The background features a complex abstract design. On the left, there are several horizontal bars of varying lengths and shades of gray. A large, dark silhouette of a tree with a thick trunk and sparse branches is positioned in the center-right. Overlaid on this are several circular nodes, some with concentric circles, and several thick, overlapping bands that curve across the scene. The overall aesthetic is technical and modern.

INFORMATION AND
COMMUNICATION
TECHNOLOGIES
IN EDUCATION

REPORT ON THE PRESENCE AND USE OF ICT IN PRIMARY
AND SECONDARY SCHOOLS (ACADEMIC YEAR 2005-2006)

SUMMARY REPORT

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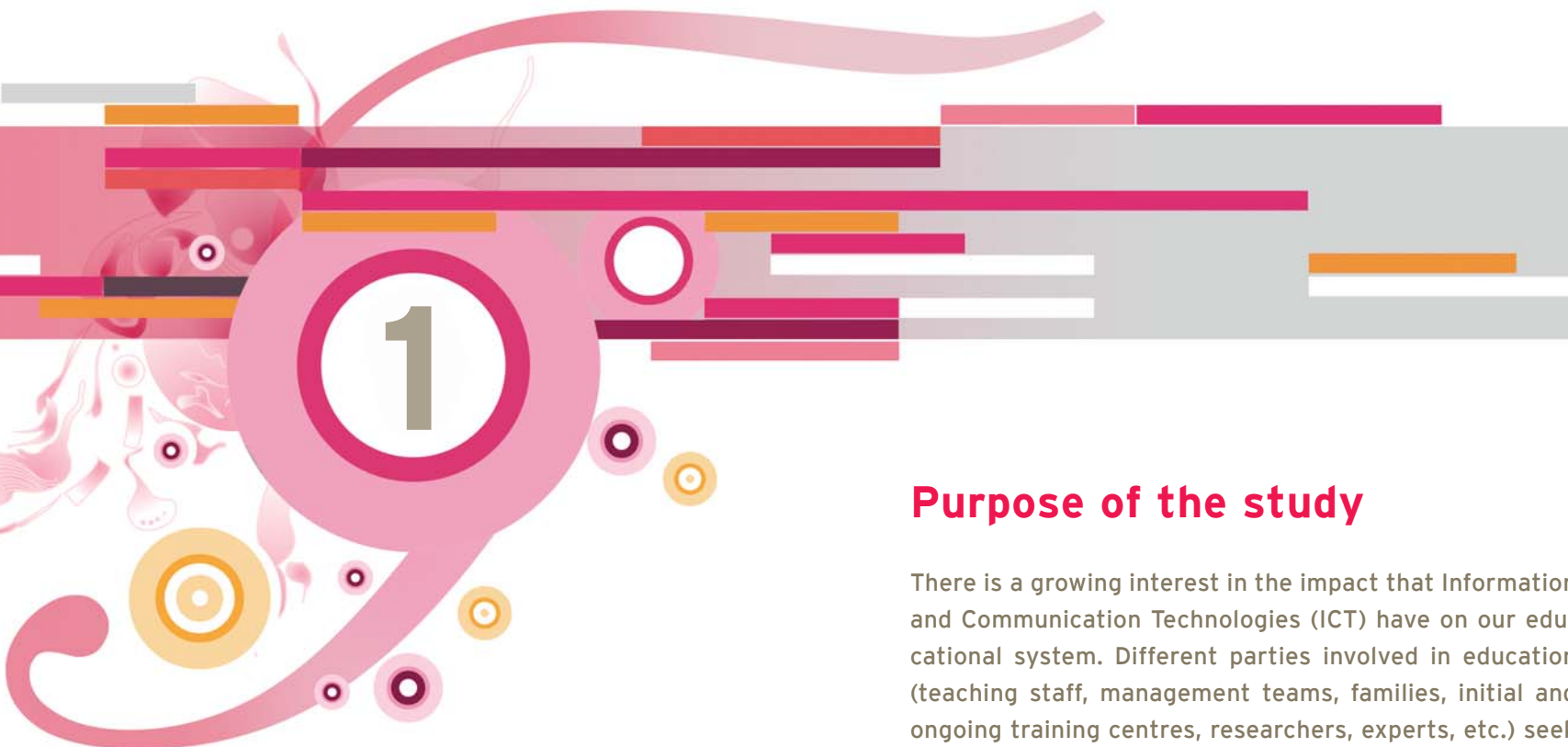
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Purpose of the study

There is a growing interest in the impact that Information and Communication Technologies (ICT) have on our educational system. Different parties involved in education (teaching staff, management teams, families, initial and ongoing training centres, researchers, experts, etc.) seek information on the resources available and the way they are used to support teaching and learning.

The present study aims to provide an up-to-date overview of the situation concerning ICT at Primary and Secondary educational centres, analysing both achievements and other aspects in need of improvement over the coming years.

This project was carried out within the framework of the *Internet en el Aula* (Internet in the Classroom) programme, whose aim is to promote the non-discriminatory development of the information society at educational centres, and to foster the use of ICT as a key tool for communication, understanding and co-operation. *Internet en el Aula* involves the participation and collaboration of the Spanish Ministry of Industry, Tourism and Commerce, via the Red.es Public Body, the Ministry of Education and Science, via the National Centre for Educational Information and Communication, and the Regional Governments of Spain.

We have the pleasure of presenting the work carried out thanks to the collaboration of numerous management teams, students and teaching staff from all stages of the educational process, who provided their opinions and experiences to make this complete picture available today. Their appraisals will undoubtedly serve as a starting point from which to strengthen and expand future plans.

This document contains a summary of the key research findings. The full report can be found at www.cnice.mec.es and www.red.es.

SOME QUESTIONS THE STUDY POSES

What ICT resources are available at schools for management tasks, class preparation and educational and learning processes?

How are these resources organised and co-ordinated?

How do teaching staff use them and what relevant training do they have?

How do pupils use ICT, within and outside the school?

How do students and teachers rate the usefulness of ICT for their activity?

What are seen as the key obstacles to a more widespread presence of ICT at schools?



2

How was it carried out?

The study was carried out during the months of May and June 2006, in all the Autonomous Regions except for the Basque Country (where no legal framework for the required collaboration was established) and Catalonia (where the fieldwork coincided with another international study).

State-owned primary and secondary schools took part in the research. In La Rioja and the Canary Islands, state-subsidised private educational institutions were also involved.

The opinions of management teams, persons responsible for ICT co-ordination at the educational institutions, teachers and students were taken. Each group provided information on the most relevant issues:

- **The management teams and ICT co-ordinators:** equipment and communications; organisation of ICT resources; usage in the educational institution's administrative tasks; inclusion in educational and curricular projects and level of satisfaction with the implementation of ICT at the educational institution.

- **The teaching staff:** access and uses of ICT within and outside the educational centre; training received and ICT skills; attitudes towards ICT.

- **The pupils:** access and uses of ICT at the educational centre and at home; ICT-related activities they feel most competent at and their evaluation of ICT.

The data presented here were obtained by calculating global descriptive statistics. In order to calculate these figures, weighting factors were established for each of the populations so that the figures presented as global results reflect the real proportions in each area of analysis (educational institutions, teaching staff and pupils).

TAKING PART IN THE STUDY WERE:

SCHOOLS **616**

209 Primary Schools,
407 Secondary Schools

STAGES

Primary School Education, Compulsory Secondary Education,
Pre-university Education and Vocational Training stages

TEACHERS **4,066**

STUDENTS **22,085**

RESPONDING TO:

SCHOOLS QUESTIONNAIRE

Management team and person responsible for ICT co-ordination
at the educational institution, where this position exists

TEACHING STAFF QUESTIONNAIRE

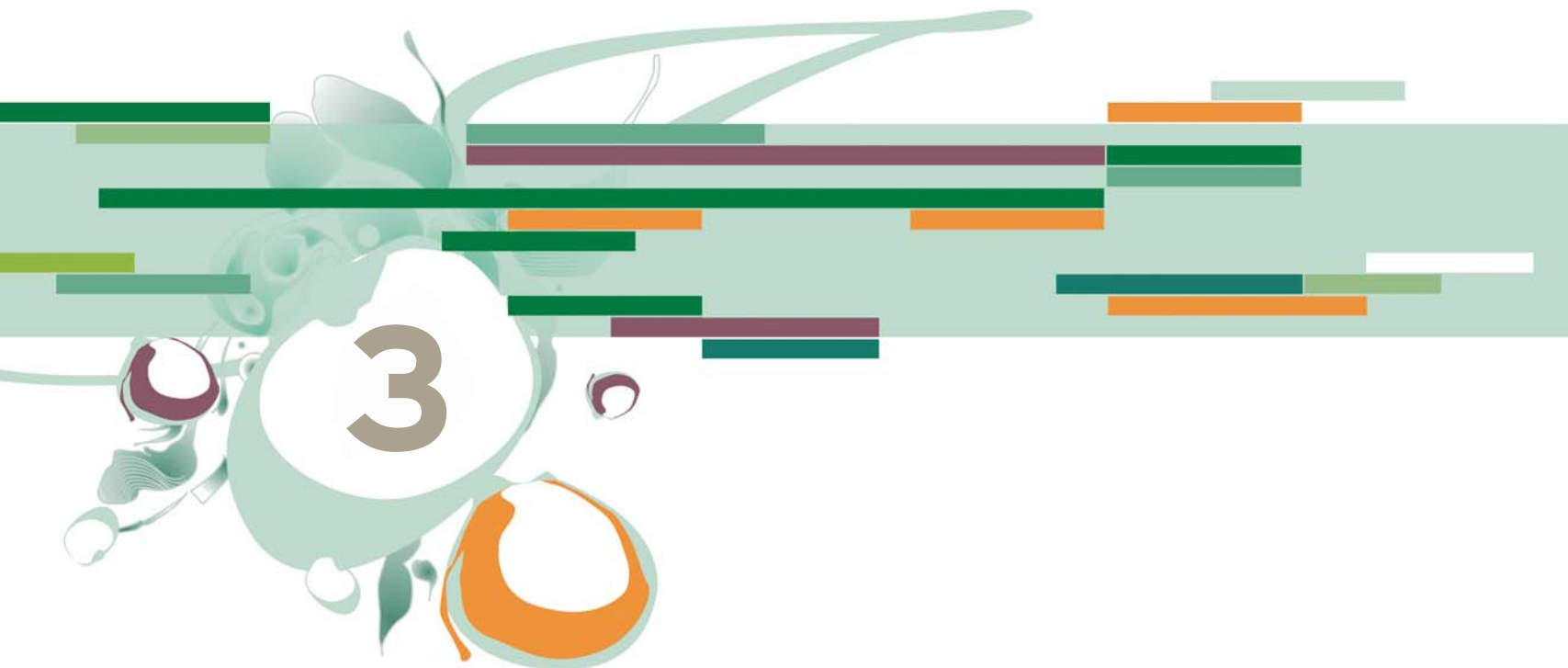
Teachers in all subjects and areas of the curriculum

