



Living Schools Lab Observation Case Studies



Introduction

With the participation of 15 partners, the two-year Living Schools Lab project promoted a whole school approach to ICT use, scaling up best practices in the use of ICT between schools with varying levels of technological proficiency. Visits to the project's Advanced Schools in 12 countries were carried out to observe school's best practices leading to a report and recommendations on developing and mainstreaming of whole school approaches to ICT.

In addition to this, twelve case studies present the evidence gathered as part of the school observation visits to two Advanced Schools in each of the 12 countries: Austria, Belgium, Cyprus, Czech Republic, Finland, France, Ireland, Italy, Lithuania, Norway, Portugal, and the United Kingdom. Alongside the case studies, each Link Observation Visit was detailed in a blog post, along with useful links and practical ideas to try in the classroom: <http://lsl.eun.org/observation-visits>.

A framework of eight main questions was used to develop the case studies:

1. What types of technologies and resources are available in the Advanced Schools?
2. Are there recent national initiatives that have had an impact upon whole school development of ICT?
3. Who leads the decisions about the development of ICT?
4. What types of training and professional development are available to teachers?
5. How is ICT being used in different subjects?
6. What kinds of research and development are the teachers engaged with?
7. Are the Advanced Schools engaged in any partnerships or networks?
8. Are there particular areas that could be mainstreamed or replicated?

All case studies contain information that has been reviewed by National Co-ordinators. The studies outline evidence gathered as part of the Link Observation Visits and throughout the Living Schools Lab project. Further information is available on each school website about the individual school, although this may be in the home language.

All of the school visits were undertaken by Diana Bannister MBE, University of Wolverhampton. These case studies should be read in conjunction with the project's Link Observation Visits final report available at <http://fcl.eun.org/lsl>.

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NB: Websites are referenced throughout this report; these were checked prior to publication. The reference to the website does not constitute an endorsement of the product or organisation.

Observation Case Studies: United Kingdom

June 2013

Broadclyst Community Primary School, Exeter, UK	
Number of students	439 (+65 children in the Nursery)
Age group of students	4-11 years
School website	http://www.bcps.org.uk
Name of principal	Mr Jonathan Bishop
LSL project Lead Teacher	Mr David James

Shireland Collegiate Academy, Sandwell, UK	
Number of students	1198
Age group of students	11-19 years
School website	http://thelearningbank.co.uk/shireland
Name of principal	Sir Mark Grundy
LSL project Lead Teachers	Kirsty Tonks, Lewis Moore

1. What types of technologies and resources are available in the Advanced Schools?

Both of the Advanced Schools in the UK are equipped with a wide range of technologies. It is significant that the Principal of the secondary school and the headteacher of the primary school have both been in the schools for more than fifteen years. This means that both headteachers have ultimately been responsible for the implementation and maintenance of technology since it was first introduced into schools in the UK. The resources have grown since the late 1990s and new technologies have been consistently introduced. Older technologies have been replaced and additional equipment has been purchased. Technology is integrated across all areas of the school for administration, learning and teaching. It is included as part of the whole school development plan cycle within the financial plan and the curriculum progress.

In Year Three at Broadclyst Community Primary School, most classrooms are equipped with ten PCs at the side and the students can access these as directed by the teacher. In Year Four the students have 1:1 access to laptops, but this equipment does not go home. In Years Five and Six, each individual student has access to their own PC and desk area for work. There is a room for TV broadcasts and this is used by all the students. There is 100 Mb leased broadband line. Teachers have access to a wide range of technologies including projectors, plasma screens, iPads, touch screens, voting buttons, visualizers, sound systems, TV studio, recording studio, digital cameras and video calling.

At Shireland Collegiate Academy in Years 7, 8 9, 10 and 11 students have laptops or netbooks (which belong to the school). In post-16 the students have iPads or laptops. All of the staff use Microsoft's Learning Suite and are provided with a laptop and iPad which they use in all lessons. The school of the campus is wireless enabled including an area outside.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

In the UK, the national agency for ICT was BECTA; however, a change of government meant that this agency was closed in 2010. It was replaced by the Technology Policy Unit, but this was closed in spring 2013. Schools had formerly looked to the information, research and development provided by BECTA to inform developments within the school. Leading schools at the forefront of using technology had previously worked with BECTA to explore and provide exemplars to demonstrate how ICT could be mainstreamed across the UK schools.

Teaching Schools are an avenue for outstanding schools to share good practice and support others. Both Advanced Schools have been designated as such and so support others to make better use of technology for learning and school improvement. There is funding to do this.

During the interviews at the beginning of the project, Kirsty Tonks, one of the lead teachers in the UK said that "there is a lack of clear direction in terms of technology for school improvement and innovation for teaching and learning. There is an inconsistency that is greater than ever before."

The leading teacher suggested that at a national level in the UK, technology itself has allowed schools to know who is actively developing the use of technology in teacher professional development. For

example: “Twitter gives voice to people” [and makes it easier to share ideas at a national level.] Teachers are able to move forward on their own initiative and use the technologies to collaborate and for their own professional development.

The lead teacher in the UK stated that local support can be very inconsistent. Some local authorities still provide ICT support for schools, but they usually pay a subscription for this service. There has been a growing movement of schools to have chosen to become academies and this means that they are completely autonomous. There are some schools that form part of an academy chain or cluster and this can mean that groups of schools are able to access ICT expertise. Kirsty Tonks commented “...autonomy is fine, if you have the expertise.” Some secondary schools have provided support for local primary schools to fill the vacuum left by the local authorities.

As an Advanced School, Shireland Collegiate Academy positions itself as a centre of excellence for ICT. The school is a Department for Education Teaching School¹ in the UK which means that it can provide training for trainee teachers. The school has worked with commercial partners including Microsoft and Steljes.

A significant number of the staff are used to demonstrate at regional and national events. The E-learning director, an Assistant Principal and four other staff all presented at the UK launch of Microsoft’s Shape the Future programme in November 2012.

3. Who leads the decisions about the development of ICT?

At a national level, schools have grown in autonomy and now have to make their own decisions about ICT. In the UK primary school, the decisions are made by the headteacher who works closely with his deputy and the senior management team. As a headteacher, Jonathan Bishop says that “It is important to choose people who can lead on certain aspects of the projects.” Staff are encouraged to understand that “Teaching is bigger than me and my room.” The Headteacher believes that real system change takes over five years, to allow groups of students and staff to adopt and integrate the ideas. Subject leaders are encouraged to write about and present evidence of what they are learning.

The headteacher states that it is pivotal to look at how to meet the wide diverse spectrum of student needs. “People try to bolt on the technology without realising the change management that is required.”

In the secondary school, there is the Principal and the Director of E-Learning. However, there are a number of other staff who are involved in the whole school plan for development from different subject departments within the school.

4. What types of training and professional development are available to teachers?

At Shireland Collegiate Academy, one of the leading teachers in the Advanced School is responsible for a team of nine staff who provide ICT support for teachers. Whilst there are Continuing Professional Development providers within the region, the school generally provides their own support to individual

¹ <https://www.gov.uk/teaching-schools-a-guide-for-potential-applicants>

staff. The leading teacher is non-class based and therefore can be part of new projects and initiatives. The leading teacher provides opportunities through events for example, a marketplace of current ICT resources that are being used by staff is offered for all teachers to attend. Keynote speakers are invited into school to speak to all staff as part of the professional development.

Continuing Professional Development (CPD) is done with all the staff and it is important that it covers the learning support as well as the IT support. There are drop-in sessions where people can find out about particular software or technologies. The school delivers professional development sessions for staff including those from other local schools on a regular basis. The school is working with Warwick University to develop a Masters level Leadership and Management programme for the staff, and staff from local schools where the key focus will be e-learning supported school improvement.

Shireland Collegiate Academy has five teacher training days per year, but two of these days are delivered as twelve twilight sessions. This allows for the training to be regular and throughout the year. Shireland Collegiate Academy supported six primary schools locally initially, but this has grown to eleven primary schools where they provide primary curriculum support, dance art, music technology and drama and deliver this support in the Primary Schools.

At Broadclyst Community Primary School, the headteacher says that ultimately “nobody and everybody is responsible for the training.” There is no particular member of staff who is responsible for the training, but staff are expected to “want to know.” Staff are given additional training if there is a need. The deputy headteacher provides support for staff and they are encouraged to ask if they need additional help. The headteacher places an emphasis on recruiting staff who are self-motivated to develop their own practice.

5. How is ICT being used in different subjects?

At Shireland Collegiate Academy, there has been the full integration of ICT across the change of curriculum model – Literacy for Life model; initially this was Year 7 and 8 and a curriculum restructure for Year 8 and now in Year 9. This means that students who join the secondary school in Year 7 are based in one area of the school and do not move to different buildings for their lessons.

E-learning is used across all subjects. Over 300 different families access the school’s Learning Gateway each month via the family portal. The school’s Raising Achievement Plan has e-learning elements in all of the strands as do all of the Subject plans which are held in the Learning Gateway. The Learning Gateway is used to drive learning across all subjects and years and receives almost two million student hits per year. The Learning Gateway is used to collect evidence of achievement and has the Management Information System (MIS) integrated within it.

The Learning Platform has enabled the teacher to address how to personalize learning for the students. On the Learning Gateway there are subject sites for staff where they can upload ideas on a topic that they are going to teach. Teachers can collate resources together and share materials. Resources have been collated with teaching and learning ideas for the entire curriculum. Students are able to access all their materials through “Class Sites”. Students can go to the “Resource Sites” and find all the materials for the topic. This means that where the teacher has identified that the student may require

additional support, the materials have been identified. On a daily basis, the teacher can make specific materials available on the “Class Sites”.

The school has established “exemplification sites” which demonstrate what the student needs to do to achieve a particular examination grade. This enables student to access real examples of other students’ work who have previously achieved the same target grade.

In Key Stage 3 (Years 7, 8 and 9) all of the students use their netbooks to deliver the competency based thematic curriculum. This means that for 19 hours a week (mornings and Wednesdays all day), it is delivered by some primary practitioners and some secondary practitioners. They use the netbooks to support Assessment for Learning and peer assessment. There are a number of examples of student authored resources both in class and after school.

In Mathematics, one of the teachers has been looking at different ways to give the students feedback for their work. The teacher has given the students feedback by creating a tutorial video to highlight some of the common mistakes. The teacher makes the videos himself using the video function on the iPad. These are then made available via YouTube.

In Year 11, students created a website called Further Your Maths². This gave the students the opportunity to set up a website and support each other with their mathematics.

Shireland Collegiate Academy has worked for a number of years on the development of provision to support what is now being called Flipped Classroom. The school has used the Learning Gateway to provide resources to stimulate learning and then to support and monitor the process.

In Art and Design, one of the teachers described the use of technology as a three-way conversation that is essential to professional learning; students use the technology, technology for the teacher use and technology for the “person”.

In this school, there has been a considerable connection made between technology and classroom support as a “joint investment.” This means that staff who have been employed as teaching assistants in the classrooms have been trained to use the technologies.

At Shireland Collegiate Academy, the lesson journey is clearly visible to everyone. Students are able to access materials through the Learning Gateway and their class sites. There is a defined starter activity where the WALTs (What are we learning today?) and WILFs (What I’m looking for?) are displayed at the beginning of every lesson and more importantly discussed with the students. The competencies are made visible to the students. Students are working with MS OneNote and can include a recorded audio or video within their work.

At Broadclyst Community Primary School, parents have access to the learning platform and can access work assigned and support their child’s learning. Across the curriculum the headteacher has worked to encourage communication and collaboration combined with problem solving activities. The headteacher Jonathan Bishop says, “Our approach is to give them something to do and solve that is worth talking about.”

² <http://furtheryourmaths.co.uk>

In Year 6, the two classes are joined together in one large teaching area where each student has a desk with their own PC. However, the school provides two full time teachers in this area and up to five teaching assistants. This means that activities can be divided into smaller groups using additional learning spaces across the school with the students working with a teaching assistant. It means that subject knowledge and expertise can be divided between the practitioners.

The school has a photography club teaching students to take work with digital media. This encourages the students to capture the community of the school. There have been video projects where students produce a video documentary.

Students at Broadclyst Community Primary School describe how they use the TV broadcast equipment to create World News and Local News. Students use “Mathletics” and like to be able to compete with other students in other schools. One student said that “using ICT has opened our eyes to the world, and opened up more opportunities for us.”

6. What kinds of research and development are the teachers engaged with?

Many staff at Shireland Collegiate Academy are engaged with developmental projects. The school runs a programme after school called iFamilies where students are invited into school with their parents to explore new software and applications. The activities enable parents and students to produce something together. The school believes that iFamilies has helped them to maintain a continued dialogue with parents and encouraged them to come into school. One student during the interviews commented: “iFamilies has made me feel more confident, I now want to achieve more.”

Year 7 and 8 students have been involved in Kodu Kup³ – a competition run by Microsoft to create a game around one of three themes. The students had six sessions over a period of six weeks. This has enabled the school to ascertain the current level of programming skills of these students and to consider the progression levels to help them design a pathway for all students.

In Year 9, the students are involved with a competition called “Apps for Good”. This was initially created as an after school activity, but it is now part of the curriculum for the students. It is delivered through “focus days” and “achievement days”.

The school regularly invites in external speakers to talk to all the staff, including Alan November and Professor Dylan Wiliam.

Recently Shireland Collegiate Academy has teamed up with one of the examining bodies, OCR,⁴ to help support the development of six research projects across the academy. All of them involve the use of technology; from using video and audio to provide more effective feedback to developing an online family literacy project.

At Broadclyst Community Primary School, some teachers are involved in research projects through Exeter University. The teachers have been involved with observations in school to look at Lesson Study.

³ <http://www.kodukup-europe.org/>

⁴ www.ocr.org.uk/

The school has recently been awarded \$25,000 funding to lead a global project with Microsoft about student entrepreneurship.⁵ This aim is for 20 schools across 20 countries (1,000 students) to create and develop ten international enterprises with project management, communication and collaboration between schools being dependent on technology.

7. Are the Advanced Schools engaged in any partnerships or networks?

Shireland has a partnership arrangement with Microsoft, Steljes/SMART, Tute, a SharePoint developer and a group of primary and secondary schools. Whilst there are no monetary benefits, it does mean that the school can access specialist support, training, cascade training and provides the venue if they want to deliver the course at the school.

Shireland Collegiate Academy is involved in a project called Apps for Good⁶ and within this they are classified as a Ninja School. The school provides the regional training for the Midlands.

Through the Teaching School initiative they were successful in bidding for a grant to support 25 local primaries in preparing for the new computing curriculum and provided a series of eight workshops across 6 months.

Broadclyst Community Primary School has partnerships with Microsoft, Exeter University, South West Grid for Learning; the school partners with primary and secondary schools in the area and in Holland. This provides an opportunity for extended curriculum activities as the students work together on projects and it includes a face to face visit.

8. Are there particular areas that could be mainstreamed or replicated?

- The timing of lessons is structured, but technology is a tool within the lesson and it is not the focus of the lesson content.
- “Stuck Powerpoints” have been created on the main teaching topics in school. During the lesson, these are readily accessible on a PC in the corner of the classroom. The teacher can direct a student to the materials or the student can access them independently during the lesson.
- The Learning Gateway is the virtual hub of the school. All of the lesson materials and resources are fully accessible through the learning environment. Teachers share lesson materials, resources have been collated for the curriculum topics and these are accessible to all staff.
- Students are encouraged to enter local and national competitions using technology. Some of these activities have become curriculum activities to enable students and staff to have time to engage in relevant projects. Within Broadclyst Community Primary School, there is an example of an enterprise project where students have used technology to design a product and create a prototype.
- Physical learning spaces have been configured to embrace the learning technologies in schools. Students are able to work together and this is encouraged in the layout of some classrooms as well as the organisation of particular activities.

⁵ <http://globalenterprisechallenge.education/>

⁶ www.appsforgood.org/

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- Tablet devices are not always available for 1:1 use, but the primary school uses the devices within group work to encourage students to collaborate.
- Tablet devices are used to capture evidence of progress within the lesson with photos and videos.
- Learner response systems and Web-based voting activities are used within various subjects.
- In the secondary school, assessment is made visible to the students and the language of assessment is shared and understood by all (Emerging, Developing, Proficient, Advanced).
- There are examples of staff from the secondary school working with local primary schools; this is for a variety of subjects. In some cases, the primary school students visit the Shireland Collegiate Academy for particular subjects, e.g. Music. However, there is evidence of the secondary teachers working with primary school practitioners in their own classrooms.
- Students have connected school and home through learning activities. In the two Advanced Schools, the students and parents expect to be able to access the learning activities beyond the school day.
- In both schools, technology is used to celebrate student achievement using digital displays around the schools. These are accessible to students, staff, parents and the wider communities of the schools.

