Are 1:1 classes with school-provided laptops and tablets widespread?

There is growing interest in classes in which every student has continuous access to a laptop or tablet computer. In this briefing paper we consider the extent of 1:1 computing, drawing on evidence from the Survey of Schools: ICT in Education and recent European Schoolnet projects and studies.

In the Survey’s teachers’ questionnaire, randomly selected teachers were asked if their school provided students in their class with a laptop for their own use.

At grade 4 (i.e. around 9.5 years old), almost 20% of students are in a 1:1 class in Denmark, Ireland and Poland (fig. 1), with a EU mean of 8%. At grade 8 (i.e. around 13.5 years old), more students are in 1:1 classes than at other grades – 21% on average in the EU – but they are heavily concentrated in Spain, Norway and Sweden, with, as at grade 4, a ‘long tail’ of countries where there are currently hardly any students in such classes.

MORE PRECISELY:
- A 1:1 class is here defined as one in which the school has provided students with a laptop or tablet PC or netbook or notebook for their own use during the school year.
In Norway very high percentages of grade 11 students (i.e. around 16.5 years old) in general education are in 1:1 classes (fig. 2), followed by Latvia, Denmark and Poland. The EU mean of 7% indicates that in most countries very few students are in 1:1 classes. In vocational classes at grade 11, Norway again leads, but there are also high percentages of students in 1:1 classes in Sweden.

**FIG. 2: Percentage of grade 11 students in 1:1 classes (2011-12)**

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To what extent do students bring their own laptops and tablets?

The availability of portable devices in class is, in practice, increased by the growing trend to allow students to bring their own laptop or tablet – and indeed their mobile phone – and to use it in class. However, this Bring Your Own Device (BYOD) policy, particularly evident in Denmark for example, does not necessarily lead to every student having access to a portable device unless equity issues are addressed.

Teachers were asked if their students were allowed to use personally owned laptops/tablets in class for learning. Fig. 3 shows that only in Norway very high percentages of grade 11 students (i.e. around 16.5 years old) in general education are in 1:1 classes, followed by Latvia, Denmark and Poland. The EU mean of 7% indicates that in most countries very few students are in 1:1 classes. In vocational classes at grade 11, Norway again leads, but there are also high percentages of students in 1:1 classes in Sweden.

**FIG. 3: Percentage of grade 4 and 8 students allowed to use their own laptop/tablet in class for learning (2011-12)**

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MORE PRECISELY:

• EU averages refer only to the EU27 countries for which sufficient data were obtained (i.e. not Germany, Netherlands and the United Kingdom) and not to other countries if responses were low for a particular item and excludes results from Croatia, Iceland and Turkey. It is a weighted average where the contribution of a country is proportional to the number of students in that country.
At grade 11 general more than 50% of students can bring their own laptop to school in 15 countries (fig. 4), while at grade 11 in vocational schools BYOD is approaching the norm: in only six countries are fewer than 50% of students not allowed to bring in their own laptop.

**FIG. 4: Percentage of grade 11 students allowed to use their own laptop/tablet in class for learning (2011-12)**

How much are personally owned laptops and tablets used in class by students?

In the Survey students at grades 8 and 11 were asked how often they used their own laptop/tablet in class for learning (regardless of whether they were in a 1:1 class). At grade 8, as can be seen in fig. 5, the highest percentages are to be found in Denmark, Luxembourg and Bulgaria, and the lowest in Finland. As can be expected, the percentage using their own laptop is lower than the percentage allowed to bring them to school, as reported above. This may be explained by the fact that a school may be extensively equipped with up-to-date laptops or computers obviating the need to bring one’s own equipment, or that the possibilities of BYOD are not yet being fully exploited.

At grade 11 general, there is more student use of their own equipment (fig. 6), almost all Danish students bringing their own laptop. In most countries there is more such use in vocational than general education.

