Ubiquitous Laptop Use Patterns Exhibited by Higher Education Students

María-Carmen Ricoy[1] and Tiberio Feliz[2]
[1]Faculty of Education Sciences, University of Vigo
[2]Faculty of Education, National University of Distance Education

Abstract

The aim of this study is to identify laptop use patterns among Spanish university students. The present work, resulting from the qualitative component, focuses on a study conducted among students using a questionnaire with semi-structured questions. A total of 433 students from two universities took part in the study. Their ages ranged between 18 and 48 (mean 22.2). The information thus obtained was subjected to content analysis, from which it can be inferred that mobility confers laptops a number of possibilities giving rise to the participants' use patterns. These are derived from the benefits of laptop use, which is not, however, devoid of problems. The results and conclusions show that the participants regularly make ubiquitous use of laptops. Their practices may be classified into a number of categories according to the academic, personal or social context involved and are associated with the numerous stated benefits, together with certain obstacles.

Key words: *competences; information and communication technologies; portable computer; ubiquitous learning; university students.*

Introduction

The possibilities of digital mobile devices as educational tools for learning in ubiquitous environments have yet to be extensively studied, both in Spain (Muñoz, González, & Hernández, 2013) and in other countries (Hyeongjik, Won, & Soo, 2013). The term ubiquitous, derived from the Latin "ubīque", literally means "everywhere", i.e., present in different places and contexts at the same time. It is used to describe the acquisition of knowledge through digital mobile Internet connection technology.

According to Traxler (2007), ubiquitous learning is characterised by being personal, private, opportunistic, informal and context-sensitive. Other authors (Tapia, López, Galán, & Rubio, 2008) also associate this type of learning with mobility and personalisation. This allows individuals to take responsibility for their own work pace and generate their own drive to learn.

As pointed out by Terras and Ramsay (2012), technology provides the possibility, at any time and place, of communicating, collaborating and exchanging content or supplying information, thereby supporting learning, either of a formal, academic nature or of a more informal sort. Ubiquitous laptop use patterns have also been classified along the lines of academic and non-academic issues, although scarce research has been conducted on this (Gaudreau, Miranda, & Gareau, 2014; Smith, & Caruso, 2010). Hence, it is deemed of interest to unravel the assemblage of applications, circumstances, etc. that come into play. Consequently, the central aim of the present study is to analyse the ubiquitous use of laptops by higher education students. It attempts to identify standard patterns, as well as the perceived pros and cons in terms of the constraints placed upon laptop use by university and labour market demands. Moreover, the study seeks to inquire into the competences required by laptop use, in light of certain research pointing out that, in general, European students do not possess efficient technical capabilities to adequately support and reinforce their learning, nor suitable generic capabilities to successfully undertake their future responsibilities in the labour market (Gvaramadze, 2012).

In Spain, institutions responsible for higher education face the challenge of achieving an optimal integration of Information and Communication Technologies (ICTs) into teaching. In fact, as in other countries, institutional calls have repeatedly been made for promoting the benefits of ICTs in formal education (Davis, Eickelmann, & Zaka, 2013). However, in order for learning in a ubiquitous environment to be effective, the use of mobile digital devices must be accompanied by suitable didactic methodologies to promote and reinforce the development of student competences. Certain studies show that students enhance their learning performance through the use of laptops (Saunders & Klemming, 2003), while others conclude that laptops do not bring about significant changes with respect to traditional education (Brallier, Palm, & Gilbert, 2007). Regardless of the relevance of the foregoing conclusions, we agree with Patten, Sánchez and Tangney (2006) that due attention should be given to the need for using new technological devices to be accompanied by changes in order to promote innovative activities with students. This would foreseeably optimise the integration of ICTs into the teaching and learning process, increasing the likelihood of academic success.

Widely available compact devices now allow us to access all kinds of information on the Web and carry out a number of different activities. According to Wang, Wiesemes and Gibbons (2012), ubiquitous learning is of interest for all students and is supported by mobile devices (laptops, 3G mobile phones, tablets, Sat Navs, etc.) with

Internet access, which are ever more widely used. These resources support new ways of learning, collaborating and communicating. Thus, we agree with Burbules (2012) that mobile resources and wireless networks provide the means to learn, and are thus becoming part of the academic and everyday activities of students and citizens.

The use of mobile resources with Internet access represents an excellent scenario for communication, interaction and the development of the learning and teaching process, as well as for preparing students for professional life. In this regard, we agree with Espasa and Meneses (2010) that, in Spain, the online feedback process is helping improve academic work carried out by university students. Moreover, based on a content analysis of employment vacancy advertisements requiring candidates to possess ICT competences, it is noted that 21st century workers are expected to possess a high level of digital skills (Gallivan, Truene, & Kvasny, 2004). Therefore, it is important to continue improving the design of educational sequences in accordance with the new training scenarios, in which good learning skills under mobility conditions must be implemented. This calls for the development and improvement of digital competences, something that remains a challenge within the Spanish educational context (Ricoy, Feliz, & Couto, 2013). Students are therefore required to combine and/or apply different skills, attitudes, values, concepts, etc. in a manner suited to different contexts.

The benefits of technology lie in the possibility of learning in, with and from the physical and digital environment. In this respect, the laptop represents a unique resource with tremendous possibilities, particularly if an Internet connection is available. It combines an entire set of tools available in many digital devices. In fact, the laptop matches the specifications for mobile devices for educational purposes stated by Naismith, Sharples, Vavoula and Lonsdale (2004): portability, compact size and light weight; facilities for interaction and individualisation, information exchange and collaboration; connectivity; etc.

Among mobile devices, the laptop, due to its unique and attractive features, is the preferred choice among university students (Kay & Lauricella, 2011). A study conducted by Smith and Caruso (2010) identified it as the most popular device for learning purposes among higher education students. Other research (Economides & Grousopoulou, 2009) points to a somewhat greater demand for this type of device with a 12-inch screen rather than a smaller-sized one, despite the reduced ease of mobility involved. In addition, students are more used to devices running on a Windows software platform for their learning activities. They also show a preference for the use of laptops over other portable digital devices, based on a number of considerations including affordability, software potentialities, greater screen size for suitably displaying the work, etc.

Kregor, Breslin and Fountain (2012) likewise detected a high penetration of laptops, widespread home broadband Internet access and the performance of online activities among higher education students. In light of its suitability for combined academic

and personal use, the laptop has become a standard piece of equipment among many students. Given the enormous potential afforded by mobile digital devices to carry out learning in ubiquity conditions, their use is also seen as a social imperative (Cope & Kalantzis, 2009). Digital competence is viewed as an ingredient to explore and internalise learning through the use of small devices, especially the laptop, equipped with wireless connectivity (Ramzan, Munir, Siddique, & Asif, 2012).

In terms of negative aspects, it should be noted that while brilliant students admitted that their learning is more constructivist, their results did not improve significantly, nor did they derive greater satisfaction from the use of such devices (Wurst, Smarkolab, & Gaffneya, 2008). Moreover, laptop multitasking in the classroom increases student distraction and can hinder understanding of the topics discussed by teachers in class (Sana et al., 2013). Also, laptop use in the classroom can reduce academic achievement standards and satisfaction levels, detract from the drive to learn and generate Internet addiction (Gaudreau et al., 2014). Therefore, it is important to take a balanced view of its integration into the education process, complementing it with other kinds of learning resources and dynamics.

With a view to analysing in greater depth the ubiquitous laptop use patterns exhibited by university students, the specific objectives of this study were to:

- Demarcate the contexts in which laptops are used.
- Determine the type of activities carried out by students with these devices.
- Delimit the competences applied.
- Discern the perceived benefits for educational purposes.
- Identify the obstacles encountered in relation to laptop use.

Methodology

The research carried out forms part of an ambitious project on digital mobile devices. Its broad aim is to investigate their ubiquitous use for learning purposes, and draw a map of digital competences. It seeks to provide education managers and planners with models for preparing designs suited to the requirements posed by the new scenarios. The project extended over the 2011-2014 period. Overall, it is based on a quantitative-qualitative approach involving the collection of data by means of an open-ended questionnaire, a closed-item one, discussion groups, and the Delphi technique.

The present work is restricted to a part of the project, undertaken with a qualitative approach, focusing on the laptop. It involves the collection of data using an open-ended question questionnaire. This type of data allows us to explore the reality of the object of study within its specific singularity and complexity, with a view to identifying use trends or patterns based on the subjects' perceptions (Hargreaves, 1994).

Instrument

The open-ended questionnaire used for data collection was prepared ad hoc by the team of researchers working on the project (with all twelve team members

participating). To meet the appropriate scientific requirements, the design of this instrument followed Silverman's (2011) indications: review the scientific literature, develop an initial open-ended question protocol based on an external expert's advice, and carry out a trial on a small group (it was applied in the trial stage to a classroom of thirty students). The research team made certain adjustments to the questions to overcome the problems identified in the trial. The protocol was subsequently submitted for validation to eighteen experts from different Spanish universities. Their analysis and assessment allowed the fine-tuning (prior to final application) of the content of the five questions, making them more easily understandable to the target group and more relevant to the specific objectives of this part of the study.

