

SMARTPHONES INFLUENCE ON STUDENTS: CASE STUDY ON ROMANIA

Marian Mocan
Politehnica University of Timisoara, Romania
marianmocan@upt.ro

Larisa Ivascu
Politehnica University of Timisoara, Romania
larisa.ivascu@upt.ro

Attila Turi
Politehnica University of Timisoara, Romania
attila.turi@upt.ro

Cristina Feniser
Technical University of Cluj-Napoca, Romania
cristina.feniser@utcluj.ro

Abstract:

The purpose of this paper is to evaluate whether social needs, convenience and various influences of mobile phones affect students and develop addiction. This research highlights the key factors that determine students' addiction and the perception of students on these technological opportunities. The results contribute to the improvement of teaching and learning methods. The study was conducted using questionnaire survey. This questionnaire was applied to students of the Polytechnic University of Timisoara. At the end of the paper the future research and the barriers identified are presented.

Keywords: mobile technology, smart phones, social influence, student, technical higher education.

1. INTRODUCTION

Smartphones are mobile phones with advanced computing capacity, storage and connectivity, including various functions that meet user needs. These functions include portable media players, digital cameras, global positioning system (GPS) and various other applications that can be installed by the user. Operating Systems (OS) installed in smart phones mainly include Apple iOS, Google Android, Symbian Nokia and RIM BlackBerry OS. Smart phones have become necessary for consumers and contribute to attainment of the users' goals (Hossain, and Ahmed, 2016). Through the installation options of different applications, these smart phones have become tools that help daily activities (Peterson, and Low, 2011).

As shown in the study by Suki (2017) the students are among the buyers who help increase sales of smart phones. The factor that most influences the growing number of smart phone users is the opportunity to install various applications that help users in daily activities. The students use cell phones every day, with different applications installed that help in implementation of various projects, communication and professional development (Chen et al., 2011).

Thus this paper highlights the key factors that determine students' addiction and the perception of students on these technological opportunities. The work is divided into two parts. The first part shows the advantages and disadvantages of smart phones usage, and the second shows the results after applying a questionnaire to students from Polytechnic University of Timisoara on the extent of their smart phones usage.

2. USE OF SMARTPHONES IN TECHNICAL EDUCATION

The education system is developed concurrently with the advance of science and cannot be separated from the development of technology and communication. Smart mobile phones began to be used extensively by students in higher education affecting positively and negatively their development. In many cases, especially in the classroom, the students are concerned about social networks and reading eBooks (Peterson, and Low, 2011). Furthermore these devices are also a motivator for the development of student activities (planning, communication, sharing, image and others) and to access opportunities offered by companies (Ivascu, and Cioca, 2014).

2.1. The implications of smart phones in academia

It was found that students have become extremely dependent on the smart phones that they can use during classes, seminar, breaks or leisure (Genoa, 2010; Draghici et al., 2016). These devices are used on various social networks, to check email, scientific calculators, but also for the different applications that are installed according to the needs of each discipline in the curriculum (Draghici, and Ivascu, 2016). Smart mobile phone users have a higher level of knowledge, have a more intense social participation, and maintain easily interpersonal ties and contacts with various people (Chen et al., 2011; Mocan et al., 2016). So these devices have become an integral part in the life of every student (Izvercian et al., 2013). Among the applications most used there are the social networks and those that contribute to photo processing.

Among the advantages (Calisir, 2013) (Suki, 2017) of smart phones there are also included:

- Very useful in emergency situations - if students need help on the street, at home or at school, can easily contact colleagues or friends
- Contribute to planning activities - can plan activities, monitor hours of rest and mental activity so that the learning result to be positive.
- Maintain personal connections - colleagues can be contacted easily and activities for the coming days can be planned.
- A good device for developing knowledge - a number of applications can be installed that help develop students' skills.
- Worldwide connectivity - students can be connected with other colleagues in another country or student associations.
- Monitoring of health - health monitoring is possible depending on a number of parameters, so students have a healthy lifestyle to help achieve their goals.

