LEARNING ANYWHERE, ANYTIME: THROUGH A LAPTOP

A PILOT STUDY IN A SECONDARY SCHOOL

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ABSTRACT

The reduction in the cost of laptops has increased their use and they have become a real tool in the teaching and learning process, making possible the development of true life-long learning abilities in young people. The young people of today have grown up with advanced technologies and spend a large part of their time using them. This fact allowed us to carry out a pilot study with laptops connected to the Internet, one-to-one, with students of Professional School. This study took place in the third term of 2005/2006, and data collection was by questionnaires, interview and log book. The results show a positive impact of the laptops in relation to motivation, group work, research and the communicative interaction. However, some pupils said that the laptop is a tool which will provide a high level of disturbance.

KEYWORDS

Laptop, learning anywhere, anytime, mobility, portability.

1. INTRODUCTION

Technological developments have helped people to be more connected than ever before and their attraction to mobile technologies increases more and more.Technologies such as Wi-Fi, WiMAX, Bluetooth or 3.5G offer universal public access and are changing our way of communicating, working, living and learning.

Mobile learning (or m-learning) will allow access to information anywhere and anytime, and according to Marçal, E. et al (2005) “Mobile computing emerges as an innovative technology for the educational area”. Supported by these ideas we began a pilot study during the 2005/2006 school year at the Professional School of Braga. Despite the increase in the number of studies in this field, in Portugal they are still scarce, therefore we were interested in studying this topic. Thus, the main objective of the pilot study was to observe the reactions of the pupils to the use of laptops on a one-to-one basis in the teaching and learning process and the effects on the students’ learning, individual and collaborative work and their attitude toward the school.

Each student was given a laptop with a twenty-four-hours-a-day 3G Internet connection. They were all given total freedom to use the laptop for the duration of the pilot study. They could use it either at the school, or at home. For the purposes of this paper we will present only part of the data obtained during the study.

2. ONE-TO-ONE LAPTOP COMPUTING STUDIES

Several studies conducted over the past five years have examined the effects of one-to-one computing on teaching, learning and students achievement. A study conducted in one South Carolina county did find that one-to-one laptop computing had a positive impact on standardized test scores, particularly for students eligible for free and reduced-price lunch (Stevenson, 1998).

A recent literature review concludes that a growing body of research “indicates that the computer and related technologies, when combined with teacher training and support, can be a transformational agent and help create new learning environments…” (Fouts, 2000). An article notes that “participation in laptop programs has come to be associated with more regular school attendance and with students staying in school longer—variables key to learning and achievement” (Carter, 2001). Some other interesting studies, like Philips’ project, which developed a portable organizer for children of 7 to 12 years old (Oosterholt et al,

1996), palmtops were used to teach genetics to children in Canada (Danesh et al, 2001), the Great Maine Schools Project (GMSP) (2004) and an important study is the Maine Learning Technology Initiative (MLTI), (Muir, et al: 2004).

The large majority of the young people use advanced technologies in her daily routine and they have data-processing abilities and skills which make several of them geniuses in computing science. In both developed and developing countries we already find young specialists in data processing who have high levels of performance, as Jepsen (2006) says, "study after study shows that kids take to computers quickly and easily, not just in the rich countries, but in the slums of the developing world. An average 5-year-old child in any country is a curious, engaging and energetic sponge for information and knowledge".

With mobile technologies a new paradigm appear in education, "in the short space of five years, mobile learning (mlearning) has moved from being a theory, explored by academic and technology enthusiasts, into a real and valuable contribution to learning" (Stead, 2005).

3. STUDY DESCRIPTION[1]

At the beginning of the third term of the school year 2005/2006 each student was given a laptop in order to carry out a pilot study, in the Escola Profissional de Braga, a Secondary School, located in Braga, in the north of Portugal. IBM provided the students with 19 laptop computers. The students had a permanent 1:1 laptop environment for three months and they had a twenty-four-hours-a-day connection to the internet, sponsored by VODAFONE.

In the first week students learnt how to use the laptops, troubleshoot problems, download software, and to use computers during Portuguese Literature classes[2]. Students had the laptops with them all the time, they brought them to school and they were able to use them in all subjects.