STUDENT QUESTIONNAIRE

One for children in Stage 2 Primary School Education
and another for students in Stage 3 Primary School Education,
Compulsory Secondary Education, Pre-university Education
and Vocational Training

INTERVIEW

Management team together with the person responsible for ICT
co-ordination at the educational institution, where this position exists



Key findings

The analysis of results was based on the evaluation model proposed by Stufflebeam and Shinkfield, which takes into account five levels of analysis. Thus the key findings in this study are organised under the following headings:

- **Resources at schools:** ICT equipment and infrastructure; availability and level of occupancy of ICT resources/classrooms; human resources for technical and teaching-related co-ordination of ICT.

- **Processes at the school in relation to ICT:** educational institution's projects; usage for educational institution management and communication; training reported by teaching staff and their ICT skills; integration of ICT into the educational institution's curriculum; teachers and management teams' ratings of the advantages of ICT; perceived obstacles to greater ICT usage.
- **Classroom processes with ICT:** uses of ICT in teaching and learning processes at each stage, and by subject and area of the curriculum, contrasting the viewpoints of teachers and students.
- **Family context:** availability of computers and Internet connection at home; influence of family's nationality or origin, and of parents' level of studies.
- **Impact on pupils:** ICT-related skills reported by pupils; agents who in their opinion have played a role in their training; uses within and outside the educational centre; pupils' appraisals of ICT.

Key findings

3.1

Resources at schools

FACTORS EVALUATED:

ICT equipment and infrastructures; the availability and level of occupancy of ICT resources/classrooms; human resources dedicated to technical and teaching-related co-ordination of ICT.

THOSE GIVING THEIR OPINION:

Management teams (accompanied by the ICT co-ordinator, where the educational institution has one) and teaching staff from the different stages and subject areas.

ICT resources

The schools have resources for administrative use and for teaching use

A large proportion of the educational institutions have a range of ICT resources, such as computers, Internet connection (mainly broadband), local area network, Intranet, computer classroom, Internet access from different facilities (secretary's office, staff room, classrooms, offices, etc.) and peripherals (DVD readers, printers, CD/DVD recorders, etc.).

More facilities at secondary schools

Comparatively speaking, the secondary schools have more resources of this kind than primary schools. Although the technical specifications of the equipment are similar, there are differences in terms of the functionality built into that equipment.

Similarly, there are more secondary than primary schools with computers and Internet connection at spaces where teachers work (staff rooms, seminars or departments).

More computers in primary school classrooms

However, more primary schools have classrooms equipped with computers.

Three-quarters of the computers are for teaching

There are ICT resources available for both administrative and educational use (meaning machines designated for preparing classes and directly teaching pupils). On average, almost 75% of the computers at an educational institution are used for teaching, at both primary and secondary educational institutions.

EQUIPMENT	PRIMARY	SECONDARY
No. pupils/computer (educational use)	12.2	6.2
Computers for teaching purposes	74.9%	76.8%
Pentium IV computers or higher	52.9%	63.3%
Local network	52.6%	79.9%
Intranet	32.8%	46.4%
Computers with Internet connection	79.8%	94.2%
Broadband	88.1%	96.5%
Computer classrooms	1.1	3.1
Computers in classrooms	60.4%	42.0%

Average level of satisfaction with the equipment

Teachers and students showed a similar level of satisfaction. In both cases, around one-third of responses judged the equipment to be good or excellent; another third as adequate, and the remaining third as inadequate or highly inadequate. The quality of the Internet connection in general received a more positive rating.

Level of occupancy of resources

A large proportion of the management teams report that the introduction of ICT has generated internal organisation problems

The level of usage of ICT resources/classrooms at the educational institutions is low. Thus, for example, in just over half of the primary schools, the resources are in use less than 30% of teaching hours (in other words, less than nine hours a week of a total of thirty in the timetable). Occupancy rates are higher in secondary schools: in almost half of them, the resources are occupied more than 50% of teaching hours, and at one in four secondary schools occupancy exceeds 70% of teaching hours.

The low general rate of occupancy for ICT resources/classrooms is also reflected in the infrequent usage of these resources by teachers and students (e.g., in data such as the low frequencies of usage reported by both), as shown in chapter 3.3 (*Classroom processes*).

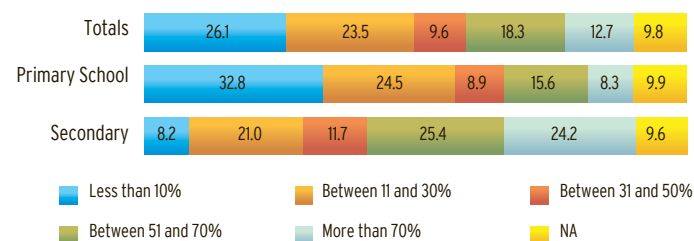
Outside teaching hours, they are more readily available to teachers, and extracurricular activities are carried out with them for pupils

Most educational institutions allow their ICT resources to be used outside teaching hours by different members of the school community (teaching staff, pupils, Parents'

Associations, families), although on the whole they are more widely available to teachers than to students. Despite this, a fair proportion of the educational institutions (one in three) offer extracurricular activities for pupils using these resources.

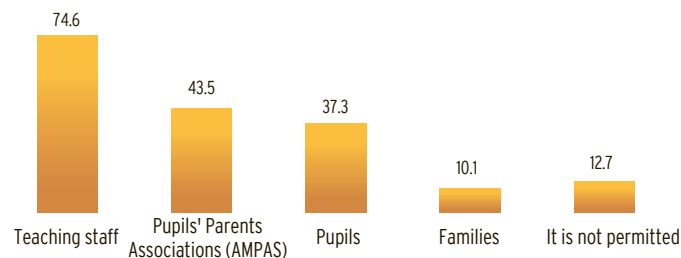
OCCUPANCY DURING TEACHING HOURS (%)

During which percentage of teaching hours are ICT resources/classrooms occupied at your school?



AVAILABILITY OUTSIDE TEACHING HOURS (%)

Which members of the school community can use the IT equipment outside teaching hours?



THE ICT CO-ORDINATOR:

advises teaching staff
on matters relating to ICT **92.5%**

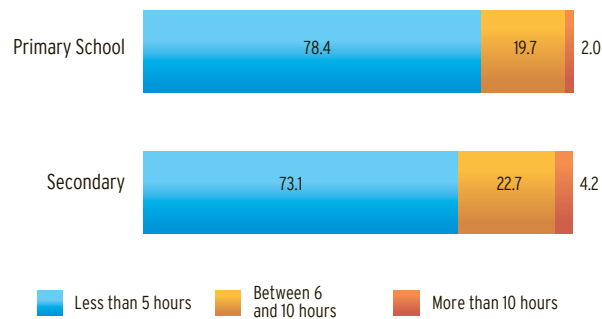
co-ordinates the ICT project
at the school **71.2%**

maintains and repairs equipment **69.5%**

supports teaching staff
in the use of ICT in their subject area **69.1%**

SCHEDULED COMMITMENT (%)

If the person at your school has dedicated
weekly hours, how many
hours does he or she have per week?



ICT co-ordination

Two out of every
three schools have a person
who takes on the role
of ICT co-ordinator,
although their timetable commitment
is very limited

Nearly 70% of the educational centres have a person in charge of ICT co-ordination. The presence of this figure is slightly more common in secondary than in primary schools, and in all of them the person takes on technical and teaching-related duties, and to a lesser extent provides student support.

The average number of hours allocated for co-ordination work is low. The most frequent type of scheduled commitment is freeing up of weekly teaching hours (at almost 80% of the educational institutions), and normally these persons have a commitment of five hours a week at most.

On-site training, self-learning and distance learning

The ICT co-ordinators mostly acquired their technical and teaching-related training via on-site ongoing training courses, organised mainly by the regional Educational Authorities. Nonetheless, many of them report that self-learning played an important role in their training (about 80% of cases).