Observation Case Studies: Austria

January 2014

Volksschule Gutenberg an der Raabklaam, Austria

Number of students	66
Age group of students	6-11 years
School website	http://vs-gutenberg.at
Name of principal	Manfred Fleck
LSL project Lead Teacher	Katharina Fasching-Suzzi

Salzburg Tourismsschulen, Austria

Number of students	320
Age group of students	14-19 years
School website	http://www.ts-salzburg.at/standorte/bad-hofgastein
Name of principal	Maria Weisinger
LSL project Lead Teacher	Silvia Listberger

1. What types of technologies and resources are available in the Advanced Schools?

The primary school is a small school with only five teachers. All teachers have access to a personal laptop to prepare and conduct their lessons; they can use the laptop at home as well. The school has a WiFi connection in all classrooms and the staffroom available for everyone. There are six to eight computers in each classroom. All computers have an Internet connection and are connected to the school network. On the network there are files for the teachers and students to share. Three classrooms have access to interactive whiteboards. In the other classrooms, there is a computer with a data projector. In addition there are ten iPads available across the school for teachers to reserve and use with the students. The school uses a Moodle platform for staff and students. In the primary curriculum, IT is not a separate subject, but schools are expected to use technologies across all areas of the curriculum. Each student is equipped with a USB stick to store and transport files between home and school.

The secondary school has developed a standard classroom provision to ensure that all teachers know what is available within each teaching room. Most classrooms have interactive whiteboards, or at least the provision of PC and data projector. At the side of each interactive whiteboard is a dry wipeboard. The school has a wireless network throughout. The school has also been operating with notebook classes for more than ten years. Students are allowed to bring their own device into lessons for learning including mobile phones and tablets.

The learning management system that has been adopted by the secondary school is lms.at;⁷ this has been developed by the regional education authority in Burgenland and is in use in Lower Austria. It has been implemented in this school over the last two years. The lms.at platform provides a communication system for the school to enable the teacher to discuss learning with the student beyond the formal lesson time. The electronic register is directly linked with the calendar and the different levels of detail enable the teacher to be able to ascertain where a particular student should be. The school believes that this means teachers can save resources consistently and the students know where to find materials. Students can access course materials away from the school, and this is particularly important because a number of students spend time away from the school site as part of their course. Some teachers have started to develop their own e-books within the system. Whilst lms.at is targeted at secondary schools, there is a similar system called SKOOLY⁸ for the primary schools.

2. Are there national initiatives that have had an impact upon whole school development of ICT?

The Austrian Federal Ministry of Education and Women's Affairs (Bundesministerium für Bildung und Frauen – BMBWF) has eFit21⁹ as a national initiative, which covers all areas integrating ICT as tool into education, culture and arts. There are also other initiatives such as EDUGroup¹⁰ and TIBS.¹¹ In addition

⁷ <https://lms.at>

⁸ <https://skooly.at>

⁹ <https://www.bmbwf.gv.at/schulen/efit21/index.html>

¹⁰ www.edugroup.at/praxis/portale.html

¹¹ www.tibs.at

school clusters have been established like eLSA¹² (mostly the secondary one grades), eLearning Cluster¹³ (mostly vocational education) and ENIS Austria¹⁴ which covers all grades and type of schools. Another initiative, which includes primary schools into mobile media is “mobile Lernbegleiter” (mobile learning tutors), a one-to-one project with primary school pupils and mentoring by higher grade students (secondary one). Both Advanced Schools in the LSL project belong to the European Network of Innovative Schools¹⁵ (ENIS) in Austria. This is a growing national network of schools that have achieved a particular status at a national level in Austria for their provision and use of ICT. The schools have to provide evidence of the provision of appropriate equipment in school by meeting a defined list of criteria.

Austria is made up of nine federal states which differ greatly. The lead teacher said that “Schools are supported locally and there is an expectation of 15 hours of Continuing Professional Development (CPD) offered by teacher training institutes. There is an expectation for all schools to use modern multimedia.”

The learning management system lms.at provides a common platform for schools. It makes information highly visible across the school and the headteacher believes that it becomes easier to maintain the profiles and evidence of student achievement.

There is an Austrian wide initiative called COOL¹⁶ (Cooperative Open Learning): a specific number of teachers attend the course for the school to be certified as a COOL school. There is a similar scheme that looks directly at digital competencies called e-COOL; this is largely focussed on encouraging digital assignment of work, electronic feedback and collating evidence within eportfolios for all students.

Within the next years the ICT infrastructure should be enhanced to offer better Internet access. Next year 16% of all government owned schools should get an enhanced WLAN network in their schools in order to offer better Internet access to teachers and students. An education cloud will be offered as an additional service (tests are running in a few schools to test the access abilities).

3. Who leads the decisions about the development of ICT?

The federal Ministry of Education has an ICT department that provides advice and support to schools. School development is divided into two sectors:

- Government owned schools (gymnasiums and vocational education schools)
- Regional owned schools – on regional basis by county, but funded on municipal level (primary and secondary one schools primarily)

School development is therefore dependent on the funding of ICT infrastructure (the Ministry is only responsible for the government owned schools)

¹² <http://elsa20.schule.at/>

¹³ eLC: elearningcluster.weebly.com

¹⁴ European Network of Innovative Schools: www.enis.at

¹⁵ www.enis.at

¹⁶ www.cooltrainers.at

4. What types of training and professional development are available to teachers?

Schools are encouraged to belong to the ENIS network to show that they are committed to developing the use of technology for staff and students.

It is the job of all teachers, but ultimately of the headteacher to motivate and improve skills. The headteacher of the primary school says “It is the goal of the school to make the students able to access the technologies of real life and to have these technologies at school so that the students develop skills for lifelong learning.” The use of ICT has been a key part of the school vision and strategy for 10 years, with active involvement of all staff. The strategic vision for the school is decided by a panel of teachers and parents (Schulforum).

Both headteachers in the LSL Advanced Schools have held leadership positions for more than 15 years and the use of technology within learning and teaching continues to be a significant part of the vision for whole school development. There is an expectation from the leaders that teachers and students will have experience of technologies in school to prepare them with lifelong skills.

The lead teacher in Austria described training courses as well organised and of good quality. Teachers are expected to demonstrate 15 hours of CPD per year across all subjects. However, the headteacher believes that there is less funding available; some of the ICT courses are technical and do not cover the pedagogical aspects. Teachers want courses that are much more practical: “Teachers want things for now and the next two days,” he commented. Sometimes the courses are in free time and on Saturdays and this can be a barrier to enabling some teachers to attend.

As a lead school, one of the best kinds of training that the head benefits from is the opportunity to work with other colleagues. In Austria there is a professional learning network called ENIS which is primarily for secondary schools, but includes some primary schools. The headteacher says “Colleagues begin to understand how to broaden their horizons by having the opportunity to network with other schools.”

Within the school there are workshops on different ICT topics. Teachers take part in different seminars at the Teachers’ University. In recent years, there have been a lot of courses for all teachers and everyone has been encouraged to participate. The headteacher has delivered training in the use of ICT at the University for trainee teachers.

The learning management system lms.at was implemented and the training was paid for by the pedagogical high school and delivered to all staff. The headteacher tries to ensure that all staff have access to appropriate training as a whole team.

The headteacher directs teachers to go on specific courses, but equally, there are staff who make requests to attend courses. The school has access to three pedagogical experts to provide ICT training.

The teacher training institutes offer ICT related training to all teachers, in some cases (dependent on funding) international training is available for teachers.

Online Campus-Virtuelle PH¹⁷ supports teacher training with eLectures for all teachers in Austria.

5. How is ICT being used in different subjects?

According to the Austrian curricula regulations ICT has to be integrated in all grades and subjects; there are descriptions in the curriculum for the different grades.

The lead teacher from the primary school in Austria says that students are able to be self-paced within their learning at least one day a week. Each classroom has ten or twelve different “stations” which operate freely with different learning activities. The student is able to work through them at his or her own pace. When the school put this system into operation, some students automatically chose to use the computer first; however, the children realised that they have to do all of the activities and only use the technology when it is appropriate.

Teachers have created a significant number of files for the interactive whiteboard. The teacher uses these with the whole class, but small groups work on the IWB during the self-paced activities. All staff have been trained to use programs such as MS Photo Story and Audacity as these can be used for different subjects.

In the secondary school, the students bring their own device to all lessons. Students use a range of devices including tablets, notebooks or laptops. The students have a “student plan” online and this gives details of their timetable. Students are taught about safe use of the Internet.

Technology is used for all communication across the school and teachers are encouraged to use resources online with less dependence on textbooks. There are examples of teachers creating interactive ebooks and these can be embedded within the learning management system. The teachers recognise that whilst it can take a considerable amount of time to create such resources, they can be changed and adapted for individual students. It means that the teacher can edit or update resources easily. At present, resources are created by teachers individually and the school has begun to identify how they could work together to produce digital content.

There is a class chat system within lms.at and the teacher can send messages to each student and the students can communicate with each other.

The use of the learning management system means that teachers can assign tasks to individual students for all different subjects. The teacher can create a library of resources for each course; this serves as a guide to the students.

In the secondary school, the staff and students are using technology across all areas of curriculum and administration.

¹⁷ www.virtuelle-ph.at

The school is using Sprongo¹⁸ as a video platform; this enables the students to upload video materials to review their performance and reflect on their progress. This is particularly helpful for sports activities.

6. What kinds of research and development are the teachers engaged with?

At a national level, the Austrian headteacher raised the importance of being engaged with research in the ENIS network. The leading teacher confirmed that the school is involved with Comenius projects involving contact with teachers from 6-7 countries and school visits from other countries.

As the LSL project has developed, the Ministry of Education has actively encouraged teachers to be involved in “synergy meetings” where teachers share best practice and findings from within different ICT projects across the schools. This allows for discussion across the schools, and enables a continuous dialogue about real practice between the schools and the Ministry. Workshops are open for all grades and different types.

Teachers are engaged in evaluation and research in different national (e.g. Danube University research) and international projects (e.g. ITEC¹⁹).

7. Are the Advanced Schools engaged in any or networks?

The primary school headteacher has worked hard to develop partnerships with the secondary schools. The secondary school has invited the primary school to attend training because there are only a small number of additional staff. The school has been able to work with other schools to develop partnerships and has been successful with Comenius projects. The headteacher believes that it is not common practice in Austria for primary schools to work with commercial partners. This is because the schools work with local distributors or suppliers of equipment.

The secondary school is a private school and is one of four schools in Salzburg owned by the Chamber of Commerce. The Chamber of Commerce are responsible for the provision of technology within the school. The teachers are employed by the Ministry of Education. All business partnerships are therefore developed through the school board of management. The school benefits from belonging to an international network of tourism schools; this gives opportunities for the leaders to work together and share examples of best practice.

8. Are there particular areas that could be mainstreamed or replicated?

¹⁸ <https://sprongo.com/>

¹⁹ <http://fcl.eun.org/itec>

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- The use of a learning management system enables the school to be consistent and transparent with the access to learning resources for all staff and students. This has potential to be extended further to encourage staff to share resources and materials both within and beyond the school.
- The secondary school works with a local business to provide work experience for the students. The mentor/co-ordinator is able to update a work experience profile and submit records online.
- The weekly plan allows the primary school students to make decisions about their learning and work at their own pace. This should be a digital resource and connected to the student portfolio.
- The primary school has distributed equipment throughout the school to ensure that each teaching room has access to a range of technologies.

Observation Case Studies: Belgium Flanders

November 2013

De Klare Bron and De Grasmus, Belgium Flanders

Number of students	De Klare Bron: 240 students De Grasmus: 160 students
Age group of students	2 ½ - 12 years
School website	http://www.degrasmus.be/ http://www.deklarebron.be/
Name of principal	Begga Willems
LSL project Lead Teachers	Hans Gelder, Cindy Persoons

Middenschool Campus Minneplein, Ieper, Belgium Flanders

Number of students	189
Age group of students	12-14 years
School website	http://msieper.campusminneplein.be/home/
Name of principal	Ann Dejaegher
LSL project Lead Teachers	Philip Everaerts, Sabine Buseyne, Emely Laheye

1. What types of technologies and resources are available in the Advanced Schools?

Two Advanced Primary Schools were identified in Belgium which both have the same headteacher. The schools have access to a broad range of technologies including MacBooks, laptops, 20 iPads (10 per school), Apple TV, data projectors and screens, and interactive whiteboards. There is WiFi access in both schools.

In the secondary school every room has at least one PC, there are 2 rooms with PC and data projector, five classrooms with an interactive whiteboard. There are 3 computer labs with PCs, IWB and Apple TV and 20 iPads available for all students. The school has developed its own curriculum called Active Learning with ICT which embraces a number of subjects and a project based approach to using technology within learning. Students are taught about e-safety. Alongside this, the ICT co-ordinator has made the first steps towards creating a “Future Classroom” in school where teachers can access a range of technologies and try to integrate them in the lesson.

The secondary school has been recognised as a SMART Showcase School by the manufacturer of SMART interactive whiteboards. Teachers in the school deliver training courses to other schools on the effective use of the interactive whiteboard.

The secondary school is a leading ICT innovator in “Scholengroep 28”, introducing the use of tablet PCs for technology enhanced learning.

2. Are there national initiatives that have had an impact upon whole school development of ICT?

The Department for Education provides advice to schools about ICT. There is an educational organisation which provides training programmes for teachers, but this is across all areas of the curriculum and schools feel that they still need to find further external support. It does tackle some innovative areas of ICT, for example, the use of tablets. The partner in this project is not the Flemish Ministry of Education but GO!, Flemish Community Education. GO! represents:

- 28 groups of schools
- Approximately 1,000 educational institutions
- Approximately 300,000 pupils and trainees
- 15% to 20% of the total number of students in Flanders and Brussels
- Approximately 32,000 staff members

In the secondary school, the headteacher has released one of the lead teachers from teaching for 1/5 each week to support the development and use of ICT. Teachers have taken the responsibility to train as trainers to be able to support other staff.

The primary school was recognised as a pilot school in the region introducing the use of iPads for technology enhanced learning.

3. Who leads the decisions about the development of ICT?

In Belgium, the Department for Education provides advice for ICT. At a school level, the secondary school has created a vision for the integration of technology across the school. The ICT co-ordinator has written a new curriculum called “Active Learning” which looks at how the use of technology can be introduced across a range of disciplines.

In the primary school, the headteacher began by buying a laptop for every teacher. Alongside this, staff were given a digital template for lesson planning and provided with access to an electronic diary.

The vision was to develop opportunities for students to create materials, to use the Internet safely and to be prepared for life with digital skills. The school policy supports an integrated way to use various media in daily classroom practice. The headteacher observes classroom practice approximately twice per year to see how ICT is being used within lessons.

One lead teacher in school has been given a reduced teaching timetable to provide eight hours coaching to other staff. This role is not given additional funding.

4. What types of training and professional development are available to teachers?

In Belgium there is no set number of hours expected for ICT professional development. Some schools provide no training at all for their teachers. The Advanced Secondary school within the LSL project provides lots of training and teachers ask for courses in ICT depending on their interest and subjects. Some of the training is delivered by teachers within the school. Students are provided with training and support for teachers; this is particularly in the areas of e-safety, blogging, IWB and active learning. Some students then go on to provide training for the teachers. In this school, the lead teachers have provided training videos and homework assignments for the teachers – more than 50 % participate. There is basic training available to a group of 16 schools for common ICT programmes, for example MS Word/MS Excel. In the primary school, there has been a focus to deliver skills based training to enable staff to use the technology. For example, there have been four sessions of team training to use the iPad. Staff have been trained to use a range of applications such as Garageband, Stopmotion, iMovie and iBooks Author.

In the Advanced Secondary school in Belgium, the lead teacher has developed a new course called “Active learning with ICT.” The school organises many of its own workshops to train and help teachers who would like to use more ICT. Teachers also frequently participate in training which is organised by external experts.

ICT-Atelier²⁰ – an external partner – provides the school with a network of teachers who exchange new ideas about the use of ICT in education through the organisation of very popular ICT weekends and shorter CPD²¹ trainings.

²⁰ <http://ictatelier.be/>

²¹ Continuing Professional Development

In the staff meetings there is a fixed agenda and this includes time to look at the classroom activities that have been supported by media. Staff are asked to exchange experiences and share their findings.

Some of the leading teachers in schools can train as trainers and this can be very helpful because the headteacher can encourage staff to support teachers in other schools too.

There is a cluster of schools at a regional level who work together to improve practice. The leading teacher suggests that “there are a lot of teachers who are scared” and it would be useful for the school to establish a virtual training school.

5. How is ICT being used in different subjects?

In the Advanced Primary schools in Belgium, there is a range of content involving ICT: board books linked to language and calculation method, learning about news in online news comprehension, use of several educational apps on iPad. Each teacher uses the online information to enrich projects, to find material for children in an appropriate way, to visualize topics or search for visual support of the lessons, illustration material for projects.

