HUMAN TECHNOLOGY

An Interdisciplinary Journal on Humans in ICT Environments ISSN: 1795-6889

www.humantechnology.jyu.fi Volume 1 (2), October 2005, 246-264

ICT IN CHILEAN SCHOOLS: STUDENTS' AND TEACHERS' ACCESS TO AND USE OF ICT

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Abstract: *This paper presents the results of the analysis of the data from a national survey of the Chilean educational ICT infrastructure and its use in schools implemented by the Centre for Technology and Education of the Chilean Ministry of Education in 2004. Results show that the context of ICT use in Chilean schools can be characterized as relatively good, insofar as there are no first-order barriers for implementing ICT pedagogy. In this context, students' ICT use can be categorized based on four factors: communication, productivity, recreation, and communication with teachers. On the other hand, teachers' ICT use can be categorized using three factors: communication, teaching, and technical. Based on these factors and considering the availability and use of ICT in schools, the question remains how to make this time most effective for improving students' learning. Additionally, results show that students, on their own, spend a considerable amount of time developing activities described as communication. The question that arises from this finding is how to take advantage of these activities in order to meet teaching and learning aims. Regarding teachers, results open possibilities for redesigning professional development courses by taking advantage of what they already do with ICT.*

Keywords: *ICT in education, ICT use in schools, ICT pedagogy, ICT infrastructure.*

INTRODUCTION

Since the early 1990s, Chile has been implementing an educational reform to upgrade the quality and equity of Chilean education. The main components of this reform are comprehensive investment and support programs, which combine more resources with new teaching and learning methodologies; specific programs for the poorer schools; a new, more

URN:NBN:fi:jyu-2005360

ambitious and contemporary curriculum aimed at developing higher order thinking skills; an extended school day for the whole student population; and better salaries and working conditions for teachers (see Banco Interamericano de Desarrollo, 2005). In this context, *Enlaces* (Links) has been the information and communications technology (ICT) initiative of this reform since 1992 (Hinostroza, Hepp, Cox, & Guzmán, 2003). Its aim is to integrate technologies as learning and teaching resources for all students and teachers in the 10,000 Chilean public schools, as 90% of the total student population attends public schools in Chile. By the year 2005, 88% of primary and 85% of secondary schools participated in *Enlaces*, covering 93% of the student population (Enclaces, 2005). Each of these schools received computers, local networks, and educational and productivity software, and most of them have free and unlimited Internet access to specially created educational content relevant to the Chilean curriculum. In addition, the Ministry of Education, in partnership with 24 universities all over the country, provides long-term technical and pedagogical support to each school, with 83% of teachers already trained in the basic use of ICT (Hepp, Hinostroza, & Laval, 2004; Potashnik, 1996).

Within this framework, *Enlaces* is still looking for strategies that produce positive impacts on students' learning results (as defined and measured by the national curriculum), as are many other ICT-in-education initiatives around the world. Despite the number of national and international studies that have tried to unveil the "expected" causal relation between ICT availability and use in schools with students' higher achievements, results still show that, although there is evidence of impact in specific areas, computer-based technology is only one element in what must be a coordinated approach for improving curriculum, pedagogy, assessment, teacher development, and other aspects of the schools' culture (McCombs, 2000; Roshelle, Pea, Hoadley, Gordin, & Means, 2000). In fact, more recent studies claim that:

> There is a growing body of evidence relating to the positive impact of ICT on learner attainment and other outcomes, but we need to develop further our understanding of effective ICT pedagogies and how they can be supported. Factors which account for whether there is positive impact on learning include subject tradition with ICT, use across the curriculum, and quality of leadership and teaching. (British Educational Communications and Technology Agency [Becta], 2005, p. 4)

In this vein of answering the call for developing further understanding of effective ICT pedagogies, some international studies do provide evidence about the way in which students and teachers use ICT (Kozma, 2003; Organization for Economic Co-operation and Development [OECD], 2001; Pelgrum & Anderson, 1999). Particularly, one of the results of the SITES Module 2 (SITES M2) research (International Association for the Evaluation of Educational Achievement, n.d.; see also Kankaanranta, 2005, this issue) is a description of four models of innovative pedagogical practices using technology:

> 1. *Student collaboration*. In this model, teachers advise students, structure their activities and monitor their progress. Students, on the other hand, collaborate with others in their class and search for information. Both teachers and students use e-

> mail and productivity tools. ICT supports the search for information and communication with others.
>
> 2. *Student research*. In this model, students conduct research and solve problems; use e-mail and productivity tools to search for information; and use multimedia, web resources and local area networks to plan and create products. Teachers, on the other hand, often design materials.
>
> 3. *Product*. In this model, students create products and publish or present results. Teachers collaborate with their peers and design instructional materials. Multimedia is used in addition to e-mail and productivity tools, and ICT supports the creation of products.
>
> 4. *Outside collaboration*. In this model, students collaborate with others both inside and outside the class, they search for information, and create and publish results. Teachers collaborate with peers in this model. (Kozma & McGee, 2003, pp. 72-75)

These definitions (as well as those described in other studies) could be useful in informing the types of activities that students and teachers perform using ICT, given the focus of the study on pedagogical practices. Despite this, these definitions do not necessarily inform the discussion about other uses of ICT that are generally not considered to be part of a "pedagogical practice" (for example, recreational ones).

Therefore, although this study builds on previous research aimed at understanding what teachers and students do with ICT in innovative schools (Kozma, 2003; Venezky, 2002), it looks for a variety of pedagogical and nonpedagogical uses of ICT and, based on these results, proposes a typology of activities that students and teachers do with ICT, incorporating the context in which these types of activities are done. The aim is to enrich the discussion regarding ICT use in schools, and to provide a characterization of ICT-based activities that could be used as a basis for further analysis.

The text is organized so as to present first the context in which Chilean students and teachers use ICT, considering (a) the availability of computers and the Internet at school and the amount of computer use, since access is, obviously, a key factor (Cox et al., 2003) for implementing ICT pedagogy; (b) students' and teachers' ICT skills, given that the general lack of teacher computer skills has been identified by some authors as a relevant barrier for the spread of ICT-based learning in schools (Carnoy, 2002; Pelgrum, 2001); and (c) some general policies present in schools, since the use of ICT as a lever to bring about change was found common among innovative schools (Venezky, 2002). Second, this article presents and analyzes the activities that students and teachers do with ICT. Finally, these results and implications are discussed in the last section.

METHODOLOGY

Results presented in this paper are based on the analysis of the data of a study carried out during 2004 by the Centre of Education and Technology of the Chilean Ministry of Education (Enlaces, 2005). That study was designed as a survey and used an adapted version of the

instruments developed by the UNESCO ICT international study (UNESCO, 2003). The general procedure of the survey considered the following activities: translation, adaptation and validation of the instruments; development and test of the online version of the instruments; sample sizing estimation and selection; administration of the survey instruments; transcription of data and database clean-up; and descriptive statistical analysis.