The semi-structured nature of the questions allows for a high level of expressiveness and depth in the participants' responses. The questions posed, preceded by the profile data characterising the participants, relate to the five specific research aims set out at the end of the introduction section. The questionnaire items included in this paper are as follows:

- In what contexts do you use a laptop?
- What kind of activities do you carry out with this device?
- What capabilities, abilities, skills, etc. do you apply when using a laptop?
- What benefits do you derive from using a laptop?
- What obstacles do you face when using a laptop?

Data Collection and Analysis

The collection of information through the questionnaire's semi-structured questions was carried out in written form during the months of October and December 2011. The media employed for such purpose were mainly digital (tele-training platforms and email). Students from university classrooms to which the researchers had access were invited to participate. The final size of the sample was determined on the basis of the saturation level reached in the analysis of results. Once a level was reached where a greater number of participants had no further effect on the results, the data collection and coding process was discontinued (Saumure & Given 2008). It should be noted that the content analysis was not conducted for the purposes of statistical generalisation, but in order to provide results and conclusions that facilitate the interpretation of reality and can be extrapolated to other, similar contexts (Brown & Yule, 1998). In the qualitative component the contribution to the understanding of reality takes precedence over its quantification (Tierney, 2012).

The analysis and interpretation of the information collected presupposes its authenticity and veracity, since the participants provided plausible arguments and considerations in their responses (Walker, 1985). The content analysis was carried out following a cyclic and iterative process, initially on an individual basis through re-reading of the texts. Based on this, the project research team drew up a

catalogue of codes, linking them to each of the study's specific stated aims by way of guidelines for the identification of the main categories. This was followed by a general discussion among the research team to agree on and define their application to the content analysis. This procedure allowed the initial subcategories to be adjusted and clearly defined, in a first stage of reduction of the raw data. The study of all the units of analysis gave rise to behaviour patterns for the overall subject group, taking into consideration both objective aspects and those of a subjective and emotional nature arising from the information collected (Clandinin & Connelly, 1994).

The information analysed was treated with computer software to facilitate the task and ensure its in-depth examination. The use of data mining software during an initial stage was followed by the use of Analysis of Qualitative Data (AQUAD) version 6.0 software. The former was used to perform an exploratory analysis, while the latter allowed a more in-depth study of the qualitative aspects of the data. A naturalistic approach (Goetz & LeCompte, 1981) was adopted to establish the different levels of sub-categorisation based on the information collected). This coding system was based on the texts narrated by the students, identifying, through the AQUAD software, meaningful idea units and allowing common units of analysis to be established in order to respond to the specific aims of the study. The metacodes were subsequently grouped together and the level of preponderance (Frequency) of subcategories was determined in order to reveal ubiquitous laptop use trends, practices, etc; without purporting to represent or emphasize them through numerical parameters. Moreover, the data obtained are accompanied by some excerpts from the participants' narrations, providing prolific evidence that allows reflection upon, understanding and knowledge of the topic under study (Klüber & Burak, 2012).

These in-depth analyses were conducted by pairs of researchers from the project team. Additionally, to reinforce the consistency of the results, they were also carried out by an external researcher. Finally, they were subjected to comparison, triangulating them to incorporate suitable adjustments by general agreement, thereby assuring the robustness of the findings presented. The credibility or reliability of the qualitative research is supported by the rigorous design and development of the analysis process, as well as by the plausibility of the information obtained and the systematisation of results (Glaser, 1992).

Participants

The selection of the sample was carried out following a criterion of ease of access to students, in light of the propitious relationships maintained by some of the researchers involved in the project. This procedure is quite common in qualitative studies and allows data to be collected in favourable conditions, thereby expediting the process (Yin, 2009). Thus, following McMillan, Schumacher and Singh (1997), we took

into account, for the purposes of defining the sample, our possibilities of access to universities, classrooms and students. The selection of the sample was driven by the aim of ensuring the consistency and coherence of the information obtained with a view to maximising its usefulness.

In this manner, we obtained the participation of students from two public Spanish universities whose geographic dispersion and particular features are of great strategic value, since they allow us to encompass a high degree of diversity in terms of location and type of students. One of these institutions is the centuries-old Complutense University of Madrid, located in Spain's capital, in the centre of the country. It is attended by a wide diversity of students from Spain and other countries. The other is the University of Vigo, founded in 1990, with a more homogeneous student population of a more local nature. The research included 310 participants from Complutense University and 123 from the University of Vigo. Given the qualitative nature of the research, the size of the final participant sample was capped on the basis of saturation of the data analysis, i.e., once the information collected no longer yielded new results (Spiggle, 1994).

The total number of students involved in this study was 433, from different areas of knowledge: Arts and Humanities, Social Sciences (accounting for a majority: N=286); Health Sciences; Experimental Sciences; Architecture and Engineering. They attended different-level courses in the academic year 2011/2012, with a preponderance of third-year students (N=168). The students' ages ranged between 18 and 48, although the majority of them (N=102) were aged 21, with a mean age of 22.2. As regards to gender, the number of female and male participants was balanced, with a slightly greater number of female students. Most of the participants had their own laptop, while the rest had access to one through loan schemes at their respective universities. A small group combined the use of a desktop computer (generally shared at home with their family members) and access to a laptop through the loan schemes run by Spanish universities.

Results

The qualitative results obtained revolve around the use of laptops by higher education students, taking into account the physical contexts (locations, circumstances and time bands), the practices carried out and the competences brought into play by the respondents, as well as the perceived benefits and obstacles. The content analysis carried out focused on five main dimensions deriving from the specific aims established and from the information collected.

Context of Laptop Use

In general, the students highlight the scope and opportunities to learn in any situation or place afforded by these devices. Almost all participants state that they use laptops regularly, several times a day, for their training. They indicate that the time

period in which they predominantly use them is in the evening or at night, when they have more free time and greater privacy at their home or place of residence. The time of day when laptops tend to be used least is during the morning hours.

Table 1

Places where students use laptops

MAIN CATEGORY: CONTEXT OF LAPTOP USE		
Subcategories	Frequency	By way of example
Home or place of residence	315	"(...) in most leisure locations such as bars we have the possibility of accessing the Internet through Wi-Fi, which allows us to use the Web at any time of day despite having to put up with certain inconvenience. (…). Therefore I use it basically at University, to do academic work, and at home".
University: classroom, library, etc.	211	
Leisure areas: cafeterias, cyber café, parks, etc.	105	
Public transport	57	
Anywhere	38	

Based on the habits expressed by most respondents, laptop use most commonly takes place in private spaces and at the institutions themselves, either inside university buildings or in their vicinity. Lower down the ranking we find laptop use during travel in public transport, mainly city buses or long-distance coaches. Leisure locations or any other places occasionally visited by participants account for a low proportion of use (Table 1).

The results of our study show that the participants make regular, ubiquitous use of laptops in both the academic and the personal sphere. They do so in different locations, at different times and in different situations. As evidenced by such continued use, they believe this device allows them to address their needs and interests and contributes to promoting their learning. It confers their learning process a high degree of personalisation and interaction, allowing it to take place in different places and with different individuals by means of a broadband connection and the different tools available.

Practices Carried out Using Laptops

Spanish higher education students use laptops to carry out different activities of an academic, personal or leisure nature. They state that they carry out such activities at the request of faculty members, at their own initiative or influenced by the socio-technical context in which they find themselves immersed.

The activities undertaken using this type of device, both in the academic sphere and in the personal and social ones, are focused on patterns associated with (Table 2):

- Communication via email, education forums, wikis and chats in order to find answers to issues and questions of an academic nature; for leisure purposes they make assiduous use of social networks (mainly Twitter and Facebook).
- Content production through the writing and editing of academic assignments and their submission for presentation to the class (basically using PowerPoint and Prezi

software), preparation of their e-portfolio in some subject, and video and image publishing (essentially using software such as Publisher, AutoCAD and Paint). This latter practice includes both academic and personal or leisure activities.

- Searching for, selecting, looking up and analysing information, etc., for both academic and personal purposes.
- File management, downloading free software, importing photographs personally taken by the students using other devices (mobile phone, digital camera or tablet). In addition, students use laptops with a broadband connection for activities related to university administration matters: registration and payment of course fees, accessing their academic record or grades, completing satisfaction questionnaires regarding the institution, etc.

Table 2

Types of activities carried out using a laptop

MAIN CATEGORY: PRACTICES CARRIED OUT USING LAPTOPS			
Subcategories		Frequency	By way of example
Communication	– Mail	433	
	– Social networks	348	
	– Forums	106	
	– Chat	103	
	– Wikis	82	"(...), I use the laptop more to search for academic content and to locate any kind of personal information. For one course subject I use it to select and analyse information following the indications of teachers through the University's tele-training platform. I also use it to find guidance on academic work, deadlines for submitting assignments, etc. They also post a lot of content in different formats for studying courses. In addition, I use my laptop for leisure activities, through the social networks. I'm on Twitter and Facebook. I also shop online for clothes and singular objects, transport tickets, accommodation bookings, etc. On a more personal level, I communicate via email."
Production	– Academic work	402	
	– Presentations	396	
	– Text editing	148	
	– e-portfolio	137	
	– Video/image	10	
Informative	– Search	400	
	– Consultation	398	
	– Analysis	104	
	– Press	97	
Management	– Files	395	
	– Downloading	201	
	– Photographs	200	
E-learning	– Online courses	170	"Besides using the internet on my laptop, the Web offers me many more possibilities, such as for example storing large amounts of information in the "cloud" without taking up any space on my hard drive."
	– Platforms	168	
Leisure	– Games	157	
	– Shopping	147	
	– Music	145	
	– Movies	140	
	– Photography	131	
	– Chat	107	
	– Press	106	

To a lesser extent, participants mention their use of laptops to follow online courses or broaden their training and professional experience and thus improve their employment prospects, as well as to carry out academic work under the supervision of faculty members on e-learning platforms. They describe their performance of leisure activities including videogames (individual or in competition with other players

through synchronous gaming), quizzes (crossword puzzles, mental calculation, object association, role play, etc.), shopping, listening to music, watching films, taking and downloading photographs, chat, and reading the news on digital media.