The Advanced Primary school in Belgium is able to provide many examples of effective use of ICT in different curriculum subjects:

- ICT to support writing: report of excursions, group discussions, class council, newsletters or articles for class newspaper.
- ICT to support the creation of ideas: making movies, animations, photo reports, presentations, or recording of an interview in connection with a project and then assembling a movie with iMovie.
- ICT to support learning language and communication: Dutch and French, recording presentations.

In the library, students are helping to create QR codes and videos; they have made little movies with instructions for borrowing books.

In the secondary school, ICT is accessible and being used across all areas of the curriculum. The school has a learning platform, provided at a national level in Belgium called “Smartschool”.²² Teachers share their lessons and individual materials through this virtual learning environment. The national government has advisers who post documents, lessons and tips centrally. The learning platform can be used at school level, but also to access the wider teaching community within Belgium. Schools have to pay a subscription to use parts of it; this is calculated on a fee per student, per account.

Students and teachers also use social media including Facebook and Twitter. Students can use Google Apps to create their own documents. Different apps are used to do research for different subjects (e.g. YouTube, Speedclock, etc.)

6. What kinds of research and development are the teachers engaged with?

²² www.smartschool.be

In Belgium there is an organisation called EduBIT which produces a monthly journal that is read by teachers in school. The leading primary school recognised the need to consult parents on a regular basis. The headteacher said “There is not enough information available about research.”

The primary schools have been able to secure additional funding from a Comenius project (November 2013 – 2015) to look at assessment and student feedback in lessons.

The secondary schools are involved with other European research projects (e.g. Creative Classrooms Lab) and believe that this kind of collaboration supports whole school developments.

7. Are the Advanced Schools engaged in any partnerships or networks?

The Advanced Primary Schools have developed a partnership with Easy-M for technical support and supply of materials. There is an ICT co-ordinator who is employed across a group of schools to provide technical support equivalent to one day per week each.

The school communicates with parents via a weekly newsletter using an online communication channel called Gimme.²³ Some teachers use a classblog and classmail to communicate with students beyond the school day.

SMART has provided the secondary school with extra materials so that they can do a SMART Board conference seminar every year. The school has signed a charter to agree the ways in which they will promote the use of SMART Boards.

The secondary school has also established a link with VOKA²⁴ (society of the Chamber of Commerce) as the patron of the new class “Active learning with ICT.”

Parents can communicate with the school through the electronic learning environment Smartschool. They can see the different exercises students can download.

There has been external fundraising by parents and this is reinvested in the purchase of new equipment.

8. Are there particular areas that could be mainstreamed or replicated?

- Videos and homework assignments for the teachers – more than 50 % participate
- Identifying a teacher trainer/coach to have a reduced teaching timetable to deliver training or team teach with colleagues and develop the use of ICT across the school.
- Using QR codes to provide access to additional information, for example, in lessons display QR codes to give supporting materials, strategies for problem solving or access to solutions. In specific areas, use QR codes to provide advice or guidance, e.g. libraries, community rooms, the sports hall.
- Use learner response systems to capture student response within lessons; some of these solutions are now Web-based and do not require additional purchase.

²³ www.gimme.eu

²⁴ www.voka.be

Observation Case Studies: Cyprus

November 2013

Geroskipou A' Primary School, Paphos, Cyprus

Number of students	327
Age group of students	6-11 years
School website	http://dim-geroskipou1-paf.schools.ac.cy
Name of principal	Keti Neocleous
LSL project Lead Teacher	Skevi Demetriou

Palouriotissa Gymnasium, Nicosia, Cyprus

Number of students	423
Age group of students	12-15 years
School website	http://gym-palouriotissa-lef.schools.ac.cy/
Name of principal	Despina Papayianni
LSL project Lead Teacher	Josephine Pavlou

1. What types of technologies and resources are available in the Advanced Schools?

The primary school in Cyprus has six interactive whiteboards; two portable projectors and a large projector in a room that is used for many purposes including staff training and information for visitors. There is fast Internet access across the school and this is available in all teaching rooms. (At present, the school sets up only temporary wireless access for teaching rooms for the purposes of specific lessons.) Each classroom is equipped with one or two desktop computers. There is a computer lab and in addition there are five laptops available for timetabled use. In every classroom there is a laser printer. Throughout the school, there is access to photocopiers, scanners and digital cameras. There is also a digital screen in the staffroom and this is used to share new ideas. Some of the schools do not have this level of equipment, but there is an expectation from the government to be able to provide better access to the technology.

In the last year, the school has initiated a scheme to allow students to bring a laptop or a tablet in from home on certain days of the week. This has to be with a prearranged agreement that the parents take responsibility for the insurance.

The headteacher of the primary school has been keen to influence the use of technology by all teachers. There is an expectation that email will be used for staff communication; there is a closed Facebook group for the teachers and SMS is used by the teachers. The headteacher is specialised on ICT integration in teaching and learning and strongly encourages technological innovations by the school teachers in their practice. ICT is embedded in the school management process.

The Advanced Secondary school in Cyprus has three computer science labs. The Physics Lab, History classroom, Design and Technology Labs, Home Economics Lab, Chemistry Lab, the Biology Lab, the Music room, Mathematics classrooms and the Multimedia room are equipped with ICT. The classrooms have Internet access and WiFi access is available in the main school building area.

In addition, the students have their own laptops or tablets (they can bring them to school as requested), bought on a basis of a financing programme by Ministry of Education and Culture.

There are 6 digital projectors and screens, 20 laptops and 4 digital cameras available for teachers to use as necessary through timetabled access.

2. Are there national initiatives that have had an impact upon whole school development of ICT?

In Cyprus, the education system is centralised and this means that there is a top-down approach to information about school organisation and new initiatives stem directly from the Ministry of Education and Culture. There has been an ICT team within the Ministry since 2002 and this connects to other centralised teams, for example the inspectorate. There are advisers for digital education and content. Whilst the schools retain their autonomy in developing their vision for the use of technologies within learning and teaching, there is an expectation from the schools to receive advice and support from the centralised teams.

In Cyprus, one of the most noticeable aspects is the speed of change. “We’ve gone from none to many,” remarked Skevi Demetriou – Advanced Primary school teacher. Whilst the PCs in the classrooms have access to the Internet, there is not yet a policy for WiFi in school, but this is currently

under consideration. In the Advanced Primary school, there has been a move towards one or two computers in every classroom. One of the potential challenges is the rate of growth of the amount of equipment; e.g. in the last three years, the school has doubled the number of PCs, enabled teachers to access laptops and had 6 interactive whiteboards. In the Advanced Secondary School, the number of PCs has doubled in the specialist rooms and the labs along with the purchase of additional interactive whiteboards. This all places demands on training and professional development for teachers and the appropriate level of technical support.

3. Who leads the decisions about the development of ICT?

Whilst the education system is predominantly centralised, this does not prevent the schools retaining some autonomy and needing a vision for whole school development. The vision for ICT is developed within the school. At both primary and secondary level, the headteacher is considered to be instrumental in leading the change in schools. Both schools have a vision to make effective use of ICT tools by staff and students. In the Advanced Primary school, the lead teacher discusses the importance of how the headteacher shares the school vision with all staff and not just the enthusiasts.

The secondary school LSL teacher recognises that there is a “constant effort” required for teachers to upskill themselves and to participate in projects both locally and further afield to bring new knowledge into school. The headteacher said, “The school gets inspiration from teachers and students; we want to replicate the technologies that are accessible outside school so that learning in school is not detached.”

In Cyprus, each school has an ICT co-ordinator who is allocated time away from teaching duties. The first line support in school is provided by the ICT co-ordinator. However, if this cannot be resolved there are ICT advisers who help with visiting the schools to resolve technical and pedagogical problems. There are clusters of neighbouring schools who liaise including joint staff meetings to exchange ideas and practices. The school has created a Dropbox account to share ideas and also uses other cloud tools such as Google Drive. The lead school has worked with support from local industry to develop the website. In both of the Advanced Schools the headteacher takes a key role to encourage innovative ideas in school and develop the use of ICT. This means that the ICT co-ordinator does not work in isolation, but is able to access guidance and support.

In the Advanced Primary school in Cyprus, the lead teacher provides “first line, first fix” technical support. If the teacher is unable to resolve the problem, she notifies the ICT adviser and he visits the school. The school has a resources committee who will provide people with technical skills when additional support is needed. The costs of this are met by the Ministry of Education and Culture, but this is only for a limited amount each year. In the Advanced Secondary School the ICT teachers are given a number of non-teaching hours for maintaining the school website and the technical support of the PCs and laptops belonging to the school. When they are unable to resolve problems, external technicians are called in.

4. What types of training and professional development are available to teachers?

There is both obligatory and non-mandatory training available. The reform of the curricula has led to mandatory training and some ICT training is included within this. The pedagogical institute exists alongside the Ministry of Education and Culture to support for subject implementation and this

includes ICT across the curriculum. There is an annual offering of seminars and it is mandatory that teachers attend. This includes a two hour regional meeting on subject specialisms and then two days every January for more general school Continuing Professional Development (CPD) courses on identified topics, e.g. bullying or new media. Teacher organisations offer some courses, but these are not funded; however, these are available in the afternoons after school and at the weekend at very low prices. The Advanced Secondary School invites experts or academics from the university or pedagogical institute.

The lead teacher for the Advanced Primary School highlights that in Cyprus, almost every teacher has a Master's degree, and some have a PhD. This is due to being placed on a list on a central ranking system; the more qualifications the teachers have, the higher up the ranking system they are placed and this enables them to have more opportunities for better employment and better pay with leadership positions.

In the secondary Advanced School, the lead teacher says that many teachers of the school have ECDL certificates²⁵ acquired through a professional development programme offered by the Ministry of Education and regularly participate in seminars about the use of ICT and integration in teaching.

The Advanced Primary school has clusters of neighbouring schools where ICT co-ordinators can liaise on developments. The schools have participated in joint staff meetings, the exchange of ideas and practices. In this school, the ICT co-ordinator meets with the headteacher every 2-3 weeks to share ideas.

5. How is ICT being used in different subjects?

There is currently a national level focus on the development of a new curriculum. There are advisers who are responsible for digital education, content and the use of the Internet in schools.

In the primary school in Cyprus more than five teachers are actively promoting the use of ICT across the curriculum, while interacting and collaborating with the rest of the teaching staff, e.g.:

- a) Mathematics: (i) Use of Geogebra²⁶ for geometry, (ii) Targeted use of various pieces of software.
- b) Greek language and Culture: (i) use of brainstorming and mapping software such as Kidspiration²⁷, (ii) Use of Kar2ouche²⁸ for creative writing, (iii) Use of the Hot Potatoes software.
- c) Social subjects: (i) Use of software allowing reflection on practice. For example "Consequences", which is interactive computer based program, is used to help children identify problematic behaviour and interact with the characters in the software to fix it. (ii) Use of Movie Maker to create short video clips about various subjects.

²⁵ ECDL (European Computer Driving Licence) - www.ecdl.com

²⁶ www.geogebra.org/

²⁷ www.inspiration.com/Kidspiration

²⁸ www.immersiveeducation.eu/index.php/kar2ouchepg/

d) Computer games are used across a wide range of subjects to aid the achievement of learning goals.

In the secondary school teachers of different subjects facilitate students' learning using ICT tools to work with supporting students' active involvement and social interaction.

ICT has been implemented in teaching practice in the school in subjects such as Computer Science, Physics, Maths, English, Modern Greek, Ancient Greek, History, Music, Design and Technology, French and Home Economics.

In Computer Science, students who are enrolled in the first grade are being taught how to use the software Paint. They are being taught Microsoft Word, which they use in order to prepare a work on a topic of their choice researching information using the Internet.

Students who are enrolled in the second grade are being taught how to use Microsoft Excel, to insert and analyse their research results and present them in graphic form. They are being taught Microsoft PowerPoint and they learn how to prepare presentations which they present to their peers or a wider audience.

Students of all grades are being taught specific programming languages so as to be able to design their own simple programs; for example, first grade students use a programming language to turn a fairy tale into a program and third graders create their own game.

In English the teacher supports students to compose dialogues and produce an animated version of their dialogues with the use of GoAnimate software²⁹. Students can publish their cartoons on line or send them to their teacher and peers by email.

In Home Economics (Health Education), in the section on "Health and Safety in the environment" students worked in groups of 4 to point out any safety hazards in their school environment. They used mobile phones, cameras and tablets to take pictures and videos of what they considered dangerous and might cause accidents to students and school personnel. The students prepared small video clips (using Movie Maker) or posters (using PowerPoint) showing the safety hazards and explaining why they are dangerous and why it is urgent for these to be fixed or removed from the school environment. Finally, they prepared a letter for the headteacher (using Word) addressing the safety hazards and asking her to take all the necessary measures.

In Mathematics students used graphing software to explore the function $y=ax+b$ using their own laptops working in pairs. Having created the graph, the students presented their work in class.

In Music, students are encouraged to use their tablets, and mobile phones in order to record their performances and group compositions and reflect on them. In addition, their devices are used to record and edit sounds. They also use software such as Audacity and Muse Score in order to notate and record their music.

²⁹ <http://goanimate.com/>

6. What kinds of research and development are the teachers engaged with?

In Cyprus, both leading teachers who were interviewed discussed how they had continually been engaged with research as part of their own professional practice. One teacher shared how the local universities try to maintain links with teachers in schools, and there is a pedagogical institute that undertakes research. The school itself conducts a survey to collate data about the use of ICT.

7. Are the Advanced Schools engaged in any partnerships or networks?

The primary school has liaised with the other schools in the community in order to design common policies for various issues and to collaborate more closely. For instance, the school has had common staff meetings to plan the organisation of joint sports days, school performances, excursions and other events.

The school website is updated with announcements and educational material helping both parents and students to keep informed about what takes place at the school, and promotes learning beyond the physical boundaries of the school.

The school has recently established another way of communicating with parents apart from email, with the use of Web SMS. The school sends SMS to parents to communicate with them on things that concern the school, such as events that are due to take place or to provide reminders.

The school is a member of the ECO Schools community of CYMEPA (Cyprus Marine Environment Protection Association)³⁰.

In the Advanced Primary school there is a Parent-Teacher Association. At the beginning of the school year there was an open day to share ICT in Education and to look at how technology is being used across the school. The parents' committee bought the interactive whiteboards for the school. The parents do give financial support to provide new equipment.

In the secondary school the school provides relevant information to students and parents to encourage partnership opportunities and to gather information about school activities and programmes. Parents are notified by SMS about school activities, staff-parents meetings as well as through the school website and the Edmodo platform³¹.

The teachers also have their own personal webpages to support the students' learning; they use the Edmodo platform and have student groups in social network pages.

The LSL Advanced School at secondary level in Cyprus demonstrates examples of being involved in European projects.

8. Are there particular areas that could be mainstreamed or replicated?

³⁰ www.cymepa.net/en/

³¹ www.edmodo.com/

Living Schools Lab – Observation Case Studies

- Primary schools in Cyprus have appointed digital student leaders to deliver training to staff and to provide support during lessons
- Teachers in the Advanced Primary school have developed Webquests; this structured framework could be replicated across different subjects
- Students are encouraged to bring laptops and tablets from home as long as the property is insured and with parental consent.
- Students are being given different roles in the lesson to enable the teacher to assess their competencies. Students rotate around different activities and take different roles.

Observation Case Studies: Czech Republic

September 2013

Základní škola Dr Edvarda Beneše , Prague, Czech Republic	
Number of students	751
Age group of students	6-15 years
School website	http://www.zscakovice.cz/
Name of principal	Martin Strélec
LSL project Lead Teacher	Petra Boháčková

Gymnázium Teplice, Teplice, Czech Republic	
Number of students	850
Age group of students	15-18 years
School website	http://www.gymtce.cz/
Name of principal	RNDr. Zdeněk Bergman
LSL project Lead Teacher	Marcela Řeháková

1. What types of technologies and resources are available in the Advanced Schools?

At **ZŠ Dr Edvarda Beneše** in Prague all of the 40 teachers have access to a personal laptop to prepare and conduct their lessons with. Some classrooms (in a part of building designed for younger students) are equipped with a computer; therefore teachers do not carry their laptop there. A WiFi connection is freely available in almost all classrooms and all staffrooms, therefore students can use their laptops or other devices during lessons to get connected to the internet and search needed information. Students can even bring in their mobile telephones which can be switched on and used for lessons, but no calls are allowed.

The school has three fully equipped computer labs, which have been upgraded in the recent years. Alongside this, Prague municipality has financed a class set of 32 iPads in 2012 for ZŠ Dr Edvarda Beneše, this was because those schools which are located in Prague, are not allowed to demand subsidy for ICT equipment from the European structural fund. A new set of 15 iPads have been purchased newly at the beginning of school year 2014/2015.

All teachers have email addresses which are at disposal for students and parents as well, moreover some of them have developed their own websites to publish useful information and teaching materials.