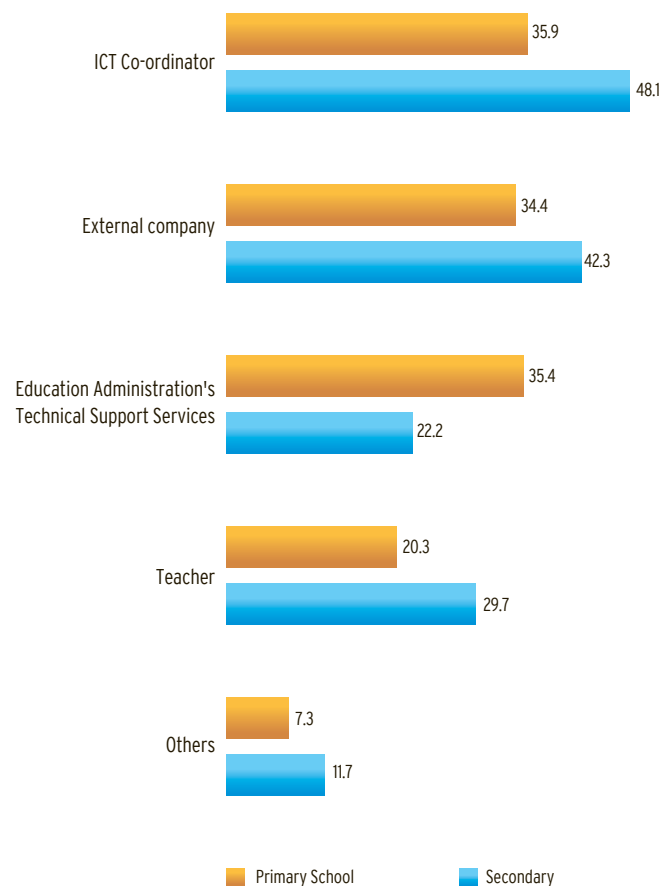
One striking figure is the popularity of training courses via Internet (more than 40% of co-ordinators say that they have used one), as well as on-site training initiatives organised by the educational institutions themselves (more than 25% of them have taken part in some training activity of this kind).

Technical maintenance of the equipment

Maintenance of equipment is mainly the responsibility of the ICT co-ordinator, an external company or the Educational Authorities' Technical Support Services, the latter two being much more commonly used in primary than in secondary educational institutions.

TECHNICAL MAINTENANCE (%)

Who mainly carries out the maintenance service for the IT equipment?



Key findings

3.2

Processes at the school

FACTORS EVALUATED:

The educational institution's ICT projects; usage for educational institution management and communication; training reported by teaching staff and their ICT skills; integration of ICT into the educational institution's curriculum; the advantages of ICT; perceived obstacles to greater ICT usage.

THOSE GIVING THEIR OPINION:

Management teams (accompanied by the ICT co-ordinator, where the educational institution has one) and teaching staff from the different stages, areas of the curriculum and subjects.

AT SCHOOL:

there is a specific project at the educational institution
focusing on ICT **54.2%**

there are also other projects relating to ICT run by departments
or groups of interested teachers **50.8%**

the innovation projects have improved the computer equipment
and peripherals available **70.1%**
and infrastructures and communications **60.5%**

the innovation projects have improved the inclusion of ICT
in the daily activity in classrooms
and at the educational institution in general **56.3%**
and access to digital educational materials **46.3%**

SOME DIFFERENCES

AT PRIMARY SCHOOLS

it is more common to find the teaching staff
as a whole involved in ICT projects. The management teams
feel that these projects have more influence
on the educational institution's daily activity.

AT SECONDARY SCHOOLS

more specific ICT projects are carried out, mainly by groups
of teachers. The management teams think that these
projects have more impact on facilities and infrastructures.

ICT projects at schools

84% of the schools have taken part
in innovation and improvement projects
in the last four years

At most educational centres there is an interest in ICT, and
a willingness to incorporate them into teaching activity.

In fact, over the last four years, a very high percentage of
primary and secondary educational institutions have taken
part in some innovation and improvement programme.
These programmes, according to the management teams,
have had their greatest impact in terms of better facilities,
infrastructures and communications. The impact has been
less marked in terms of the inclusion of ICT in everyday life
at the educational institution and in the classroom, and on
access to digital materials.

In addition, more than half of the educational institutions
have a specific ICT project, defined according to their own
needs. These projects are the initiative of groups of tea-
chers who voluntarily agree to put innovative experiences
into practise or introduce improvements in the way they
use these resources for a period of time.

School management and communication using ICT

The use of ICT for management tasks at the educational institutions is very widespread, and the management teams rate their usefulness and efficiency very highly

Equipment in different school facilities

A large proportion of the educational institutions have computers and an Internet connection at different school facilities, mainly in the head teacher's offices and secretary's offices. These resources are available to a lesser extent in departments, being more common at secondary than primary schools.

At the same time, a large number of educational institutions have ICT-based services (the most common are: generic email account, local area network and educational institution website). Almost all of them are more common at secondary schools than at primary schools.

More for management than for communication

Some of the administrative tasks at the educational institutions are dealt with using ICT resources (managing records, enrolments, etc.), but these resources are not used to the same extent for different communication activities. In this case, the use of ICT is more frequent for communication with other educational institutions than for internal communication or contact with families. This is true in larger as well as smaller educational institutions.

There are some notable differences in ICT usage for communication between primary and secondary schools: the former use these resources more in their relations with other educational institutions, while the latter use them more for internal communication.

SCHOOLS USE ICT FOR:

administrative tasks 92.4%
communication with other schools 61.2%
internal communication 36.0%
communication with families 28.4%

THERE ARE COMPUTERS IN:	PRIMARY	SECONDARY
Head teacher's office	93.8%	96.5%
Secretary's office	76.6%	97.4%
Staff room	60.9%	95.6%
Head of studies' office	53.6%	95.6%
Departments/Seminars	18.8%	85.4%

SERVICES WITH ICT		
Generic email account	83.9%	78.7%
Local area network	52.6%	79.9%
Educational institution's website	45.3%	81.3%
Intranet services	32.8%	46.4%
Wifi network	29.7%	41.4%

THE MANAGEMENT TEAMS SAY THAT:

over the last four years
there has been a positive evolution at their educational
institution regarding ICT **85.2%**

the improvements have had less impact
on the incorporation of ICT into daily activity
and on access to digital materials
than on equipment and infrastructures.

ICT generate organisational problems **64.2%**

parallel programmes are needed to improve equipment,
the creation of specially-adapted software,
technical and teaching-related support and teacher training,
especially in teaching-related usage.

THE TEACHING STAFF SAY THAT:

ICT have great educational potential **84.0%**

they are very interested in ICT **76.5%**

the main barriers to incorporating ICT
into their practise are the low levels of teacher training
in this area **78.2%**
and a lack of time to spend on ICT **72.3%**

ICT in the school curriculum

About 70% of the educational institutions habitually incorporate ICT into their educational and curricular projects, which are the documents where the teaching staff take the most important educational decisions. But although this planning is critical, it does not seem to be enough to spread the educational usage of ICT at the educational institution. This can be clearly seen in statements from students and teachers, whose key findings are presented in the following chapters.

Very positive attitudes

Both management teams and teaching staff agree on the usefulness of ICT: they think that ICT favour new teaching models, that thanks to ICT they acquire key learning skills, that they improve and facilitate pupils' work, or that they should be used across the board (and not only in IT classes).

And major obstacles

In spite of this, both perceive the presence of barriers which prevent more widespread usage of ICT at the educational institutions, such as a low level of teacher training and a lack of time.

Training of teaching staff in ICT

50% have taken part in some kind of training during the 2005-2006 school year

A high proportion of teaching staff have access to computers and Internet, both at their educational centres and at home, and frequently use them (almost every day) in their personal and professional work.

In addition, two-thirds of the teaching staff say that they have taken some kind of specific ICT training.

ICT training was mostly in the form of on-site ongoing training courses organised by the regional Educational Authorities, although the teachers report that self-learning also plays an important role. We should also note that Internet-based courses are very popular (one-third of teaching staff have taken some course of this type).

Teachers' interest in ICT training is also evaluated by the management teams, who acknowledge that the innovation and improvement programmes focused on ICT in recent years have had a positive impact on teacher training.