Competences Applied in Laptop Use

Students consider that the use of any technological device calls for the application of a number of competences. Hence, they hold that in order to work with a laptop they need to possess a minimum level of technological skills, which, in itself, they view as an interesting educational challenge.

Our study reveals that students predominantly apply their technical competence when making use of laptops, combining it with other transverse competences.

Many participants argue that the capabilities required by laptop use include the following (Table 3):

- Personal decision-making autonomy.
- Exploring or investigating applications or digital environments.
- Communicating by means of several tools.
- Collaborating and interacting with fellow students, faculty members and other users.
- Critical judgment with regard to the information and content accessed.
- Intuition or ability to associate strategies.
- Constancy and perseverance to carry out the activities.
- Personal maturity for taking decisions.
- An open mind to select or discard different possibilities or situations that may arise.

Table 3

Competences applied by students when using laptops

MAIN CATEGORY: COMPETENCES USED WITH LAPTOPS			
	Subcategories	Frequency	By way of example
COMPETENCE	– Technical	425	"To carry out any activity with a laptop the skills I apply are mainly of a technical nature, which allow me to use it swiftly and find solutions when confronted with computing problems. It is important to be familiar with the range of resources offered by software and digital applications if you want to get the most out of them. Basically, in my case, I consider that the competence I apply most when using a laptop, besides a minimum of technical skills, is my intuitive and exploratory ability, since the way I learn is by trial and error, trying out the various options."
	– Autonomy	381	
	– Communicative	370	
	– Exploration	368	
	– Critical judgment	150	
	– Intuition	142	
	– Collaborative	130	
	– Constancy	99	
	– Openness	67	
	– Maturity	61	

Perceived Benefits and Obstacles Associated with Laptop Use

University students identify multiple benefits together with certain obstacles associated with their ubiquitous use of laptops, as well as the competences they apply. They associate the main advantages with the aspects of flexible use, acquisition of knowledge, possibilities of information and communication, enhancement of future

professional prospects, and leisure and personal management activities. With regard to flexibility, the participants overwhelmingly stated that ubiquitous laptop use has the following advantages (Table 4):

Table 4

Benefits associated with laptop use identified by students

MAIN CATEGORY: *PERCEIVED BENEFITS ASSOCIATED WITH LAPTOP USE*			
Subcategories		Frequency	By way of example
Flexibility	– Mobility	301	
	– Convenience	297	
	– Work savings	278	
	– Hours	276	
	– Polyvalence	268	
	– Supporter	196	"(...). Also, it gives me greater flexibility to combine my availability with that of other students when we have to work as a group, or with lecturers if I need any clarifications that I can ask for and get a reply (...)."
Learning	– Resolution	145	
	– Improvement	136	
	– Permanent	131	
	– Amplitude	120	
	– Personalised	119	
	– Collaborative	115	"(…) Another benefit I would like to highlight is convenience when travelling, knowing that you will always have your work terminal with you wherever you go and that you will be able to access all the information saved on it with a simple click of the mouse."
	– Motivated	111	
	– Innovation	109	
Information	– Consult	107	
	– Share	103	
Communication	– Synchronous	95	
	– Asynchronous	91	
Labour	– Online work	89	
	– Utility	83	
Leisure	– Entertainment	81	
Management	-Academic	76	

- Mobility, allowing them to overcome the physical, geographical and time barriers they face in an educational system they regard as quite traditional.
- The possibility of performing academic and personal practices at any time and place.
- Convenience in carrying out the various academic activities they must undertake individually, as well as when engaging in group interaction and collaboration, particularly through certain Gmail tools (Docs/Drive) and wikis.
- They state that by using these devices they can get the most out of their time and enhance their performance by controlling the effort they put into each task and by pacing their work as best suits them.
- Polyvalence, seen as an added value, associated with an ever-greater range of new opportunities, as well as the use of multiple tools and functionalities. Although in some cases these may be of a very specific nature, in others they allow a high degree of diversification, given their applicability to different situations and tasks. Students consider that the versatility of laptops increases exponentially with a broadband connection.

- Reduced need for printouts. Students view as an advantage the possibility afforded by laptops of submitting content in digital format (with the attendant savings in paper and ink) and sending it in a swift and efficient manner. Moreover, they view this practice as a way of helping to minimise the degradation of the environment.

Regarding the positive impact of laptops on learning, they cite permanent personal enrichment and growth, self-motivation resulting from more innovative dynamics that facilitate collaboration, and the ability to clarify doubts.

Also mentioned by participants, although in fewer number, are other benefits associated with the collection of information and its exchange with other students and Internet users, and the application of laptops to communication using both synchronous tools (chats) and asynchronous ones (forums, wikis, e-mail and social networks). A moderate proportion of the sample state that they make use of the possibilities afforded by this resource for work purposes, leisure and managing academic affairs (registration and payment of course fees, accessing personal academic records, finding out about scholarships and grants, as well as the steps associated with such management).

On the other hand, students come across a number of obstacles, possibly leading to the consolidation of certain patterns in the ubiquitous use of laptops, to the detriment of others. The constraints encountered mainly involve:

- Technical issues – a poor broadband connection and the malfunctioning of certain URLs.
- Constraints associated with low device battery performance, limiting their freedom of movement if they are required to communicate or remain online to carry out their academic or personal activities; or with the currency of Internet content.
- Inadequate training. Participants stated they did not feel they had sufficiently developed the basic and specific competences they would need to possess, in order to interrelate them or to support technical skills.
- Financial constraints. For some university students, the inability to afford a laptop remains a handicap. Although affordable brands can be found on the market, their price is not within the reach of all students.
- Time consumption issues, since laptops do not allow all participants to economise time. They essentially associated time wastage with the difficulty in accessing the Internet through a Wi-Fi connection, since the quality of the signal is not always good.

Discussion and Conclusion

In general, the present study reveals that university students make ubiquitous and regular use of laptops in the academic, personal and social spheres. They use different places, times and situations to pursue their training. This allows them to constantly enrich themselves by interweaving formal learning with informal, experiential and interactive learning.

The time band in which they least use laptops is during the morning, possibly due to the constraints imposed by teacher-directed instruction. Given that they are physically attending students, the tasks proposed by their lecturers are not always supported by or focused on technology. In this respect, Burbules (2012) points out the need, in addition to ICT-related activity, to build structured forms of learning in which the teacher plays a substantial role. However, the aims, methodologies, learning activities and relationships or interactions among students and between them and their teachers must change in a technological society whose comprehensive dynamics and demands have been altered.

The patterns of laptop use among higher education students in Spain, based on the practices exhibited by them, comprise six blocks: communication, content production, information handling; management, e-learning, and leisure. This classification is influenced by the requirements imposed by lecturers on the training process, the students' own initiative, and contextual determinants and their repercussions. Hence, the use patterns are geared towards meeting academic and personal needs. With certain similarities, a study carried out by Smith and Caruso (2010) detected that students use laptops mainly to communicate, share images, search for information and buy or sell. The findings of our study point to scarcely diverse and limited activity patterns resulting from a constrained everyday practice in laptop use. This is also the case in other countries with a moderate level of technological development and per capita income, or lower than in highly industrialised countries (Danner & Pessu, 2013).

University students are fully aware that, in order to carry out a number of activities with a laptop, they need to possess technical skills. However, they acknowledge that, beyond such skills, digital competence calls for a combination of various transverse capabilities. The importance of technology in the day-to-day life of citizens in general and university students in particular is enormous. Technological literacy has become a functional requirement to carry out initial training, interact with people and perform many types of jobs. We agree with Bennett, Maton and Kervin (2008), that, although higher education students currently have more competences and opportunities with ICTs than those of previous generations, they must continue to meet the technological challenge so as to be ever better prepared.

Laptops benefit students mainly by allowing them to enjoy great flexibility in terms of mobility, allowing them to use their devices anywhere, in any situation and at any time of day. They have a positive impact by facilitating permanent learning and the combination of formal and informal learning. Likewise, they facilitate students' access to information and communication by very diverse means, the swift resolution or clarification of academic issues, and collaboration, both synchronous and asynchronous. These aspects show a great parallelism with the practice patterns exhibited by university students, obviously reinforced by the benefits they perceive. In other research work, the stated benefits generated by this type of device were found to include, among others, the possibility of carrying out learning with a high level

of personalisation (Tapia et al., 2008). The results of our study likewise indicate that students also find laptops useful for different management tasks. As a leisure resource, they are primarily appreciated for their entertainment potential.