Gymnázium Teplice owns approximately 140 PCs, 41 projectors, 7 interactive whiteboards (some of them include voting systems). There are three computer labs, students can use a study equipped with several PCs as well. All computers have an internet connection; some parts of the school have WiFi. Students are allowed to use their mobile telephones to access information for learning. All computers are connected to the school network, which represents a collection of varied files for the management of the school, teachers and students. The access to these files is therefore graduated according to different levels of confidentiality, users are divided into groups with distinct rights.

Gymnázium Teplice strives to change all the technologies after six years of use. Due to financial reasons, second hand computers are sometimes bought. The school also cooperates with local companies, which occasionally donate older equipment.

Both of the Czech schools use **Bakaláři**, the virtual information system and online learning environment. This gives students and their parents regular details about what is going on at school. The system itself offers a wide range of information that is updated regularly. Students can access the learning topics online and homework; they can also get to know about their grades or evaluation comments. Parents can for example check their child's absence in lessons. Students can set up individual consultation or tutorials with teachers as well as submit their homework electronically. However, they are not allowed to make their materials public, only teachers can put materials into a shared file. Staff are expected to open up **Bakaláři** at least once a day.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

A huge reform of the education system called Framework Education Programme was implemented in the Czech Republic between 2005-2008. The main idea behind the reform was to make schools more independent from the central administration. The aim was to allow teachers to work on their own initiative to develop a richer variety of teaching approaches with the emphasis on constructivist methods. As a consequence the reform encouraged competitiveness of different schools and programmes. Curricular documents are developed at two levels – state and school. In the system of curricular documents, the state level is represented by the National Education Programme (NEP) and Framework Education Programmes (FEPs). Whereas the NEP formulates the requirements for the education which are applicable in initial education as a whole, the FEPs define the binding scope of education for its individual stages (for preschool, elementary and secondary education). The school level is represented by School Education Programmes (SEPs), on the basis of which education is implemented in individual schools. The School Education Programme is created by each school according to the principles prescribed in the respective FEP.

In 2014 Czech government approved a common strategy in education called Strategy 2020 and a Digital Strategy 2020 aimed particularly at the area of ICT is being finalised by the Ministry of Education (MoE) at the moment. This digital strategy outlines main priorities and goals within ICT in education up to 2020. This strategy should be approved by the government in the coming months and then followed by concrete measures such as teacher training.

The development of ICT in education was also one of the purposes of a special initiative under ECOP adopted in May 2010 - EU money to schools (2010-2012). This initiative was managed by the MoE and aimed at all elementary and secondary schools (excluding schools in the capital city). It supported various innovative curricular approaches (not only ICT) in different areas of teaching: MST³², financial literacy, reading and information literacy, foreign language teaching, inclusive education, usage of ICT in all the subjects. Schools could apply for a grant directly to MoE. It was expected that approximately 2/3 of the whole budget will be invested to ICT. Examples of supported areas within ICT are: digitalisation of textbooks, e-learning, further teacher training, modernisation of schools' equipment – purchase of DVDs, cameras, netbooks, tablets, notebooks, computers, software programmes, interactive whiteboards (IWBs), e-skills trainings (different training organised by a range of institutions), etc. Within the initiative, teachers could get financial support of creating digital learning materials which would be shared with peers.

In the last decade, there has been an expectation that all teachers will use the computer and become digitally literate. Teachers could take part in courses to enhance their ICT skills, nowadays there is an expectation that they are able to use basic communication and presentation tools (such as email or PowerPoint). In addition, a lot of teachers use the interactive whiteboard, which has become a regular and useful tool, especially at primary schools. Teachers can become a member of a different teacher online communities, the most visited one is known as a methodological portal “rvp.cz”. The portal

³² Mathematics, Science and Technology

contains amount of digital learning materials created by teachers, which can be reviewed by peers. News related to education is published there as well. The portal is run by an organisation under the MoE called the National Institute for Education.

3. Who leads the decisions about the development of ICT?

Schools in the Czech Republic are directly managed by regional (secondary schools) and local (primary schools) authorities. Regional and local authorities are school founders, they are responsible for money and control of the schools.

The role of the headteacher is crucial to the success of the school use of technology; this is largely because the headteacher makes the decisions about the schools curricula and also the financial investments. Both headteachers in the LSL Advanced Schools believe that lead staff have an entrepreneurial attitude to developments in school.

The headteacher of **ZŠ Dr Edvarda Beneše** said he saw as a priority “the students to be able to access the technologies of real life and to have them at school so that the students develop skills for lifelong learning.” The headteacher of the **Gymnázium Teplice** said that he wanted the school to be seen as innovative. He attended project meetings in other countries and found out what other schools were doing. The headteacher has also participated at European events such as the Lifelong Learning Programme. The role of the headteacher recognises the need for distributed leadership within the school and clearly acknowledges the expertise of the other colleagues. In Gymnázium Teplice, the forward vision and changes are discussed mainly at a department level; subsequently the head of each subject takes new ideas forward to the headteacher.

Due to the financial situation in the education field, gaining money for up-to-date ICT equipment requires substantial effort. For that reason, both schools “try to participate in as many projects as possible”. Gymnázium Teplice has appointed a project co-ordinator who is responsible for knowing about the projects being undertaken by the school. This means that there is awareness about how the work of the project can impact upon whole school change and development.

4. What types of training and professional development are available to teachers?

In the Czech Republic, the local authorities approve the budget of the schools and its framework use. However, the majority of training is decided by the school. It is usually necessary to pay a course fee. In the interview, the leading teacher expressed that it would be useful for more funding for courses to be made available, because whilst there is choice, it can be difficult to allocate time and money to be able to attend the courses.

Training in the use of ICT is not mandatory, but it is recommended. There are certain types of training according ICT level and needs of teachers. There is a list of accredited agencies and schools by MoE. To become the accredited school, which can charge for training, it is necessary to gain approval on the basis of a submitted plan. The courses take place within the academic year. Both leading schools offer a CPD (Continuing Professional Development) course for other schools, for example in IWB effective learning and teaching.

At **ZŠ Dr Edvarda Beneše**, the headteacher says that “as a school, we can provide our own experts so that teachers can support each other”. The headteacher encourages staff to build their own PLN (personal learning network) – a community of people with the same interest (in this case ICT) where they can discuss problems, ask questions and share practice. The lead teacher of ZŠ Dr Edvarda Beneše says, “It is recommended by the school that we observe one another teach twice per term, particularly if we want to see another teacher using a specific technology.” The teacher takes notes, but there is no formal feedback. The formal feedback is provided by headteacher in case that he observes lessons.

The school purchased a class set of iPads and all teachers got training on how to use them by external company. The LSL lead teacher and one other teacher at the school has then provided individual support as requested. Staff took also part in other ICT courses within the year on face-to-face or on-line basis.

In addition, the school helps teachers from other schools to use modern technologies effectively; for example, one of the teachers took part in discussions on the methodological portal “rvp.cz” and helped the other teachers with the use of IWB. The school has repeatedly held workshops on using IWB in classes within the school as well.

At **Gymnázium Teplice** teachers are involved in further professional development – either in use of interactive whiteboards or MS Office courses – Word, Excel, and PowerPoint (it is for all teachers). Then teachers attend regular courses about how to use the school system including the e-register, and the virtual learning environment. At least one teacher from each department participated in seminars to learn how to use the interactive whiteboard and then cascaded the training to other staff. Some of the teachers meet once or twice a year as part of the ‘SMART school’ which is organised by a local company called AV Media.

Gymnázium Teplice wants to develop the teacher’s profile and get each teacher to decide which area they would like to develop as part of their professional development. Each teacher would have a file and this would allow the school to monitor the professional development of all staff.

Gymnázium Teplice is a training centre for teachers in the surrounding area. The school offers a range of courses that have been approved by the Ministry of Education; e.g. Using Interactive Whiteboard, Teaching Foreign Languages Using ICT and Interactive Whiteboard, Effective Learning and Teaching Using MS Office and Preparation of Project Materials, Digital Graphics in Art or Using Freeware Programmes and the Internet when teaching.

5. How is ICT being used in different subjects?

ZŠ Dr Edvarda Beneše uses for example Edmodo³³ that is an online communication and collaboration application for students and teachers. The school believes that students have already realised its importance for their studying especially in acquiring foreign languages.

³³ www.edmodo.com

In the students' foreign language learning they are encouraged to talk with students from another school using Skype. Students use online tools for creating mind maps, for brainstorming, for blogging and this helps the students to document their progress.

Teachers have also used a wide range of apps, for example Tellagami³⁴, to provide a voice over to learning resources. This can be used across all aspects of the curriculum.

Students at this school also use cameras, camcorders or voice recorders during lessons or planned projects, they know the basic way of processing videos and photos in certain applications. Moodle is used to conduct online education for students both inside and outside of the school, therefore they can plan and organise their own self-paced study. Teachers are able to assign different learning to different students. The student can select the sequence of activities and the teacher can monitor progress. Again, working with Moodle or using Google Docs students receive comments from their teachers and they can discuss it with teachers and other students in forums. The school supports a "Bring Your Own Device" (BYOD) programme meaning students can work with their own iPads or mobile phones.

Students are also introduced to the system called Crocodoc³⁵ where they can submit their home assignments on-line, share other documents with their classmates and edit them on-line.

The school bought four interactive whiteboards and headteacher offered them to teachers who were interested in. "Slowly the teachers learned to use it. Most of the teachers feel the need to use technology and others will when someone shows them." The headteacher said that the only area where he has enforced the use of technology was the electronic class book. (Bakaláři)

There is a computer in each class, the teacher writes down marks, and records them on the computer; everything is recorded digitally. All PCs are connected to the Internet; there are labs which have additional equipment. Teachers, students and parents can see the lesson topic. They can see grades, evaluation and homework.

At **Gymnázium Teplice** students have access to study materials on the school network and teachers send a lot of materials via the school communication system. The system is accessible only to the teachers, students and their parents that have passwords. The homepage of the school is described by the school as "the most visited web page among Czech secondary school web pages." The system itself offers a wide range of information that is updated regularly. Students can get to know about their grades, evaluation, homework, they can even find out (online) which topics were taught in the lessons. Students can set up individual consultation or tutorials with teachers and send their homework in an electronic way.

Gymnázium Teplice demonstrates a whole range of everyday ICT usage in various activities – preparation of tests for students, PowerPoint presentations when teaching, students assessments, homework setting, students preparing their own presentations and presenting them, doing homework online, doing research online about students' preferences and opinions.

³⁴ <https://telligami.com/>

³⁵ www.crocodoc.com

During the lesson observation the teacher accessed the resources from the shared files for teachers where a huge bank of materials has been built up over time. All the teachers share their resources; the Virtual Learning Environment is viewed as the hub of the school information. The lead teacher admits that “it took a lot to convince other staff about sharing the resources, but it is so worthwhile.”

The school is able to demonstrate an effective way of using ICT in many curriculum subjects: Biology, Geography, Physics, Chemistry, Mathematics, History, Music and Arts, and Foreign Languages (English, French, Spanish, German, and Russian).

6. What kinds of research and development are the teachers engaged with?

The leading teacher in the Czech Republic said “As a school, we don’t use research, we see this as more the role of the University and we concentrate on methodology.” This suggested that research is something that is done to the schools, rather than with them. It indicates that schools see universities as a leading authority on certain types of research, rather than recognising the opportunities to engage in collaborative understanding in order to move classroom practice forward.

At Gymnázium Teplice, the school was involved in a number of European school cooperation projects such as Comenius. All of the teachers are constantly engaged in developmental research. “We don’t generally work with other schools, unless for projects where we go abroad, not with schools in CZ.” The school is currently involved with a project called “Let’s play with maths” and this will enable school to have an interactive whiteboard and produce tasks for various ages³⁶. The leading teacher at Gymnázium Teplice says that it is important for the school profile to be engaged in projects.

ZŠ Dr Edvarda Beneše has recognised the benefits of engaging with European projects to learn from and with other schools across Europe.

7. Are the Advanced Schools engaged in any partnerships or networks?

In the Czech Republic, getting partners for schools and additional funding belong to the responsibility of the headteacher. Although there is no national guidance available on this, both of the Advanced Schools were able to demonstrate examples of school partnerships and partnerships with local businesses.

ZŠ Dr Edvarda Beneše has worked with partners to fund the WiFi connection at school. These private companies provide better WiFi connection for homes too. Gymnázium Teplice is involved in Microsoft Partners in Learning Programme who are the only formal partners. The funding for the computer lab at school was supported by Hewlett Packard. “It is important to look for more opportunities to engage with the local community,” said the lead teacher at Gymnázium Teplice.

Both of the schools are also active on an international level. They have been involved in a number of eTwinning and Comenius school partnership projects. All of the projects have improved both language and ICT skills of both teachers and pupils. Gymnázium Teplice had for example in 2009 a project with Iceland, Norway and Switzerland to develop a “Didactic Park” producing interactive learning materials.

ZŠ Dr Edvarda Beneše is engaged with other European projects such as iTEC, inGenious and Creative Classrooms Lab. This is seen as a way to gain additional funding and to learn from colleagues in other

³⁶ www.lyska.net/MathProject

countries. The school also helped to translate an English version of a presentation about tips of using iPads into Czech (“103 zajímavých aktivit pro využití iPadů ve třídě”), the school took part in the first Czech ‘digital learning day’ where students prepared activities and showed how they can use ICT effectively.

Both schools encourage an open dialogue with the community of stakeholders, e.g. Gymnázium Teplice distributes questionnaires to collate feedback from parents and students.

8. Are there particular areas that could be mainstreamed or replicated?

ZŠ Dr Edvarda Beneše:

- Role of headteacher: The headteacher says “as a headteacher it is important to observe the teachers and watch lessons. It is important to speak to the students.” The headteacher looks at the lesson materials to see what the teachers are doing, he provides them feedback and advises. Concerning the future use of ICT in education, he claims that “it is very difficult to say what is going to happen in the future because it depends on progress in the technology. In the next ten years, we will certainly have more devices available for students and maintain strong connectivity.”
- 1:1 approach: School’s headteacher is aware of the fact that students want to be connected to learning 24/7 at school and at home. He believes that schools will have to provide online courses in the near future. Apart from that he emphasises that school has other functions apart from education, for example, social interaction.
- Outdoor education: There has been consideration of how ICT can be used in outdoor spaces. The use of iPads is encouraged in the school’s fully outdoor eco-classroom.
- ICT labs are not just used for ICT, but in varied lessons.
- Different tools and virtual environments are used to publish and share the students work (YouTube, blogs, school’s website).
- Students have designed a trail using QR codes to enable the local community discover information in a nearby park.

Gymnázium Teplice

- This school has developed its own profile exam where students have four hours to respond to a task, but they are allowed to use the internet.
- Funded the role of a project co-ordinator (released from 0.25 teaching hours with responsibility for bid writing, project development, to seek opportunities for innovation funding and activities across the school).
- Identified two key staff to receive additional training, but with the responsibility to cascade this training to the other teachers.
- Involved the students in designing the showcase ‘tour’ of the school. This enables the students to be aware of how school is developing and encourage them to contribute innovative ideas.
- Technology features within interactive and semi-permanent displays allowing students to learn in corridors and in dedicated areas without being instructed.
- Creation of the Virtual Learning Environment, where teaching materials and other important information are shared.

Observation Case Studies: Finland

September 2013

Wäinö Aaltonen School, Turku, Finland

Number of students	463
Age group of students	6-13 years
School website	http://www.kieliluokat.fi/gb/wa.php http://www.wa-koulu.blogspot.fi/
Name of principal	Henri Littunen
LSL project Lead Teacher	Pikke Syrjä-Väisänen

Purolpelto School, Turku, Finland

Number of students	523
Age group of students	12-15 years
School website	http://blog.edu.turku.fi/puris/
Name of principal	Anne Alho
LSL project Lead Teacher	Teija Frigo-Sandholm

1. What types of technologies and resources are available in the Advanced Schools?

In both of the Advanced Schools in Finland, daily communication happens in the Management Integration System (MIS) called WILMA. This is a program where teachers document everything concerning students, including results and evaluation. This is a tool for communication between home and the school; it is the main way to inform and stay in contact with parents. WILMA is also used as a tool for communication between teachers and students, particularly older students.

At Puropelto School, there is broadband access across the school, with access in most teaching rooms or areas identified for using technology in teaching and learning, and for students working independently in the school.

In most classrooms, there is a projector, screen and visualiser. Ten of the classrooms have an interactive whiteboard. There are netbooks available on each floor for teachers to access. These are in a “cage” which charges them as necessary. There are 100 machines altogether.

In Wäinö Aaltonen School there is fibre-optic connection in every building. In every classroom, there is access to the Internet. Moreover, there is WLAN-access covering the whole school. There are approximately 150 computers and every teacher has a personal laptop computer. For a “cell” of three teachers there are 25 computers available. There are some netbooks available for students.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

In Finland, the Finnish National Board of Education (FNBE) supports schools by awarding state grants for the use of ICT in different learning situations and environments. FNBE also finances teachers’ in-service training. There is a national programme to deliver training to make lessons different, where leading schools are invited to provide the training for other schools. Teachers do not receive much training for ICT during initial teacher education but learn during practice in school.

