

THE USE OF INFORMATION AND COMMUNICATION TECNOLOGIES BY PORTUGUESE STUDENTS

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Our study, which has been done during the school-year 2002/2003, is based on the answers of 59 488 individuals (70%) of a sample of 84 757 students attending the 4th, 6th, 8th, 9th, and 11th grades, throughout the entire network of Portuguese public and private schools, within the total universe of 539 842 students. The goal of the study was to know about the use of information technologies used by Portuguese students, either at school or at home. Our questionnaires encompassed quantitative and qualitative questions, all of them closed. An answer sheet, which was supposed to be automatically read, was conceived. We highlight the main conclusions:

- 64% of the student's families have a computer and 36% have an Internet connection at home. The computer equipment of Portuguese families improved substantially in the latter years (in 2001, the percentage of families having computers was 39%, while the percentage of families with Internet was 30%). 92% of the 11th year students own a mobile telephone and 72% own a personal computer.
- Only about 60% of the students use the computer at home (36% do not have a computer and 5% have one but do not use it). The computer is being used for text processing (46%) and playing (43%). Internet search follows with 19%. Playing games is an activity typically associated to boys, in particular the students who use their computer for longer periods.
- The initiation to computer use was done for 44% of the inquired students by self-learning (this part of the population is made up mainly by boys). This question, when it is examined separately by each school year, show that self-learning is more common in the 9th and 11th grade. Teacher's influence on computer learning is significant for the 4th and 6th grades students, but is minor for the 8th and 9th grades (17-18%).
- Also computer learning induced by teachers is much more important for students belonging to families with lower income. It is well known that wealthier families have more equipments and more capacity for forming their children.
- Only 39% of the students use *e-mail*, mainly to communicate with friends (almost never with teachers) and this use appears strongly associated with high socio-cultural environments.
- Less favored students use computers more at school than at home.

1 Introduction

Portuguese schools have been endowed with computers, in the framework of programs aimed at promoting the information society. However, the school is not any more the sole space where we learn: in the information society space and time do not restrict social interactions [1].

To know the national reality concerning the Information and Communication Technologies (ICT) is necessary to undertake future actions. The fact that statistics are scarce and obsolete motivates us to undertake field studies aimed directly at teachers and students.

Thus, the Department of Evaluation, Prospective and Planning (DAPP) of the Ministry for Education, through the program “Nonius 21st Century”, in collaboration with the Competence Center “Softciências” of the Portuguese Physical Society and the Center for Computational Physics of the University of Coimbra (Science Teaching Group), carried out a research project that included two statistical studies, one involving 19 337 teachers of all grades (except higher education), in 2001/2002 [3], and another, accomplished in July 2003, involving students [4].

These works result from the need to measure and evaluate the relation between students and technologies with the aim of selecting the tools and methods that may lead to educational progress in what concerns the introduction of the ICT in schools.

This paper provides some results of the study “The information and communication technologies: its use by the students” [2]. We present a summary of the research, as well as of its objectives, analysis, results and conclusions. In http://www.dapp.min-edu.pt/nonio/pdf/estudo_alunos-v3.pdf the complete version of this research is available (in Portuguese).

2 The study

2.1 Description

Our study’s base was a questionnaire and an associated answer sheet ready for optical reading. It involved a sample of 84 757 students from the 4th, 6th, 8th, 9th and 11th grades from a universe of 539 842 students, attending Portuguese state and private schools, in 2002/2003. Information gathering took place between November 2002 and March 2003. 59 488 students’ answers (70,2%) were validated.

2.2 Goals

Our goals were the following:

- Characterize the computing equipment of families and students.
- Characterize quantitatively and qualitatively the use students make of the computer hardware they own, in particular for accomplishing tasks related to the educational activity.
- Quantify the number of weekly hours students spend at the computer (doing homework’s, playing, surfing the net, chatting, etc.)
- Know the forms and contexts computers are used by students at school.
- Relate previous objectives with several variables as gender, school type and social development index (SDI)¹ of the school county.
- To know what the students think about ICT.