Our main objective was to find out how teaching and learning change when students are provided with their own laptop computer and how the students' behaviour was affected. Data relating to the use of technology in school and at home and the effect of this use on learning activities and computer literacy was collected by questionnaire focused on pupils' attitudes towards access to information on the Internet with a laptop, concerning the individual and collaborative learning and also about the school. This questionnaire was divided into three parts. For this paper we present only the results of part two where we wanted to study the attitudes of the pupils to the use of the laptop for accessing information and on their opinions regarding the differences between individual and collaborative learning.

3.1 Data Analysis

The data analysis presented in this section is derived from the questionnaire relating to the laptops. For reasons of space we grouped the answers of part two under headings of agreement, disagreement and indecision relative to the items in the table.

The first category concerns mobility in respect of access to, and publication of information, as we can see in table 1. It confirms that most of the students (63%) liked the ability to access information from anywhere, they like to be able to work where and when they want (90%), with the laptop they easily have access to the work of their colleagues (84%) and that they publish work when and where they want to (89%). The mobility and flexibility aspect that the laptop allows was emphasised by several pupils and they considered it as a very valuable learning aid.

Table 1. Mobility (N=19)

Items	Disagree		Undecided		Agree	
	f	%	f	%	f	%
With a laptop I can access information anywhere	3	16	4	21	12	63
I like to work where and when I want	1	5	1	5	17	90
I can easily access the work of my colleagues	0	0	3	16	16	84
I publish my work when and where I want	0	0	2	11	17	89

Regarding motivation (table 2), the majority of the pupils (63%) feel that with the laptop they are more involved in the school activities and 89% of the pupils take the initiative to search for the information which they need for their learning. As regards the question about whether they prefer to work alone, 48% of the pupils agreed and 37% of the pupils were undecided. These data are in agreement with the results of Great Maine Schools Project (2004), "Our findings strongly suggest that the laptop program has improved student motivation and interest in school".

[1] Research supported by IBM and VODAFONE.

[2] http://portuguesonline2.no.sapo.pt

Table 2. Motivation (N=19)

Items	Disagree		Undecided		Agree	
	f	%	f	%	f	%
I feel I'm involved in the school activities	0	0	7	37	12	63
I take the initiative of seeking the information that I need	0	0	2	11	17	89
I prefer to work alone	4	21	7	37	8	48

For self-learning (table 3), the majority of the pupils (63%) said they felt more autonomous in learning when working with a laptop and almost all (95%) said that they also carried out activities for other subjects. The majority (84%) of the pupils said that they easily learnt how to use the laptop keyboard and that the laptop gave them the ability to carry out school activities more quickly and it also allowed communication with classmates.

Table 3. Self-learning (N=19)

Items	Disagree		Undecided		Agree	
	f	%	f	%	f	%
I feel more autonomous in learning	0	0	7	37	12	63
I also do activities for other subjects	0	0	1	5	18	95
I easily learned how to use the laptop keyboard	0	0	3	16	16	84

In respect of the category communication/interaction (table 4), the majority of the pupils (58%) said that they collaborated more in online group activities, and 100% of the pupils said that they now communicate more online since they received the laptop and 89% said they increased electronic text communication since they learnt to use some communication services. The data which we obtained shows that the ability to communicate/interact with classmates improved the performance of the more timid pupils.

Table 4. Communication/Interaction (N=19)

Items	Disagree		Undecided		Agree	
	f	%	f	%	f	%
I collaborate more in online group activities	0	0	8	42	11	58
Now I communicate more online than before	0	0	0	0	19	100
I increased electronic text communication	0	0	2	11	17	89

On the impact of the use of the laptop in different teaching fields (table 5), the majority of the pupils (84%) said that the laptop had an impact in finding information on the Web, in curriculum contents learning (89%), in collaborative work (84%) and in individual work (95%). A great impact was also seen in the usage during leisure time with 95% of the pupils to saying that having a laptop had a great impact on their leisure, especially for the pupils who did not have an Internet connection at home.