The students' perceived obstacles for laptop use, together with the benefits, are associated with their use patterns. The problems highlighted by students include technical difficulties, inadequate training to use the device, and price. Although the shortcomings associated with a lack of Internet connectivity or a low-speed connection are not serious, they may have a certain impact on academic performance. In view of these worrisome factors, we adhere to Danner and Pessu's (2013) call for the institutional, political, research and education policymakers to propose solutions aimed at mitigating the students' difficulties.

Constraints of the Study and Contribution to Practice

The findings presented are of a preliminary nature, given that the project is still under way. Upon its completion, we shall be in a position to present the final results obtained through methodological triangulation. The results and conclusions, being of a qualitative nature, do not lend themselves to statistical generalization. However, they may be extrapolated to other contexts, subject to proper reflection, since they provide substantial topics of universal interest (Stenhouse, 1985) in a permanently connected global community. The findings presented enhance comprehension and broaden knowledge of the ubiquitous laptop use exhibited by university students – both for academic purposes and at their own initiative, for leisure activities or as a means of social interaction.

The present work reveals consistent patterns, based on specific indicators, regarding the ubiquitous use of laptops, according to the contexts, activities, competences brought into play, and benefits or obstacles faced, thereby providing clear evidence regarding the situation under study. Whether taken separately or as whole, they can be of use to higher education teachers, assisting them in the planning and implementation of their teaching. Moreover, they could promote reflection, particularly as regards further enquiry into the applicability of laptops, on the subject of improving laptop use patterns through the diversification of pedagogical practices and resources.

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María-Carmen Ricoy
Faculty of Education Sciences, University of Vigo
 (Universidad de Vigo),
Avd/Castelao, s/n, 32004 Ourense, Spain
cricoy@uvigo.es

Tiberio Feliz
Faculty of Education, National University of Distance Education (Universidad Nacional de Educación a Distancia),
C/Juan del Rosal, nº14, 2ª, 28040 Madrid, Spain
tfeliz@edu.uned.es

Uzorci u sveprisutnoj uporabi laptopa kod studenata u visokom obrazovanju

Sažetak

Cilj ovoga istraživanja bio je prepoznati uzorke u korištenju laptopa među studentima na fakultetima u Španjolskoj. Ovaj rad, koji je rezultat kvalitativne komponente, usmjeren je na istraživanje među studentima putem upitnika s polistrukturiranim pitanjima. U istraživanju su sudjelovala ukupno 433 studenta s dva sveučilišta. Njihova dob bila je između 18 i 48 godina (srednja vrijednost 22,2). Dobiveni podatci podvrgnuti su analizi sadržaja iz koje možemo zaključiti da mobilnost daje prijenosnim računalima niz mogućnosti koje utječu na uzorak njihova korištenja kod ispitanika. Uzorci su dobiveni iz tvrdnji o dobrobiti korištenja prijenosnog računala, ali isto tako i ograničenja. Rezultati i zaključci pokazuju da je korištenje prijenosnih računala kod ispitanika sveprisutno. Njihove navike mogu biti klasificirane u nekoliko kategorija s obzirom na akademski, osobni ili društveni kontekst, te su povezani s mnogim navedenim dobrobitima, kao i određenim ograničenjima.

Ključne riječi: *informacijske i komunikacijske tehnologije; kompetencije; prijenosno računalo; studenti na sveučilištu; sveprisutno učenje.*

Uvod

Potencijali digitalnih mobilnih uređaja kao obrazovnih alata za učenje u sveprisutnim okruženjima moraju se dobro proučiti kako u Španjolskoj (Muñoz, González, i Hernández, 2013) tako i u ostalim zemljama (Hyeongjik, Won, i Soo, 2013). Riječ sveprisutno potječe od latinske riječi „ubīque", u doslovnom prijevodu „svugdje", odnosno prisutno na različitim mjestima i kontekstima u isto vrijeme. Koristi se kod opisivanja usvajanja znanja kroz tehnologiju digitalne mobilne internetske veze. Prema Traxleru (2007), sveprisutno učenje karakterizira se kao osobno, vlastito, oportunističko, neformalno i osjetljivo na kontekst. Drugi autori (Tapia, López, Galán, i Rubio, 2008) taj način učenja također povezuju s mobilnošću i personalizacijom. To omogućuje pojedincima preuzimanje odgovornosti za vlastiti ritam rada i za generiranje poticaja za učenje.

Kao što ističu Terras i Ramsay (2012), tehnologija omogućuje da u bilo koje vrijeme i na bilo kojemu mjestu komuniciramo, surađujemo i izmjenjujemo sadržaj ili nudimo informaciju, potičući tako učenje bilo formalne, akademske ili neformalne prirode. Uzorci sveprisutnog korištenja prijenosnoga računala klasificirani su s obzirom na akademske ili neakademske sadržaje, iako je broj istraživanja o tome prilično oskudan (Gaudreau, Miranda i Gareau, 2014; Smith i Caruso, 2010). Zbog toga je od interesa razjasniti skup aplikacija, okolnosti i dr. koje se pojavljuju. Upravo je glavni cilj ovoga istraživanja analizirati sveprisutnost korištenja prijenosnih računala kod studenata u visokom obrazovanju. Ovim istraživanjem pokušat će se identificirati standardni uzorci, kao i percepcija prednosti i nedostataka s obzirom na zahtjeve koji se nameću za korištenjem laptopa od sveučilišta i tržišta rada. Nadalje, istraživanje će pokušati prikazati kompetencije koje nalaže korištenje laptopa u svjetlu istraživanja koja su ukazala na to da europski studenti ,općenito, nemaju dovoljno učinkovite tehničke sposobnosti kojima bi na zadovoljavajućoj razini mogli poduprijeti i učvrstiti svoje učenje, kao ni dostatne generičke sposobnosti kako bi mogli preuzeti odgovornost na tržištu rada (Gvaramadze, 2012).

Institucije odgovorne za visoko obrazovanje u Španjolskoj suočene su s izazovom ostvarivanja optimalne integracije informacijskih i komunikacijskih tehnologija (IKT) u poučavanje. Štoviše, kao i u ostalim zemljama, učestali su institucionalni pozivi za promoviranjem dobrobiti IKTa u formalnom obrazovanju (Davis, Eickelmann, i Zaka, 2013). Međutim, kako bi u sveprisutnom okruženju ono bilo učinkovito, korištenje mobilnih digitalnih uređaja mora biti praćeno odgovarajućim didaktičkim metodama koje promiču i učvršćuju razvoj kompetencija kod studenata. Neka istraživanja ukazala su na to da studenti unapređuju svoje učenje koristeći se prijenosnim računalima(Saunders, i Klemming, 2003), a druga istraživanja zaključuju da prijenosna računala ne donose značajne promjene u odnosu na tradicionalno obrazovanje (Brallier, Palm, i Gilbert, 2007). Neovisno o važnosti prethodnih zaključaka, slažemo se s Pattenom, Sánchezom i Tangneyem (2006) da određena pažnja mora biti posvećena potrebi za korištenjem novih tehnologijskih uređaja koji prate trendove te kako bi se promovirale inovativne aktivnosti sa studentima. To bi očigledno optimaliziralo integraciju IKT-a u procese poučavanja i učenja, kao i povećalo vjerojatnost akademskog uspjeha.

Široko dostupni kompaktni uređaji danas omogućuju pristup informacijama na mreži i izvođenje različitih aktivnosti. Prema Wang, Wiesemes i Gibbons (2012), sveprisutno učenje od interesa je svim studentima, a podržavaju ga mobilni uređaji (prijenosna računala, 3G mobilni telefoni, tableti, Sat Navs i drugi) s pristupom na internet koji se sve češće koristi. Ti izvori podržavaju nove načine učenja, suradnje i komunikacije. Upravo zbog toga se slažemo sa Burbulesom (2012) u tome da mobilni izvori i bežične mreže stvaraju sredstva za učenje i stoga postaju dio akademskih i svakodnevnih aktivnosti studenata i građana.

Korištenje mobilnih izvora s pristupom internetu predstavlja izvrstan scenarij za komunikaciju, interakciju i razvoj procesa učenja i poučavanja, kao i za pripremu

studenata za profesionalni život. U vezi s tim slažemo se s Espasom i Menesesom (2010) da u Španjolskoj *online* proces povratne informacije pomaže u poboljšanju akademskog rada u koji su uključeni studenti na sveučilištu. Štoviše, iz analize sadržaja oglasa za posao koji nalažu posjedovanje IKT kompetencija, uočeno je da se očekuje da radnici u 21. stoljeću imaju visoke razine digitalnih vještina (Gallivan, Truene, Kvasny, 2004). Prema tome, vrlo je važno nastaviti s poboljšanjima u kreiranju obrazovnih ishoda u skladu s novim scenarijima obuke, u koju se moraju implementirati dobre vještine učenja u mobilnim uvjetima. To nalaže razvoj i poboljšanje digitalnih kompetencija, što je u španjolskom obrazovnom kontekstu i dalje veliki izazov (Ricoy, Feliz, i Couto, 2013). Studenti moraju kombinirati i/ili primijeniti različite vještine, stavove, vrijednosti, koncepte i dr. na način koji je primjenjiv na različite kontekste.