Evaluating existing research (Kaplan and Haenlein, 2010) (Suki, 2017) one can conclude that among the disadvantages of smart phones the following can be found:

- Decreasing interest in classes - students are concerned during classes of social networking or other applications. Thus the degree of understanding of the concepts discussed decreases.
- Installed games - often students are captured by a game that they use both during seminars and courses.
- Changing the behaviour of the student - a smart phone can change the behaviour of a student by the influence the installed applications and games have.
- Fatigue - following nights spent on social networks or different games, students may be tired the next day, and the ability to focus decreases.
- Disturbance of other colleagues - once a student is watching his mobile phone it can disturb other colleagues (either through online chatting or showing various details found on the Internet).
- Reducing the time spent with family - even during free weekend or vacation, students are concerned with the smart phone and spending time with family is minimized.
- Excessive use leads to addiction - often students use computers and various applications for writing so that they forget to calculate mentally or write using the writing tool.

Based on these advantages and disadvantages, the paper examines the influence of these smart phones on students from the technical university in Romania. The factors that contribute to students' addiction of these devices, the opportunities and barriers in use are presented.

2.2. Methodology

For this study, questionnaire survey was used. This questionnaire was applied to 500 university students of technical university education of the university from the fundamental domain Engineering and Management. The students follow the Faculty of Management in Production and Transportation from "Politehnica" University. The courses have a duration of four years. When applying these questionnaires the facilities of Google Form (Form Google Platform) were used and they address students in online.

2.3. Analysis of obtained data

The data collected from the 500 students was assessed as follows. The Respondents can be characterized by: young people between 18 - 22 years, with Romanian citizenship that are undergraduate students at the FMPT. The Faculty of Management in Production and Transportation is one of 10 faculties of the Polytechnic University of Timisoara, the Fundamental domain is Engineering Sciences, and the Graduation domain is Engineering and Management, with the following Science Branches: Mechanical Engineering, Mechatronics, Industrial Engineering, and Management.

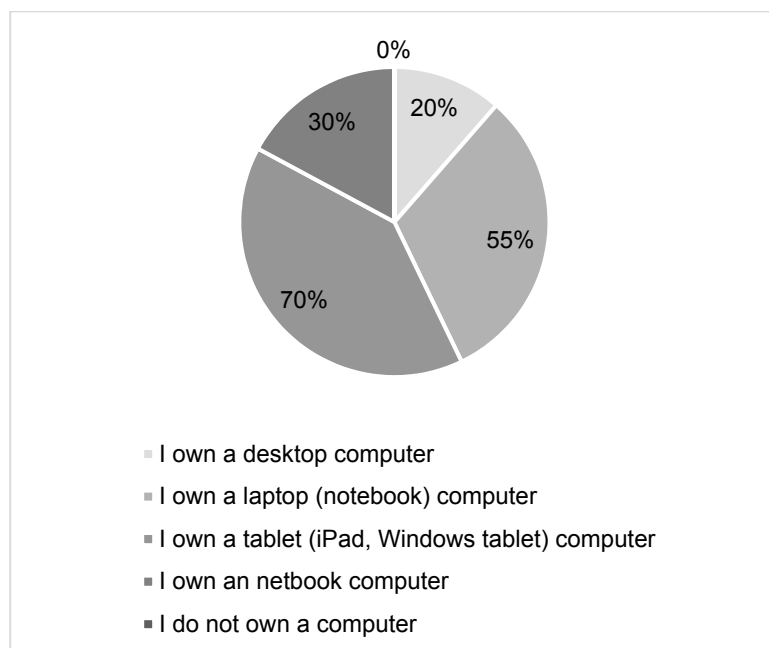
The applied questionnaire includes evaluation to two main areas of research:

1. Use of information technology in learning
2. Smart phones influence on students.

The first category includes general questions about the devices used by students during study programs. It can be seen that students have also other tools to accomplish projects and requirements for the school year. The second part of the questionnaire includes questions about frequency of use of smart phones and the factors that contribute to dependent use.

Analysing the computer type held by the students it can be observed that 70% have tablet, 55% laptop, and only 20% still own a desktop computer (see Picture 1). Netbook category recorded a rate of 30%, lower than the tablets as a result of higher prices. This question allows multiple responses because it was find that students have at least one computer for their work. Analysing the types of activities performed on these computers it is observed that 39% of students use computers for gaming, mainly, 56% use it for projects and other topics of larger dimensions and 5% use it to connect to social networks. The percentage of social network connection is down due to technological advances that led to the smart phones. These connect easily to the Internet and the ability to surf the social networks is easy.