The sample of the study was stratified and proportional with a 95% of confidence and it was representative of all the schools in the country. The survey consisted of the administration of three questionnaires:

- Computer Lab Coordinator Questionnaire, applied to one teacher per school.
- Teacher Questionnaire, applied to a maximum of five randomly selected teachers per school. In primary schools, the selection was among teachers teaching 7^{th} or 8^{th} grade, in secondary schools among teachers teaching 10^{th} grade.
- Student Questionnaire, applied to a maximum of 10 randomly selected students per schools. In primary schools, students where in 7^{th} or 8^{th} grade and in secondary schools students where in 10^{th} grade.

Questionnaires were available both as paper and on-line versions, and participants were encouraged to use the latter. Regardless of the version of the questionnaire, the application was supervised by a trained data collector.

The data collection of the national survey resulted in questionnaires answered by 385 technology coordinators; 1,911 teachers; and 3,843 students. Half of the questionnaires were answered using the on-line version and no statistically meaningful bias was found comparing the answers of the two versions.

After the process of database clean up, two procedures were carried out. First, the data were adjusted using an expansion factor based on the sample stratification in order to represent the schools in the system. Then, for the results that represented the student population, a correction factor based on the student population of each school was used in order to assign the adequate weight to each school. The resulting data was used for the analysis presented in this paper.

The research questions that guided the analysis presented in this paper were:

- What access do students and teachers have to ICT in the schools?
- What ICT skills do students and teachers have in the schools?
- What general ICT-related policies are present in the schools?
- What type of activities do students and teachers perform with ICT?

In order to answer these questions, three analyses were carried out. First, the frequency of items related to ICT access of students and teachers, and the ICT skills and the ICT policies were identified. Next, a multivariate analysis, specifically a factorial analysis, was conducted. (Factors were identified using the principal component extraction and varimax rotation methods). This analysis was done to find the groups of activities that teachers and students do, based on the 19 and 20 items of ICT use in the student and teacher questionnaires, respectively. Finally, a bivariate Pearson correlation between these factors was carried out with the students' and teachers' resulting factors.

RESULTS

Availability and Access to ICT

Since 1993, the *Enlaces* project has acquired and distributed computers to the schools. By 2004, this effort, together with schools' own initiatives, has resulted in the average Chilean primary schools having 16 computers, with a ratio of 36 students per computer, and secondary schools having 37 computers, with a ratio of 26 students per computer. The distribution of these computers in schools is presented in Figure 1.

The majority of the computers in primary and secondary schools are located in the Computer Lab (72% and 62%, respectively), and only 3% are in the classrooms of primary schools and 6% in secondary school classrooms. This implies that, on average, secondary schools have 2 computers placed in the classrooms, and that not every primary school has even one in the classroom.

The concept of building a network of schools was embedded in the early design of *Enlaces* (see Hepp, 1998), therefore the provision of access to the Internet and digital resources is at the core of the program. Results of the survey showed that 74% and 98% of primary and secondary schools, respectively, have access to Internet, and that, in 33% of the primary and 60% of secondary schools, the connection is broadband.

The infrastructure available at schools is widely used during the week. In fact, results indicated that the computer lab is used 32 hours per week in primary schools and 37 hours per week in secondary schools. Figure 2 shows the amount of time that the computer lab is used for different activities during the week.

Figure 2 also shows that the distribution of use among the various users of the computer lab is similar, in so far as primary and secondary schools students use the lab 65% of the time. Teachers use the lab 29% of the time and the community uses it 6% of the time[1]. On the other

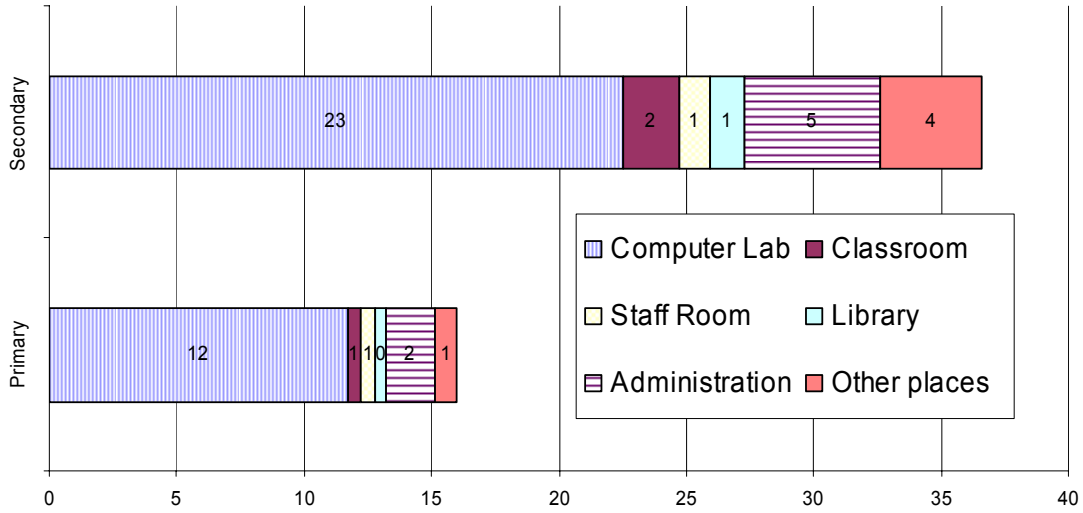

Figure 1. Number and location of computers.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

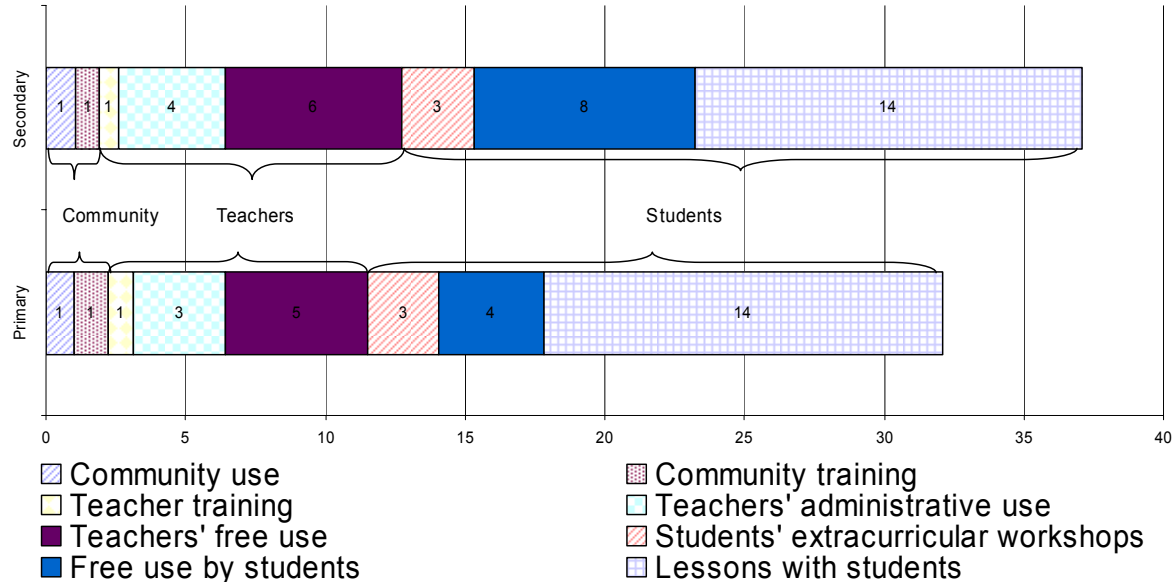

Figure 2. Hours per week that the school computer lab is used for different activities.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

hand, primary school students have less time of free access to the computers, as compared to secondary school students (12% vs. 21%) and primary school teachers spend more time using the lab for lessons than do their peers in secondary schools (44% vs. 38%).