THE TEACHING STAFF SAY THAT:

they have attended ongoing training courses **89.2%**

they have attended on-site courses **89.4%** and/or distance courses via Internet **27.2%**

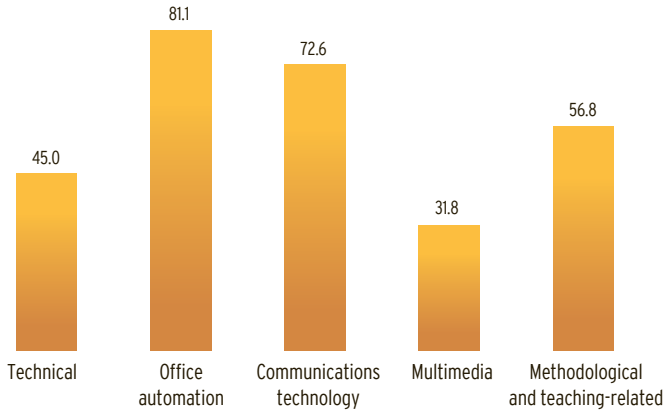
they have attended courses organised by the regional Educational Authorities **75.9%**

they have attended courses at private educational institutions **23.2%** and universities **21.8%**

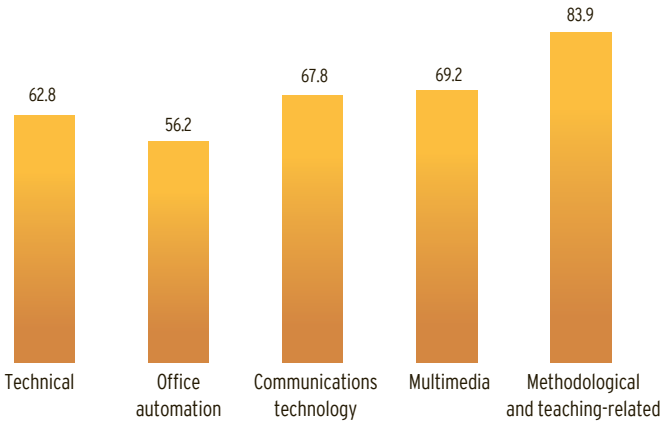
they are self-taught **64.8%**

THEY FEEL ABLE TO:	%
Use a word processor	92.9
Save and retrieve information in a digital format	90.9
Use Internet	90.6
Send and receive email messages	79.7
Consult databases	64.9
Use Internet as a means of group communication	54.5
Use a spreadsheet	44.4
Create multimedia presentations	42.4
Create simple websites	22.1

TRAINING RECEIVED (%)



SUPPLEMENTARY TRAINING SOUGHT (%)



Teachers' perceived competence

More than half of the teaching staff define themselves as user level when it comes to ICT skills. Only just over 10% consider that their knowledge reaches an advanced or expert level.

A very high percentage of teaching staff report that they feel able to use a word processor, save and retrieve information in different formats, or use Internet. But common activities like developing simple websites, preparing multimedia presentations or using a spreadsheet are tasks that well over half of the teaching staff report not knowing how to perform.

Little confidence at the technical and teaching-related levels

The teaching staff are more widely trained in office automation than in teaching methodology, but in both cases only one in five teachers claim to be confident at a technical or teaching-related level.

Training needs, especially in methodology

When we analyse the competence levels that teachers claim to have in different tasks using ICT, we see that those teachers who say that they feel more competent are, in turn, the most frequent users of ICT for professional purposes. This can be seen, for example, in the use of word processing software or Internet usage, two of the three most common activities with ICT at educational centres.

Nonetheless, it is important to note that in all the activities with ICT evaluated, more teachers report feeling confident than report using them habitually. This trend can be seen in both frequent and less frequent activities, such as the use of calculation applications or class presentations.

The low level of technical and teaching confidence reported by the teaching staff, and the lack of time (factors cited as the key obstacles found by teachers to using ICT) seem to have an impact on the low level of usage, even in ICT-related activities they feel competent at.

Consequently, a very high percentage of them would like supplementary training in the different areas evaluated (especially methodology), even those areas where they have had previous training.

Key findings



3.3

Classroom processes

FACTORS EVALUATED:

The uses of ICT in teaching and learning processes within the different educational stages, areas of the curriculum and subjects, contrasting the opinions of teachers and students.

THOSE GIVING THEIR OPINION:

Teaching staff from each stage, subject and area of the curriculum, and pupils in Stage 2 and 3 Primary School Education, Compulsory Secondary Education, Pre-university Education and Vocational Training.

Some key statistics

The frequency of ICT usage by teaching staff at the educational institution increases with the educational stage

Of the uses of ICT reported by teachers, three are carried out with a high frequency (almost every day or several times a week) by a significant proportion of the teaching staff: using a word processor (55%), surfing the net (42%) and managing personal work (29%).

According to the information provided by the teachers, we can see that some ICT uses in the classroom are very uncommon

82% of the teaching staff say that they never or hardly ever use ICT for presentations or simulations in the classroom. And 71% affirm that they never or hardly ever use the computer to back up classroom explanations.

The pupils use ICT at the educational institution with a low frequency at every stage, but it is higher in Primary School and in Vocational Training

The uses of ICT match the curricular demands of each stage: games, exercises and drawing are more common in

Primary School Education, while other activities not commonly found at earlier stages (such as programming or using spreadsheets) start to have a significant presence in Vocational Training.

The least common activities with ICT at the educational centre are those related to communication and evaluation

The teaching staff say that they never or hardly ever use activities involving communication via ICT, such as collaboration with other professionals (88%) or communication with students, families or other educational institutions (86%). Lastly, there is a very low incidence of pupil evaluation with the aid of ICT: 84% of teachers never or hardly ever do this.

One in four teachers propose using Internet to carry out projects in collaboration with groups of students

27% of teaching staff work with students in this way with a medium or high frequency (at least several times a month).

Almost 60% of teaching staff use digital teaching materials and multimedia contents

The frequency of usage for this type of resources is higher among Primary School teachers and Post-compulsory Education (Pre-university Education and Vocational Training) teachers. In Primary School, multimedia software with curriculum-related or reference contents and websites with educational content are more commonly used. In Vocational Training, resources which up until that point had been little used, such as tools created by them and classroom management software, begin to have a significant presence.

Uses of ICT in Primary School Education

Teachers believe that:

As in the other stages, the most frequent ICT-related activities are word processing, surfing the net and managing personal work

At this stage, ICT uses related to communication and collaboration are uncommon. Nonetheless, one in four teachers say that they use Internet at least several times a month for group work with pupils. A similar proportion of Primary School teaching staff use design and drawing programmes. The use of other applications (for example, spreadsheets, presentations and simulations) or ICT resources for evaluation was very seldom reported.

Physical Education, Special Education and Speech Therapy specialists are the ones who make more varied use of ICT

Physical Education teachers perform collaborative tasks via Internet, use drawing or design programmes and prepare presentations or simulations with ICT for use in class with a higher frequency. As for Special Education teachers, they are the ones most likely to download educational software and use ICT resources more often to support classroom explanations and for evaluation.

PRIMARY SCHOOL TEACHERS USE ICT FOR:

(WITH A MEDIUM OR HIGH FREQUENCY)*

word processing 71.1%

surfing the net for information 65.3%

managing personal work 39.6%

downloading educational software
from Internet 29.6%

using Internet for group work 26.3%

using the computer as class support 23.3%

using design programmes 22.4%

evaluating pupils 9.4%

using spreadsheets 9.4%

communicating with pupils and families 8.8%

preparing presentations
and simulations 8.2%

collaborating with a group
via Internet 6.3%

PRIMARY SCHOOL PUPILS USE THE COMPUTER FOR:

(WITH A MEDIUM OR HIGH FREQUENCY)*

playing games 45.6%

using programmes to learn (mathematics, etc.) 37.8%

drawing, colouring, etc. 36.8%

writing, preparing projects 33.6%

searching the net for information 31.8%

doing homework 25.3%

using spreadsheets 17.8%

writing emails, taking part in chat sessions,
instant messaging 13.3%

programming 12.0%

downloading music 11.7%

downloading programmes 11.6%

group or team collaboration 8.8%

*HIGH: Almost every day or several times a week.
MEDIUM: Between once a week and once a month.

Compared to the Compulsory Secondary Education teaching staff, Primary School teachers use multimedia software and websites with educational contents more often

The teaching staff at this stage value, above all, the fact that these resources contribute to stimulating and motivating learning.

The most commonly-used resources are: software with curriculum-related content (91% of teaching staff using this type of resources), reference software (72%) and websites with educational resources (64%).

Special Education teachers are again those most likely to use these resources, compared to tutors and other specialist teachers at this stage.

Pupils believe that:

The frequency of computer usage at primary schools is low

One-third of Stage 3 Primary School students use the computers at the educational institution once or twice a month, at most. Only 26% use them with a high frequency (several times a week or almost every day).

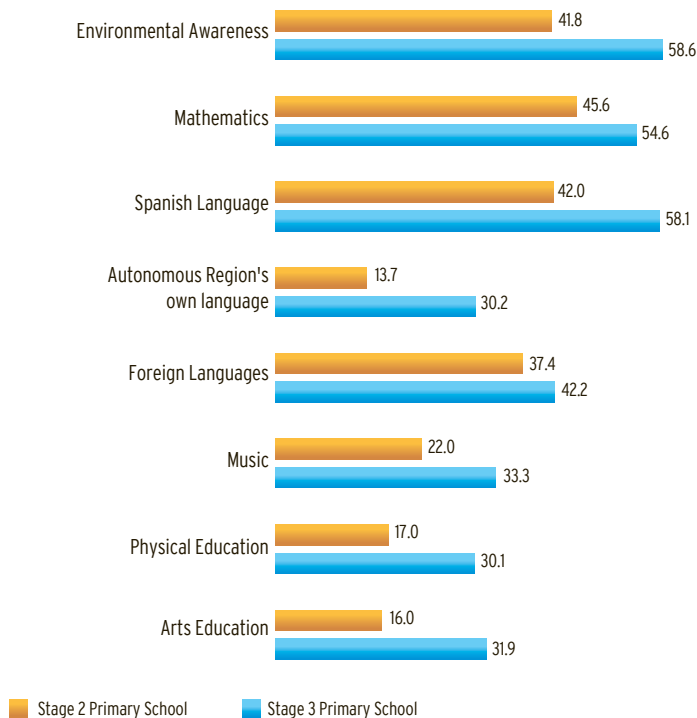
Children carry out few activities with ICT at school (games, drawing and colouring and learning programmes)

Thus, when Stage 3 Primary pupils were asked how often they carry out different activities with ICT at school, a very high percentage (always above 50%) reported that they carry out the following tasks never or less than once a month: word processing (64%), surfing the net for information (66%), writing emails, taking part in chat sessions and instant messaging (84%), downloading programmes (86%) or collaborating with a group via Internet (89%).