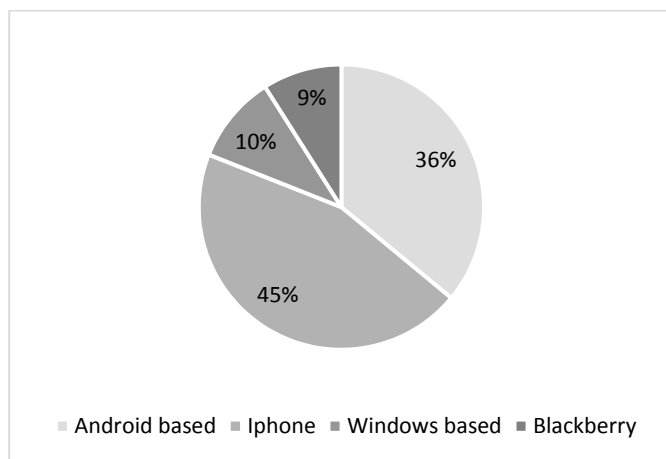
Picture 1: Type of computer held



Evaluating the time period since the students own these computers, it has been found that most, 73% of them own the respective computer at least for three years. So annual investments are not made in such computers. Students use own and faculty computers so that projects are realized at applied seminars and the need of buying a computer is minimal.

In the second part of the questionnaire, the impact of smart phones on students is assessed. It was find that most are owning such devices and use them every day. Among the survey respondents it is observed that 96% have smart phones. It was noted the increased interest of students for these types of mobile phones. From the perspective of the type of phone used it can be seen that 45% own iPhone and 36% own Android-based phones (see Picture 2). Blackberry phones are declining in student preferences. The same trajectory is also registered by phones using Windows operating system.

Picture 2: Type of smart phone held



The respondents appreciate that they use a smart phones for maximum 2 years (69% of respondents). The students change their phone when another version is released or receive gift from parents. Another important factor in purchasing mobile phones is the colleagues and friends group. In groups of students it is observed a homogeneity of brand use and increased interest in discovering new models.

All respondents to this questionnaire are using smart phones for different activities (see Table 1). Smart phones are used to check emails by 85% of respondents. Of those surveyed 95% are chatting with friends, 85% add comments to photos of friends and all respondents use smart phones to take pictures. The high quality of pictures taken lead the students to intensify the use of this facility and the use software to edit them. Editing photos is performed at a rate of 100%, and 75% of students use different functions such animations using appropriate applications. Opportunities offered by various web sites lead to easy shopping so that 43% of respondents made their purchases online. Fashion items, various gifts and IT are mainly bought.

Also, another attraction for young people is the function of listening to music and share it with friends. These smart phones replace devices intended to music listening, being a way to relax students. Of the respondents, 81% listen to music to relax.

Evaluating learning activities that can be done with these smart phones it is seen that students are not concerned with such activities on smart phones. 38.5% of respondents use their phones to read the courses and seminar papers / projects. This percentage is recorded due to the small size of screens which does not facilitates the completion of long texts. Instead, it is recorded that 69% of respondents use the facility to audio record various school activities.

Faculty web site is accessed by 76% of students, an increasing percentage compared to the previous year. This percentage remains low due to the use of Yahoo groups created on which the students receive all updates and notices from the faculty secretary. Moreover, it is found that emails from inbox groups are taken by the year coordinators and posted on social networks. This conclusion is supported by the responses for the question "When did you last accessed the personal email?" And "Where do you find faculty related necessary information?" It is found that about 30% of respondents have not read their e-mail for at least two months and the information related to the program of study can be found on social networks.