Regarding the individual time of ICT use, Figure 3 shows results indicating that the average primary school teacher uses the computer for 4 hours a week (2 with students and 2 without students) and a secondary school teacher uses it for 8 hours a week (3 with students and 5 without students). On the other hand, the average primary school student uses the

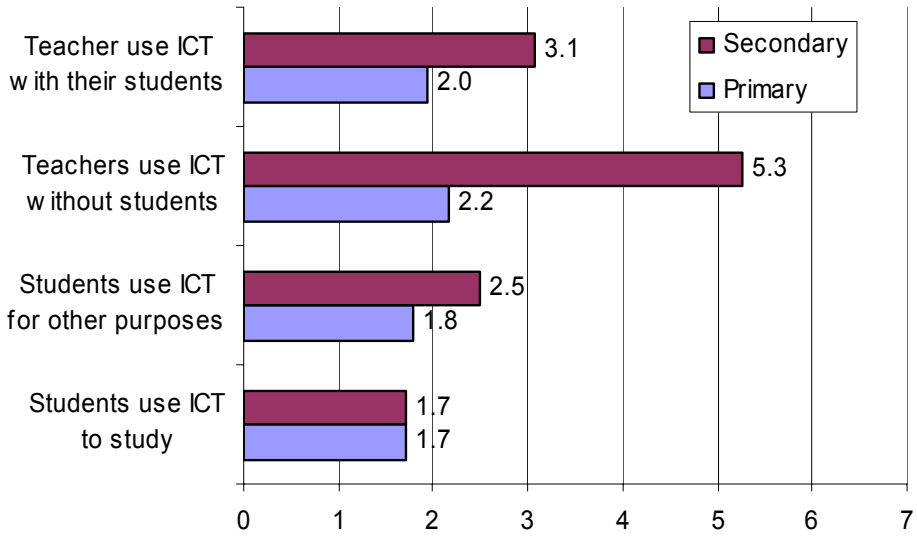

Figure 3. Individual time of ICT use of teachers and students at schools (in hours per week).
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

computer 3.5 hours a week and a secondary school student uses it 4.2 hours a week (in both cases, about 1.7 hours are used to study with ICT, with or without the teacher).

In relation to the access to ICT beyond the school, results presented in Figure 4 show that secondary school students and teachers have more access to ICT at home than do primary school students and teachers. In fact, 84% of the secondary school teachers have computers at home and 65% have Internet access. On the other hand, although 79% of primary school teacher have access to computers, only 46% have access to Internet.

Regarding students, results indicated that 56% of the secondary school students have access to a computer at home and 46% have access to Internet. However, only 39% of primary school students have access to a computer at home and 18% have access to Internet.

These figures regarding access to ICT are above the average of the general population in Chile. In fact, the national census implemented in 2002 showed that in Chile only 20.5% of the households had a computer and only 10.2% had also Internet (Instituto Nacional de Estadísticas de Chile [INE], 2003). These differences are found also in other countries (Istance, 2002) and could indicate that the presence of ICT in schools has acted as a catalyst for the acquisition of computers at home, particularly among teachers. Also, the differences between the access of primary and secondary school students found here are similar to the ones found in other countries (see Becta, 2005). This pattern calls for further research regarding the implication of these differences.

Additionally, results of the study showed that 47% of the primary school students and 69% of secondary school students have their own mobile phone. Notably, this result is not due to any policy of the Ministry of Education.

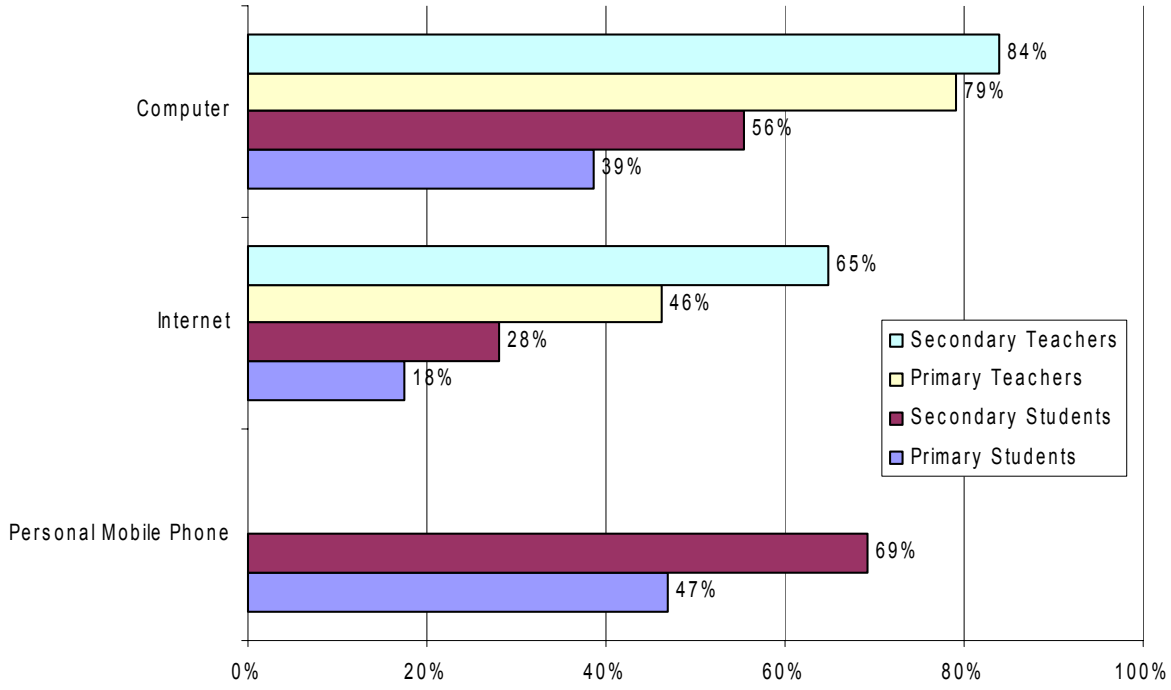

Figure 4. Availability of ICT at home for teachers and students.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