In their opinion, the areas where computers are used most are Environmental Awareness, Language and Mathematics.

ICT USES IN DIFFERENT AREAS
PRIMARY SCHOOL STUDENTS (%)
 (WITH A MEDIUM OR HIGH FREQUENCY)*

How frequently do you use a computer
 in each of the following subjects?



*HIGH: Almost every day or several times a week.
 MEDIUM: Between once a week and once a month.

COMPULSORY SECONDARY EDUCATION
TEACHERS USE ICT FOR:
 (WITH A MEDIUM OR HIGH FREQUENCY)*

- word processing **79.1%**
- surfing the net for information **69.4%**
- managing personal work **44.0%**
- downloading educational software
 from Internet **28.2%**
- using Internet for group work **22.5%**
- using design programmes **21.8%**
- using the computer as class support **20.8%**
- using spreadsheets **19.8%**
- preparing presentations and simulations **14.5%**
- evaluating pupils **13.3%**
- communicating with pupils and families **10.6%**
- collaborating with a group
 via Internet **10.1%**

Uses in Compulsory Secondary Education

Teachers believe that:

Almost 40% of teaching staff at this stage use the computers at the secondary school almost every day

Compared to Primary School Education, the use of ICT by teachers at the educational institution is more frequent at this stage (with a difference of more than 7 points).

The most frequent activities with ICT are those which have the highest presence across all stages (word processing, surfing the net and managing personal work). Nevertheless, Internet is used less frequently to carry out group work with students (with four-point differences in favour of Primary School Education).

43% of teaching staff use digital teaching materials with a medium or high frequency

These resources are used less than in Primary School Education and Post-compulsory Education, although their use is fairly widespread. The most common use is of curriculum-related software (used by 82% of teaching staff who

use this type of resources), reference software (65%) and websites with educational resources (63%). At the same time, almost 40% of teachers at this stage use ICT resources they make themselves, and about one in five use classroom management tools.

Technology teachers are the most frequent users of these resources

There is also a high percentage of Mathematics, Natural Science and Music teachers who use digital teaching materials and multimedia contents.

Pupils believe that:

The students in this stage (together with those in Pre-university Education) are the ones who least often use computers at the school

41% of children in Compulsory Secondary Education never or practically never (less than once a month) use computers at their school. In addition, over 60% of students in Stage 1 Compulsory Secondary Education do not use computers at the educational centre for any of the general uses evaluated (information, communication, games, learning, etc.).

Among the pupils who do use these resources, the most widespread uses are word processing to write or prepare projects, playing games or using the computer to draw and colour. During Stage 2 Compulsory Secondary Education, using Internet as a source of information increases. Other uses related to communication and collaboration are absent or extremely uncommon.

Pupils only use the computer with a medium or high frequency in Technology (38% of students) and Social Sciences (20%)

In Natural Science and Foreign Languages, 16% of pupils say that they use the computer with a medium or high frequency. In the remaining areas, more than 80% of Compulsory Secondary Education pupils report that they never or hardly ever use it.

COMPULSORY SECONDARY EDUCATION PUPILS

USE THE COMPUTER FOR:

(WITH A MEDIUM OR HIGH FREQUENCY)*

writing, preparing projects 38.8%

surfing the net for information 30.4%

playing games 27.0%

drawing, colouring, etc. 26.4%

doing homework 24.2%

writing emails, taking part in chat sessions,
instant messaging 20.3%

using programmes to learn
(mathematics, etc.) 16.5%

using spreadsheets 16.2%

downloading music 13.1%

downloading programmes 11.9%

programming 10.8%

group or team collaboration 9.3%

*HIGH: Almost every day or several times a week.
MEDIUM: Between once a week and once a month.

POST-COMPULSORY EDUCATION TEACHERS USE ICT FOR:

(WITH A MEDIUM OR HIGH FREQUENCY)*

- word processing 86.6%
- surfing the net for information 76.4%
- managing personal work 54.4%
- using the computer as class support 38.8%
- using Internet for group work 35.6%
- using spreadsheets 32.7%
- downloading educational software
from Internet 32.4%
- preparing presentations and simulations 28.3%
- using design programmes 28.2%
- evaluating pupils 20.1%
- communicating with pupils and families 19.0%
- collaborating with a group via Internet 14.0%

*HIGH: Almost every day or several times a week.

MEDIUM: Between once a week and once a month.

Uses in Post-compulsory Education

Teachers believe that:

In Pre-university Education
and Vocational Training,
teaching staff use the computer
more frequently

This can be seen both in ICT-based activities that teachers at earlier stages carried out with a medium or high frequency (digital information, managing personal work, etc.) and in other much less common ones (communication; use of specific calculation, drawing or design applications; use of simulations and presentations, etc.).

On the other hand, more than half of the staff teaching at these stages frequently use multimedia resources (at least several times a month). This is the case, for example, with curriculum-related software (75% of teaching staff using these resources), software containing reference material (60%) or websites with educational resources (55%).

It is noteworthy that digital teaching materials that are seldom used at other educational stages have a significant presence in Post-compulsory Education, such as ICT resources created by the teachers themselves (47%) or classroom management tools (27%).

In Pre-university Education, ICT uses are more closely related to preparing classes than to teaching

When we compare these data with the opinions of pupils, we can see that ICT usage at the educational centre by Pre-university Education students is very rare, and consists of just a handful of activities.

In Vocational Training, ICT have a greater presence in the learning of subjects, both theoretical and, specially, applied ones

Teachers and students both agree that activities with ICT are more frequent and varied at this educational stage.

Students believe that:

Almost half of the students in Pre-university Education never or hardly ever use the computer during class hours

Pre-university Education students, together with those in Compulsory Secondary Education, are those who make least use of computers at the educational centre.

Additionally, students in this stage are the ones who make least use of computers in the subject areas overall.

PRE-UNIVERSITY EDUCATION AND VOCATIONAL TRAINING STUDENTS USE THE COMPUTER FOR:
(WITH A MEDIUM OR HIGH FREQUENCY)*

	PRE-UNIVERSITY EDUCATION	VOCATIONAL TRAINING INT. LEVEL	VOCATIONAL TRAINING HIGHER LEVEL
Writing, preparing projects	37.2%	58.8%	60.6%
Surfing the net for information	35.5%	44.8%	52.7%
Doing homework	25.2%	47.7%	54.3%
Drawing, colouring, etc.	22.6%	36.3%	33.1%
Writing emails, taking part in chat sessions, using instant messaging	22.0%	31.0%	32.9%
Playing games	21.9%	29.2%	22.3%
Using spreadsheets	18.2%	34.0%	25.6%
Downloading programmes	13.6%	19.5%	18.6%
Downloading music	11.2%	17.3%	12.0%
Using programmes to learn subjects	11.2%	9.3%	10.0%
Programming	10.9%	18.7%	21.6%
Group or team collaboration	8.6%	13.0%	13.9%

*HIGH: Almost every day or several times a week.
MEDIUM: Between once a week and once a month.

The most common activities with ICT are still using the computer to write and prepare projects, surfing the net for information and doing homework.

Almost 40% of students in Intermediate and Higher Level Vocational Training use computers at their school during class hours almost every day

Young people in Vocational Training are the ones who most regularly use the computer during class hours, for both theoretical and, specially, applied subjects. This finding contrasts with the lack of computer usage they say they have in placements at work centres (49% report that they never or hardly ever use them).

The most widespread activities among Vocational Training students are word processing, using the computer to do homework, graphics applications and spreadsheets. Communication tools also have a significant presence: email, chat, instant messaging, etc.

Key findings



3.4

Family context

FACTORS EVALUATED:

The availability of computers and Internet connection at home; impact of the family's origin or nationality and the parents' level of studies.

THOSE GIVING THEIR OPINION:

Pupils in Stage 2 and 3 Primary School Education, Compulsory Secondary Education, Pre-university Education and Intermediate and Higher Level Vocational Training.

PUPILS SAY THAT:

- they have a computer at home **85.1%**
- they can use the computer at home **84.5%**
- they have Internet at home **52.6%**
- their family is interested in them knowing how to use a computer well **60.4%**
- they were trained in ICT mainly within the family context **30.3%**

ICT in the home

More than 85% of students' homes (from Stage 2 Primary School Education onwards) have a computer, and 52% have an Internet connection

The majority of students surveyed state that they have a computer at home that they can use freely. The percentage of pupils with a computer at home increases with the educational stage. Thus, for example, while at Stage 2 Primary School 74% of pupils have a computer at home, in Pre-university Education this figure rises to 95%.

The availability of Internet is high, but lower than that of computers: half of the students have a connection at home.

Similarly, the frequency of computer usage at home is high. Almost three-quarters of pupils use them several times a week or almost every day, and very few students use them less than once a month or hardly ever. The frequency of usage also increases with age: while 54% of Stage 2 Primary School pupils use it almost every day, in Pre-university Education 86% of students use it with this same frequency.

Pupils judge their parents to be interested in them learning how to use the computer well. They also think that the family plays an important role in their ICT training, although their influence lessens as the students' age increases.

