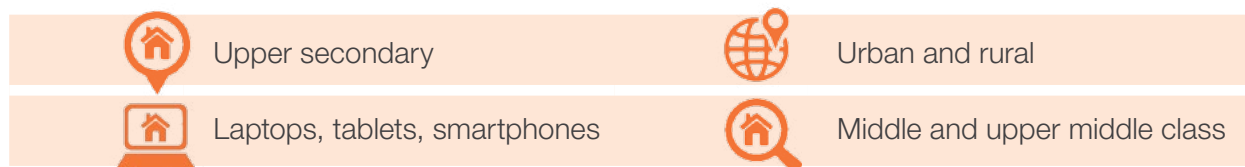# 9.5. A planned BYOD approach maintaining equality of provision in Norway

This case study looks at how clear vision and detailed planning at regional level supports schools in achieving BYOD goals whilst maintaining equality of provision.

Upper secondary	Urban and rural
Laptops, tablets, smartphones	Middle and upper middle class

Background and context

In 2008 the Norwegian government decided to implement 1:1 computing in all upper secondary schools. Drivers for the policy were the previous decisions to digitise all learning materials and to require schools to teach digital literacy. When tasked with implementing the 1:1 policy, most Norwegian counties decided to purchase and retain ownership of computers for students. However, the county of Rogaland decided to implement a BYOD strategy. Students/their families were given the opportunity to purchase a laptop from one of two suppliers at an advantageous price negotiated by the county.

Alternatively, students could bring in to school any laptop they purchased or already owned. Rogaland's decision was informed by research identifying BYOD as an emerging trend in education in some other countries.

Skeisvang is a Rogaland vocational upper secondary school with 850 students aged 16 to 18 and 170 staff, including 120 teachers. The school offers a broad range of vocational studies as well as academic subjects. The school's catchment area includes a city of approximately 40,000 people and an island of a similar size. The population consists mostly of people at the middle or upper end of the socio-economic spectrum and includes some minorities who arrived in Norway as asylum seekers.

The laptops and other mobile devices

Students in Rogaland schools can choose to purchase one of four models of laptop including two Windows and two Mac devices. The county has not arranged tablet computer options although some schools have trialled school-purchased tablets.

County officials believe laptops are currently better learning devices than tablets for upper secondary level.

Some subjects, especially some offered by vocational schools such as Skeisvang (e.g. technical drawing), use software not available on tablets and others require substantial quantities of written work. The use of tablets is not discouraged by either the county or school but students are recommended to use a keyboard.

Skeisvang school has found that most students prefer to use laptops and some who tried tablets have gone back to using laptops or use tablets in addition to their laptop, mostly for recreational activities.

Where Rogaland schools identify a need for specialist software requiring desktop computers, they are able to procure these. However, improvements in the power and functionality of laptops has increased the variety of software that can be supported and led to a decreasing demand for desktop computers.

Students can use their own tablets and smartphones in schools for learning related and social activities. However, only laptops are allowed during examinations. Skeisvang places no restrictions on the type or number of devices students bring into school. There are rules regarding the use of phones in class; the teacher's permission is required and phones must be set to vibrate not ring. Students are aware of, and generally abide by, the school's acceptable use policy which students have been involved in agreeing. Most students have a smartphone from the age of 10 or 11 in schools with similar rules and, therefore, are used to the restrictions involved.

Funding arrangements

The county subsidises laptop purchase with prices ranging from 2,000 to 3,000 Krone (up to approximately Euro 350). Many students purchase laptops with gift money received at church confirmation, or a secular celebration, in the year before joining upper secondary school.

In order to comply with national equality regulations, the county is obliged to have an option where students can have access to a device free of charge. This is achieved by ensuring that the price of the laptop with the most basic specification can be paid over three years using the annual grant which Norway provides to all students to pay for education related equipment. Higher specification devices can be partly purchased with the grant money. Some students choose not to buy a laptop through the county scheme as they prefer to purchase a different device.

Participation in BYOD

At Skeisvang school all staff teach students who bring their own devices into school. Some students do not have a device and some do not always bring their device into school. Laptops are available for these students to borrow.

Neither the county nor the school have the authority to require that all students buy a laptop. Participation in BYOD cannot be mandatory for students as a result of legislation which states that BYOD in school is limited to solutions where students can use their personal digital equipment. A BYOD approach where students must use their private equipment is not possible within current legislation.

Advice, staff training and incentives

The County publishes advice for schools, tailored according to the type of courses offered, and maintains a county portal from which schools can download software and resources.

Each school has one or more ICT pedagogical staff who may be full time or half time, depending upon the size of the school. These staff provide their fellow teachers with training and support in the pedagogical use of technology. This is especially important in Norway where ICT is embedded into every subject. Some schools are clustering ICT pedagogical support for knowledge sharing and to develop shared resources.

A modular programme for ICT competence focussed on the pedagogical use of ICT, and including modules on ICT in assessment and classroom management, has been developed with the University of Selanger. Approximately 350 teachers have taken one or more modules.

Teachers undertaking these modules accumulate grant points which can result in salary increases if they are not already earning the maximum salary for their role.

At the start of each year ICT pedagogical staff in Rogaland schools deliver training for teachers and students. They encourage teachers to make use of digital resources and aim to get all students to the same level of understanding.

