11.1	11.3	11.7	6.0
Very satisfied	2.2	2.5	1.7	2.3	2.0

The level of satisfaction with the computer knowledge negatively correlates with students' academic performance (rho= -.11, p<0.05), and positively correlates with their courses' attendance (rho=.09, p<0.05) and seminars' attendance (rho=.13, p<0.05). These correlations can be explained by the fact students having higher grades had also significantly higher expectations. An important factor that we can also take into account is student's experience on the labour market. In our sample, 37% of the students were employed at the time we conducted the research and 30% of them were involved in different voluntary activities. However, we found no relationship between student's satisfaction with computer knowledge acquired at the university and their work experience (t=-1.08, p=.28) or students voluntary work experience (t=-1.14, p=.25). Therefore, students' practical experiences, on the labour market and on voluntary work, do not influence their satisfaction regarding computer knowledge obtained at the university.

Students' opinions about employers' expectations

The most important goal of the higher education is to offer students information and skills in order to get jobs in the knowledge based economy, where ICT are critical to improve the competitiveness of the employers. In this context, it is important to know students' opinions about employers' computer skills demands.

The majority of the respondents considered that employers expect them to know especially how to use Microsoft Office for Windows (Word, Excel, and Power Point) and other software linked to publishing and text-editing: Adobe Photoshop, Corel Draw, also software related to research data – as SPSS (Table 2). One can argue that

the higher student's perception that an employer has computer skills demands, the lower the level of student's satisfaction with the computer knowledge acquired at the university. Still, our data did not support this hypothesis. Moreover, there is a small positive correlation between students' satisfaction with the computer knowledge acquired at the university and their perceptions regarding the level of employers' demands regarding maintaining online forums (rho=.12, $p<.05$). Generally speaking, students' expectations on computer-based knowledge at the university are not related with their estimation about labour market demands.

Table 2. How important do you think it is, for an employer, to hire a person who knows [...]? (%)

	Elaborate an attractive and well formatted text	Use Excel	Use Prezi or Power Point	Use software like Adobe Photoshop, Corel Draw, SPSS	How to create and maintain on line forums
Not at all important	.2	.4	.2	1.3	1.7
Not important	1.3	5.0	1.5	6.3	7.0
Somehow important	7.2	15.7	8.0	27.1	19.4
Important	25.4	36.5	28.4	36.2	38.9
Very important	65.9	42.4	62.0	29.1	33.0

When we compare students having work experience with those without work experience, we found some differences that need further exploration. Those who already had a job, at the time we conducted the survey, considered that employers demands are to know to use Excel (χ^2=9.57, $df = 4$, $p<.05$) to a higher extent than those who did not have a job. Furthermore, students who had a job perceived to a smaller extend the fact that employers demand high skills in using Adobe Photoshop, Corel Draw or SPSS (χ^2=16.88, $df = 4$, $p<.01$). Therefore students' work experience helped them to understand that that some computer skills acquired at the university are more valuable than others, on the labour market.

Students' computer usage

In the era of the internet, social networking websites, and the internet groups, students are expected to use ICT to prepare for courses and seminars. Moreover, non-traditional students, as we have defined here, are supposed to use online tools to interact with teachers and colleagues, so they would need higher computer-based skills, to meet courses and seminars requirements, compare to traditional ones.

Google search and Power Point presentations are the applications often used by the majority of the students to prepare homework (Table 3). As we expected, students with higher grades search more for scientific articles on online data bases (rho=.20, $p< .01$) and for articles on Google Scholar (rho=.10, $p< .05$), and they also use more often Prezi for oral presentations (rho=.16, $p< .01$).

Table 3. How often did you use [...] for courses and seminars assignments? (%)

	Never	One time	Two-three times	More times	Every time
Search for scientific journal online data base	30.7	15.6	24.0	23.6	6.1
Search on Google scholar	36.5	12.8	22.4	21.4	7.0
Search on Google	.6	.6	4.1	27.9	66.9
Facebook	45.2	12.0	12.9	17.2	12.7
Online forums / groups	36.7	14.8	17.4	22.0	9.1
Excel	21.5	13.5	27.0	28.5	9.6
Software to analyze research findings	42.5	18.1	20.1	15.9	3.4
Bibliography software	48.5	13.7	14.3	14.1	9.4
Online survey	53.9	17.1	13.0	12.5	3.5
Power Point	3.3	5.0	8.7	52.7	30.2
Prezi	50.0	16.2	12.1	15.4	6.3

There were differences between traditional students and non-traditional students in terms of computer usage for homework (Table 4). We have already underlined the fact that non-traditional students have more school requirements to go online and interact with teachers and colleagues. Still, our findings show that traditional students use, in general, computer and the internet to a higher extent to prepare for courses and seminars, compared with non-traditional students. Only in the case of the Excel usage, non-traditional students were more skilled compared to traditional students. This particular result can be explained by the fact that a significant part of the non-traditional students in our sample came from a master program where there was a course in the syllabus about how to use Excel at proficiency level.

