

TEACHERS AND THE ADAPTATION OF UPPER SECONDARY EDUCATION TO INFORMATION AND COMMUNICATION TECHNOLOGY

In 1998, countries participating in OECD's Education Indicators Programme initiated an international survey of upper secondary schools (ISUSS). The aim was to compare the different ways in which countries meet the challenges of upper secondary education in the use of information and communication technology (ICT).

Principals were asked to estimate the percentage of teachers who use information and communication technology in the school. On average, principals reported that less than half of teachers use computer applications, about four teachers in ten use the Internet, and about one in five teachers use e-mail at least once a month. The distribution of schools where different proportions of teachers regularly use various forms of ICT is set out in the Figure. It uses an arbitrary threshold of 60 percent to indicate common teacher use of ICT. It shows the percentage of students going to upper secondary schools where that threshold has been reached for various types of technology. Overall, only a minority of upper secondary students attend school where the principal reported that at least 60 percent of the teachers use computers. In the four Nordic countries in the survey, along with Korea, however, use of computers and the internet have become the norm for many teachers, with

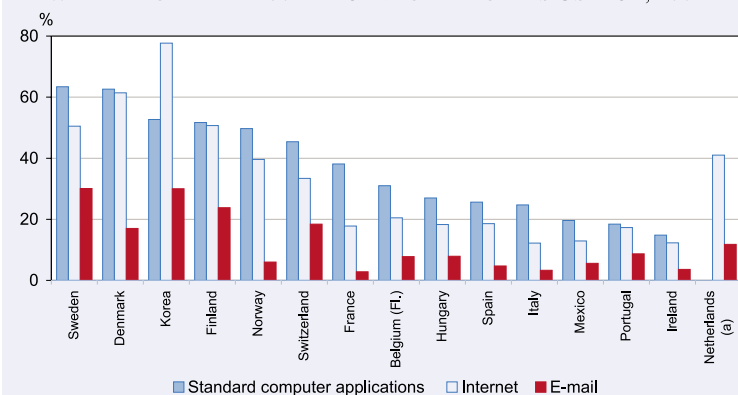
most students going to schools whose teachers are mainly computer users.

ICT can be used to facilitate a broad range of teaching and learning activities. They can be used in both independent and group learning situations. ICT can also be used to allow students to work at their own individual pace, developing research and analytical skills and gaining additional opportunities for learning by simulation. Teachers can integrate computer-related activities into students' homework. Moreover, information and communication technology opens new possibilities in storing and retrieving information and thus can be used as a resource centre. But how are computers used in practice today? Computers are primarily being used as an information-gathering device. On average, more than two-thirds of students attend school where computers are used "a lot" to obtain information from the Internet. Compared to this, computers are used much less frequently for developing independent learning skills, providing additional instruction and practicing opportunities for students, allowing students to learn/work at their own pace during lessons, interdisciplinary work and creating opportunities for learning by simulation.

Principals were asked to describe the obstacles of reaching their ICT goals. From a list of 22 potential obstacles, they were invited to select the three most serious obstacles. The results are summarised in the Table. Of the 22 listed obstacles, only six appear on the top of the list of at least one country. These, however, are spread across the whole range of problems related to the fundamental technological changes schools have to manage. They include shortage of computers and software, short life-cycle of equipment, maintenance and support problems, difficulties in organising access and integrating new technology in the present education framework, teachers' insufficient knowledge and skills in using and applying ICT, and inflexible working conditions for the increased preparation time required by ICT application.

An insufficient number of computers for student use appears to be one of the three most serious problems in all countries except

PERCENTAGE OF UPPER SECONDARY STUDENTS ATTENDING SCHOOLS WHERE MORE THAN 60 PER CENT OF TEACHERS USE ICT, 2001



(a) Country did not meet international sampling requirements. The reported data are unweighted.

Source: OECD ISUSS database, 2003; OECD (2004), p. 89.

The three most serious obstacles to reaching goals related to information technology in upper secondary schools as reported by school principals (2001)

Country	Ratio of students to computers	Ratio of teachers to computers	Hardware and software-related obstacles				Teacher-related obstacles			
			Insufficient number of computers for teachers	Insufficient number of computers for students	Outdated computers (older than 3 years)	Not enough variety of software	Shortage of maintenance and technical support	Insufficient time for teachers to prepare lessons	Difficulties in integrating computers into classroom instruction	Lack of interest/willingness of teachers to use computers	Teachers' lack of knowledge/skills in using computers in instruction
Belgium (Fl.)	7.5	14.7	.	..			...	.		..
Denmark	2.8	2.1		..						..
Finland	5.0	1.6		.			..			..
France	5.8	8.5		.			..			..
Hungary	10.2	5.5		..	..		..			.
Ireland	13.1	9.4		..			..			..
Italy	11.7	14.6		..	..		..			..
Korea	6.4	0.8		..	..		..			..
Mexico	16.5	7.2		..	..		..			..
Norway	3.7	1.7		.						..
Portugal	14.4	9.6		..						..
Spain	15.5	5.9		..	.					..
Sweden	3.4	1.3		..						..
Switzerland	9.0	3.2		.						..
Netherlands ^{a)}	13.5	2.3								..

... = The most serious obstacle.
 .. = The second most serious obstacle.
 . = The third most serious obstacle.

^{a)} Country did not meet international sampling requirements. The reported data are unweighted.

Source: OECD ISUSS database, 2003; OECD (2004), p. 99.

Belgium (Flemish community), Hungary and Korea. Since sufficiency can change with rising demand as usage becomes more extensive, the number of computers available is likely to persist as an issue for some time. Lack of teacher knowledge and skills is typically the second-most serious obstacles perceived by principals. Again, since new technologies in the rapid phase of change and development require constant user strain and effort, there seems to be permanent teacher frustration and a need for further training, which is rarely calculated in teacher work time. An insufficient number of computers for teachers is one of the three most serious obstacles in Denmark, Hungary, Mexico, Norway and Portugal, according to school principals. Since computer literacy can be best developed by actual computer use, unlimited access time for teachers is the best way of supporting the development of teachers ICT skills. Principals in five countries find that the large number of outdated computers is one of the three most serious problems.

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Reference

OECD (2004), *Completing the Foundation for Lifelong Learning, an OECD Survey of Upper Secondary Schools*, Paris.