Wäinö Aaltonen School was active in the ATRIUM project of the FNBE during 2010 and 2011. In this project the target was to develop new learning environments on the Web. The Moodle learning platform was widely used (and still is) as a daily environment for learning in the school. The national curriculum is being rewritten by the FNBE emphasising the role of ICT in learning.³⁷

3. Who leads the decisions about the development of ICT?

The lead teacher states that, in Finland, whilst there has been a national focus to provide much more equipment, there is no direction or information given. It depends on the principal and interested or willing teachers. In school there is a leadership group who discuss and guide the school. This school has saved a lot of money by not buying new textbooks to work through exercises. Instead, the teachers are creating their own resources.

At Puropelto School, according to the headteacher, the use of ICT has been a key part of the school vision and strategy for six years, with active involvement of headteacher and management granting funds for teachers’ professional development and ICT resources.

³⁷ http://www.oph.fi/download/151294_ops2016_curriculum_reform_in_finland.pdf

The vision for the school is decided by the city council and the school board for all of the schools in the city; this then determines the actual amount of funding that is made available for the schools and what it should be used for. Puropelto School is part of the national Ubiquitous Information Society programme; locally the school has the status of media school.

Wäinö Aaltonen School says that there is support at a national level where all the innovators can come together. The ICT board of Education recommends that a school has an ICT co-ordinator role for 3-5 hours per week. Within the school, there is a leadership group which meets regularly to discuss and guide the school. Students in school expect to use ICT for their learning and share evidence of how ICT benefits their work.

4. What types of training and professional development are available to teachers?

Training is delivered mainly in town by the local TOP-keskus (Computer in Education Centre, Turku)³⁸. All the teachers have one Saturday in every semester which is a course day and they have to attend. It happens in every school, but every school decides its own programme for professional development.

TOP-keskus is the main partner in developing new ways of using IT as a part of learning. TOP-keskus is known all over Finland for its pioneering work in testing new methods of IT-based learning. It aims to improve the digital competence of teachers via regular courses. There is also other training provision available through the teacher training providers in the universities and polytechnics.

At Puropelto School one of the staff has provided the training. Whole staff training has been developed as required. Teachers run small workshops to help each other and ask for guidance from other colleagues. One of the teachers receives all the information about the courses that are available and distributes this to the other teachers.

5. How is ICT being used in different subjects?

The students in Wäinö Aaltonen School are used to doing their school work by using IT. The students have easy access to computers. Web-homework is widely used instead of exercise books; using research projects for students, embedding the use of technologies. Use of Moodle and SkyDrive-services make it possible for students to continue their work at home after school. At home almost 100% of students in the neighbourhood of the school have access to the Internet.

Using Moodle and SkyDrive-services makes it possible for teachers to give instant and regular feedback to students. Feedback can be given over the Web both during and after a project. In Wäinö Aaltonen School, Web-tests are used in Moodle instead of traditional paper and pen tests. In these tests it is possible to give feedback and results immediately.

Another important emphasis in using IT in Wäinö Aaltonen School is media production. Wäiski-TV³⁹ produces a new programme every Friday. The programme is 100% made by the students of the school. There are specialised roles for the production team of Wäiski-TV. The stories and themes in every part of Wäiski-TV are always 100% up to date. Mostly it has something to do with everyday work in the

³⁸ <http://edu.turku.fi/top-keskus/>

³⁹ Wäiski is a colloquial form for Wäinö Aaltonen school

school or special occasions during a week. Every episode of Wäiski-TV is uploaded to YouTube where students and their parents can see the latest edition of Wäiski-TV.

In Wäinö Aaltonen School there are 25 teachers. All teachers are familiar with ICT but there is a group of leading users. This group consists of 12 teachers. There are groups (“cells”) of teachers (3-4) where one or two “heavy users” of ICT are collegially supporting the others.

There is a variety of digital content available for teachers in Wäinö Aaltonen School. Many of the teachers are producing their own digital content in Moodle. This content is available for colleagues. There is a wide variety of publisher produced content available in Moodle for every school subject.

In Finland, the primary school teacher suggests that personalisation of student learning is tackled through exercises in Moodle. However, most of the students are doing the same exercise but working at their own pace. The differentiation is by outcome, rather than by task.

The vision for Wäinö Aaltonen School is to actively encourage the students and to give them a possibility to structure their own learning instead of just filling in exercise books. Developing the ability of critical thinking and choosing a relevant part of information for learning is another goal in the strategy. In practice, the lead teacher described how this could mean, for example, using IT instead of exercise books and producing Prezi and PowerPoint presentations, “instead of just filling empty lines.”

At Puropelto School the teachers say that there is guidance available for using IT, but it is very open. The lessons are 75 minutes long. The teacher uses the interactive whiteboard to present the key areas of learning including the use of videos and inviting the students to demonstrate too. In the computer lab, the students are able to undertake learning at their own pace.

The school has explored the use of bambuser.com to record the lesson so that a student who is absent can participate.⁴⁰

The secondary students recognise that they have access to a large amount of equipment in school and do not need anything further. Students can bring mobile phones to school, but they do not use them in the lesson.

6. What kinds of research and development are the teachers engaged with?

In Wäinö Aaltonen School there have been common projects with the institute of Science of Education in Turku University. For several years there has been a close cooperation between Wäinö Aaltonen School and TOP-keskus. This cooperation includes shared projects with the Finnish Ministry of Education. The leading teacher has recently been accepted to undertake a postgraduate course at University, where she intends to explore the use of ICT by school principals at a national level.

One teacher in the school has researched the work of Arne Trageton (2010), a Norwegian professor who has written about developing students’ creative writing on computers using a particular method of “typing” on the keyboard.

7. Are the Advanced Schools engaged in any partnerships or networks?

⁴⁰ <http://bambuser.com/>

Wäinö Aaltonen School partners with the upper comprehensive schools of Puropelto and Luostarivuori in Turku.

Puropelto School has formed several partnerships with the other media schools of Turku as a result of the Ubiquitous Information Society initiative.

For several years there has been a close cooperation between Wäinö Aaltonen School and TOP-keskus. This cooperation includes shared projects with the Finnish National Board of Education.

In Finland, the lead teacher stated that there are quite strict rules about partnerships with commercial suppliers and this may bring some limitations for schools.

The use of WILMA as a Management Information System has supported the development of partnerships and communication between home and school.

In Wäinö Aaltonen School, there is a parents' union and parents raise money for the schools. The school has held an open door day, so parents are able to use ICT, and students could show animation movies to parents. At present, the school does not have extensive networks between schools but there are subject networks for maths and languages.

8. Are there particular areas that could be mainstreamed or replicated?

- Wäinö Aaltonen School demonstrates the benefits of getting older students to work with younger students to support their learning.
- The school visits highlighted that a group of media students are engaged with the activities of the whole school. Teams are selected each year to produce programmes for the students with news, an interview and the weather forecast for the week ahead. Students can create a regular digital newsletter, magazine, school prospectus, video clips about specific subject areas and publish online.
- In Puropelto school the headteacher has identified two staff as teacher trainers.
- As part of the Living Schools Lab Project, the teachers have started to observe one another teach to see what is happening.
- The training centre currently provides courses in the use of ICT within the curriculum. The Advanced Schools could now work together with the centre to consider how the training can be connected to whole school development.
- The headteacher observes the teachers in their classrooms and talks to the students about their learning on a regular basis.

Observation Case Studies: France

EPPU Ingrandes sur Loire - France	
Number of students	200
Age group of students	5-11 years
School website	http://ecoleprimairepublique-ingrandessurloire.e-primo.fr/
Name of principal	Anne-Sophie Picard
LSL project Lead Teacher	Anne-Sophie Picard

Lycée Pilote Innovant International - France	
Number of students	500
Age group of students	14-18 years – Upper Secondary
School website	Lycée Pilot Innovant International
Name of principal	Madame Evelyne Azihari
LSL project Lead Teachers	Xavier Garnier, Joel Coutable

1. What types of technologies and resources are available in the Advanced Schools?

At Lycée Pilote Innovant International, every student has his or her own tablet. The use of tablets has allowed the school to gather everything together in one tool in a digital workspace. The school wanted to photocopy less, use less paper and make full use of the 50 minute lesson time.

In the primary school there is one computer lab, but this is in need of updating. In the classroom, there is an interactive whiteboard; this is on wheels and “parked” at the side of the classroom. At the front, the teacher has access to a chalkboard and a dry wipe board. There is an Internet connection throughout the school.

EducElem is a portal that provides a range of software that has been put together by teachers. There are exercises for the pre-school and primary age group. Teachers have to validate the resources. Teachers are allowed to take the resources in EducElem to adapt and improve them.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

The leading teacher described how in France CNDP⁴¹ is the national centre for pedagogical documentation, not just ICT, supporting the national plan. Priority has been given to digital workspaces with 4,000 schools equipped = 6,000,000 students; they want 6,000 schools for 2014. The digital homework notebook and lesson plan is compulsory across France. There are experiments in e-books in 69 secondary schools involving 15,000 students. There are experiments in the use of tablet computers. The leading teacher described how every secondary school student has a competency assessment on the use of the Internet, called B2i (“Brevet Informatique et Internet” since 2011 for primary, lower and high secondary schools). B2i is now included in “Socle commun de connaissances et compétences”, the French version of OECD Key competencies (2005). There is an assessment for teachers and a priority for digital safety called C2i: “Certificat informatique et Internet” (2005) It exists for several professional fields.⁴²

The Ministry of Education has a very specific platform through a regional academy responsible for ICT training with a list of possible trainers and advertising of conferences and seminars.

Lycée Pilote Innovant International School is the only school in France that has been identified to implement whole school change and it receives extra funding for this. This is why the school was able to give tablets to all the students.

A new Law was passed July 8, 2013 which promotes a new strategy “Bringing all schools into the Digital Age”: this strategy supports educational innovation to contribute to the development of innovative projects and educational experiments promoting the digital use in schools.

A “Directorate of Digital Education” was created in the Ministry of Education to organise and lead the digital strategy through the network of “Digital Academics”.

⁴¹ CNDP= Centre National de Documentation Pédagogique: www.cndp.fr (CNDP is now called “Canopé”)

⁴² <http://c2i.education.fr>

Section 18 of the Law establishes governance based on new relationship between the state and the regional and local authorities for shared management responsibilities, particularly in terms of equipment, maintenance and digital resources. A contractual policy is based on new partnership agreements between the state, regional and local authorities.

Section 53 of the Law establishes also “Media and Information literacy” in the curriculum through the digital support.

Section 68 creates the Higher Schools of Teaching and Education: to ensure consistency between initial and continuing training of teachers with new teaching and learning practices mediated by digital technology.

Web-based platforms M@gistère (Primary) and P@airformance (Secondary) are available for teachers. The creation of Viaéduc, a professional social network, offers teachers a platform for exchange.

Two new experiments were initiated in September 2013. The objectives are to study the effects of digital technology in teaching practices and develop effective strategies for educational uses of digital tools and resources.

1. Provide personalized assistance to the first year of secondary school pupils: 30,000 pupils involved in a programme named D’Col based on hybrid accompaniment with digital resources and CNED services (National Centre for Distance Learning).
2. Connecting secondary schools: 20 schools having a high-speed connection, existing uses of digital technology and a sustainable team. Objective: To study the impact of digital technology on all developed educational uses in order to establish a deployment strategy for the devices. 100 connected secondary schools expected towards 2015.

3. Who leads the decisions about the development of ICT?

The National Agency for ICT is a service of CNDP⁴³. In France, the high schools are led at a regional level. There are regional projects and this means that the schools can access additional funding to participate and receive specific support. The Living Cloud Project is a regional project which should grow. The lead teacher Xavier Garnier said: “Innovation can come from adapting to the new students that we have, we continue to be reflective over the kind of environment we are in.”

Regional support offers Internet connection to families at home for a cheaper price.

There are two institutions providing support; the MoE is responsible for staffing and advice, whilst technology and services are provided by the district.

The deputy principal of the school is responsible for ICT, but there is a collective team who undertake the work in the classrooms. The school has a four year project called “The Living Cloud”, which is not viewed as an ICT project but as an innovation project for the whole school.

⁴³ Now called: “direction de la recherche et du développement sur les usages du numérique éducatif” (directorate of research and development on the uses of digital technologies for education)

The lead teacher outlined that there is no fixed management team in schools. However, there are several teachers who work together to lead projects. There is a pedagogical council at a regional level which has lead teachers from across the projects. Joel Coutable describes how all of the ideas for change are “user centred, it answers their needs.”

In the primary school, the headteacher leads by example, and is responsible for the day to day management of the school. However, the decisions about the development of the school are made at a regional level with the board of the school. The primary school teachers are observed by the inspector and recommendations are then made about the regional training requirements and school needs including pedagogical support. The local city council is responsible for buildings, furniture and equipment, including ICT devices, provided to the pre-primary and primary schools

The LSL lead teacher Xavier Garnier says: “The role of the ICT facilitator is to help, to train, but not to force the teacher. It is not possible to fit the teacher to a template. He can motivate the teacher and respect pedagogical freedom, which is important in France.”

In the primary school, the headteacher says that there is no vision for the school, because there is focus on the current day to day success. “It is a heavy curriculum and a need to maintain standards to prepare the students for secondary school. Traditions have challenged innovation.”

Advisers are trained by the inspector or other advisers. They can choose a subject to be trained in, they never work alone. As far as possible, the advisers work in teams but work with seconded teachers. They try to discuss, provide peer to peer support and collate good examples from the area.

4. What types of training and professional development are available to teachers?

During the Link Observation Visit to the primary school, there was opportunity to interview one of the local ICT advisers. He commented: “Advisers have to take the teachers from the level they are working at.” The adviser explained that the inspector was able to focus the professional development in the area to ICT development across the different subjects in the curriculum. Alongside this, the inspector has been able to arrange for any companies providing equipment to all the schools through regional procurement must provide the training with the equipment. The local adviser has delivered the training at a regional level for four years and he knows the level the teachers are working at. The inspector has gone into every single classroom over the past four years and he is beginning to see some of the schools for a second time now.

At present, there is a virtual learning environment being implemented at a regional level. The advisers will provide 2 days’ training for 15 teachers. Every district can choose the VLE that they want. This Advanced School adopted the virtual learning environment⁴⁴ (the portal is called “e-primo”) from the company called itslearning⁴⁵ chosen by the district.

At Lycée Pilote Innovant International there are workshops twice a year where the school looks at what has been achieved and plans the next set of actions. The heads of department meets once a month to discuss the pedagogical needs of the teachers. Teachers are curious and want to initiate ideas. Two teachers have recently been given a rare opportunity of a reduced teaching timetable to look at the

⁴⁴ <http://ecoleprimairepublique-ingrandessurloire.e-primo.fr/>

⁴⁵ www.itslearning.com/

use of tablets and to explore the practice across the school and to support other teachers for approximately 4.5 hours per week.

5. How is ICT being used in different subjects?

There is an ICT curriculum, but the teacher can choose to deliver this in any way and this means that there is a huge variation between teachers. In the primary school identified within this project, the headteacher has largely focussed on developing the use of ICT in mathematics at this stage.

Students are given individual support during mentoring time called Needs Deepening Mentor time (NDM) and a mentor teacher will have 10 students. Mentors change each year and they have to keep records to ensure that information can be passed on. There is a teacher in school who is responsible for individual target setting, but part of the mentoring time is for this. Each student has a web folio and the teacher aims to use this to enable the student to include some of their development and achievements. The school has lessons called IDM which stands for interdisciplinary modules; in these lessons at the core of this, students cover various curriculum topics ensuring that mathematics and the use of languages is interwoven with ICT. There should be further consideration to how ICT leads to changes in the curriculum and this needs to progress through with the students from primary to secondary school.

6. What kinds of research and development are the teachers engaged with?

Lycée Pilote Innovant International is working on two research projects at present: one with Poitiers University and Techne laboratory about pedagogical issues and results with tablets; the second project is with several French universities, especially Université Sorbonne Nouvelle - Paris 3 (Divina Frau-Meigs) about Transliteracy (project funded by National Agency for Research).⁴⁶

As a school, the secondary teachers have identified an innovation team and have begun to keep a blog to log their progress and their challenges. This has a section of frequently asked questions. As part of the Living Schools Lab project, the secondary school has made the blog available to other schools within the Regional Hub in Poitiers.

7. Are the Advanced Schools engaged in any partnerships or networks?

The lead teacher highlighted some of the potential benefits of the school partnerships. This school belongs to a network of innovative schools in France (FESPI Network⁴⁷). The schools are progressive and radical with their innovations. One of the benefits of these partnerships is that it has enabled the schools to provide common training. The schools have a virtual platform where teachers can share digital resources.