Table 4. Relationship between computer usage for class preparation and group of students – traditional / untraditional students (χ^2)

	χ^2	df	Type of relationship
Search for scientific journal online data base	20.95**	4	+
Search on Google scholar	30.21**	4	+
Search on Google	9.15	4	ns
Facebook	19.70**	4	+
Online forums / groups	16.63**	4	+
Excel	9.87*	4	-
Software to analyze research findings	9.31	4	ns
Computer applications to organize references	11.92*	4	+
Online survey	2.84	4	
Power Point	11.19*	4	+
Prezi	20.03**	4	+

Note.
    * Correlation is significant at .05
    ** Correlation is significant at .01
    In the third column, "type of relationship"; "+" suggests that traditional students, compared to non-traditional ones, use computer tools to a higher extent to prepare for classes.

    "ns" = "not significant".

Differences between traditional and non-traditional students in computer usage to prepare for classes could be explained by the fact that the first group has higher grades (t= 5.66, p<.01). One can argue that having higher grades is associated with higher motivation to learn in general, and it will result in high computer skills, but also the opposite relationship could be valid: students' with high computer skills will get higher grades because teachers also value the use of new technologies in students' assignments.

Teachers' computer usage

An important aim of our study was to reveal students' expectations regarding teachers' computer use, teachers' ICT use in classes and outside the class to communicate with students (i.e. Facebook and Yahoo groups use to communicate). Therefore we compare students' evaluation of ICT use of their favourite teacher with students' evaluation of ICT use by teachers in general. We obtain significant differences in the level of Power Point use in classes, with "favourite teacher" using more this application in presentations than teachers in general (Table 5). Also, "favourite teacher" provides more often: electronic books, chapters, articles or links to scientific journals to students. Smaller differences between "favorite teacher" and "teachers in general" were found for using Prezi in classes and interacting with students using Yahoo/Google groups and Facebook. Probably students evaluated as "less important" for a teacher to use Prezi during lectures because also a smaller percentage of them actually uses this application. Prezi was the least known application by the students from our sample.

If we take into consideration student's average grade, there are significant differences between academic performance of students who value the use of Power Point by their favorite teachers and those who do not (t=2.26, p<.05). Similar pattern we found for favorite teacher using Prezi in class (t=2.42, p<.05) and interacting with students on online forums (t=3.19, p<.01). The results show that students with higher grades consider less important for their favorite teacher to use Power Point and Prezi in presentations or to communicate with them using online forums. In sum, for students with higher academic grades, teachers' ICT adoption in class is, to a lower extent, a criteria for considering them as favorite.

In general, there are significant differences between "favorite teacher" and "teachers in general" regarding computer usage in teaching and interacting with students (Table 3, third column). There are significant differences between "favorite teacher' evaluations and "teachers in general" in using Power Point and no significant differences for interaction with students using online groups. For example, students consider that their favourite teacher uses Power Point presentation "many times" (34.8%) and "every time" (50.3%) from the total (85.1%), whereas teachers in general use Power Point for teaching "many times" (56%) and "every time" (28%) from the

Table 5. How often your favourite teacher / teachers in general [...]?

	Favorite teacher (%)	Teachers in general (%)	Difference between favorite teacher and teachers in general t value
Provides journal articles or links to web sites of scientific journals	66.8	59.7	3.52**
Provides electronic books or chapters	81.1	73.9	3.57**
Uses Power Point presentation in class	85.1	84.0	3.16**
Uses Prezi presentation in class	12.7	10.6	-1.62
Handles their presentations to students	75.3	67.2	4.6**
Interacts with students using online forum	60.6	52.4	4.3**
Interacts with students using Facebook	41.2	25.6	3.93**
Interacts with students on Yahoo / Google groups	28.8	20.6	1.74
Use movies or pictures in their lectures	60.7	56.4	3.37**

Note.
    The first two columns contain cumulative percentage for "many times" and "every time".
    The third column presents difference between students' opinions regarding how often their favorite teacher uses ICT in class and how often teachers in general use ICT in class.
    ** Correlation is significant at .01.

total (84%). We can conclude by saying that students would like teachers to use more Power Point presentations in classes than they actually do. Students expect also more use of electronic publications, movies and pictures at courses or seminars, and also more intense communication with their teachers on online forums and Facebook.

Conclusion

Students' level of satisfaction with computer knowledge acquired in college tends to be rather low and it positively correlates with the number of the courses they attended at the university and negatively with their level of expectation. Students' expectations regarding labour market demands did not influence their level of satisfaction with computer knowledge.

Students having work experience considered that employers value more the use of Excel than their peers with no work experience. Also, the first group uses more often editing software as Adobe Photoshop and Corel Draw, and, to a smaller extent, SPSS to analyze data, compare to the second group. Therefore, work experience influences the way students' evaluate labor market demands regarding computer-based knowledge.

In what regards students' computer usage, Google search and Power Point presentations are often used by the majority of the students in class. Students with lower grades and non-traditional ones use ICT for academic purposes to lower extent. Furthermore, students expect from teachers to use and handle Power Point presentations, to provide electronic books, chapters, articles or links scientific journals. Generally speaking, there are significant differences between students' expecta-

tions and teachers' behavior regarding the use information and communication technologies in class.

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