**FIG. 5: Percentage of grade 8 students using their own laptop/tablet in class for learning at least weekly (2011-12)**

**FIG. 6: Percentage of grade 11 students using their own laptop/tablet in class for learning at least weekly (2011-12)**

**Conclusion**

This brief overview shows that currently relatively few students are in a 1:1 class and they are concentrated in a few countries and at specific grades. Students report limited use in lessons, for learning, of their own laptops or tablets. Nevertheless, the percentage of students using their own devices increases with the level of education, with quite positive figures for grade 11 students. This of course does not say anything about the quality of their use and its effect on educational outcomes.
Project Focus: analysis of 1:1 initiatives in Europe

As this issue analyses the main findings on 1:1 computing and portable devices in schools from the Survey of Schools: ICT in Education, we asked Anja Balanskat, senior analyst and project manager at European Schoolnet, to explain the results from the comprehensive study she coordinated on behalf of EC Joint Research Centre, Institute for Prospective Technological Studies (JRC-IPTS): “Overview and analysis of 1:1 learning initiatives in Europe”.

The study analysed 31 recent 1:1 initiatives from 19 European countries involving altogether 46900 schools and around 17.5 million students. These cover important large-scale nationwide initiatives involving up to 600 000 students, as in Portugal and Spain, but also smaller-scale initiatives involving 100 to 1000 students, as in Austria, the Czech Republic, Italy, and the UK. One of the objectives of the study was to identify factors for sustainability and upscaling of 1:1 initiatives. Therefore, all initiatives included in the study had to reach a significant number of students and classrooms involved in the initiative in a specific local, regional or national context. They also had to comply with the criteria for inclusion of 1:1 initiatives provided in this study, which is “equipping all students of a given school, class or age group, with a portable mobile computer device”.

Q: According to your analysis, who are the main initiators of 1:1 initiatives across Europe? What is the role of industries?

The majority of the initiatives were initiated at national level by Ministries of Education or regional education authorities and are implemented within an educational framework. Industries play a role in the implementation of projects as part of public-private partnerships to equip schools with the devices, and are less involved in providing training and ongoing support.

Q: How are 1:1 initiatives financed?

There are 3 main financing models emerging. In the full financing model the state or an educational authority fully finances the equipment for students in schools. This happens via grants given to schools that applied for it, or in other cases, via grants to schools and grades selected by the state. The co-financing model involves the state as a financier, but also parents or other stakeholders contribute to the financing. This model has been identified by experts as the most sustainable model as various stakeholders take responsibility for the device. In a few cases, e.g. the Acer-European Schoolnet Netbook pilot, the industry provided equipment for free to schools.

Q: What is the impact of 1:1 initiatives on curriculum and assessment? What is the added value for teaching and learning?

A 1:1 learning model, where every learner has access to his/her personal learning device intended to lead to pedagogical change and innovation, is a stated objective in the majority of the 31 initiatives. Therefore, we can observe a shift away from technology to a focus on pedagogy in more recent 1:1 initiatives (from 2008 onwards). However, as evaluation studies reveal, the curriculum does not hinder 1:1 pedagogy, but needs to be redesigned for 21st century learning. New forms of assessment (including the use of mobile devices), more formative assessment and taking into account new competencies acquired (and not only knowledge), need to be applied in order to fully exploit the benefits of 1:1 learning approaches.

Q: In theory, 1:1 initiatives contribute to dissolve the boundaries between formal and informal learning. Is this actually happening, according to your study?

This is only starting to change; 12 initiatives aim, among other objectives, to foster anytime-anywhere learning opportunities (school & home use of the device). The personal ownership of the device is an important factor for the successful use of the technology in various contexts. Evidence from the evaluation of projects shows, that parents become more engaged in their children’s learning when the devices are taken home by students. Likewise, the devices have to be used on a regular basis by teachers at school and students need to be engaged in high level tasks that relate to their interests and experiences.

Images below from the Acer-EUN Tablet Pilot