At a national level, the schools are generally more nervous of commercial partners because they are conscious of the legalities attached to following procurement guidelines. However, schools welcome

⁴⁶ www.translit.fr

⁴⁷ www.fespi.fr

the opportunity to work with a single supplier to provide resources and training for the teachers. For example, the teacher refers to recent provision of equipment and materials by Acer.

8. Are there particular areas that could be mainstreamed or replicated?

- At LP11, the teachers are keeping a blog to talk about their implementation of tablets and to encourage the teachers to support one another.
- The digital portfolio at the secondary school allows the mentors to see the comments that the teachers are making across the individual student profile.
- In the secondary school, the science teacher has worked with a local expert to create resources.
- In the primary school the teacher uses digital templates to give the students more time to concentrate on their lesson to gather the information.

Observation Case Studies: Ireland

January 2014

Scoil na gCeithre Máistrí, Athlone, Ireland	
Number of students	299
Age group of students	5-12 years
School website	www.ceithremaistri.scoilnet.ie/blog
Name of principal	Laobhaoise Nic Aogáin
LSL project Lead Teacher	Gearóid Ó Duibhir

Coláiste Bríde, Presentation Secondary School, Clondalkin, Ireland	
Number of students	960
Age group of students	12-18 years
School website	http://www.colaistebride.com/
Name of principal	Marie-Thérèse Kilmartin
LSL project Lead Teacher	Sarah-Jayne Carey

1. What types of technologies and resources are available in the Advanced Schools?

In the primary school in Ireland, the school has access to the Internet via the wired and wireless network giving coverage throughout the school. The ICT co-ordinator has worked with the school to ensure that each class teacher has a defined level of access to technology with the classroom. In every classroom there is a tablet laptop, a data projector, a printer, speakers and a visualiser. There is a computer lab and library facilities together; this is increasingly used as a space for the students to work on projects. All the computers in this space have two sets of headphones, one of which has a microphone so that children can work in pairs on language based activities. The school has tutor control software (AB Tutor Control) which allows the teacher to monitor progress. The school has 32 portal notebooks (Fizzbooks) which are distributed to the junior classes each morning by a group of students.

Within the school older students are allowed to bring their own technologies to school for use in class. This has facilitated the sharing of software so that the exposure in school can continue at home (e.g. using Audacity for practising reading).

In the secondary school in Ireland, all teaching classrooms and tutorial rooms have data projectors, thus all students have access to numerous Internet based resources which teachers use in teaching and learning. All Maths and Science rooms have an interactive whiteboard and visualizers. All classrooms have a computer and access to printers, scanners and faxing facilities. A wireless network is available throughout the school and the school has worked with O2 to provide this. Students can use their mobile phone in lessons with agreement from the individual teachers.

In four ICT labs students have their own direct PC access and ICT is integrated into all programmes and subjects throughout the school.

The school has a managed network and ICT services are managed remotely. There is a helpdesk for the school and the school is provided with technical support for ½ day every two weeks. The headteacher Marie-Thérèse Kilmartin emphasises that one of the most important factors “is that it [technology] absolutely needs to be able to work.”

In 2004 when the announcement of a new school building was made, the headteacher established an ICT committee to set priorities. This involved visits to look at other school models including in the UK. This helped the school to futureproof the technologies available. The school liaised with the former National Centre Technology in Education (NCTE) (now PDST Technology in Education),⁴⁸ becoming early users of the national E-Portal, and set staff expectations that ICT would be embedded into the new school and all school systems. As part of the move to the new school in February 2006 a plan was developed to upskill all staff with the use of ICT. Through the NCTE, the school linked with the Dublin West Education Centre (DWEC) and developed a number of core ICT staff members to become NCTE local facilitators for staff training and development. ICT training is a staff priority and is on all agendas and it is at the heart of the school focus. In September 2012, the Board of Management identified, as part of the 5 Year Plan, five areas of focus under teaching and learning including ICT. An ICT committee

⁴⁸ The National Centre for Technology in Education now Professional Development Service for Teachers Technology in Education: www.pdst.ie

with 15 members was established to divide out responsibility and look at policy, resources and new initiatives.

From 2008 the headteacher welcomed other schools to visit the school as an example of a working model. All staff have been involved in this process, not just the lead teachers who had good ICT skills but to all teachers including those who had no ICT skills. The school has developed a local reputation of bringing teachers with very little IT experience to being very comfortable in a changed classroom environment with computers, data projectors, video cameras and interactive whiteboards.

The school was invited to present at CEIST Conference (2009) to other schools within the Trust around the school's model of ICT integration. Since then CEIST, in collaboration with Unity Technology Solutions, has invited the school to be an example of best practice for the other schools within the Trustee group, in ICT integration and development.

In 2011, the school was selected to become part of the pilot for science at Junior Cycle.⁴⁹ The Principal applied to become a pilot school for the new Junior Cycle JC2 in December 2011 and was successful.

The school has been involved with a national "Connected Classrooms Project" where one of the mathematics teachers in school has taught higher level maths via Microsoft Lync to a small number of students in another class remotely at Presentation Secondary School Warrenmount⁵⁰ which is in Dublin (though it could be anywhere in the world). This means that the teacher has been connected in real time to these students remotely whilst still continuing to have her own class of students in the classroom.

2. 2. Are there national initiatives that have had an impact upon whole school development of ICT?

In Ireland, the leading teacher in the primary school described how the financial recession had led to "ICT going off the boil at a national level." There is a new vision for numeracy and literacy; these subjects are the current main focus. NCTE filmed some video examples of personalised learning so that teachers could observe exemplary practice. These show the use of technology within learning and teaching.

However, the leading teacher remarked that the school level focus on ICT remains just as important.

In the secondary school, members of the ICT committee are keeping an eye on developments in other schools regarding new technologies, e-books, iPads, smart phones, tablets, etc. as personal devices in the classroom. The school is equally conscious of costs and the socio-economic background of the students.

3. Who leads the decisions about the development of ICT?

⁴⁹ www.juniorcycle.ie

⁵⁰ www.warrenmountsecondary.ie

At a national level, the Professional Development Service for Teachers (PDST)⁵¹ Technology in Education provides the support and guidance to schools implementing the use of technology within learning and teaching. The PDST co-ordinates the Schools Broadband Programme. Alongside this, the PDST provide professional development and training to teachers. Furthermore, PDST leads the development and access to Scoilnet,⁵² a portal providing access to high quality teaching resources.

In both schools in Ireland, there is evidence of whole school change being led by a team of staff with the principals driving the decision making process.

The primary school started the process of developing an e-learning strategy in line with the NCTE e-Learning Plan⁵³ and guidelines and has established an ICT committee of enthusiastic and motivated teachers. It is significant that there is a representation of staff from across the different year groups; this allows for pinpointing dissemination of ideas, policy and feedback to the appropriate class levels.

These meetings are structured and usually last for 45 minutes to include elements of Feedback, Planning and Training (FPT 45). There is a whole staff meeting on Thursdays.

4. What types of training and professional development are available to teachers?

Initially in the secondary school in Ireland there were a small number of teachers who had ICT competence and interest, but the school has used the role of the lead teacher to provide support to other staff in school. This means that there are 10-15 teachers who will readily embrace new initiatives in school and encourage others to engage.

The school has used the curriculum to initiate some training opportunities, for example, the Italian teacher has developed language links with a school in Italy. The students have been able to connect via Skype; however, the teacher has used collaborative ICT tools to build the ongoing partnership for the school. The school has been twinned with a school in Bassano del Grappa, Italy; the teacher has been able to develop his own skills of using tools such as Padlet, email and Skype. These skills have been passed on to other teachers in school.

ICT training for the development of staff skills continues to be provided in-house, with the school's staff acting as facilitators. A range of topics have been addressed including aspects of digital citizenship, how to access and use AFL on-line resources.

The school has encouraged staff to complete online courses, Masters in Technology for Education (DCU), film-making, and cooperative learning (TCD). Staff complete short courses by PDST Technology in Education and these are offered through Dublin West Education Centre. The school board have a grant to encourage staff to undertake Continuing Professional Development.

The Principal and the ICT coordinator are actively involved with other key ICT leaders in discussions about ICT development as the school moves forward with the development of the new Junior Cycle.⁵⁴

In Ireland, ICT training is delivered through whole school training. PDST Technology in Education⁵⁵ offers whole school training and many primary schools avail themselves of this as a summer CPD option

⁵¹ www.pdsttechnologyineducation.ie

⁵² www.scoilnet.ie

⁵³ www.pdsttechnologyineducation.ie/en/Planning/e-Learning-Handbook/The-e-Learning-Handbook.html

⁵⁴ www.juniorcycle.ie/

⁵⁵ www.pdsttechnologyineducation.ie/en/Training/

(Continuing Professional Development). The lead teacher has recognised that some of the younger teachers are proficient at the use of ICT for social media, but benefit from specific training to demonstrate how to access and manage resources within the classroom.

The lead teacher recognises the benefits of a teacher being able to undertake certified training that enables them to gain incremental points towards their career to make it more worthwhile for the teacher to undertake the training. All training is purely by choice; there is no obligation to do CPD/training. In the last year this has probably amounted to one extra hour per week. There is no structure for calculating hours for CPD. If primary teachers take part in a 5 day summer course, they can have three flexible days off in the year if the Continuous Professional Development Training is verified by the DfE⁵⁶. Teachers have to register with the Teaching Council⁵⁷ every year.

5. How is ICT being used in different subjects?

In the secondary school in Ireland, Edmodo⁵⁸ has been implemented for all subjects and all year groups. This learning management system enables the school to make resources available to students on line. It means that there is a continuous connection between school and home learning as students can access learning online. Students can collaborate on line and communicate more openly with their teachers. Computer rooms have been opened during lunch and after school to accommodate any students with no home access to computers. It has enabled teachers to feedback on a more instant, regular basis. During the observation visit, the maths teacher began the lesson by accessing examples of homework that had been submitted online and addressing some of the common misconceptions prior to the start of the new lesson.

All Maths and Science classes use interactive whiteboards to enhance the learning experience; higher level students have connected with a partner school via Microsoft Lync. Italian and French Departments use Skype, Email and Edmodo to communicate with partner schools in France and Italy.

In History, Geography and Art, Internet access means that students can virtually visit galleries and museums. In the music department, it is embedded in the curriculum for students and staff to integrate Sibelius, Musescore and YouTube.

Through the school's involvement with Bridge21,⁵⁹ Trinity College Dublin, students in transition year are developing their ICT skills and sharing this with students from other schools through group networks.

Students with Special Educational Needs and English language deficit use ICT as a support for their learning. The school has introduced Touch, Type, Read, Spell (TTRS) and other software packages to enhance learning at their own level. Many of the packages allow for individualised learning and progress tracking. The school has purchased class sets of Kindles for English classes and as a literacy incentive and the SEN Department are trialling two iPads with students.

⁵⁶ Department of Education and Skills

⁵⁷ www.teachingcouncil.ie

⁵⁸ www.edmodo.com

⁵⁹ www.bridge21.ie

As a Gaelscoil, the teaching of a second language is central to the work of the primary school. The integration of ICT has allowed the school to extend the learning opportunities for the children both in and beyond the classroom. All computers throughout the school have the same software installed. (All software is freeware, so that such licensing is neither a problem nor a drain on resources.) This covers age-appropriate material and allows teachers to differentiate when assigning work to children.

The development of Literacy is a key aim of the school and an example of how the school is using ICT to enhance this is the recording software Audacity to allow children to record themselves reading.

In keeping with national educational development, Numeracy and Literacy is central to the school development and as a Gaelscoil this is of greater significance as bilingualism is central to teaching and learning. As such, ICT is being used effectively in each of the three areas Maths, Irish and English, and beyond.

6. What kinds of research and development are the teachers engaged with?

In both the primary and secondary School in Ireland, the principals are keen for staff to be involved in external projects, recognising the benefit of being able to engage with larger initiatives for the benefit of the school.

The leading teacher from Ireland commented that he “does not actively look for research but keeps up on research and keeps an ear to the ground. There is always research in the background, and this in turn inspires him to do some further research.” He has written for a monthly journal.

“Involvement in the Living Schools Lab gives Scoil na gCeithre Máistrí the opportunity to extend and enhance the teaching and learning of its students with and through ICT and to continue its long-running practice of establishing ICT as a central tool in offering our children the best education possible.” (Primary Headteacher)

7. Are the Advanced Schools engaged in any partnerships or networks?

The secondary school website gives up to date information on what is happening in the school. Parents can download application forms, newsletters, booklists and the school calendar. Parents have been given access to their daughter’s record through E-Portal; thus parents can access school reports and attendance.

As indicated previously, the secondary school is using technology to videolink with Presentation Warrenmount and Digital Hub (H2) Dublin; and Skyping with schools in France and Italy. The school is linked with Trinity College, Dublin Access Programme (TAP), with TCD Bridge 21, with CEIST and Unity Technology Solutions. The secondary school is a lead school for Serco / E-Portal and is currently looking at being an early adaptor for the next generation.

The school maintains strong links with the local college and with employers in the area of Clondalkin.

In 2011 the school became involved with the Global Education Experience (GEE) project, organised through the Presentation Sisters. The school was linked with Presentation Secondary School Delhi 6 in India; this has involved reciprocal visits.

The primary school uses a school blog to communicate with parents. In addition, the parents are kept fully informed about events through the parent text service and email.

The primary school has forged strong links with other schools, the community and industry since its establishment. The school hosts visits from principals and ICT co-ordinators of schools in the region to demonstrate how ICT has been embedded in the school.

The school has built links with Ericsson, who have a software development plant in the town of Athlone. Many parents of students in the school are employed by Ericsson and they have always played a supporting role in the development of ICT within the school. However, the ICT co-ordinator feels that there are more opportunities for companies to support the primary schools.

8. Are there particular areas that could be mainstreamed or replicated?

- The eTwinning project where the secondary school has developed links with a school in Italy. The school has used Skype for the oral discussion between classes. However, the students have been able to continue to share resources using Padlet. The students have used this shared collaborative space to learn about new vocabulary, sentence structure, basic dialogue and they have included written text, photos and videos to teach each other.
- The Connected Classrooms Project could be adapted for other subjects too; for example, in this school a mathematics teacher delivered higher level maths lessons to students from another school via Microsoft Lync. Schools may be able to identify subject experts across different areas of the curriculum. Equally, the school may be able to engage with an external expert in a library, museum or specific organisation who is willing to share practice.
- The distribution of technologies across the school to ensure that all classrooms have potential to access devices within all areas of the curriculum. This further enhances the baseline provision of specific technologies to all classrooms across the school.
- The e-Learning Planning process⁶⁰ as a whole school planning process is one that could be mainstreamed.
- The 45 minute e-Learning Team meeting format of 15 minutes each for Feedback, Planning and Training for short structured meetings can provide focused purposeful meetings.

⁶⁰ www.pdsttechnologyineducation.ie/en/Planning/

Observation Case Studies: Italy

Istituto Comprensivo di Cadeo e Pontenure, Italy	
Number of students	1200
Age group of students	6-15 years
School website	http://www.istitutocomprensivocadeo.it/
Name of principal	Mr Daniele Barca
LSL project Lead Teacher	Angelo Bardini, Giovanna Rosi

ITIS Majorana, Brindisi, Italy	
Number of students	1198
Age group of students	15-19 years
School website	http://www.majoranabrindisi.it/
Name of principal	Salvatore Giuliano
LSL project Lead Teachers	Salvatore Giuliano, Daniela Di Giuseppe, Giacchino Margarito, Rossella Palmizio

1. What types of technologies and resources are available in the Advanced Schools?

The state Comprensivo Istituto di Cadeo e Pontenure is introducing technologies in most of its classes and it is recognised at national level for its effective use of ICT. As a regional service centre it has been involved in assistive technologies for disabilities and dyslexia for ten years: it provides students, parents and teachers with educational aids, assistive and adaptive technologies and training courses on how to use them. Described by the school as a campus for students with Learning Disabilities (LD), it serves the whole province of Piacenza. It consists of a lab-type learning environment (in extra school hours) aimed at learning how to use dyslexia learning aids, resources, software and tools.

The library has a surface of 500 square metres; it is considered by the school as the heart of the educational activity. Its guidelines draw inspiration from the ten “rights of the reader” by Daniel Pennac.⁶¹

Since 2009 it has been involved in the project “Classroom 2.0” issued by the Italian Ministry of Education, University and Research (MIUR) with a class from the secondary school and one class from the primary. It has introduced the use of iPads with its own funds in two classes of the secondary school with the aim to become a School 2.0. This means that the school would be given the task to assess and order interactive whiteboards for primary and secondary schools of the province and nearby provinces. Students use the interactive whiteboard and tablets every day; they work in small groups and they are strongly involved in the activities for the whole class as well as in paired work.