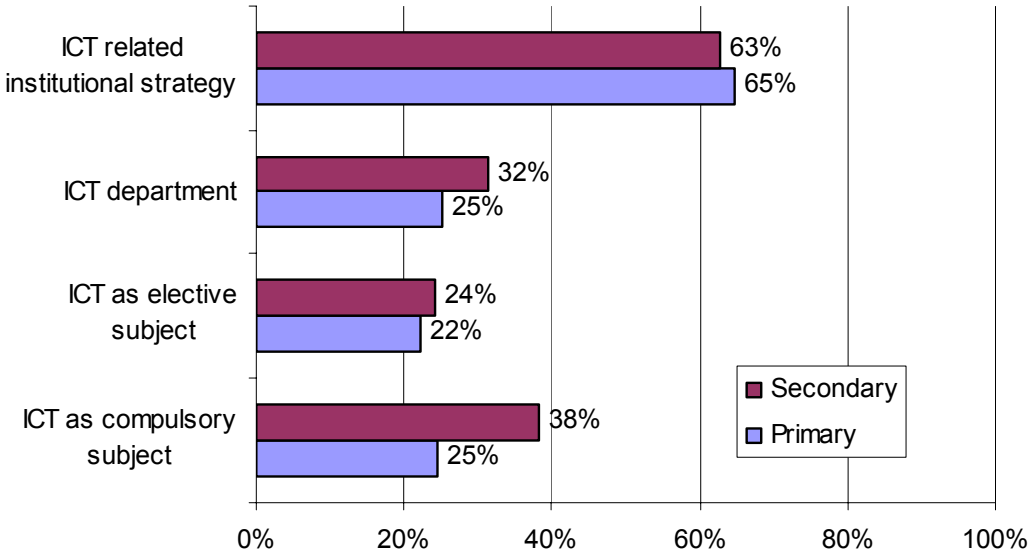

Figure 5. Frequency of ICT initiatives at school level.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

Another aspect that has been considered important in the use of ICT in schools is the existence of ICT-related policies at the school level. In this respect, the survey asked about the presence of some initiatives at the schools. Figure 5 shows the frequency of the presence of some ICT-related strategies in the schools.

The fact that more than 60% of the schools have an ICT-related strategy could be a promising antecedent for the uptake of ICT in the Chilean schools. In fact, the existence of ICT-related institutional strategies has shown to be important for the infusion of ICT in pedagogical practices (Venezky, 2002). On the other hand, the fact that fewer than 40% of the schools have ICT as a compulsory course could indicate the need to develop policy-level strategies that help to ensure that students acquire a certain level of ICT skills, as mentioned in the next section.

ICT Skills

The importance of students acquiring ICT skills has been recognized internationally (OECD, 2001) and it is also part of *Enlaces'* agenda. Figures 6 and 7 show the percentage of students and teachers, respectively, who ranked themselves as “very good” in using various ICT tools.

As it can be noticed in Figure 6, primary and secondary school students more frequently tended to rate themselves as being very good in the use of communication tools as well as some productivity tools (word processor and presentation software). In general, results showed that more secondary school students viewed themselves as confident in using ICT tools, as compared to primary school students, which is consistent with their longer exposure to these tools, particularly at home (see also Figure 4).

Figure 7 shows that teachers follow a similar pattern compared to students, but they added some additional productivity tools, such as educational software and spreadsheets. Although teachers have more access to ICT at home than students (see Figure 4), when it comes to rating their ICT skills, in general terms, fewer teachers rated themselves confident in using ICT as compared to the students, especially in secondary schools.

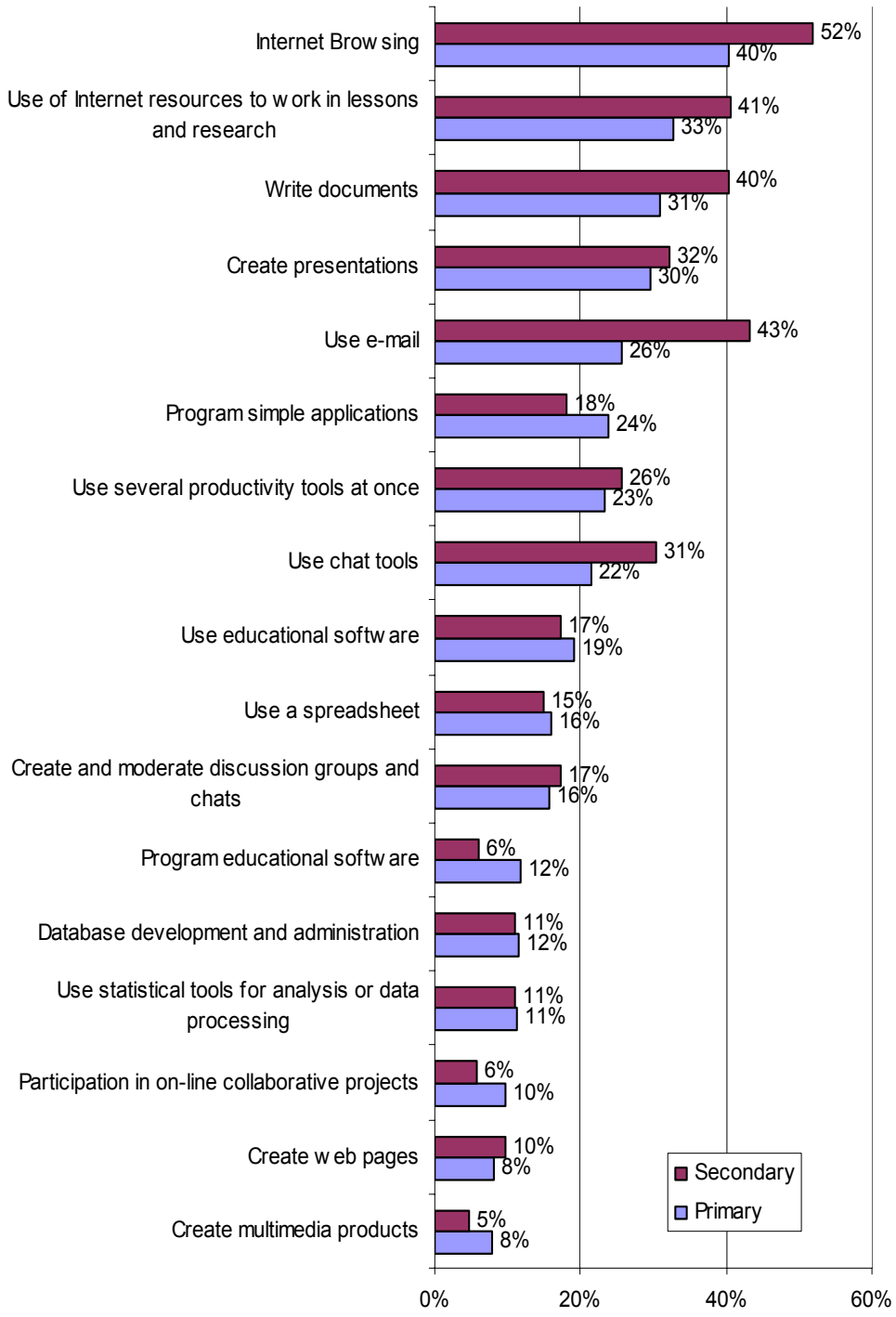

Figure 6. Percentage of students that answer that they are "very good" in using specific ICT tools.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