The family's place of origin

This has an impact on the availability of computers and Internet at home, the years of experience and the frequency of usage of these resources

Computers and Internet are more often present in the homes of Spanish pupils than in those of other nationalities, with a difference of 16 and 10 points, respectively.

Pupils of Spanish nationality use the computer more often at home. More than 70% of Spanish students use the computer several times a week or almost every day, a figure that falls to almost 60% among pupils of other nationalities.

The years of experience using computers also differs depending on the family's place of origin. For example, 62% of pupils of Spanish nationality have been using a computer for more than three years, while this percentage falls to 49% among students of other nationalities.

Finally, the family's nationality has a lesser impact on aspects such as years of experience using Internet, students' perceived level of competence or their attitudes towards ICT.

BETWEEN FAMILIES OF SPANISH AND NON-SPANISH ORIGIN, THERE IS A DIFFERENCE OF:

16 points

in availability of computers

10 points

in availability of Internet

13 points

in years of experience using computers

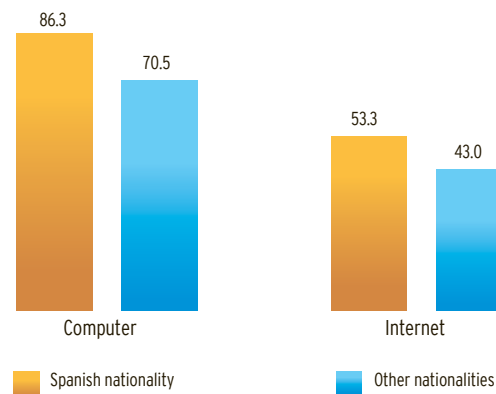
(among those who have been using them the longest)

14 points

in high frequencies (almost every day) of computer usage...

... IN FAVOUR OF SPANISH FAMILIES.

Do you have a computer and/or Internet at home? (%)



BETWEEN FAMILIES
WITH PRIMARY SCHOOL EDUCATION
AND UNIVERSITY STUDIES,
THERE IS A DIFFERENCE OF:

10 points
in availability of computers

31 points
in availability of Internet

20 points
in years of experience using computers
(among those who have been
using them the longest)

9 points
in years of experience using computers
(among those who have been using
them the longest)...

... IN FAVOUR OF FAMILIES
WITH UNIVERSITY STUDIES.

The family's level of studies

The greater the family's
level of studies,
the more ICT resources
they have at home

The parents' level of studies is related to the presence of computers at home and to the presence of an Internet connection. Those families with university studies are most likely to have these resources.

Children of university
graduate families
begin using ICT earlier

The frequency of computer usage at home by pupils does not show significant differences according to the parents' level of studies. However, the higher the family's level of studies, the earlier pupils begin using ICT resources. For example, among students with university graduate parents, 51% have used computers for more than five years, a figure that drops to 31% among students whose parents have primary school studies.

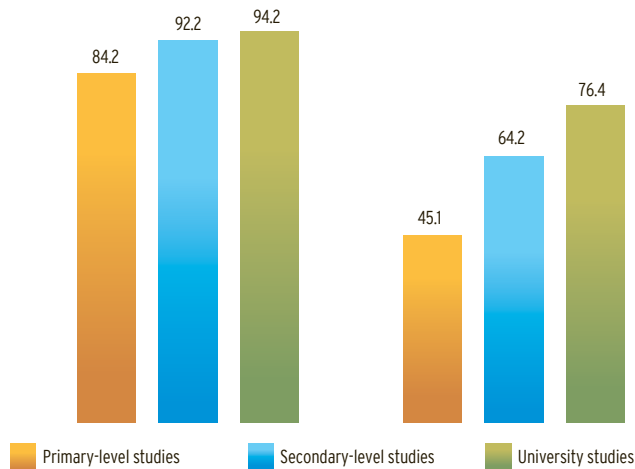
The role the family plays in ICT training also varies according to the parents' level of studies. Students from families with university studies are the ones who have more often learnt to use a computer with their own family.

Students feel more competent the higher their parents' level of studies

Finally, the family's level of studies influences pupils' attitude towards ICT. If we take the father's level of studies as an example, students with university graduate fathers show more interest in computers than those with primary-level studies. Similarly, children of fathers with higher education rate themselves as more competent at using computers.

AVAILABILITY OF ICT RESOURCES AT HOME (%)

Do you have a computer and/or Internet at home?



Key findings



3.5

Impact on pupils

FACTORS EVALUATED:

ICT-related skills reported by pupils; the parties who they consider played a role in their training; uses within and outside the educational centre; pupils' appraisals of ICT.

THOSE GIVING THEIR OPINION:

Pupils in Stage 2 and 3 Primary School Education, Compulsory Secondary Education, Pre-university Education and Vocational Training, and teaching staff of the different stages, areas of the curriculum and subjects.

THE PUPILS:

have used the computer at some time **98.7%**

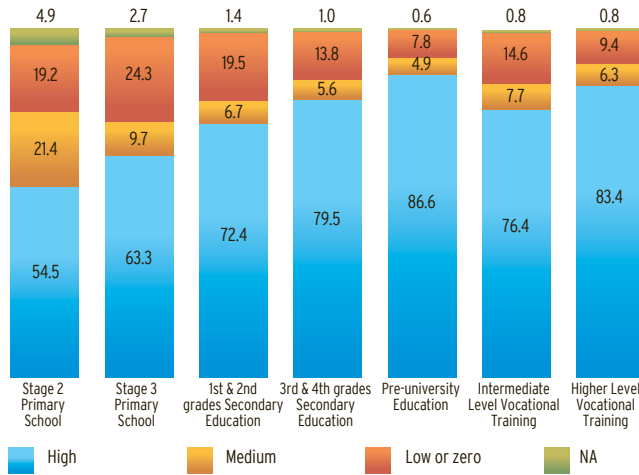
use the computer at home almost every day
or several times a week **72.6%**

access computers at friends' houses,
cybercafés, etc. **92%**

know how to select information on Internet,
save it, retrieve it and print it **91.2%**

USE OF THE COMPUTER AT HOME (%)

How frequently do you use the computer at home?



ICT usage patterns

Computers and Internet
are resources that
are accessible to all age groups

Almost all students from Stage 2 Primary School onwards say that they have used a computer at some time. There is also a very high percentage of pupils who frequently use the computer at home, and access computers at the homes of friends and family, cybercafés, etc.

The use of computers is more frequent outside the educational centre than inside it. At home, almost three-quarters of pupils report using them several times a week or almost every day. Those using them most often are Pre-university Education students (86% use them almost daily). Stage 2 Primary pupils use them less often, though still with a high frequency (54% use them almost daily).

The age students
are introduced to computers
is gradually becoming lower

Pupils begin using computers at an increasingly early age. Thus, for example, while 26% of Stage 3 Primary School pupils began using them between the ages of five and seven, in Stage 2 Primary School this percentage is doubled (reaching 55%).

Activities outside the school

Playing games, downloading music and communication are the most widespread uses of ICT, although they are also used for studying or preparing projects

The following are some of the most significant findings:

- Leisure activities are the most common (playing computer games, downloading music, etc.), but playing games on the computer becomes less frequent with age.
- Communication gains importance from an early age (it is the most common use from Stage 2 Compulsory Secondary Education onwards) and enjoys a privileged position among all possible activities.
- Activities related to school work or learning are less common, although they become more significant with age (almost half of the pupils in every age group use them with a medium or high frequency).
- Collaborative activities have a limited presence (about 20% of students perform them with a medium or high frequency) and continue to be uncommon even among the older students.
- There is considerable use of drawing programmes among the youngest children, but this decreases with age.

OUTSIDE THE SCHOOL, THE THREE MOST FREQUENT USES ARE:

(WITH A MEDIUM OR HIGH FREQUENCY)*

AT THE END OF PRIMARY SCHOOL

Playing games on the computer **71.0%**
Drawing, colouring, etc. **53.6%**
Writing texts **46.6%**

AT THE END OF COMPULSORY SECONDARY EDUCATION

Playing games on the computer **66.9%**
Using email, chats, blogs, etc. **63.7%**
Writing texts **61.1%**

IN PRE-UNIVERSITY EDUCATION

Using email, chats, blogs, etc. **70.5%**
Writing texts **66.4%**
Surfing the net **66.1%**

IN INTERMEDIATE LEVEL VOCATIONAL TRAINING

Writing texts **64.9%**
Doing homework **62.3%**
Using email, chats, blogs, etc. **59.5%**

IN HIGHER LEVEL VOCATIONAL TRAINING

Doing homework **70.3%**
Writing texts **67.4%**
Using email, chats, blogs, etc. **65.0%**

*HIGH: Almost every day or several times a week.

MEDIUM: Between once a week and once a month.

- Word processors are quite widely used (a little over 45% of Stage 3 Primary School students use them with a medium or high frequency) and their use increases with age (to almost 70%).

Nonetheless, it is striking that several ICT uses have a low or zero frequency (less than once a month or never) for a high percentage of students (over 30%). These uses include email, word processing and using the computer to do homework.

More activities
and frequency of usage outside
than inside the school

As we might expect, patterns of ICT usage (in terms of frequency, type of activities, etc.) are different within and outside the educational centre. While the main activities at school are those related to producing texts, searching for information or doing homework, outside the educational institution activities such as playing games, communicating or those related to school work take priority.