Dobrobiti tehnologije nalaze se u mogućnosti učenja iz fizičke i digitalne okoline i s njom. S obzirom na to prijenosno računalo kombinira cjelokupni asortiman alata koji su dostupni u mnogim digitalnim uređajima. Zapravo, prijenosno računalo prilagođeno je specifikacijama za mobilne uređaje u obrazovne namjene, što tvrde Naismith, Sharples, Vavoula i Lonsdale (2004): prenosivost, kompaktna veličina i mala težina; mogućnost interakcije i individualizacije, razmjena informacija i suradnja; povezanost itd.

Među mobilnim je uređajima prijenosno računalo, s obzirom na svoje jedinstvene i privlačne karakteristike, preferirani izbor među studentima (Kay i Lauricella, 2011). Istraživanje koje su proveli Smith i Caruso (2010) identificiralo ga je kao najpopularnije sredstvo za učenje među studentima u visokom obrazovanju. Druga istraživanja (Economides i Grousopoulou, 2009) ukazuju na nešto povećanu potražnju za tom vrstom uređaja s ekranom od 12 inča u odnosu na manje uređaje, unatoč smanjenoj lakoći mobilnosti koju podrazumijevaju veći uređaji. Nadalje, studenti su navikli obavljati svoje aktivnosti na uređajima pod Windows platformama. Također su ukazali na sklonost upotrebe prijenosnih računala u odnosu na ostale prijenosne digitalne uređaje s obzirom na financijske mogućnosti, potencijal softvera, veličinu ekrana za prikladno prikazivanje rada itd.

Kregor, Breslin i Fountain (2012) također su ukazali na visoku penetraciju prijenosnih računala, rasprostranjenost širokopojasnog pristupa internetu i uspjeha studenata u visokom obrazovanju kod izvođenja *online* zadataka. U svjetlu prikladnosti kombiniranja akademskih zadataka i upotrebe za osobne potrebe, prijenosno računalo postalo je dio standardne opreme mnogih studenata. S obzirom na velik potencijal u izvođenju sveprisutnog učenja u različitim uvjetima, a koji su omogućili mobilni digitalni uređaji, njihovo korištenje promatra se i kao društveni imperativ (Cope& Kalantzis, 2009). Digitalna kompetencija promatra se kao sastojak potreban za proučavanje i internalizaciju učenja korištenjem malih uređaja, posebno prijenosnog računala, opremljenog s mogućnošću bežičnog povezivanja (Ramzan, Munir, Siddique, i Asif, 2012).

Gledajući negativne aspekte, trebalo bi napomenuti da su i izvanredni studenti priznali da je učenje više konstruktivističko, odnosno da se njihovi rezultati nisu

značajno poboljšali niti da su iz učenja uz pomoć takvih uređaja osjetili veće zadovoljstvo (Wurst, Smarkolab, i Gaffneya, 2008). Štoviše, višezadaćnost (eng. *multitasking*) u radu na prijenosnom računalu u razredu povećava odvlačenje pažnje studenata i može omesti razumijevanje tema o kojima govore nastavnici na predavanjima (Sana i dr., 2013). Također, korištenje prijenosnog računala u razredu može umanjiti standard postignuća i razinu zadovoljstva, umanjiti poticaj za učenjem i izazvati ovisnost o internetu (Gaudreau i dr., 2014). Prema tome, vrlo je važno primijeniti uravnotežen pristup integraciji prijenosnog računala u obrazovni proces, kombinirajući ga s ostalim izvorima i dinamikom učenja.

S namjerom da dublje analiziramo uzorak sveprisutnosti korištenja prijenosnih računala, što iznose sveučilišni studenti, specifični su ciljevi ovoga istraživanja:

- Identificirati kontekste u kojima se prijenosna računala koriste.
- Odrediti vrste aktivnosti koje studenti izvode koristeći se tim uređajima.
- Ograničiti kompetencije koje se primjenjuju.
- Razlučiti percepciju korisnosti u obrazovne svrhe.
- Identificirati prepreke s obzirom na korištenje prijenosnih računala.

Metodologija

Provedeno istraživanje dio je ambicioznog projekta o digitalnim mobilnim uređajima. Cilj ovoga istraživanja bio je proučiti njihovu sveprisutnost u korištenju za obrazovne svrhe, iscrtati mapu digitalnih kompetencija. Ono teži ponuditi obrazovnim rukovoditeljima i projektantima modele za pripremu nacrta primjerenih novim scenarijima. Projekt je trajao od 2011. do 2014. godine. On se općenito temelji na kvantitativnom i kvalitativnom pristupu prikupljanja podataka koristeći se upitnikom otvorenog tipa, upitnikom zatvorenog tipa, raspravom u grupama i Delphi tehnikom.

Ovaj rad ograničio se na dio projekta, odnosno na kvalitativni pristup s naglaskom na prijenosno računalo. Podrazumijeva prikupljanje podataka koristeći se upitnikom otvorenog tipa. Takva vrsta podataka omogućuje realno ispitivanje predmeta istraživanja unutar vlastitih osobnosti i složenosti, s ciljem prepoznavanja trendova ili uzoraka korištenja na osnovi percepcije ispitanika (Hargreaves, 1994).

Instrument

Upitnik otvorenoga tipa korišten za prikupljanje podataka pripremio je *ad hoc* tim istraživača zaposlenih na projektu (svih dvanaest članova tima sudjelovalo je u njegovoj izradi). Kako bi se udovoljilo uvjetima znanstvenih istraživanja, izrada ovoga upitnika pratila je Silvermanove indikacije (2011): pregled znanstvene literature, razvoj inicijalnog pitanja otvorenoga tipa na osnovi preporuke stručnjaka, provedba pilot istraživanja na manjoj skupini (u pilot istraživanju to je bio razred od trideset studenata). Tim istraživača prilagodio je pitanja kako bi se izbjegli problemi koji su identificirani u pilot istraživanju. Protokol je nakon toga predan na provjeru valjanosti osamnaest stručnjaka s različitih sveučilišta u Španjolskoj. Upravo njihove analize i

ocjene omogućile su završno uređivanje (prije konačne primjene) sadržaja pet pitanja, čineći ih razumljivijima za ispitanike i svrsishodnijima za specifične ciljeve ovog dijela istraživanja.

Priroda polistrukturiranih pitanja omogućuje visok stupanj izražavanja i dubinu u odgovorima ispitanika. Postavljena pitanja, kojima su prethodili podaci o profilu ispitanika, vezana su uz pet specifičnih ciljeva istraživanja navedenih u uvodu. Čestice u upitniku bile su sljedeće:

- U kojim se situacijama koristiš prijenosnim računalom?
- Kakve aktivnosti izvodiš koristeći se tim uređajem?
- Koje mogućnosti, sposobnosti, vještine i dr. primjenjuješ dok se koristiš prijenosnim računalom?
- Koje koristi imaš od korištenja prijenosnim računalom?
- Na koje prepreke nailaziš kada se koristiš prijenosnim računalom?

Prikupljanje i analiza podataka

Prikupljanje informacija putem polustrukturiranog upitnika provedeno je u pisanom obliku od listopada do prosinca 2011. godine. Medij koji je za tu svrhu upotrijebljen uglavnom je bio digitalni (*tele-training* platforme i elektronička pošta *e-mail*). S obzirom na to da su istraživači imali pristup sveučilišnim prostorijama, upravo su studenti koji su u njima boravili dobili poziv na sudjelovanje u istraživanju. Krajnji broj uzorka ispitanika bio je određen na osnovi razine zasićenja koja je dobivena analizom rezultata. Kada je dosegnuta razina u kojoj veći broj ispitanika nije više utjecao na rezultate, proces prikupljanja podataka i kodiranja bio je prekinut (Saumure i Given 2008). Potrebno je napomenuti da analiza sadržaja nije provedena s ciljem statističkog poopćavanja, nego kako bi rezultati i zaključci omogućili interpretaciju stvarnosti te bili preneseni u druge, slične kontekste (Brown i Yule, 1998). Kod kvalitativne komponente doprinos razumijevanja stvarnosti ima prednost u odnosu na njezino kvantificiranje (Tierney, 2012).

Analiza i interpretacija dobivenih podataka pretpostavlja autentičnost i vjerodostojnost uz uvjet da su ispitanici u svojim odgovorima dali prihvatljive argumente i razmatranja (Walker, 1985). Analiza sadržaja provedena je prateći kružni, ponavljajući proces individualnih iščitavanja tekstova. Na osnovi toga ovaj tim istraživača izradio je katalog kodova, povezujući ih sa svakim od specifičnih ciljeva istraživanja putem smjernica za identifikaciju osnovnih kategorija. Slijedila je otvorena rasprava među skupinom istraživača kako bi se složili i definirali svoju primjenu analize sadržaja. Ta je procedura omogućila prilagodbu i jasno definiranje prvotnih podkategorija dobivenih reduciranjem neobrađenih podataka. Istraživanje svih dijelova analize iskristaliziralo je uzorak ponašanja za cijelu skupinu ispitanika, uzimajući u obzir objektivne aspekte i one subjektivne i emocionalne prirode dobivene na temelju prikupljenih informacija (Clandinin i Connelly, 1994).