Table 1: Students' activity using smart phones

Type of answers	Percent
E- Mail	85
Chat with friends	95
Add comments, upload pictures in social media (Instagram, Facebook, Twitter, et al.)	85
Listen to music	81
Manage the schedule	75
Make shopping	43
Take pictures	100
Edit pictures / Edit movies	100
Create and edit texts	69
Synchronize with your home computer	79
Create animations	75
Take notes in class	21
Record lectures (audio)	69
Read class related PDF, Word or other documents	38.5
View www.mpt.upt.ro (our web-site)	76
View other web-pages	75.4

Many facilities offered by smart phones contribute to the satisfaction of the desires of students. From the respondents of this research, 58% have at least four applications used at the laboratory and seminar and 35% have at least one application. Thus using applications is an opportunity for students using scientific calculators on the phone, measurement and conversion applications and other facilities which contribute to rapid resolving the activities received during application lessons.

Evaluating the time period during which the students use smartphones, it is seen that all of them are using the phones in campus or at home to communicate and transmit their information. Of these, 85% use the phone in laboratory classes / courses and 65% in the library. When they are on their way to university, 75% of students access educational materials on the phone.

Table 2: Usual use of the smartphone for learning activities

Type of data	Percent
At the library	65
In the lecture theatre	80
During laboratory/courses	85
Elsewhere on campus	100
On the go (on the bus)	75
At home	100

Of the 500 respondents, 85% use their phones for social networks and the chat during course hours. The habit of students to surf the social networks during hours of course should be eliminated. Most students use chat to communicate with each other during course classes so they create discussion groups, and attention is diminished considerably.

Instead, students working in private or public companies do not use the mobile phone during the hours spent at work due to existing penalties if they are detected as not focusing on the work tasks.

In conclusion, the students estimated that smartphones:

- Improve access to courses and learning material
- Help to learn more independently and efficiently
- Help solve applications at laboratories
- Increase the communication between the students of a faculty
- Facilitate a number of school opportunities
- Drive students to attend courses
- Social networks are an environment in which students can highlight certain qualities / successes.

Following the research carried out it can be concluded that the key addictive factors are:

- Easy navigation on the Internet

- Communication with groups of colleagues
- Knowledge share with working team members
- Access to development opportunities with ease.

2.4. Accessing the institutional web site

Using statistical data related to the institutional web site it can be seen that Windows is the most used to access it. There are also 1572 hits from Linux and the next position has the iOS situated which is available on the iPhone smartphones. Hence it can be concluded, by correlation with to the answers given by respondents that the desktop systems are mostly used because of the larger size of the screen. Tuesday, Wednesday and Thursday are the days when the number of hits increases considerably.

Picture 3: Accessing the faculty web site – Operating Systems

Operating Systems (Top 10) - Full list/Versions - Unknown				
Operating Systems				
	Pages	Percent	Hits	Percent
Windows	5,627	62.3 %	29,765	58.3 %
Linux	1,572	17.4 %	13,843	27.1 %
Unknown	653	7.2 %	1,428	2.7 %
iOS	534	5.9 %	4,552	8.9 %
Macintosh	443	4.9 %	1,154	2.2 %
Java	163	1.8 %	307	0.6 %
Unknown Unix system	0	0 %	1	0 %

In terms of browsers we see that most site visits are done on Google Chrome and on the next position lies Internet Explorer. Safari and Opera are ranked 3 and 4, recording 15% of total visits from Google Chrome. This is synchronized with the operating system used as most use Windows. On desktops, most students use Google Chrome.

Picture 4: Accessing the faculty web site – Browsers

Browsers (Top 10) - Full list/Versions - Unknown					
Browsers					
	Grabber	Pages	Percent	Hits	Percent
Google Chrome	No	4,476	49.7 %	33,514	65.6 %
MS Internet Explorer	No	1,952	21.7 %	3,668	7.1 %
Firefox	No	953	10.5 %	5,158	10 %
Unknown	?	802	8.9 %	1,512	2.9 %
Safari	No	586	6.5 %	4,701	9.2 %
Opera	No	140	1.5 %	1,071	2 %
Android browser (PDA/Phone browser)	No	29	0.3 %	770	1.5 %
iPhone (PDA/Phone browser)	No	27	0.3 %	334	0.6 %
Mozilla	No	12	0.1 %	202	0.3 %

It is noted that students are concerned about technology and there is always a desire to acquire new devices to facilitate their daily work. Functions used by students on these smartphones are: telephone, social networks and communication with groups of friends and acquaintances.