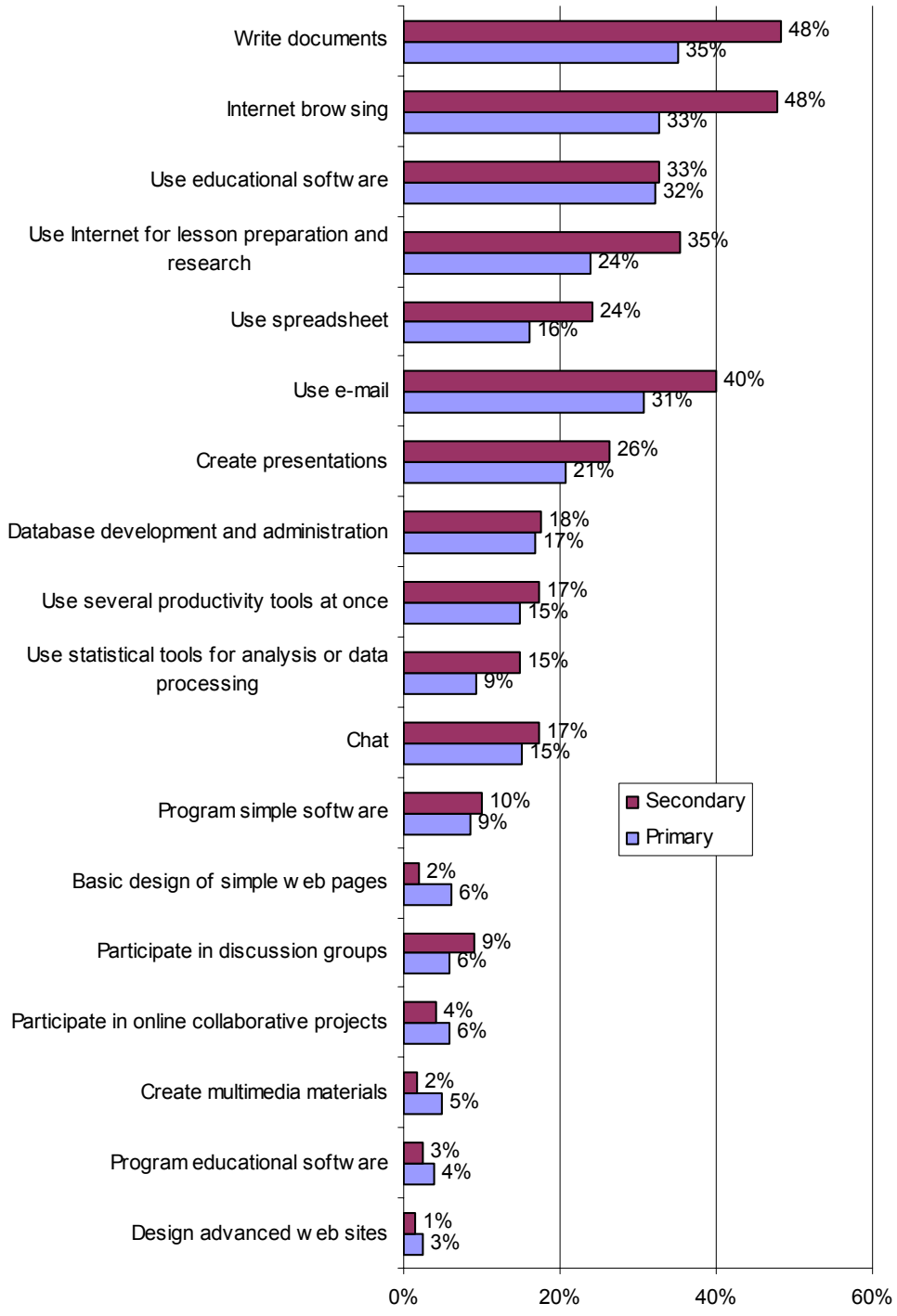

Figure 7. Percentage of teachers that answer that they are "very good" in using specific ICT tools.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

ICT Use at Schools

The survey asked students to report on the frequency with which they do different activities with ICT. These responses were then analyzed looking for correlations among students' responses. Figure 8 shows the frequency of the activities that students reported that they do "very frequently" at school, grouped by the resulting factors of the analysis.

The factorial analysis resulted in these four factors that explained 64.3% of the total variance.

1. *Communication*. In this factor, students communicated by e-mail and chatted with classmates, friends and relatives, browsed the Internet, searched for and downloaded music, read magazines and newspapers on the Internet, and participated in news groups or lists on the Internet. This group is characterized as using communication tools with a social orientation.
2. *Productivity*. In this factor, students searched for and researched information, used educational software, created presentations, and wrote and printed documents. This group is characterized as using ICT for study-related purposes.
3. *Recreation*. In this factor, students used the computer for programming, playing, painting and drawing, and creating music. This group can be described as using ICT for recreational purposes or activities.
4. *Communication with teachers*. In this factor, students sent e-mails and chatted with teachers.

Regarding the activities, Figure 8 shows that primary and secondary school students do similar activities very frequently at schools. The main differences were that primary school students tended to print and draw, create presentations, use educational software, and play relatively more often than do secondary school students. On the other hand, secondary school students used more Internet tools (e-mail, chat, and browsers).

Figure 9 shows that the most frequent ICT activities that students do are the ones characterized as Productivity, followed by Recreational (for primary school students) and Communication (for secondary school students). These results suggest a profile of students' ICT use, in which they split their time of ICT use communicating, producing (handling information) and entertaining themselves. In this sense, one could argue that the current term to call these technologies, ICT (information and communication technologies), really should be IRCT (information, recreation, and communication technologies).

Additionally, the survey asked teachers about the learning activities that they thought students do with ICT. Figure 10 shows the frequency of activities that teachers reported students did very frequently. The most frequent activities reported by primary school teachers were that students searched for information on the Internet for assigned tasks, collaborated with other students, used educational software for remedial or rehearsal activities, and developed activities that imply research. Secondary school teachers reported that their students searched for information on the Internet for assigned tasks, developed activities that imply research, submitted the results of their work in digital format, and did presentations supported by ICT tools.