Informacije su analizirane uz pomoć računalnog programa kako bi se zadatak izvršio i kako bi se osiguralo dubinsko preispitivanje. Nakon primjene programa za

dubinsko istraživanje podataka (*data mining*) u inicijalnoj fazi, uslijedila je analiza kvalitativnih podataka (AQUAD) verzija 6.0. *Data mining* se koristio za provedbu istraživačke analize podataka, a AQUAD je omogućio dubinsku analizu kvalitativnih aspekata podataka. Naturalistički pristup (Goetz i LeCompte, 1981) koristio se da bi se ustanovile različite razine potkategorija na osnovi prikupljenih informacija. Taj sustav kodiranja oslanja se na tekstove, odnosno na studentske iskaze koji identificiraju, putem AQUAD softvera, suvisle idejne cjeline i dopuštaju njihovu analizu kako bi se odgovorilo na specifične ciljeve ovoga istraživanja. Metakodovi su grupirani, a razina prednosti (učestalost) potkategorija određena je kako bi se razotkrili trendovi i aktivnosti sveprisutnog korištenja prijenosnim računalom, a koje ne podrazumijeva njihovo prikazivanje ili naglašavanja putem numeričkih parametara. Uz dobivene podatke donosimo i isječke iz studentskih iskaza, što daje obilne dokaze koji dopuštaju refleksiju, razumijevanje i poznavanje teme koja se proučava (Klüber i Burak 2012).

Ove dubinske analize proveli su u parovima istraživači na projektu. Nadalje, kako bi se učvrstila postojanost rezultata, iste je analize proveo i vanjski istraživač. Na kraju su rezultati podvrgnuti usporedbi triangulacijom da bi se, uz suglasnost svih, napravile određene preinake i tako osigurala otpornost na manja odstupanja rezultata istraživanja. Za vjerodostojnost ili pouzdanost kvalitativnog istraživanja zaslužni su rigorozan dizajn i razvoj procesa analize, kao i prihvatljivost dobivene informacije i sistematizacija rezultata (Glaser, 1992).

Uzorak ispitanika

Odabir uzorka napravljen je prateći kriterij jednostavnog pristupa studentima, u svjetlu dobrih odnosa koje su uspostavili i održali neki istraživači na projektu. Ta je procedura uobičajena kod kvalitativnih istraživanja i omogućuje prikupljanje podataka u povoljnim uvjetima ubrzavajući proces (Yin, 2009). Prateći McMillana, Schumachera i Singha (1997), uzeli smo u obzir, za potrebe definiranja uzorka, naše mogućnosti pristupanja fakultetima, razredima i studentima. Odabir uzorka bio je potaknut ciljem da se ostvari konzistentnost i usklađenost dobivenih informacija, kao i maksimalna korisnost.

Na taj smo način postigli sudjelovanje studenata s dva javna sveučilišta u Španjolskoj, čija geografska disperzija i karakteristike imaju značajnu stratešku vrijednost jer nam omogućuju uključivanje visokog stupnja različitosti s obzirom na lokaciju i tip studenata. Jedna od takvih institucija je stoljećima staro Sveučilište u Madridu Compultense, smješteno u središtu države, u glavnom gradu Španjolske. Studenti toga sveučilišta vrlo su raznoliki s obzirom na to da dolaze iz različitih dijelova Španjolske, ali i iz drugih zemalja. Druga je institucija Sveučilište Vigo, osnovano 1990. s uglavnom homogenom studentskom populacijom, relativno lokalnog karaktera. Istraživanjem je obuhvaćeno 310 ispitanika sa Sveučilišta Compultense i 123 sa Sveučilišta Vigo. S obzirom na kvalitativnu prirodu istraživanja veličina konačnog uzorka ispitanika određena je na osnovi zasićenosti analize podataka, odnosno onoga trenutka kada dobivena informacija više nije donosila nove rezultate (Spiggle, 1994).

Ukupan broj studenata uključenih u ovo istraživanje bio je 433, iz različitih područja znanja: umjetnost i humanističke znanosti, društvene znanosti (većina ispitanika: 386); medicina, eksperimentalne znanosti; arhitektura i strojarstvo. Oni su u 2011./2012. akademskoj godini sudjelovali u kolegijima različite težine, a prednost su imali studenti treće godine (168). Dob studenata bila je od 18 do 48 godina, iako je većina studenata (102) imala 21 godinu, a srednja vrijednost za dob bila je 22,2. S obzirom na spol, broj muških i ženskih ispitanika bio je ujednačen, s nešto malo više ženskih ispitanika. Većina ispitanika imala je vlastiti laptop, a ostali su imali pristup računalu putem različitih programa posudbe na svojim fakultetima. Manja skupina ispitanika kombinirala je upotrebu stolnog računala (uglavnom dijeljenog s članovima obitelji) i prijenosnog računala dobivenog putem programa posudbe koje nude sveučilišta u Španjolskoj.

Rezultati

Dobiveni kvalitativni rezultati vrte se oko studenata u visokom obrazovanju koji se koriste laptopom, uzimajući u obzir fizički kontekst (lokacija, okolnosti i vremenski okvir), radnje koje obavljaju i kompetencije koje aktiviraju, kao i percepciju korisnosti i nedostataka. Provedena analiza sadržaja usmjerena je na pet osnovnih dimenzija koje proizlaze iz utvrđenih specifičnih ciljeva i prikupljene informacije.

Kontekst upotrebe laptopa

Općenito, studenti naglašavaju doseg i priliku za učenjem u bilo kojoj situaciji ili mjestu koje im takav uređaj omogućuje. Gotovo svi ispitanici tvrde da se laptopom koriste redovito, nekoliko puta na dan za svoje poslove. Naglašavaju da je doba dana kada se uglavnom koriste prijenosnim računalom predvečer ili večer jer imaju više slobodnoga vremena i više privatnosti u svojim domovima ili studentskim rezidencijama. Studenti se svojim prijenosnim računalima najmanje koriste u jutarnjim satima.

Na osnovi izraženih navika većine ispitanika laptop se uglavnom koristi u privatnim prostorima i institucijama, unutar fakulteta ili u njegovoj blizini. Nešto niže na ljestvici nalazimo korištenje laptopom za vrijeme putovanja javnim prijevozom, uglavnom gradskim autobusima ili međugradskim prijevoznim sredstvima. Na mjestima za razonodu ili ostalim mjestima koja ispitanici posjećuju proporcija upotrebe laptopa prilično je niska (tablica 1).

Rezultati našega istraživanja pokazuju da se ispitanici redovito koriste laptopom u akademskoj i osobnoj sferi. Laptopom se koriste na različitim lokacijama, u različitim vremenima i situacijama. Dokaz takvom kontinuiranom korištenju je i vjerovanje da im taj uređaj omogućuje ostvarivanje potreba i interesa te doprinosi poboljšanju učenja. Koristeći se širokopojasnom vezom i ostalim dostupnim alatima, laptop daje procesu učenja visoki stupanj osobnosti i interakcije jer omogućuje učenje na različitim mjestima i s različitim pojedincima.

Tablica 1

Mjesta na kojima se studenti koriste prijenosnim računalima

OSNOVNA KATEGORIJA: KONTEKST UPOTREBE LAPTOPA		
Potkategorija	Učestalost	Na primjeru
Dom ili mjesto boravka	315	
Fakultet: predavaonica, knjižnica itd.	211	„(...) u većini mjesta za razonodu poput kafića imamo mogućnost pristupa internetu putem Wi-Fi, što nam omogućuje korištenje weba u bilo koje doba dana, iako se moramo nositi i s određenim nelagodama. (…). Stoga ga uglavnom koristim na fakultetu za neke akademske poslove i kod kuće".
Područja za razonodu:restorani, *cyber caffee*, parkovi itd.	105	
Javni prijevoz	57	
Bilo gdje	38	

Rad s pomoću laptopa

Studenti u Španjolskoj koriste se laptopom za obavljanje različitih oblika aktivnosti: akademske, osobne ili zabavne. Studenti tvrde da takve aktivnosti mogu obavljati na zahtjev nastavnika, na vlastitu inicijativu ili pod utjecajem društveno-tehničkog okruženja u kojemu se nađu.