Table 5. Impact on laptop use (N=19)

Area	None		Little		Some		Much	
	f	%	f	%	f	%	f	%
Data research	2	11	1	5	10	52	6	32
Learning curriculum contents	0	0	2	11	13	68	4	21
Collaborative work	1	5	2	11	13	68	3	16
Individual work	1	5	0	0	10	53	8	42
Usage during leisure time	1	5	0	0	4	21	14	74

As regards the frequency of use of the laptop for different activities (table 6), we wanted to find out if the pupils also worked in curriculum activities outside the classroom. Thus, the majority of the pupils (58%) said they worked on Portuguese language syllabus activities 2 a 5 times week. Most (74%) also said they wrote in the forum topic once a week. As regards listening to the Portuguese literature podcasts, the majority (72%) said they rarely listened to them, which surprised us because in other activities the pupils showed large receptivity of this didactic tool. However, more than half of pupils (58%) said they had published work in the Wiki pages and had done other school work 2 or 5 times a week. These show us that the frequency of the use of the laptop for doing activities concerning the teaching/learning process did not have as significant an increase as we had hoped. Regarding the use of Messenger and email, 42% and 37% of the pupils, respectively, said they used them 2 or more times a day. In respect of the use of laptop for playing, 41% of the pupils said they did it 2 or more times a week, however, downloading data was rare for 32% of the pupils and 26% said they did it 2 or more times a day.

The research revealed that in their spare time, the students used the laptop more for entertainment than for study, as can be seen in table 5. The students said that initially, the "novelty" aspect of the laptops meant that they did not concentrate on their use for teaching and learning but instead they used them in their spare time for personal entertainment

Table 6. Frequency of use one laptop (N=19)

Area	Never		Rarely		Once a week		2 to 5 times week		Once a day		2 or more times a day	
	f	%	f	%	f	%	f	%	f	%	f	%
To access to the Portuguese subject assessments	0	0	0	0	4	21	11	58	3	16	1	5
To participate in the forum	0	0	1	5	14	74	3	16	0	0	1	5
To listen to Portuguese literature podcasts	2	11	13	72	2	11	0	0	0	0	1	6
To Publish work in Wiki pages	0	0	1	5	5	26	11	58	2	11	0	0
To do school work	0	0	0	0	6	32	11	58	1	5	1	5
To use Messenger	0	0	0	0	0	0	4	21	7	37	8	42
To use email	0	0	1	5	1	5	7	37	3	16	7	37
To Play	0	0	2	11	2	11	8	41	5	26	2	11
To download data	1	5	6	32	2	11	4	21	1	5	5	26

4. CONCLUSION

Our findings strongly suggest that the laptop program has improved student motivation to work in groups or individually and it has increased interest in curriculum activities and in the school generally. The use of ICT in education has a history of changing the pedagogical assumptions made by everyone involved.

According to the results of this pilot project both students and teacher appreciated the flexibility that laptop computing provided. The results were a little more positive than expected. Most students who participated in this study worked well, to organise their activities and to use laptops in an effective way. When working with laptops some students said they had more leisure time. Flexibility and mobility were the most appreciated elements of this pilot study according to our results. The flexibility of mLearning made it possible to learn almost anywhere, the students and teacher could choose the best place to work themselves.

The idea of mobility is that we can work anywhere, that is, in "non-places" which are very suitable for working because it is easy to concentrate without distractions but sometimes some students cannot concentrate on work effectively and they are easily distracted. Some people need quite surroundings to be able to study, other people can study anywhere. In this pilot study we experimented with teaching and learning outside the classroom and the student's participation was very positive.

Our findings approximate very closely to the conclusion of Canadian mobile computing project (Cox, 2006), that showed that laptops enabled a much wider range of student interaction with course materials, with teachers and with each other, and seemed to spark more intense student involvement in all activities. In writing, we're finding that students are reviewing and editing their material a lot more, they're sharing, reviewing and critiquing much more than before. This research showed a positive correlation between participation in laptop programs and increased academic activities. The potential benefits of using laptops in school are improvements in student motivation, engagement, organization, homework completion and collaborative learning. In the future we expect a powerful and versatile laptop computer to satisfy all mobile needs. The use of laptops in the classroom sparks rethinking of educational methods. The students' positive response greatly encouraged us to continue working in such a recent and innovative experience.

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