The school has established a regular system for all innovation within the school, in order to create a digital curriculum across the different subjects reflecting the progression of the students across the different age groups. The school has provided the students of the nursery school (3 to 5 years old) with a digital wall (touchscreen wall) to let them express their feelings and relations. The students of the primary school (from 6 to 10 years old) have immersive digital content that can be accessed easily and quickly. Students in the secondary school have the opportunity to use technologies every day at school as well as at home.

In ITIS Majorana, the classes are provided with one tablet per student, an interactive whiteboard and WiFi connection. Textbooks are digital and interactive and they are printed out by the school itself, thus reducing the costs for the families. A digital learning environment is available, where students can find recorded lessons in case they are not present. Students’ attendance, activities and performances are tracked and recorded by the use of a personal digital student card.

The WiFi broadband connection is available in the school and since students have their own devices and are responsible for them, they can use them in the school library or in other school areas, thus enhancing the informal learning or peer education sessions during all the school day.

The school council is entirely involved in the use of technology across the school. All curriculum subjects are covered (Italian language, History, Geography, Sciences, Chemistry, English, Physics, Law and Economics, Mathematics, Informatics, Design and Technology, Natural Sciences). The project started in 2007 and has progressively involved new schools into the network.

⁶¹ <http://www.broad-street.com/images/uploaded/Ten%20rights%20of%20readers%20poster.pdf>

Digital textbooks, resources and software are regularly used during lessons. In order to keep digital textbooks and resources up-to-date, teachers are involved, together with their peers from the other partner schools, not only in the selection of online digital content but in the production of it, according to students' learning styles and achievement. The project started mainly because textbooks were considered as not suitable to students and a decision was taken to produce them according to end-users needs and preferences. Some students take part in the review of digital content material and, during the Link Observation Visit, there was an opportunity to hear from some of the students who had authored one of the books.

When the Book In Progress⁶² project started in 2007, the school was alone in this innovation process. They immediately got the support from the families because this innovation project on textbooks allowed them to save up to 500 € each year and to invest part of that money on personal technological devices (such as laptops, tablets, etc.). There are commercial and private sponsors.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

Indire is the national research institute in Italy in charge of the teacher training at a national level. It is part of the Ministry of Education where the advisers provide policy advice and training, including blended courses on technology.

There are regional offices for the Ministry and each region autonomously issues calls for proposals for schools to apply for funding to support other schools.

The institute has been responsible for the organisation and implementation of several "Actions". The initial action was to provide interactive whiteboards (IWBs) and training; this was co-ordinated across the country by regional offices for Indire. 36,000 IWBs were installed in schools and schools have bought some of their own; this amounts to approximately 52,000 altogether.

A second action was Class 2.0; the aim of this was to provide students with PC access and to bridge the gap between learning at school and at home.

A third action, School 2.0, was about the transformation of whole school into a flexible environment where teaching and extra curriculum collaborative activities enable collaborative learning – 50 schools, 1,400 teachers and 15,000 students.

The leading teacher, Daniela di Giuseppe from ITIS Majorana, felt that the implementation of ICT over the years by the government has led to "a completely new world, a complete revolution... my teaching is completely different now. I can encourage the students to initiate their own learning; they are at the centre of their own learning path."

3. Who leads the decisions about the development of ICT?

The Principal in each school is responsible for ICT implementation. "Teachers are proactive and want to learn." The lead teacher is able to give examples of staff who have taken part in professional development of their own accord, even though it is not compulsory. In both of the

⁶² www.bookinprogress.it/patrocini.php

schools, there is evidence of a leadership group who meet regularly to review the development of ICT in school.

4. What types of training and professional development are available to teachers?

Training usually takes place in the afternoon, after school. Training is mandatory for NQTs and this is provided by INDIRE at a regional level. Istituto Comprensivo di Cadeo has been promoting ICT training courses at district, provincial and inter-provincial level since 1999. These training courses are organised partly as a frontal lesson and partly as a lab/workshop. Experimental projects are: Classroom 2.0, issued by MIUR, and School Digital Publishing (EDS).

The deputy headteacher explained that the care the school has always taken for technological innovation and training activities has allowed the formation of a group of teachers who provide ICT training within the school and who are recognised as leading users and teacher trainers on the use of ICT.

ICT has been embedded across the curriculum for at least 4 years, the school being spurred by the ministerial project “Classroom 2.0” and by its interest in testing and experiencing technologies. The teachers of Classrooms 2.0 take part regularly in training courses organised by the Regional School Office together with the University of Bologna.

At present it is promoting training courses, at provincial level, based on the teachers’ needs for a basic use of interactive whiteboards, effective teaching strategies, and development of teaching experiences about integration and inclusion. The school participates in a teaching innovation project (by MIUR) concerning digital publishing and new learning environments.

In this Advanced School in Italy, the motivation for teachers to undertake training is because teachers believe that ICT makes a difference to learning. They help each other to learn how to use new tools. The teachers have not dedicated a regular time to the sharing of practice, but support each other as and when needed. Daniela Di Giuseppe describes teachers in the Advanced School as “proactive and they want to learn.” Teachers have taken part in Continuing Professional Development on their own accord, even if it is not compulsory, and to do this they will attend sessions after school in the afternoon. She comments that “Training is a right and a duty.”

This Advanced School has undertaken training from some commercial providers, e.g. Apple.

In Istituto Comprensivo di Cadeo e Pontenure, there are two teachers who are trainers for interactive whiteboards. Several other teachers are external experts for the use of iPads and different subjects. This means that they provide training to teachers from across the region. Training is delivered in the secondary school in the library and in the ICT lab. This school embraces opportunities to engage with teachers from other schools to enhance practice; for example, the lead teacher was able to give the example of three teachers from Milan visiting the school to speak about how to enhance the motivation of students in English using ICT, e.g. with IWBs and learning platforms.

5. How is ICT being used in different subjects?

ICT is being used across the curriculum in History and Geography; the school has identified resources with a variety of images, virtual tours of museums and other places of historical and geographical interest. The primary classes are experimenting with digital publishing through learning environments such as e-books and 3D navigation in the form of a game. In other subjects, such as Italian and Maths, students make use of specific software, learning objects and digital learning content. Through the interactive whiteboard and tablets, either the whole class or groups of students easily gather, compare and reflect on ideas.

In Italy the lead teacher acknowledges that the school believes that having a personal device for each student helps to personalise the learning. Students can work on their own and learn at their own pace. In school, students with specific learning needs are able to access appropriate software. However, the school has recognised that it is useful to identify a list of software for your students.

Students use the interactive whiteboard and tablets every day, making use of digital cameras, video cameras and "apps". Then they employ specific software for photo and video editing in order to get a final high-quality product. The interactive whiteboard and tablets are a means to provide students with reinforcing/strengthening activities about content that they have already dealt with in class.

The class email and Dropbox supports and enlarges communication modes within the class and with families: this supports students who have long term absence from school.

In addition to technologies students can access in the classroom, the labs for Mathematics and Science, Music, Art have their own interactive whiteboards and specific software.

6. What kinds of research and development are the teachers engaged with?

The leading school in Italy highlighted how the school has links with some Universities. Across the school staff, most colleagues are engaged in research on the Internet that informs their classroom practice.

7. Are the Advanced Schools engaged in any partnerships or networks?

Both of the headteachers recognise that it is the headteacher's job is to raise money for the school and therefore it is important to work in partnership with others. Both of the Advanced Schools have used technology to engage in partnership working with the parents. In ITIS Majorana, the messages from the electronic register are connected directly to the mobile telephone. Parents can see if their child has attended the lessons.

Partnerships with other school are mainly based on projects, they usually last one year, although this is not always fixed. The school is working with some upper secondary schools.

The school is trying to build a virtual relationship with parents. This is the first year of electronic reports on the Web. If parents have problems with access then print outs are available.

At ITIS Majorana, Book in Progress network meets twice a year physically. There are leaders for every subject who collate all the material. Quality assurance is done by the teachers themselves. Teachers volunteer to be involved in the project and they are not necessarily paid, however they can receive incentives from their school.

The school has a good relationship with parents and they are willing to provide financial support to the school. Some parents make voluntary contributions, for example thirty euros per child or 50 euro for two students – nearly all parents believe in doing this.

One of the schools is supported by a local company with the provision of technology. There is a local non-profit organisation – a foundation which helps the school to raise money. This is mainly run by the secondary deputy and local authority.

8. Are there particular areas that could be mainstreamed or replicated?

- Opportunities for the school to open beyond the hours of the school day to the community to use equipment.
- Use of libraries in schools: the school in Piacenza has demonstrated the importance of the library and how the physical space is being used to develop the use of technologies within learning and teaching.
- The afternoon learning labs have allowed technology to be implemented across the curriculum.
- The teacher encourages the students to take different roles in lessons by giving each student a badge with a responsibility with learning activities, e.g. writer, director, reader, presenter, photographer.
- There are whole school projects across the school that involve teachers from different departments.
- The school has given consideration to the tools that the student requires for learning within the “learning rucksack”.
- The creation of digital textbooks by teachers and students.

Observation Case Studies: Lithuania

Kauno Varpelio Primary School, Lithuania	
Number of students	393
Age group of students	6-11 years
School website	http://www.varpeliom.kaunas.lm.lt/home-naujienos.html
Name of principal	Daina Gitana Paražinskienė
LSL project Lead Teacher	Aurika Jolanta Jonauskiene

Klaipėdos Simono Dachų Progimnazium, Lithuania	
Number of students	1000
Age group of students	7-15 years
School website	http://www.sdachas.lm.lt
Name of principal	Elena Blaziene
LSL project Lead Teacher	Virginija Bireniene

1. What types of technologies and resources are available in the Advanced Schools?

In the primary school in Lithuania, all classrooms are equipped with a PC and projector. Three classrooms have interactive whiteboards. There is a computer lab with 16 PCs and throughout the school there are approximately 41 computers with Internet access. The use of the lab is timetabled for the teachers. The school also uses the behaviour management and cumulative grade system ClassDojo.⁶³

In the secondary school, there is some wireless access to the Internet, and most of the classrooms have an Internet connection. Students are able to use computers and the Internet in the library of the school. There is a quiet space for teachers equipped with 15 computer work stations. All school classrooms have Internet connection and are equipped with computers. There are 19 interactive whiteboards (IWBs) in classrooms. Some teachers create their own interactive presentations.

The secondary school has its own ICT usage strategy, the main aspect of which is a wide and diverse application of ICT, its integration into a variety of subjects and non-formal education as well as support of different projects and ICT training.

There is a national ICT platform for schools called TAMO,⁶⁴ where teachers can register their classes and student achievement. Parents have access to the information to check on their child's progress. The teacher can put information here about the subject content and give details about assignments.

2. Are there national initiatives that have had an impact upon whole school development of ICT?

In Lithuania, direction has come from the Ministry of Education to implement computer classroom/computer labs in school since 2001. ICT is not mandatory, but expectations are set with proposals and suggestions. At the secondary level, these have been used to teach ICT as a subject, but the use of ICT has grown across all subjects. However, access to technology is dependent upon the headteacher in school and the lead teacher emphasises that the picture is not consistent across all schools. In the primary school, it was the involvement in a national project that led to the school understanding how to create an ICT strategy ("Ugdymo plėtotės centras").

The European Regional Development Fund and the European Social Fund have provided money for a substantial amount of projects. For example, at present there is a plan to develop a virtual networks project.

ICT leaders have completed a questionnaire to outline what schools want to achieve by 2020. There has been discussion of a national programme to look at giving iPads to 12 year old students.

A number of scenarios have also been developed through the iTEC project; these will be tested and implemented further.

⁶³ www.classdojo.com

⁶⁴ www.tamo.lt

3. Who leads the decisions about the development of ICT?

The school receive advice and guidance about ICT from the Ministry for Education. There is a centre where ICT projects are co-ordinated.

In the secondary school, the ICT is led by the Physics teacher. The school engages with European projects to gain access to professional practice and to support whole school development. In the primary school, the headteacher, deputy headteacher and the English teacher have led a group of staff who are keen to demonstrate the use of ICT across the curriculum.

Both the Advanced Primary school and the secondary school believe that it is essential to collaborate with other schools to discover how to improve and develop practice. They have identified enthusiasts who are proficient with English and ICT to enable them to participate in European projects as they see this as a mechanism to further their own knowledge and to continue to innovate in school.

4. What types of training and professional development are available to teachers?

There are regional professional development centres – local satellites of the Ministry of Education. Klaipeda professional development centre (PSKC) manages the training schedule in its region. These provide subject networks and seminars in the pedagogical issues. These are mostly free for teachers to attend (the schools pay for 5 training days every year for every teacher), and teachers are able to collect experience hours (30 hours every year) which support their career advancement.

Both Advanced Schools allow teachers to develop their digital competence; they can participate in various seminars and courses. The schools have provided training for all staff, for example on how to use the interactive whiteboard. Staff are encouraged to promote their work at conferences and seminars. The secondary school has a workgroup which, using different surveys, evaluates the strengths and weaknesses of the school work. The school also has a database to record all the courses that have been completed.

It is a formal requirement for teachers in Lithuania to achieve their digital competence certificate; this is a mandatory course for those seeking certification. A teacher has to renew his or her teaching qualification every five years, and this includes digital competence. This is completed at the professional training agency. These courses are not financed.

One of the biggest barriers for teachers in Lithuania trying to access training is language. This can prevent teachers participating in European projects, but at a national level it can mean that they are unable to access examples of resources or translate relevant materials.

Teachers in Lithuania are highly motivated to complete training because it can lead to career progression and additional salary incentives.

5. How is ICT being used in different subjects?

In the primary school, an ICT syllabus has been written since 2004 and it has been implemented by teachers in the school's computer lab. Teachers have decided the content for each year group.

The teachers use the following applications: email, video presentations on YouTube channel, multimedia on CD/DVD, digital photography, TAMO register, personal digital workspaces for communication with students' parents, Microsoft Office productivity suite, Microsoft Research Auto Collage, Photo Story, Notebook Software, SMART Board, Eclipse Crossword, and Google Earth.

The following programmes are examples of those used by teachers with students: Mano darbeliai (My handicraft), Mažasis Mocartas (Little Mozart), Vaikų žaidimai (Kids' games), Užburtas miškas (Enchanted forest), and Web portal: www.pradinukas.lt

In the secondary school, the students are taught to use second-generation Web-technologies, such as Prezi,⁶⁵ GlogsterEdu,⁶⁶ ThingLink,⁶⁷ SlideRocket.⁶⁸

In the module "Physics and Technologies" using tools such as GoAnimate,⁶⁹ Clipgenerator,⁷⁰ Blabberize⁷¹ students create animation and video clips for physics lessons.

6. What kinds of research and development are the teachers engaged with?

There is research into the use of ICT led by the Ministry of Education and teachers are encouraged to be involved in European and International projects and attend conferences or seminars.

In Lithuania, the leading teacher highlighted involvement in iTEC because teachers can engage with research and practice from across different countries. Teachers of the school have also participated in research on effective ICT use in other projects such as INSPIRE.

The primary school leads research into the development of Gifted and Talented Students.

Schools in Lithuania are also involved in an e-portfolio project called EuFolio⁷² with partners from Austria, Cyprus, Ireland, Bulgaria, Slovenia and Spain.

7. Are the Advanced Schools engaged in any partnerships or networks?

The secondary Advanced School participates in several projects funded by the European Commission including:

⁶⁵ www.prezi.com

⁶⁶ <http://edu.glogster.com>

⁶⁷ www.thinglink.com

⁶⁸ www.sliderocket.com

⁶⁹ <http://goanimate.com>

⁷⁰ www.clipgenerator.com

⁷¹ <http://blabberize.com>

⁷² <http://eufolio.eu>

- eTwinning – 7 projects have been accomplished; two of them won awards for the best eTwinning school.
- INSPIRE – 5 STEM teachers have been involved in this project; 60 digital learning objects from INSPIRE resources have been tested and used in lessons.
- eQNet – approximately 100 digital Learning Objects have been selected and placed on the website Clascement; 600 Physics Learning Objects have been described, a book has been published, several articles have been published and presented in conferences.
- Creative Classroom Lab (CCL) – one learning story has been created and implemented using iPads.

The Advanced Primary School has earned a reputation at a national level for supporting gifted and talented students. This has led to the development of a growing network of schools identifying students and creating appropriate resources.

The academy “Whizz Kids” was founded for Gifted and Talented children which brings together 110-120 children in the school and other schools of the Republic. These children often have to perform the tasks associated with the use of ICT. The best works of children have been posted on the site.⁷³

8. Are there particular areas that could be mainstreamed or replicated?

- Use technology resources to support Gifted and Talented Students
- A behaviour management system has been introduced to recognise student achievement
- Use of multiple devices to allow student response and interaction
- Use of Web-based applications to enable students to create learning games
- Use of Internet for research based activities within lesson time

⁷³ <http://smalsutis.eu/>

Observation Case Studies: Norway

Skjelnan School, Tromsø, Norway	
Number of students	250
Age group of students	6-13 years
School website	http://skjelnan.tromsokolen.no/
Name of principal	Rune Torsteinsen
LSL project Lead Teacher	Anders Rasmussen

Tromstun School, Tromsø, Norway	
Number of students	420
Age group of students	11-14 years
School website	http://tromstun.tromsokolen.no/
Name of principal	Lena Abrahamsen
LSL project Lead Teachers	Sturla Vik, Kay Larssen

1. What types of technologies and resources are available in the Advanced Schools?

Skjelnan School has Internet access in all classrooms and there is a wireless network across the whole school. Several classrooms have their own computers. The school has a digital platform for parents and students for communication, involvement and collaboration. All plans are digital and available on the Internet. The school use social media as mean of communication. Twelve months ago, the school invested in a class set of iPads that can be reserved by the teacher using an online calendar. The school uses GPS in geocaching activities.