3 Results

From the analysis of the answers of the 59 488 students, divided by five school grades (4th – 10 674, 6th – 13 710, 8th – 13 042 and the 11th – 8 140), some important results come out:

1. 64% of students’ families have a computer, 59% a printer, 31% a scanner, 36% Internet connection, 51% CD-R and CD-RW, 19% photo or video digital camera and 28% of families do not possess any of these equipment. The availability of computer hardware by families has substantially improved in the latter years: in 2001 the percentage of computers was of 39% and of Internet connection 30% [4].

¹ The Social Developing Index (SDI) is composed by the following parameters: life expectancy at birth, educational level, and comfort and sanitation. It is legally defined by countries. We have grouped SDI values in four groups from low development and bad life conditions (SDI1) up to a quality life in all aspects (SDI4), with intermediate values, the SDI 2 and SDI 3, respectively.

- The equipments own by families depend not only on the school grade their children are attending (Figure 1) but also on the county's SDI.

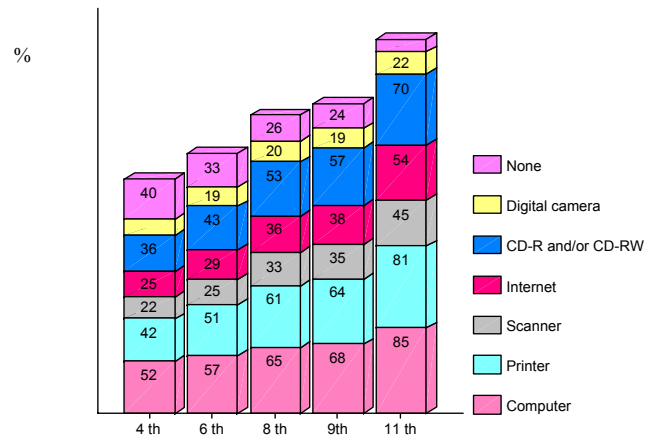


Figure 1 - Distribution of computer equipment by the attended school grade

- As for the equipment that belongs to the students themselves, we verified that: 55% of the students have computer, 71% mobile phone, 53% console, 30% Game Boy, 23% game accessories and 9% do not have any of this material. Relatively to the equipment relationship with SDI, one notices that mobile phone, consoles and Game Boy depend less on SDI than the computer (Figure 2).

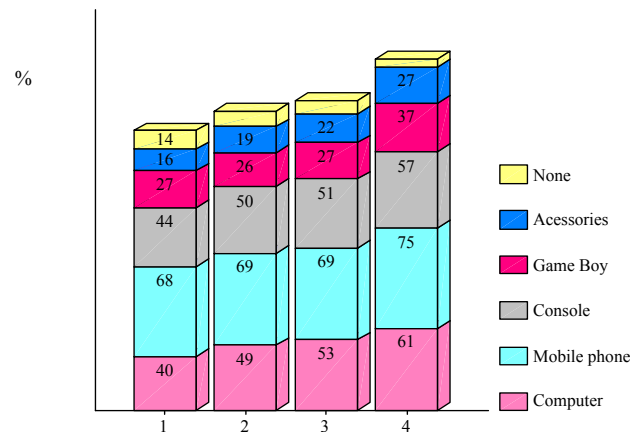


Figure 2 - Distribution of students' equipment by SDI

- 60% of the pupils who use computer at home (we recall that 36% do not have and 5% do not use it), 46% use it for Word-processing and 43% for playing. Internet use comes next with 30%, educative games with 18% and email with 19%. Surfing in the Net appears quite often in the 11th grade.
- What students best enjoy to do with computers is to play - 27% - and in the 8th, 9th and 11th grades to participate in chats. Word-processing had 8% of choices, search in the Net 5%, play educative games 2% and send e-mails 1%. We checked the predominance of the recreational (27%) against educative games (2%). Games are more associated to boys, in particular those who use the computer for longer periods.