However, there are some noteworthy findings here:

- All activities (leisure, information, communication or even study-related activities, though these are not the most important) are carried out with a higher frequency outside than inside the school.

- Both within and outside the educational centre, the computer is seldom used to learn school subjects (mathematics, language, history, etc.).

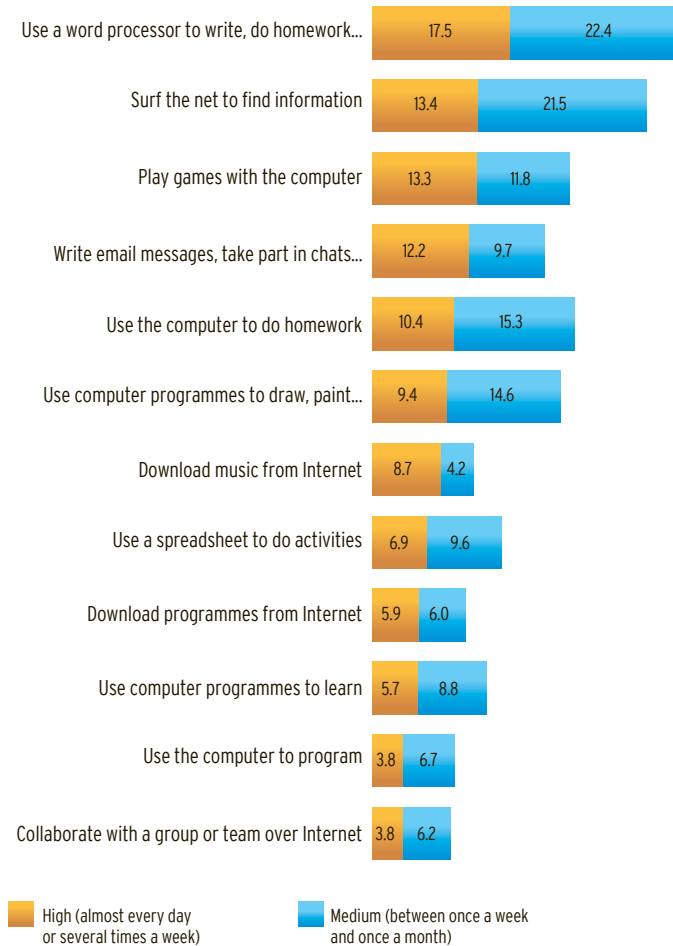
- Use of computers for programming (both within and outside the school) increases with the educational level. In Vocational Training stages, about 20% of pupils use the computer for programming with a medium or high frequency.

There is a gap
between the students' ICT
skills and the patterns
of usage at school

There is a major gap between the habits and skills that students report regarding ICT and the low presence of these activities at educational centres. Pupils say that they know how to resolve numerous tasks with ICT and use them in different contexts (games, leisure, communication, information and learning), but they make little use of them at educational centres (both in terms of variety and frequency), as discussed in section 3.3 (*Classroom processes*).

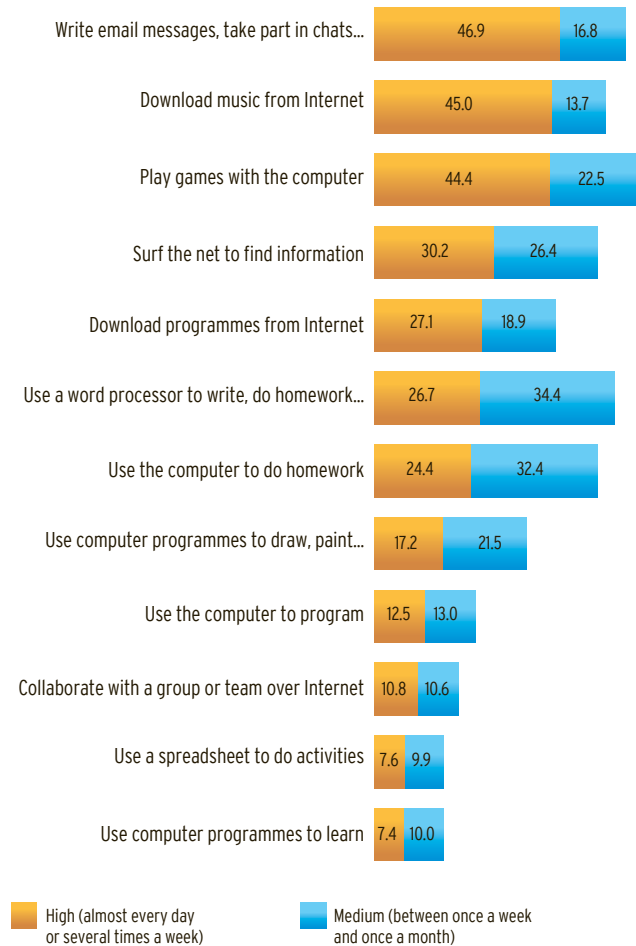
INSIDE THE SCHOOL (%)

At your school, how frequently do you use a computer for the following tasks?



OUTSIDE THE SCHOOL (%)

Outside your school, how frequently do you use a computer for the following tasks?



Perceived competence in the use of ICT

Pupils say that they feel able to employ ICT in a wide range of activities (games, information and communication, or learning-related), but the perceived level of competence varies with age, and affects patterns of ICT usage.

In Stage 2 Primary School they know how to use a computer on their own, although one in four pupils say that they need help using some applications

The ICT-related tasks they feel most competent at in Stage 2 Primary School are playing games and using programmes for drawing, colouring and editing photos.

Additionally, more than 70% of students at this stage see themselves as competent enough to carry out basic tasks, such as starting up a game; opening, closing or copying a file; or writing and correcting a text. Nevertheless, there are other tasks they consider themselves less competent at, although also with significant percentages. Internet (search engines, downloads) and email (sending and receiving messages) usage are tasks that between 38% and 56% of students know how to perform. Finally, a remarkable one in five students in this age group feel able to activate antivirus software and/or design a website.

At the end of Primary School Education they feel competent at activities related to communication and the use of information

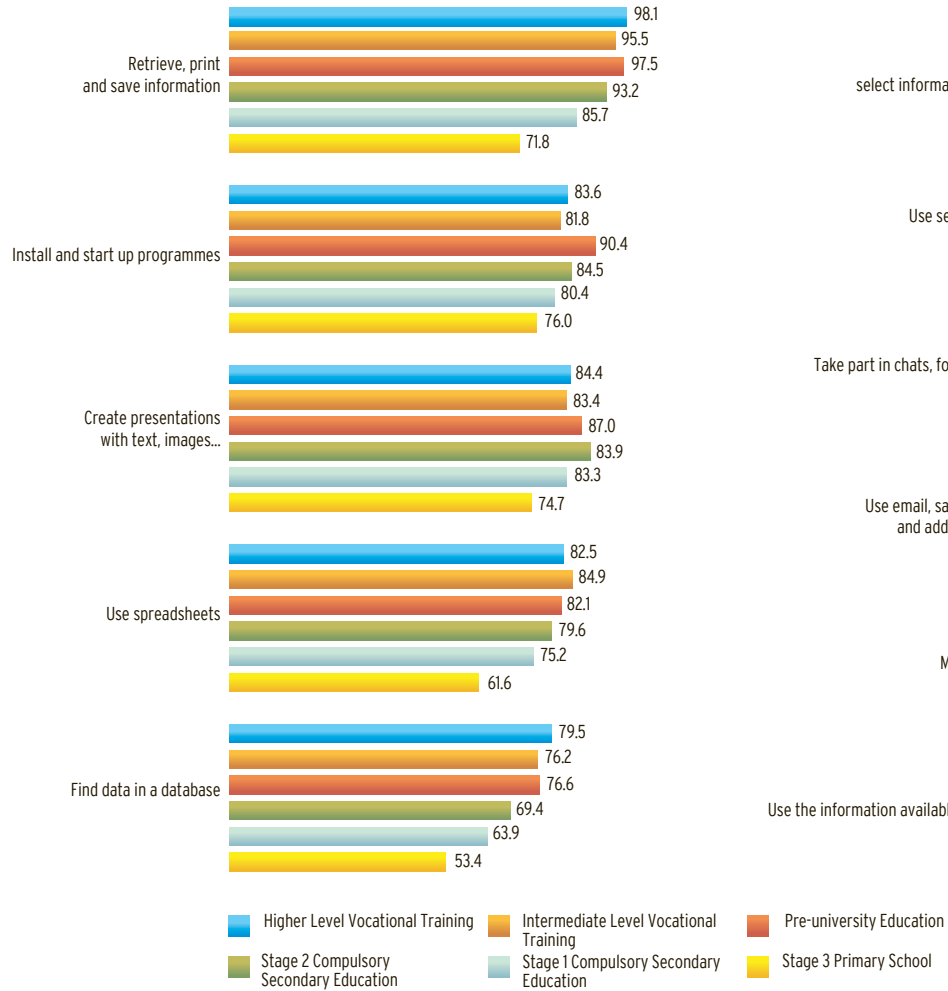
In Stage 3 Primary School, more than 75% of pupils say that they know how to search for information on Internet, select it, retrieve it and print it, and even prepare a presentation with images, text and sound.