Tablica2

Vrste aktivnost koje se provode uz pomoć laptopa

OSNOVNE KATEGORIJE: IZVRŠAVANJE AKTIVNOSTI PUTEM LAPTOPA			
	Potkategorije	Učestalost	Na primjeru
Komunikacija	– Pošta	433	„(...), Laptopom se koristim uglavnom za pretraživanje akademskog sadržaja i kako bih došao do nekih osobnih informacija. Za jedan kolegij se njime koristim kako bih odabrao i analizirao informacije prateći uputu nastavnika na fakultetskoj *tele-learning* platformi. Također se njime koristim za pronalaženje smjernica vezanih uz akademski rad, rokove za predaju zadataka itd. Nastavnici također objavljuju puno sadržaja iz kolegija u različitim oblicima. Nadalje, laptopom se koristim za slobodne aktivnosti putem društvenih mreža (Twitter i Facebook). Odjeću, predmete, karte za prijevoz, rezervacije smještaja i dr. također kupujem *online*. Na osobnoj razini komuniciram koristeći se e-poštom. "
	– Društvene mreže	348	
	– Forumi	106	
	– Čavrljanje (Chat)	103	
	– Wiki	82	
Produkcija	– Akademski rad	402	
	– Prezentacije	396	
	– Uređenje teksta	148	
	– E-portfolio	137	
	– Video/slika	10	
Informacija	– Pretraživanje	400	
	– Savjetovanje	398	
	– Analiza	104	
	– Tiskovine	97	
Menadžment	– Datoteke	395	
	– Preuzimanja	201	
	– Fotografije	200	
E-učenje	– *Online* tečajevi	170	„Osim što se na laptopu služim internetom, mreža mi omogućuje raznovrsne aktivnosti poput pohranjivanja velikog broja informacija u servisu „cloud" (hrv. *oblak*) a da pritom ne zauzimam prostor na tvrdom disku."
	– Platforme	168	
Slobodno vrijeme	– Igre	157	
	– Trgovina	147	
	– Glazba	145	
	– Filmovi	140	
	– Fotografija	131	
	– Čavrljanje	107	
	– Tiskovine	106	

Aktivnosti koje se izvode s pomoću laptopa u akademskoj sferi, kao i u osobnoj i društvenoj, usmjerene su na uzorke koji su povezani s (tablica2):

- Komunikacijom putem e-pošte, obrazovnih foruma, wikija i čavrljanjem kako bi se dobili odgovori na pitanja i probleme akademske prirode; u slobodno vrijeme studenti se dosljedno koriste društvenim mrežama (uglavnom Twitter i Facebook).
- Produkcijom sadržaja pisanjem i uređivanjem akademskih zadataka i njihovim prezentiranjem kolegama (uglavnom koristeći se PowerPoint i Prezi softwarom), pripremu vlastitih e-portfolija za određene kolegije, video i slikovno objavljivanje (u osnovi koristeći se softverom kao što je Publisher, AutoCAD i Paint). Potonje podrazumijeva akademske aktivnosti i aktivnosti u slobodno vrijeme.
- Pretraživanjem, odabirom, traženjem i analiziranjem informacije, i dr. u akademske i osobne svrhe.
- Upravljanjem datotekama, preuzimanjem besplatnog softvera, preuzimanjem fotografija koje su studenti osobno izradili koristeći se drugim uređajima (mobilni telefon, digitalni fotoaparat, tablet). Nadalje, studenti se koriste laptopom sa širokopojasnom vezom za aktivnosti vezane uz administrativna pitanja na fakultetu: prijava i plaćanje školarine, pristup ocjenama i evidenciji obrazovnih postignuća, ispunjavanje upitnika vezanih uz instituciju i dr.

U nešto manjem omjeru ispitanici spominju korištenje laptopa kako bi pratili *online* kolegije ili proširili vlastito (profesionalno) iskustvo te poboljšali izglede za zapošljavanje, kao i izvedbu akademskih zadataka pod nadzorom nastavnika na platformama za e-učenje. Služenje laptopom u slobodno vrijeme i zabavu podrazumijevaju videoigre (individualne ili natjecateljske s ostalim igračima u sinkronim igrama), kvizove (križaljke, mentalni izračuni, asocijacije, igra uloga itd.), trgovanje, slušanje glazbe, gledanje filmova, preuzimanje fotografija, čavrljanje i čitanje novosti u digitalnom obliku.

Kompetencije primijenjene u radu na laptopu

Studenti smatraju da korištenje bilo kojim tehnološkim uređajem zahtijeva primjenu određenog broja kompetencija. Smatraju da rad s laptopom zahtijeva minimalnu razinu tehničke vještine, koja je sama po sebi interesantan obrazovni izazov.

Naše istraživanje otkrilo je da studenti uglavnom primjenjuju svoju tehničku kompetenciju kada koriste laptop, kombinirajući je s ostalim transverzalnim kompetencijama.

Mnogi ispitanici uvjereni su da su vještine potrebne za korištenje laptopom sljedeće (tablica 3):

- Osobna autonomija u donošenju odluka.
- Istraživanje ili proučavanje aplikacija ili digitalnih okruženja.
- Komunikacija putem nekoliko alata.
- Suradnja i interakcija s kolegama, nastavnicima i ostalim korisnicima.
- Kritičko prosuđivanje vezano uz informaciju i dostupne sadržaje.

- Intuicija ili sposobnost povezivanja strategija.
- Postojanost i ustrajnost u izvođenju aktivnosti.
- Osobna zrelost za donošenje odluka.
- Otvorenost za odabir ili odbacivanje različitih mogućnosti ili situacija koje mogu nastati.

Tablica 3

Kompetencije koje studenti primjenjuju u radu s laptopom

OSNOVNA KATEGORIJA: KOMPETENCIJE KOD KORIŠTENJA LAPTOPA		
Potkategorije	Učestalost	Na primjeru
KOMPTENCIJA – Tehnička – Autonomija – Komunikacijska – Istraživanje – Kritička procjena – Intuicija – Suradnja – Postojanost – Otvorenost – Zrelost	425 381 370 368 150 142 130 99 67 61	„Da bih izvršio bilo koju aktivnost na laptopu, vještine koje primjenjujem uglavnom su tehničke prirode koje mi omogućuju brzi rad, te pronalaženje rješenja kada se suočim s računalnim problemima. Vrlo je važno biti upoznat s opsegom izvora koje nudi softver i digitalne aplikacije ako ih želiš maksimalno iskoristiti. U vlastitom slučaju smatram da kompetencija koju najčešće primjenjujem kada se koristim laptopom, uz minimalne tehničke vještine, jest intuicija i sposobnost istraživanja, jer je strategija koju primjenjujem u učenju pokušaj i pogreška, odnosno isprobavanje različitih mogućnosti.“

Percepcija korisnosti i nedostataka vezanih uz uporabu laptopa

Studenti na fakultetu mogu identificirati višestruke koristi kao i neke nedostatke vezane uz njihovo stalno korištenje laptopa, a i kompetencije koje pri tome primjenjuju. Glavne prednosti povezuju s fleksibilnošću korištenja, usvajanju znanja, mogućnošću za informiranjem i komunikacijom, poboljšanju budućih profesionalnih mogućnosti, aktivnosti vezanih uz upravljanje osobnim djelatnostima i slobodnim vremenom. S obzirom na fleksibilnost ispitanici su izjavili da sveprisutno korištenje laptopa ima sljedeće prednosti (tablica 4):

- Mobilnost – omogućuje im da premoste fizička, zemljopisna i vremenska ograničenja s kojima se suočavaju u obrazovnom sustavu koji doživljavaju kao tradicionalan.
- Mogućnost izvođenja akademskih i osobnih aktivnosti u bilo koje vrijeme i na bilo kojemu mjestu.
- Pogodno kod izvođenja različitih akademskih aktivnosti koje moraju raditi individualno ili u skupini uz suradnju, posebno koristeći se nekim Gmail alatima (Docs/Drive) i wikijima.
- Tvrde da prilikom korištenja navedenih uređaja mogu izvući maksimum u odnosu na vrijeme te poboljšati vlastitu izvedbu tako da kontroliraju trud koji ulažu u svaki zadatak i tempo rada koji im najviše odgovara.
- Polivalentnost, kao dodatna vrijednost, povezana s rastućim opsegom novih mogućnosti, kao i korištenje mnogostrukim alatima i funkcijama. Iako u nekim slučajevima oni mogu biti specifične prirode, kod većine omogućuju visok stupanj raznolikosti, s obzirom na njihovu primjenu na različite situacije i zadatke. Studenti

smatraju da se svestranost laptopa povećava eksponencijalno sa širokopojasnom vezom.

- Smanjena potreba za ispisanim materijalom. Studenti kao prednost vide mogućnost predavanja sadržaja u digitalnom obliku (s uštedom u papiru i toneru), kao i slanja na brz i učinkovit način. Štoviše, tu praksu doživljavaju kao brigu o okolišu, točnije kao smanjenje onečišćenja.

Vezano uz pozitivan učinak laptopa na učenje ispitanici navode trajno obogaćivanje i razvoj, samomotivaciju koja rezultira iz inovativne dinamike koja podržava suradnju i mogućnost razjašnjavanja sumnji.

Iako u manjoj mjeri, ispitanici također spominju ostale prednosti vezane uz prikupljanje i razmjenu informacija s ostalim studentima i korisnicima interneta, upotrebu laptopa za komunikaciju putem sinkronih i (čavrljanje) i asinkronih komunikacija (forumi, wikii, e-pošta i društvene mreže). Umjeren broj ispitanika izjavio je da se koristi mogućnostima koje im navedeni izvor nudi za posao, zabavu i upravljanje akademskim poslovima (prijavljivanje, plaćanje školarine, pristupanje osobnim podacima vezanima uz akademsko postignuće, pronalaženje stipendija i potpora, kao i postupke vezane uz takvo upravljanje).