6. In families, which have computers (64%), 27% of the parents do not use the computer, 17% use the computer but not the Internet and 20% use the computer and the Internet. We verified that, in the families, the computer mainly serves the youngsters, in particular those in the higher school levels.
7. 44% of the parents find important that their children know to work with computers. This percentage increases with the school year and varies very little with the SDI.
8. The introduction of students to computer work was as follows: self-learning 44%, with the family 33%, with teachers 23%, with friends/colleagues 19%, and 10% have not learned anything yet. Self-learning is more frequent in 9th and 11th grades. The influence of the teacher is very significant for the students in 4th grade, less significant for the ones in 6th grade and residual in 8th and 9th forms (17-18%). For students of the 11th grade teachers' influence has some importance (28%), in particular for the SDI1 and SDI2 groups. We verified a larger influence of families in the initiation to computers of younger students (attending the 4th and 6th grades) but of high SDI. Boys tend more to self-learning than girls.
9. At home, 53% of students perform their homework with computer help, 58% play, 44% surf in the Net and 30% participate in chats.
10. Weekly time spent to perform computer tasks (study, play, Net surfing, chatting) is very small, even if one thinks of the activities students enjoy doing. This may be due to the price of staying on-line.
11. Only 39% of students of 8th, 9th and 11th grades (in a total of 48 814 students) take advantage of e-mail, mainly to communicate with friends and always in high SDI regions (bandwidth only exist for SDI3 and 4). Teachers almost do not use e-mail.
12. School computers are mainly used during classes (strict disciplines and/or educative complements) and free time. In the former the prevailing use in educative complements² with the exception of the 4th grade. Although not very intensively, scientific disciplines are those which most use the computer.
13. The distribution of computer used along the different school activities in all school grades (in the 8th and 9th grades this relation has no expression) show an interesting SDI dependence (Figure 3).

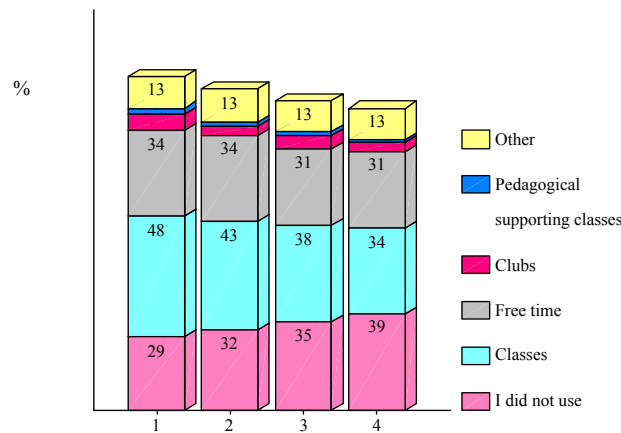


Figure 3 – Distribution of computer use in schools by SDI.

14. 6% of students in the 4th grade say that computers in their schools are out of service, 15% stress the need for equipment upgrade and 27% say they do not have Internet or that it does not work.
15. The frequency of computer use in schools is 14% for “once a week” and 8% for “less than once a month”. A surprising fact is that the frequency of computer use in schools decreases with SDI.
16. Only 26% of students can use computers and Internet at their schools when they do not have classes or whenever they want to.

² Project Area, Accompanied Study and Civic Formation.

17. What students most do with computers at school is Word-processing, Internet surfing, game playing and chatting. They do at schools the same activities they do at home.
18. 24% of students in the 4th grade 18% of the 6th grade, 31% of the 8th grade, 27% of the 9th grade and 17% of 11th grade have never used computers.
19. Students think that teachers do not use computers at school mainly because computers are lacking (61%). 36% say that teachers "have to teach the syllabus".
20. 82% of students consider that it is not important to know very much about computers to be a good student.

4 Final Comment

In Portugal (excluding the Madeira and Azores islands), the education level of the parents is still low: 35% of the fathers and 32% of the mothers have only the 4th grade and only 10% of parents have an academic degree.

The fact that not only the equipments, which are available, at home are more and better in more developed environments is related to the well-known info-exclusion problem. The role of the school to prevent this is of course crucial [4].

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