Reports on the students' activities by both the primary and secondary school teachers coincide with the students' self-reports, assigning a high frequency to the activities related to

the search of information on the Internet and developed activities that imply research. Additionally is interesting to note the relative high frequency of secondary teachers that reported that their students hand in their results in digital format.

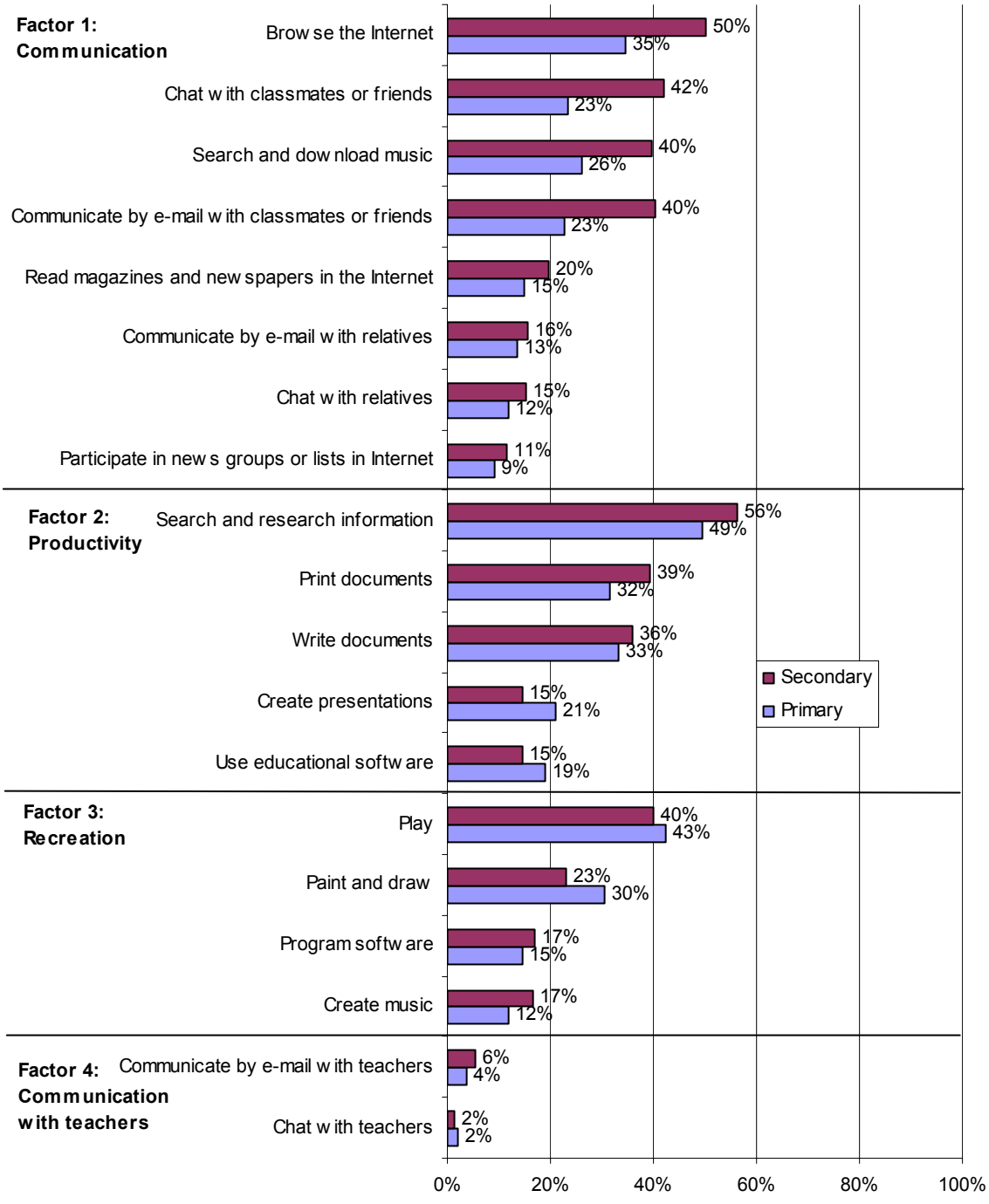

Figure 8. Students' activities with computers and Internet reported as "very frequently" done at school.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

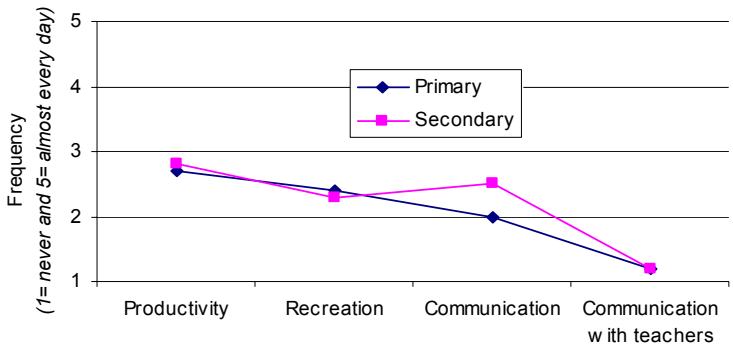

Figure 9. Frequency of the groups of students' activities.