Each year Skeisvang school run a 10-hour course over several weeks focussing on digital security, acceptable use and online safety. They encourage teachers to, "be creative, learn from students, suggest and allow different methods of learning and tools for learning, e.g. mind maps, Google docs, apps and web 2.0 tools". However, they find that formal training courses are not helpful if the skills learned are not put into practice immediately.

Technical support

ICT technical support arrangements and staffing vary between schools and may be outsourced. Schools used to be more autonomous regarding ICT and some staff are highly technically skilled. However, technical support is being centralised at county level with service level agreements to ensure all schools receive a consistent service.

Students are responsible for maintenance of their own laptops and these are insured against accidental damage. Schools help with installing software and online emergency assistance is provided.

Schools lend laptops to students when their own has been sent away to be fixed. Also, county level agreements with suppliers include repairs and temporary loans.

At Skeisvang school students training to be IT technicians help to support students on other courses as part of their training. This involves running workshops as well as maintaining and repairing students' BYOD laptops. These students have also delivered computer coding courses for visiting primary school students. This practical experience enhances the IT technician students' CVs and self-confidence.

Benefits

Advantages of BYOD reported to the county:

- Teachers and students focus more on the content of learning activities rather than the technology used to access or support these.

- Students have a closer relationship with a laptop they own and take more responsibility for it. There is less need for schools to deal with repairs and less lost time while students become familiar with school laptops; this time can instead be spent learning.

Skeisvang school have found that:

- Students are more careful with their own laptops than with school owned devices.

- As the school has no responsibility for repairs or maintenance of student laptops, they make "significant savings" compared with the cost of supporting school owned devices. These savings have not been quantified but schools in other counties are concerned about ICT support costs and are starting to express an interest in BYOD.

- When teachers had to reserve computers in a computer lab in advance of lessons, this created a barrier to use and this is still a problem in some lower secondary schools. Knowing students have their own devices with them at all times means that teachers can decide at short notice to try something new in addition to planned activities.

- Students can use their devices for more than just note taking; they can use functions and services such as filming and social media in a pedagogical way to assist in learning.

Challenges

Challenges reported to the county by schools, particularly in early stages of BYOD implementation included:

- Some teachers find it difficult to support students with different machine set ups or software versions, particularly those teachers with less well developed ICT skills.

- Some teachers find it difficult to cope with the reduced level of control.

Challenges mentioned by Skeisvang school are:

- The school would like to be able to provide more CPD for staff but this is constrained by the time available.

- Sometimes students do not bring their laptops into school because "they forget or it is broken or they can't be bothered".

- Some staff feel decisions made at county level, which they do not agree with, have been imposed on them, e.g. having no internet filtering. This might have been avoided or reduced by more staff training at an early stage. In practice there have been no significant problems with unfiltered internet access but some issues with excessive Facebook use have been experienced

Lessons learned

Skeisvang school find many students are not comprehensively ICT literate. They are good at playing computer games but need to learn about other ICT tools. In helping students to acquire additional skills and knowledge, teachers are encouraged to think of themselves as facilitators rather than experts. The teacher needs to "set the ball in motion and let the students run with it", then students learn additional skills quickly.

Regarding technical infrastructure:

- Fast and reliable broadband is vital. A 100 Mbps connection is provided by the county and operated by a national provider.

- Excellent Wi-Fi connectivity is needed and this requires planning, investment and monitoring to ensure that it is very stable.

- It is important to have areas with sufficient power sockets available to allow charging of students' devices. As students own the devices they use in school and take them home at night, it is not necessary to invest in charging cabinets or trolleys.

- A single sign on system makes access to all necessary services from BYOD devices easy and secure.

Skeisvang recommend the approach taken by Rogaland county which has avoided 31 schools duplicating effort and reinventing. New technologies and methods are piloted in one school first and rolled out to others if successful.

Evaluation and impact

No formal evaluation of the BYOD policy has taken place in Rogaland. A survey was undertaken after four years to explore why not all students were participating in the subsidised laptop scheme. Responses indicated a need to improve information provided about the scheme and that many students did not feel the laptops available met their needs. These needs related mainly to personal use of computers, for example for gaming. Some gamers brought in their own laptops. After improvements to laptop specifications, participation in the subsidised laptop scheme increased from 50 to 70%. Other Norwegian counties may be following Rogaland's lead on BYOD. An Ambient Insight mobile learning market report reported in 2013 that 'it's learning', a company providing a learning platform, has agreements with five Norwegian counties to support their schools' BYOD policies.

County level reflections

Rogaland officials report no significant problems implementing their BYOD strategy and have received no complaints that suggest BYOD is unfair. The system is now well embedded and contracts with laptop suppliers have recently been renewed. County coordinator Tore Wersland says: "Technology shifting can be a challenge but we don't have to follow every trend. It may be too early for tablets; we should not be running ahead of student needs. It is good for a county to be a little conservative but we love to see schools carrying out lots of projects to find new ways to innovate, including with tablets. We need a standard approach and also lots of exploration and testing". Regarding teachers' skills, Tore emphasises the importance of teacher training that "focuses on pedagogy including how and when to use ICT and how to use it wisely".

A teacher's advice to other schools

Timothy Scott Golding, a teacher and head of department at Skeisvang advises other schools implementing BYOD to:

- "Keep things open" - do not focus on restricting access to undesirable or potentially distracting online content and services. Instead educate students in responsible use and digital literacy.

- "Don't be afraid of trialling and failing", learn from mistakes, there will be mistakes but they lead to improvements.

- "Plan" – in Rogaland County there has been good planning including a staged approach.