At the end of Compulsory Secondary Education the percentage of students who feel able to use collaborative and communication applications increases

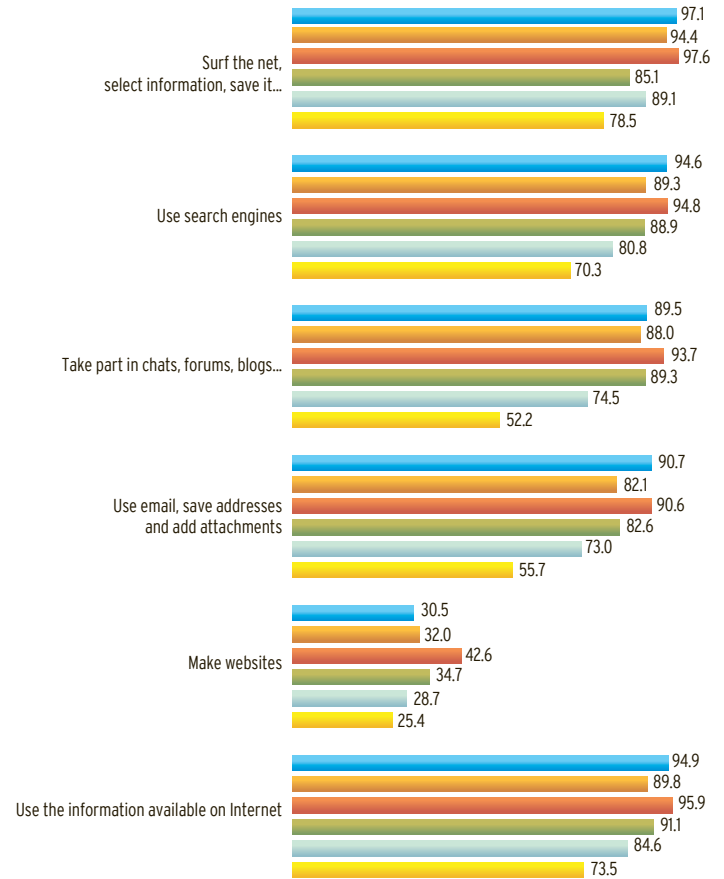
In addition, from 16 years of age onwards they feel competent in the same uses as in previous stages (games, information, communication, learning, etc.), though with higher percentages (about 90%).

TASKS THE CHILDREN KNOW HOW TO PERFORM WITH A COMPUTER (%)

Do you know how to do the following tasks with a computer?



Do you know how to do the following tasks with a computer?



**BETWEEN BOYS AND GIRLS,
THERE ARE SOME DIFFERENCES IN:**

USES OUTSIDE THE SCHOOL (HIGH FREQ.*)	BOYS	GIRLS
Downloading music	43.1%	37.2%
Downloading programmes	31.6%	18.7%
Writing emails, chats, etc.	39.8%	42.6%
Word processing	26.4%	29.1%
Doing homework with the computer	23.6%	28.1%
PERCEIVED COMPETENCE		
Installing and running programmes	88.3%	78.1%
Designing websites	38.3%	27.4%
Taking part in chat sessions, forums, etc.	78.1%	81.0%
Writing emails	76.4%	78.3%
Using information from Internet	86.5%	88.3%
APPRAISALS		
Interest in computers	72.8%	66.4%
Using a computer is easy	60.2%	54.2%

* Almost every day or several times a week.

Gender-related differences

Between boys and girls there are small differences in access, usage and competence. These differences are slightly more marked when it comes to their appraisals

Male and female students download music or programmes with a high frequency, although boys do so more often than girls. On the other hand, the girls' frequency of usage for activities such as writing emails or taking part in chat sessions, word processing or using the computer to do homework exceeds the boys'.

There are also some differences in terms of the competence perceived by boys and girls, especially at more technical activities. It is more often boys who report that they know how to install and run programmes or design websites, while a higher percentage of girls feel competent participating in chat sessions, forums and blogs, using email or using information from Internet.

The greatest differences between boys and girls are in terms of their appraisals of ICT. In this respect, the boys show a greater interest, and a higher percentage of them think that computers are easy to use.

Students' appraisals of ICT

Very interested in ICT;
somewhat more sceptical about their
usefulness for learning

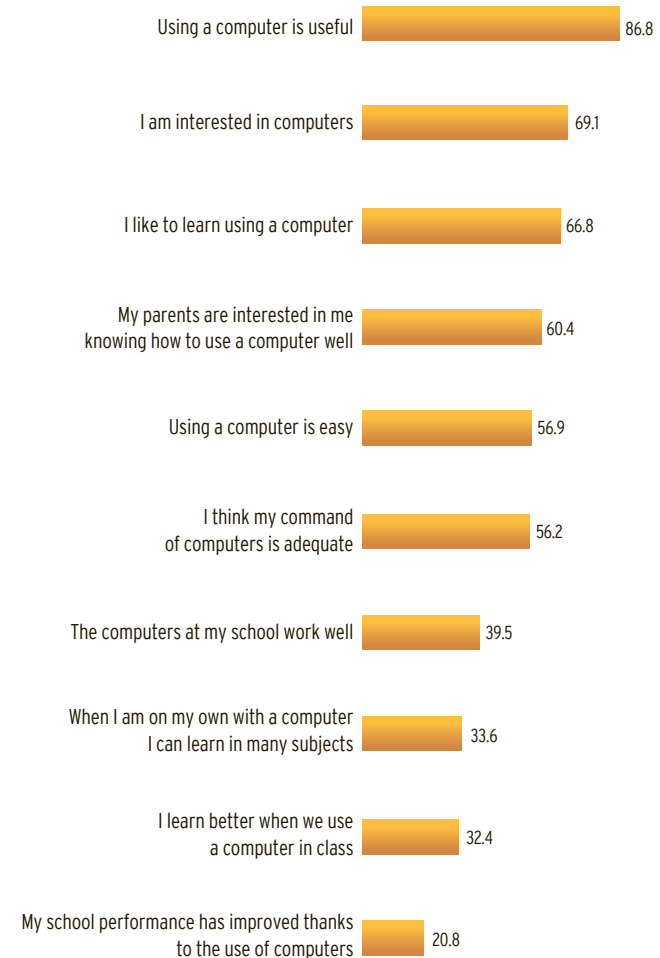
Boys and girls of all ages show a strong interest in ICT, even though they are sceptical in quite large numbers about their usefulness for learning. In their opinion, they like computers and are interested in them, but few believe that they facilitate autonomous learning, or that they can improve their academic performance.

Thus, 87% of the students surveyed think that using computers is useful to them, compared to 34% who think that computers help them to learn on their own, or 21% who think that computers have improved their performance. (In these cases, we have considered the responses to some extent or greatly.)

The limited experience students have with ICT at the educational centre (in terms of the variety of activities, frequency of usage, diversity of subjects they are used for, etc.) seems to have an impact on their poor evaluation of the usefulness of computers for learning.

OPINIONS ABOUT ICT (%)

Indicate to what extent you agree with the following statements



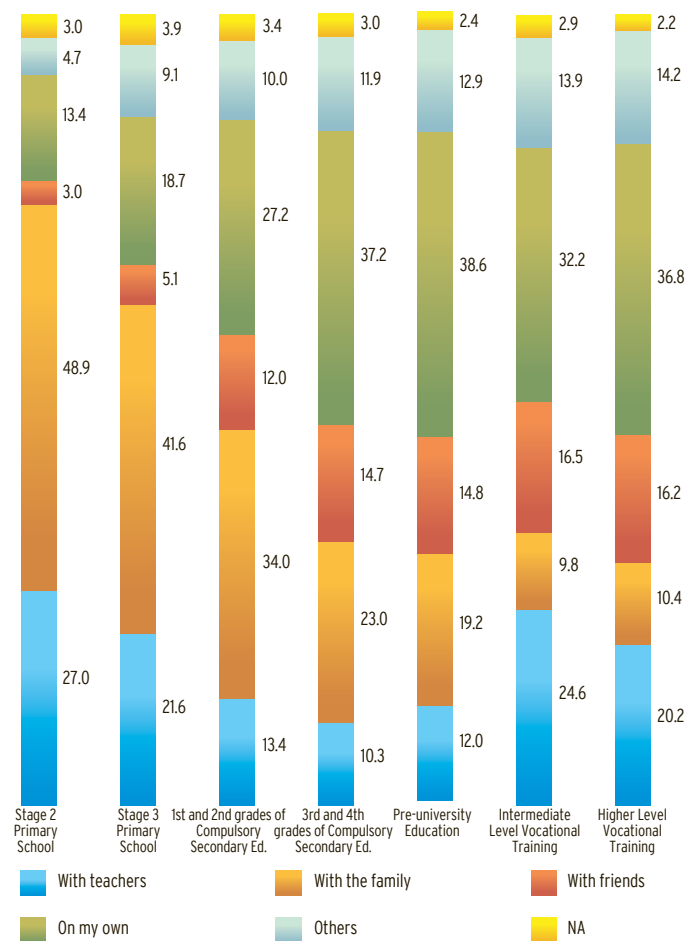
ICT trainers

The students think that the family or they themselves (depending on the age) have been mainly responsible for their ICT training

For Primary School pupils, the family is the main training agent, even more than teachers. Secondary and Pre-university Education students think that the family is less important in their training, the onus now being on self-training. Finally, Vocational Training students report that the family plays hardly any part in their ICT training, this being left to self-training and teachers.

WHO TRAINS STUDENTS IN ICT? (%)

With whom have you mainly learnt to use computers and Internet?



We would like to express our most sincere gratitude to all those (management teams, persons responsible for ICT, teachers and students) who have generously provided their opinions and experiences, without which this study would not have been possible.