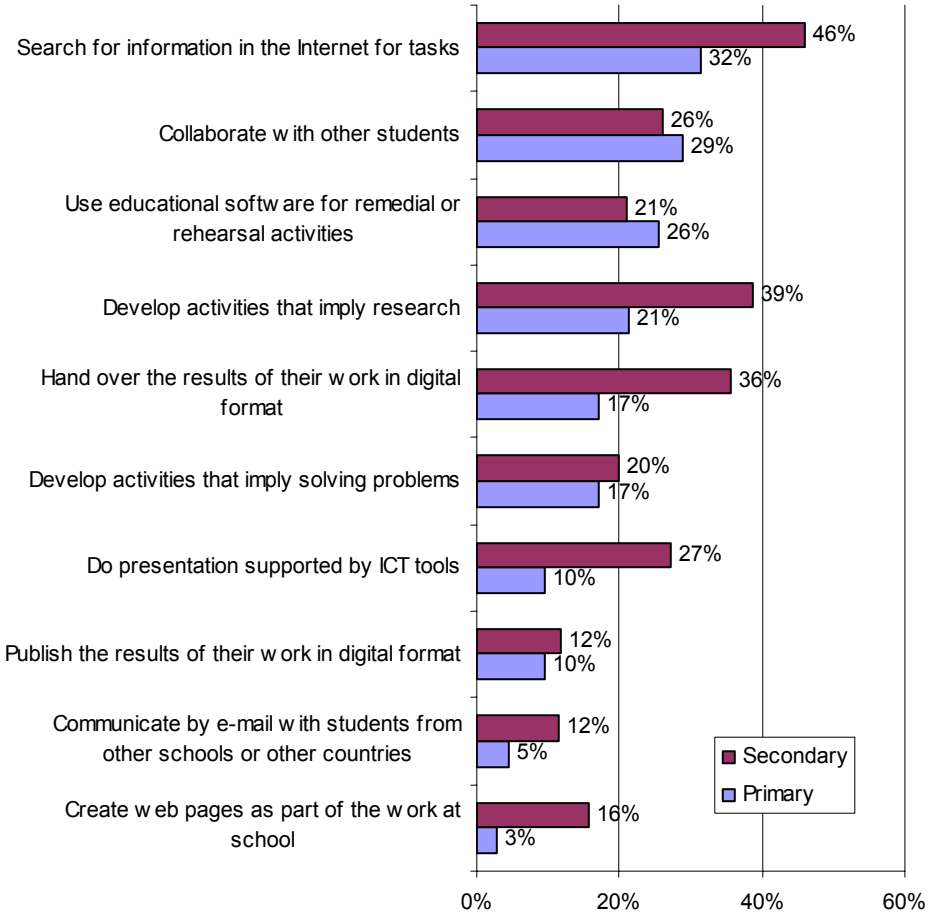

Figure 10. Teachers' assessments of students' learning activities with computers and the Internet, reported as done "very frequently" at schools.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

The survey also asked teachers to report on the frequency of various activities with ICT. These responses were then analyzed by looking for correlations among teachers' responses. Figure 11 shows the frequency of the activities that teachers reported they do very frequently, grouped by the resulting factors of the analysis.

The factorial analysis resulted in these three factors that explained 59.6% of the total variance.

1. *Communication*. In this factor, teachers searched for educational resources on the Web, communicated by e-mail and chatted with colleagues, friends and relatives, browsed the Internet, searched for and downloaded music, played games and read magazines and newspapers on the Internet. This group is characterized as using ICT with a social orientation.
2. *Teaching*. In this factor, teachers used ICT to teach specific subjects, including computer skills; monitored and evaluated students' progress; prepared reports and marked assignments; used educational software for remedial or rehearsal activities; elaborated documents or presentations; and prepared lessons and materials to support teaching. This group is characterized as using ICT to support teaching and learning activities.
3. *Technical* (hobby). In this, factor teachers programmed pieces of software, communicated with students' parents, chatted with colleagues, and participated in interest groups or lists on the Internet. This group is characterized as having a more technical orientation in the use of ICT.

Regarding the activities, Figure 11 shows that primary and secondary school teachers do similar activities very frequently at schools. The main differences are that primary school teachers at the 7th and 8th grades tend to teach specific subjects, use educational software, and teach computer skills relatively more than secondary school teachers. On the other hand, secondary school teachers use more Internet tools (e-mail, chat, browsers) than their peers at the primary school level.

Figure 12 shows that the most frequent activities that teachers do with ICT are the ones characterized as teaching and as communication. Also, it confirms that secondary teachers tend to do activities characterized as communication more often than primary teachers. .

In this case, results indicate that teachers do follow the established tendency to use computers and the Internet mainly as information and communication devices (not as recreation devices, as students did), splitting their time of use of ICT primarily in these two groups of activities.

Finally, as shown in Table 1 on the correlation between the student and teacher factors, almost all correlations are statistically significant. The ones with the highest correlations are the factor Communication among students and teachers, and the teachers' Communication and Teaching with students' factor Productivity. Although these are quite interesting results that relate the teachers' and students' use of ICT, further analysis is needed that considers possible influences of other variables, like family background and/or the school's characteristics, as suggested in the analysis of the factors underlying educational results by Fuchs & Wössmann (2004).

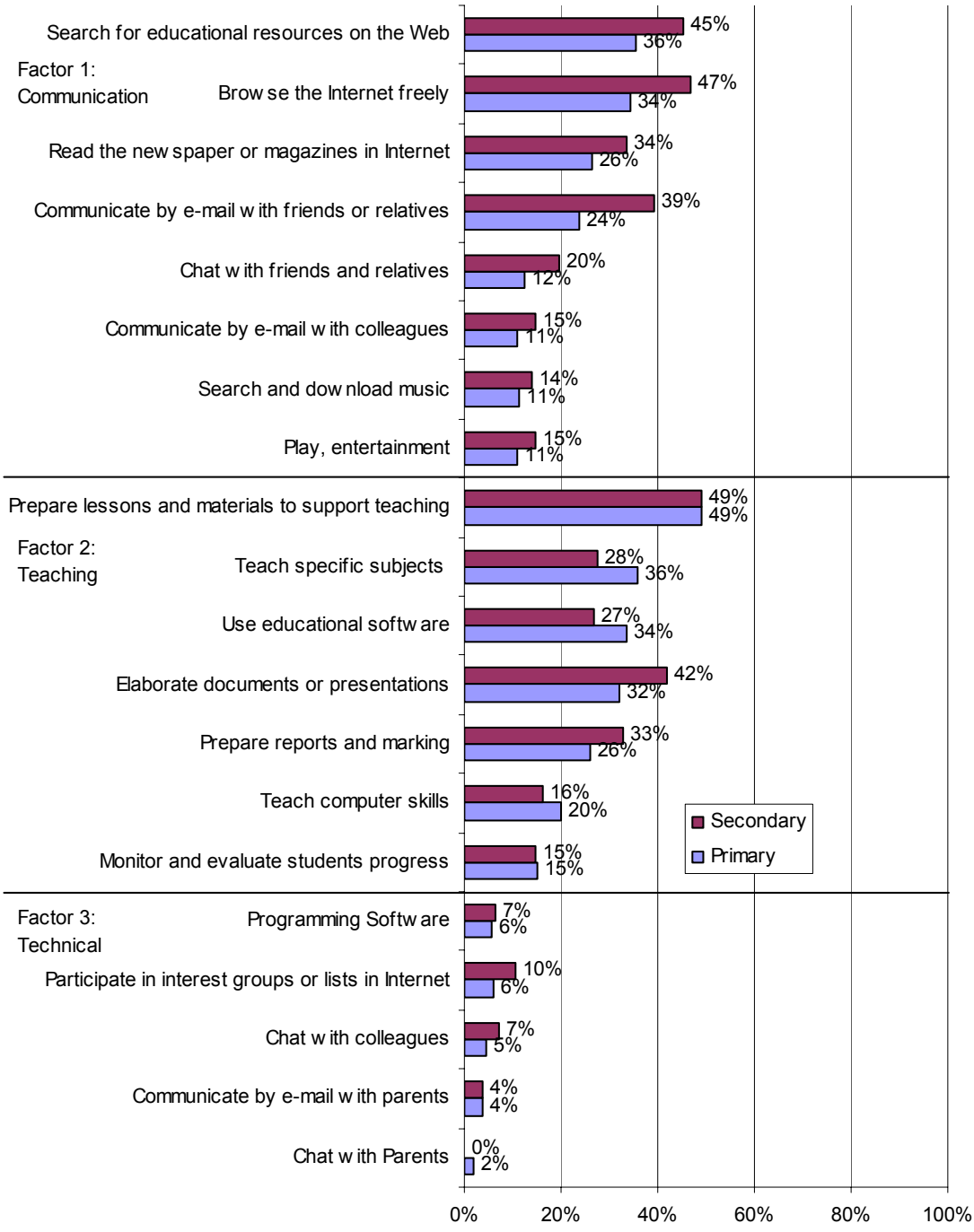

Figure 11. Teachers' activities with computers and Internet reported as "very frequently" done at schools.
(Source: Information Society Survey of the Centre of Education and Technology of the Chilean Ministry of Education)