Tablica 4

Koristi vezane uz korištenje laptopom prema iskazima studenata

OSNOVNA KATEGORIJA: *PERCEPCIJA KORISNOSTI VEZANA UZ KORIŠTENJE LAPTOPOM*			
Potkategorije		Učestalost	Na primjeru
Fleksibilnost	– Mobilnost	301	
	– Prikladnost	297	
	– Ušteda u radu	278	
	– Sati	276	
	– Polivalentnost	268	
	– Podrška	196	„(...). Također, omogućuje mi veću fleksibilnost kod vlastite raspoloživosti s ostalim studentima, kada moramo raditi u skupinama, ili s predavačima, kada su mi potrebna pojašnjenja i kada mogu poslati upit i dobiti odgovor (...).“
Učenje	– Odlučnost	145	
	– Poboljšanje	136	
	– Trajnost	131	
	– Opsežnost	120	
	– Osobnost	119	
	– Suradnja	115	
	– Motivacija	111	„(…) Drugu korist koju želim istaknuti jest pogodnost kod putovanja jer znaš da svoju radnu stanicu možeš imati kod sebe neovisno o tome kamo ideš te da ćeš moći pristupiti pohranjenim informacijama jednostavnim „klikom“ miša.“
	– Inovacija	109	
Informacija	– Savjet	107	
	– Dijeljenje	103	
Komunikacija	– Sinkrona	95	
	– Asinkrona	91	
Rad	– Online rad	89	
	– Korisnost	83	
Slobodno vrijeme	– Zabava	81	
Upravljanje	– Akademsko	76	

S druge strane, studenti nailaze i na određen broj prepreka koje mogu dovesti do sjedinjenja određenih uzoraka pri upotrebi laptopa, na štetu ostalih. Poteškoće koje su identificirali uglavnom podrazumijevaju:

- Tehničke probleme – loša širokopojasna veza i neispravnost određenih URL-ova.
- Poteškoće vezane uz smanjenu trajnost baterije, što ograničava slobodu kretanja ako se traži da studenti komuniciraju ili budu *online* kako bi izvršili određeni zadatak bilo akademske bilo osobne prirode; poteškoće vezane uz protok sadržaja na internetu.
- Nedovoljnu obuku. Ispitanici su izjavili da ne osjećaju da su u dovoljnoj mjeri razvili osnovne i specifične kompetencije koje trebaju usvojiti kako bi ih mogli povezati ili kako bi potpomogli tehničke vještine.
- Financijska ograničenja. Nemogućnost kupovine laptopa nekim studentima predstavlja smetnju (hendikep). Iako se na tržištu mogu naći i jeftiniji laptopi, oni još uvijek nisu prihvatljivi svim studentima.
- Problemi vezani uz trošenje vremena s obzirom na to da laptop ne omogućuje svim ispitanicima dobro upravljanje vremenom. Uglavnom su gubitak vremena povezali s poteškoćama u spajanju na internet putem Wi-Fi veze zbog ne uvijek dobre kvalitete signala.

Rasprava i zaključak

Općenito, ovim je istraživanjem otkriveno da se studenti redovito i uvijek koriste laptopom u akademskim, osobnim i društvenim područjima. Njime se koriste na različitim mjestima, u različitim vremenima i situacijama kako bi nastavili obuku. To ujedno omogućuje i stalno samousavršavanje jer se isprepleću formalno i neformalno, iskustveno i interaktivno učenje.

Studenti se najmanje koriste laptopom u jutarnjim satima, što je možda posljedica prisustvovanja nastavi, a ono što im nastavnici zadaju nije uvijek povezano s tehnologijom. Tako Burbules (2012) ukazuje na potrebu da uz aktivnosti vezane uz IKT gradimo strukturirane oblike učenja u kojima i nastavnik ima važnu ulogu. Međutim, ciljevi, metodologije, aktivnosti učenja i odnosi ili interakcija među studentima, kao i među nastavnicima i studentima u tehnološkom društvu mora biti promijenjeno, jer su se promijenili i sveobuhvatne dinamike i zahtjevi.

Uzorak korištenja laptopa među studentima na fakultetima u Španjolskoj, na osnovi njihovih iskaza, čini šest blokova: komunikacija, produkcija sadržaja, rukovanje informacijama; upravljanje; e-učenje i slobodno vrijeme. Na tu klasifikaciju utječu zahtjevi koje nameću nastavnici u procesu obrazovanja, vlastita inicijativa studenata, čimbenici okruženja i njihov odjek. Stoga su uzorci korištenja usmjereni prema zadovoljavanju akademskih i osobnih potreba. Istraživanje koje su proveli Smith i Caruso (2010) otkrilo je, uz određene sličnosti, da se studenti koriste laptopom uglavnom za komunikaciju, dijeljenje slika, pronalazak informacija, za kupovinu ili prodaju. Rezultati našega istraživanja ukazuju na postojanje vrlo male raznolikosti

u aktivnostima i ograničenost uzoraka aktivnosti, što je rezultat ograničenog, svakodnevnog korištenja laptopom. Slučaj je isti i u drugim zemljama u kojima je tehnološka razina razvoja, kao i prihod po glavi stanovnika, umjeren ili niži od onih u vrlo industrijaliziranim zemljama (Danner i Pessu, 2013).

Studenti na fakultetu vrlo su osviješteni u tome da moraju posjedovati tehničke vještine kako bi izveli određeni broj zadataka koristeći se laptopom. Međutim, također prepoznaju da, uz te vještine, digitalna kompetencija zahtijeva i kombinaciju različitih transverzalnih sposobnosti. Važnost tehnologije u svakodnevnom životu građana općenito, a posebno studenata, golema je. Tehnološka pismenost postala je funkcionalni uvjet za provođenje inicijalne obuke, interakcije s ljudima i u izvedbi mnogih vrsta poslova. Slažemo se s Bennettom, Matonom i Kervinom (2008) da, iako studenti u visokom obrazovanju trenutno imaju više kompetencija i mogućnosti s IKTom od studenata prijašnjih generacija, oni moraju zadovoljiti tehnologijski izazov kako bi bili što bolje pripremljeni za daljnja djelovanja.

Laptop studentima uglavnom omogućuje uživanje u fleksibilnosti s obzirom na mobilnost, korištenje uređaja na bilo kojem mjestu, u bilo kojoj situaciji i u bilo koje vrijeme dana. Pozitivan učinak utvrđen je jer laptop potpomaže trajno učenje i kombinaciju formalnog i neformalnog učenja. Također, potpomažu pristup informacijama i komunikaciji na različite načine, brzo razrješavanje ili pojašnjenje akademskih pitanja, sinkronu ili asinkronu suradnju. Ti aspekti ukazuju na veliku usporednost s uzorcima iz prakse koju navode i sami studenti, što je očito potencirano, i s korisnošću koju percipiraju. Druga istraživanja otkrila su da korisnost koju generira taj tip uređaja uključuje, između ostalih, mogućnost učenja na visokoj razini personalizacije (Tapia i sur., 2008). Rezultati našega istraživanja također su pokazali da studenti vide laptop kao koristan za rješavanja zadatka upravljanja (eng. *management*). Što se tiče slobodnog vremena vrijednost laptopa je u mogućnosti zabave koju pruža.

Percepcija studenata o nedostacima korištenja laptopom, zajedno s koristima, povezana je s njihovim uzorkom korištenja. Problemi koje studenti naglašavaju uključuju tehničke poteškoće, nedovoljnu obuku za upotrebu uređaja i cijenu. Iako nedostatci vezani uz nedovoljnu mogućnost povezivanja na internet ili nedovoljno brzu vezu nisu ozbiljni, oni mogu imati određeni učinak na akademsko postignuće. S obzirom na te čimbenike priklonit ćemo se pozivu Dannera i Pessua (2013) da institucionalni, politički, znanstveni i obrazovni tvorci politike predlože rješenja koja će ublažiti studentske poteškoće.

Ograničenja u istraživanju i doprinos praksi

Prikazani su rezultati preliminarni s obzirom na to da je projekt još uvijek aktivan. Po njegovu završetku moći ćemo prikazati završne rezultate dobivene metodologijom triangulacije. Rezultati i zaključci, koji su kvalitativne prirode, ne podliježu statističkom generaliziranju. Međutim, oni se, uz odgovarajuća razmatranja, mogu ekstrapolirati u druge kontekste s obzirom na to da se radi o temama od univerzalnog interesa

(Stenhouse, 1985) u trajno povezanoj globalnoj zajednici. Rezultati omogućuju razumijevanje i šire znanje o sveprisutnoj upotrebi laptopa među studentima – u akademske svrhe ili na vlastitu inicijativu, za aktivnosti u slobodno vrijeme ili kao oblik društvene interakcije.

Ovaj rad otkriva stalne uzorke, na osnovi pokazatelja, vezane uz sveprisutnu upotrebu laptopa, s obzirom na kontekst, aktivnosti, kompetencije koje dolaze do izražaja, korisnost i nedostatke s kojima se suočavaju, što je jasan pokazatelj situacije koja se promatra. Gledano u cjelini ili odvojeno ti podaci mogu biti korisni nastavnicima u visokom obrazovanju u planiranju i provođenju nastave. Štoviše, mogli bi potaknuti refleksivno ponašanje, posebno vezano uz daljnje propitivanje primjenjivosti laptopa i poboljšanje uzoraka korištenja laptopa putem diversifikacije pedagoške prakse i izvora.