3. IMPROVING THE CURRENT SITUATION - TRENDS AND PROPOSALS

Due to technological advances, students use all the opportunities provided for the activity of learning. Students' concentration and attention for courses are disturbed by activities carried out on smartphones. Therefore, a number of measures may be applied to improve the current situation. These are:

- Restricting access to social networks during hours of courses and seminars
- The active involvement of students in the classroom
- Teamwork during seminar / project classes
- Improving the attractiveness of learning materials
- Monitoring access to online documentation sources.

Implementation of these measures contribute to rising the interest of students for learning and training to higher levels. These improvements contribute to increasing the quality of human resources for national and international companies. Thus the companies become competitive and excel in their activity domains (Ghicajanu et al., 2014).

4. CONCLUSIONS AND FUTURE RESEARCH

This study evaluated the students' dependence on smart phones and its impact on their behaviour in teaching and learning process. Technological advances contribute to professional development, but intensity of use must be balanced. Students are concerned with various developing technologies. It can be concluded that social needs have the greatest effect on students' dependence on smart phones. There is a relationship that develops between students' behaviour and technological progress.

Universities should encourage the use of smart phones, tablets and notebooks for teaching and learning, but it has to discourage the use of smartphones during classes on social networking and other web sites.

REFERENCE LIST

1. Calisir, F., Atahan, L., & Saracoglu, M. (2013). Factors Affecting Social Network Sites Usage on Smartphones of Students in Turke, *Proceedings of the World Congress on Engineering and Computer Science*, vol. II.
2. Chen, K., Chen, V., & Yen, D.C. (2011). Dimensions of self-efficacy in the study of smart phone acceptance, *Computer Standards & Interfaces*, 33, 422-431.
3. Draghici, A., & Ivascu, L. (2016). Students Perception on Higher Education Opportunities, *Proceedings of The 13th International Conference Efficiency and Responsibility in Education*, 80-86.
4. Draghici, A., Baban, C.F., Draghici, G., Ivascu, L.V. (2016). The Development of an Evaluation Model for Universities and Industry Collaboration in Open Innovation, *MakeLearn & TIIM Joint International Confernece 2016: Managing Innovation and Diversity in Knowledge Society through Turbulent Time*, ISBN 978-961-6914-16-1, 445-451.
5. Genova, G.L. (2010). The anywhere office – anywhere liability. *Business Communication Quarterly*, 73(1), 119-126.
6. Ghicajanu, M., Irimie, S., Marica, L., Munteanu, R. (2014). Criteria for Excellence in Business. 2nd Global Conference on Business, Economics, Management and Tourism, 23, 445-452.
7. Hossain, M.E., & Ahmed, S.M.Z. (2016). Academic use of smartphones by university students: a developing country perspective, *Information Science & Library Science*, 34(4), 651-665.
8. Ivascu, L., & Cioca, L.I. (2014). Opportunity Risk: Integrated Approach to Risk Management for Creating Enterprise Opportunities, *2nd International Conference on Psychology, Management and Social Science*, 49, 77-80.
9. Izvercian, M., Radu, A., Ivascu, (2013). The Impact of Human Resources and Total Quality Management on the Enterprise, 12th International Symposium in Management, Universitatea Politehnica din Timișoara, *Procedia - Social and Behavioral Sciences*, 124, 27-33.
10. Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68.
11. Mocan, M., Turi, A., Ivascu, L., Artene, A., Feniser, C. (2016). Analyzing and Improving Teaching Methods in Higher Education: Case Study on Romania, *MakeLearn & TIIM Joint International Confernece 2016: Managing Innovation and Diversity in Knowledge Society through Turbulent Time*, ISBN 978-961-6914-16-1, 611-618.
12. Peterson, L., & Low, B. (2011). Student attitudes towards mobile library services for Smartphone. *Journal of Library Hi Tech*, 29(3), 412-23.
13. Suki, N.M. (2017). Students' dependence on smart phones: The influence of social needs, social influences and convenience. *International Journal of Information and Learning Technology*, 30(3), 124-134, doi: 10.1108/10650741311306309.
14. Google form Platform, <https://www.google.com/forms/about/>
15. Politehnica University of Timisoara, www.upt.ro