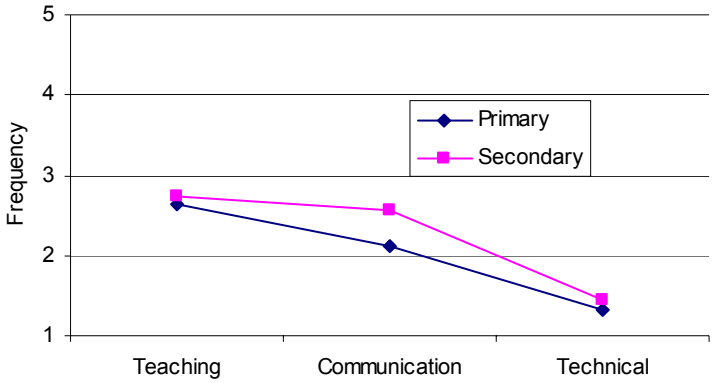

Figure 12. Frequency of the teachers' groups of activities.

Table 1. Correlation between students' and teachers' factors.

	Teachers´ Factors		
Students´ Factors	Teaching	Communication	Technical
Communication	0.11*	0.51**	0.2**
Productivity	0.31*	0.36*	0.2*
Recreational	0.12*	0.3*	0.14*
Communications with teachers	0.07	0.3*	0.21*

* $p < 0.05$ ** $p < 0.01$

DISCUSSION

The infrastructure of ICTs in Chilean schools is promising. Students in Chilean schools have relatively high access to computers, as compared to many Latin American countries. However, the student-per-computer ratio is still about twice as high as in schools in developed countries that, in general, have ratios below 15 students per computers (Becta, 2005).

Regarding the location of computers, the fact that the majority of the computers in primary and secondary schools are located in the computer labs is mainly due to the ICT in Education policy in Chile. This program provided computer labs to schools without the possibility of installing these computers in the classrooms. Therefore, the fact that some secondary schools do have a few computers in the classrooms is due to their own initiative. These results support the assumption that the majority of students' and teachers' ICT-related activities are carried out in the computer lab. Additionally, the relatively high percentage of schools connected to Internet enables ICT-related activities and use of Internet resources.

Focusing on the use of the computer lab, results showed that they are used intensively during the week. This result could be attributed to the fact that more than 60% of the schools report that they have an ICT-related strategy at their school, which has been identified as a key factor that promotes ICT use at schools (Fullan, 1998; Venezky, 2002). Additionally, the

results showed that teachers use the computer lab about half of the time that the students do. This relative high proportion of time in which teachers use the lab calls for further analysis, since they have substantially more access to ICT at home than do students. In any case, regarding access to ICT at school, it can be argued that this dimension, for Chilean students and teachers, is no longer a critical one.

The results regarding ICT skills show that half of the teachers and students rank themselves as very good in using the Internet and productivity tools. Given that teachers' ICT skills has been identified as a critical factor for ICT pedagogy implementation (Carnoy, 2002; Pelgrum, 2001), these results appear to be relatively good.

Summarizing, the context of ICT use in Chilean schools can be characterized as relatively good (i.e., one that provides basic conditions) insofar it appears that, in general, there are no first-order barriers, such as the ones related to the lack of ICT skills, infrastructure, or time of use, for implementing ICT pedagogy (Ertmer, 1999).

It is within this context that the resulting students' and teachers' factors reflect different types of activities with ICT. It can be argued that both students' and teachers' factors mirror a more general use of ICT, namely, as a tool for work (Teaching, Productivity), as a communication device (Communication), and as a recreational artifact (Recreation, Technical). Self-reported students' and teachers' ICT skills cohere with the resulting factors.

Looking at individual use, results presented in Figure 3 show that an average secondary school student uses a computer at school about four hours per week. Although this amount of time may be considered relatively short, it is not dramatically different from the time students spend attending science, language, or mathematic lessons during the week. Clearly, whether this time of ICT use is enough to produce an impact on students' learning achievement will greatly depend on the activities they do during these hours of use.

To analyze any expectation of an impact on students' achievements would require more research. However, Figure 3 does indicate the average secondary school student spends about 1.7 hours per week in class-related computer work (Productivity). There is no indication of what or how many subjects the student might be working on during that time. Still, it is reasonable to ask, can ICT make a difference in students' understanding of one subject in this limited time? The essence of this question is even more pressing if the student spends this 1.7 hours on multiple subjects. Moreover, a more precise question could be asked, how could schools model or prioritize the use of educational software, the creation of presentations, the writing of documents, or search and research information activities in order to effectively contribute to students' learning within this time frame?

On the other hand, results also show that students do invest considerable time performing other activities that can be described as typical of the information society (factors titled Communication and Recreation; see Figures 8 and 9). The types of activities grouped in these factors seem to be those that students would decide to do on their own, without their teachers' intervention. Despite the academic value that one might assign (or not) to them, the fact is that students will continue doing these activities, whether teachers like them or not (and similar to the fact that students increasingly use mobile phones within the school environment). Given this scenario, some questions that arise are (a) What are students learning while doing these activities? (b) Do these activities contribute to students' curriculum-related learning? and (c) Given the time that students spend doing these activities, could teaching and learning activities be designed that take into consideration what students already do with ICT and have pedagogical value added to them?

Regarding teachers, the results show that they more frequently perform activities characterized as Teaching and Communication, which highly correlated with students' factors of Productivity and Communication. Moreover, the activities characterized as Communication are almost the same for students and teachers. The difference between the time that primary and secondary school teachers use ICT could be explained by the fact that secondary school teachers do more frequently activities characterized as Communication. In the same line as with students, this use of ICT by teachers opens possibilities for redesigning professional development courses by taking advantage of what they already do with ICT.

Summarizing, the results presented in this paper helped to deepen the understanding of the type of activities that teachers and students do with ICT and the context in which they occur. A more precise picture on what and how long students and teachers use ICT in Chilean schools has been provided. Also, the results bring up new questions related to the way in which to shape specific ICT uses in order to impact students' achievements and to take pedagogical advantage of activities that teachers and students already do with ICT.

ENDNOTE

[1] Regarding the use of the computer labs by the community, since 2003 Enlaces has been implementing a national policy that encourages schools to provide ICT-related courses and services to the parents' communities of the schools.

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We thank the Center for Education and Technology of the Chilean Ministry of Education for providing the data for this analysis.

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