At Skjelnan School, the city council has recently given some extra funding and this has been used to buy PCs; several classrooms now have four or five PCs at one side of the room.

The school uses Mobil Skole⁷⁴ to send SMS messages to parents and they can send texts back to the headteacher. One parent in each class is included in the parents' union and they can send texts to the other parents.

The headteacher believes that the implementation of iPads allowed the teachers to become personal users of technology because they took ownership. The iPads have then been implemented into the classroom. The next stage is for the teachers to allow the students to make some of their own decisions about what they learn.

Tromstun School is a new school which opened in 2012. Each classroom is equipped with an interactive whiteboard and a lectern with a PC for the class teacher. Students in year 9 have access to individual laptops. In September 2013, a regional development began to equip all year 8 with their own laptops to use throughout school. In the classrooms, storage cabinets are available to charge the devices and students are not allowed to use them during breaks.

In Tromstun School, the ICT coordinator demonstrated how she is able to operate a paperless classroom. Students do not need to do any work in exercise books.

2. Are there recent national initiatives that have had an impact upon whole school development of ICT?

In Norway, Tromsø has a National Centre for ICT. The leading teacher suggested that the Living Schools Lab project has allowed the National Centre to play a more significant role in schools because of the expectation to develop a regional hub. There are 40 schools in the municipality and this project has the potential to help them to collaborate better. The national centre does have a lab for teachers to visit but it is difficult to access in school time.

In Norway, there is technical support provided by three teachers from city hall. These teachers specialise in ICT and work across all forty schools within the region. For example, there is training in the use of iPads, spreadsheets, communication and collaboration, and SMART Boards. There is a technical centre and an online service desk with technicians. This is a free service. As a school the advisory training and support can be booked to provide specific training. They come into school to do this for ten hours per term during the academic year and usually provide support to the whole staff, but sometimes to specific groups of teachers.

⁷⁴ www.mobilskole.no

There is a national plan for ICT and a regional plan that the schools are able to follow. This clearly outlines for the schools what they need to achieve for each age group. It defines the learning goals for the students and the software that they should use. The challenge for the schools is to connect the ICT plan to the whole school vision. It is important to ensure that all teachers know the content of the plan. There are examples of activities and then three different levels for what students should achieve.

3. Who leads the decisions about the development of ICT?

In Skjelnan School, the headteacher has been at the school since 1996. Teachers got their own computers in 2001. The school was one of the first in the area to get its own computer lab. It was the first school with SMART Boards four and a half years ago.

As an Advanced School, the headteacher says that the Skjelnan School has a 25% turnover in the equipment each year, to ensure that it stays up to date.

Parents have helped to finance additional technology resources; for example, the Parent Teacher Association contributed towards the funding of iPads. The school has provided one evening for parents on netiquette and an evening on e-safety for three hours.

All the ICT Co-ordinators in Tromsø meet every other month at a regional level to discuss new technologies and applications.

4. What types of training and professional development are available to teachers?

At Skjelnan School the headteacher has had a strong focus on training for all of the staff. Pedagogical change has been encouraged through training and workshops. Whole staff meetings are used for staff to showcase practice. The headteacher does not observe lessons, but he does have conversations with the teachers and with the students about their learning.

The interactive whiteboard is an important tool that the teachers feel they cannot live without. The headteacher believes that the iPad has “allowed the learning to become more personalised.” This is because the teacher can take it home and continue learning in their own time, enabling them to think about the individual needs of their own students.

This year the school has identified a single focus on mathematics. 16 teachers out of 22 will take a course to provide support to address student learning needs in mathematics. Teachers will do the training on line and use staff meeting time to do it. They have to do 50 hours.

The school has a close network with five other schools. They host workshops for the other teachers and the headteacher has provided some consultancy for those schools. The school can receive training and support from pedagogical experts who are based at a regional level. These teachers will come into school.

In Tromstun School, the ICT co-ordinator is responsible for delivering the training and goes in to deliver lessons with the students so that the other teachers can watch. The principal and the headteacher observe lessons once a year and give the teachers feedback. The principles for the observation are agreed prior to the visit.

The staff have participated in workshops in the school and at the National Centre for ICT in Education. Two teachers have participated this autumn in the iTEC project (Innovative Technologies for an Engaging Classroom) at European Schoolnet.

5. How is ICT being used in different subjects?

Skjelnan School has been working with implementation of SMART Boards in all the classrooms for the last 2.5 years. Teachers use SMART Boards in their everyday teaching. The school has had a computer lab since 2001. The school publishes the students' weekly schedule on the website. It makes it easy to follow the class curriculum and the assessments for every week.

During the observation there was evidence of carousel activities where students moved through four activities in one hour and some of these involved the student having individual use of a PC or iPad with headphones. At Skjelnan School the classroom rotation is significant because this allows the students more time to access the technology with focussed tasks.

The 12-13 year olds compete in the First LEGO League each year and use Robolab and LEGO Mindstorms to demonstrate their computer programming skills.

At Tromstun School, all students use ICT on a daily basis, in every subject. They show evidence of benefits through student-to-student courses and a high level of presentation skills. Students can access their own school documents from their home computers at any time. All plans are digital and available on Internet. The school use social media such as Facebook to communicate news from the website and general information.

They have access through their user account to several resources which contains software used to personalise their learning. Students make presentations of their work both on PC and tablets. Students use educational software relevant to their curriculum.

Students get feedback though digital media, i.e. texts, audio and instantly through use of digital white boards. Tromstun has been focussing on methodology for the students and setting targets.

6. What kinds of research and development are the teachers engaged with?

In Norway, the leading teacher commented that he is undertaking his Master's degree on the implementation of iPads in school. This was for his personal professional development. He had recognised the need to undertake the research on a current topic within his own school.

The school is already in an existing project which provides experiences which it shares through the National Centre for ICT in Education's blog. In addition to this, there are four teachers working along with the headteacher regularly to showcase ICT in several subjects.

7. Are the Advanced Schools engaged in any partnerships or networks?

There is no tradition of working with commercial partners in school. The secondary school does work with the University.

8. Are there particular areas that could be mainstreamed or replicated?

- The eTwinning project exploring students writing fairy tales and developing animations.
- There are monthly meetings with the ICT co-ordinators to look at current developments.
- At Skjelnan school, the developing physical space for creativity, science and technology could be replicated at either primary or secondary level. Rather than a computer lab with just PCs around the edge, the room has space to have science equipment, LEGO, and the use of tablet devices.
- Engaging with national competitions gives the students a real brief to work to.

Observation Case Studies: Portugal

Escola Básica Parque das Nações, Lisbon, Portugal

Number of students	255 (+100 Pre-Primary)
Age group of students	6-11 years
School website	http://www.queiroz.pt
Name of principal	Filomena Vitorino (Head of School)
LSL project Lead Teacher	Sandra Silva

Escola Secundária Eça de Queirós, Lisbon, Portugal

Number of students	1047
Age group of students	12-18 years
School website	http://www.queiroz.pt
Name of principal	Maria José Soares - Director of the Group Escolas Eça de Queiros
LSL project Lead Teacher	Maria Teresa Godinho

1. What types of technologies and resources are available in the Advanced Schools?

Until 2010/2011 the Portuguese government implemented a programme, “e-escolinha”, which had the purpose of introducing computers in the 1st cycle and encouraging Internet access for students from 1st to 4th grade. Through this programme, each student of the 1st cycle could get a Magellan computer for a very small amount of money. As the project ended in 2010/2011, only the students of 3rd and 4th grades in the primary school have their own Magellan computer. However, the school has purchased more Magellan computers for the younger students to use.

In the secondary school, the staff and students have access to a wide range of technologies. All classrooms are equipped with a computer and a video projector. One third of the classrooms have an interactive whiteboard. The school offers 7 rooms equipped with 14+1 computers for classroom use. Any teacher may request a computer room to teach a class. There is a broadband access throughout the school open to teachers, students and staff. Everyone can access the wireless network anywhere in the school. One of the broadband connections is provided by the Ministry of Education, another one is supplied by Zon⁷⁵ and is a committed network that allows a Virtual Private Network (VPN) connection with the other schools in the cluster. In the Advanced Secondary school in Portugal, the lead teacher recognises that in the last ten years the level of technology within the school has significantly changed. Ten years ago, the school had approximately one computer to five students, but today there are at least 300 computers.

The school has a library equipped with 8 computers and a social space (leisure lounge) with 10 computers where students have free Internet access. There are also two study rooms; one of them is equipped with 6 computers where students can work autonomously.

The school has implemented a student management system which allows students and parents to check absences and classifications online as well as students’ access control. This means that students access the school via magnetic cards and make payments using their card for transactions in school, eliminating the use of money.

The whole school community, teachers, students and staff have an official email used to send information to parents or to any other member of the school community. The Moodle platform and email are used to support students' learning beyond the school day.

There is support from the management board of the cluster of schools to try to sustain and improve the standard of technologies available.

2. Are there national initiatives that have had an impact upon whole school development of ICT?

In Portugal the teachers have a national agency for ICT called Direção-Geral da Educação (DGE)⁷⁶ funded by the Ministry of Education. The agency provides advice and support for schools to make use of technology. DGE is also involved with a range of European projects and actively works with schools to encourage them to participate. There are also nine competency centres that provide support and training to schools.

⁷⁵ www.nos.pt

⁷⁶ www.dgidec.min-edu.pt

3. Who leads the decisions about the development of ICT?

Both of the Advanced Schools identified to work on the Living Schools Lab project were already part of a cluster. There is an ICT co-ordinator who is responsible for the technical infrastructure across the cluster, the purchase of new equipment, the training of staff and the daily technical support.

However, there is a management board across the cluster and this is where the decisions are made about the development of the use of technology within learning and teaching.

The school Eça de Queiroz provides a comprehensive educational offer and training that includes 3rd cycle (12-14) and secondary education (15-17), regular or vocational, including Adult Training Education, which allows for the development of a common educational project in several levels and cycles of education, ensured by a joint horizontal and vertical curriculum.

4. What types of training and professional development are available to teachers?

In Portugal there are training centres where teachers attend compulsory Continuing Professional Development (CPD). Individual training is paid for by the teacher, and this can cost approximately €110 for 50 hours. Teachers have to undertake 25 hours of CPD per year, but this is across all the different areas of the curriculum. There are nine ICT competency centres that are available to schools across Portugal, but these are not accessed by all schools. Some schools prefer to provide their own training. Teachers easily follow recommendations for training in ICT. However this training is expensive, making it very difficult to access training that is not strictly necessary for their assessment.

Training classes were established for all teachers across the cluster and since 2009/2010 they have been available in the following areas: interactive whiteboards, Moodle platform, e-learning, all kinds of access to the services provided by the school, setting up an official email, school Web page, acquisition of several interactive features (educational software) – "virtual school", promoting the use of technologies linked to Google Apps for education, especially virtual pen. Alongside this, teachers are actively encouraged to promote best practice. Throughout the year the school asks the ICT lead and a primary teacher to provide additional on-going support.

5. How is ICT being used in different subjects?

The students have a competency based curriculum for their age and stages of learning.

The teachers are making use of technology across the curriculum. However, at present, the students in the primary school who have access to their own device are only allowed to bring it to school on certain days of the week. The teacher decides when and how the students can use the technology.

In the Advanced Primary school, as all students of the 3rd and 4th grade have computers at home, the teachers of these classes have adopted the official national curriculum and established the use of ICT in their lesson plans.

Students have installed pedagogical games in the areas of Portuguese language, mathematics and study of the environment on their computers, which allows them to do a self-assessment of their knowledge.

In the secondary school, it is now expected that the teachers' resources are available in a digital format. The school uses software called AB Tutor⁷⁷ in the computer rooms, which allows the teacher to manage or control the student's computer and guide the students through their tasks as appropriate.

Teachers retain their autonomy to be able to use a range of platforms with the students, though it appears to be common to all teachers to communicate with the students via email and to provide access to the main content of the lesson via Moodle. There are also ebooks available across a wide range of subjects. Every student has an official email and a virtual pen. Interactive whiteboards, emails, and virtual communities, namely Facebook, are used.

In Geography, the teachers use a range of applications including interactive maps, the National Institute for Statistics, and the school's Moodle VLE to enable the students to access a range of resources and lesson materials.

In Biology and Geology, the teacher uses the microscopic camera and visualization software.

During the observation visit, the Psychology teacher demonstrated his use of Facebook with the students to provide access to resources, but to continue the dialogue beyond the lesson. The teacher has agreed to communicate with the students in the evenings by use of Facebook, but not at weekends. In this way, the students know that there are limits to when they can expect a response from the teacher. The teacher says "It's a matter of setting the guidelines, the boundaries for students."

In Mathematics, the teacher uses a digital graphing calculator to demonstrate to students how to build graphs, tables and statistical calculations. The teacher is able to make use of the interactive whiteboard to demonstrate examples and invite the students to show their strategies for solving a problem. There is an interactive version of the textbook which enables the students to see the exercises and figures/shapes immediately available to them; there is consequently no need to write them on the board. During the observation visit, the mathematics teacher readily interchanged between the various different resources available to her to teach the students about co-ordinates.

In Philosophy the teacher has organised almost all the syllabus of the 10th and 11th grade in PowerPoint files and makes use of the digital textbook for the subject. This means that the students do not have to bring the textbook to school as the teacher makes the digital version available to the whole class.

In Art, one of the teachers has created a number of blogs to exhibit the students' work. Students can view work in progress and completed work. The teacher can provide access to information beyond the lesson time, including information about techniques and materials. The teacher uses this method to encourage the students to comment on topics and share ideas. It enables the teacher to present a range of multimedia resources. The teacher has identified the importance of students being able to access virtual museums and generally uses a digital stimulus rather than books when working with the students.

The Advanced Secondary school provides a robotics club for the students that is organised by one of the teachers. At present there are ten students who attend the club. This enables those students to cover subject content from science and technology. It provides an introduction to programming

⁷⁷ www.abtutor.com

language. Students begin the practice of robotics with LEGO kits. The school has been awarded several prizes in the National Festival of Robotics.

EçaTV⁷⁸ (cluster internal TV) plays an important role in spreading the activities that take place inside the cluster and in the promotion of good pedagogical practice.

6. What kinds of research and development are the teachers engaged with?

Across the cluster, the schools are involved with various development projects working with a range of partners.

- Plurália project (Comenius project)
- International Conference of Innovative Teachers – organized by Microsoft
- EçaTV and the Robotics Club are ongoing projects within the school.

The cluster regularly seeks opportunities to showcase the school in the use of ICT with visitors from all over the globe. These institutional visits have been promoted and supported by DGE within the Ministry.

7. Are the Advanced Schools engaged in any partnerships or networks?

In the primary school there is a workstation called “KidSmart Learning Center” (computer equipment properly protected for the age group) that has an integrated coloured module with cutting edge IBM technology, educational software and a guide for preschool teachers.

The KidSmart⁷⁹ project was created by IBM in partnership with institutions responsible for education around the world (Ministry of Education). The aim was to provide all children in situations of isolation or social and economic disadvantage, with contact with the new technologies, facilitating their use and making equitable learning opportunities for children in preschool. The project began in the United States and is currently spread in more than 30 countries around the world.

The installation of workstations in Kindergartens which fulfilled the requirements of this idea, began in 2004 in Portugal. The protocol between IBM and the Ministry of Education allowed the selection of this school and the donation of the respective workstation, contributing to the development of the Information Society and Knowledge through the promotion of "e-inclusion".

Within the agreement with IBM, The Ministry of Education has promoted training for adequate use of KidSmart Programs, to preschool teachers who received the station.

In the Basic School Parque das Nações, the KidSmart station is in its 2nd year of use. It was determined by the team of preschool teachers that the station would be in each room for two months. Although only two of the preschool teachers have received training from ERTE⁸⁰, all teachers were then integrated into the learning provided for the use of this station and new technologies. A blog is available giving an insight into use of the equipment⁸¹.

⁷⁸ www.youtube.com/user/TVagrupamentoECA

⁷⁹ www.kidsmartearlylearning.org/EN/

⁸⁰ ERTE: Equipa de Recursos e Tecnologias Educativas (DGE unit of educational resources and technologies)

⁸¹ <http://gaivotasnailha.blogspot.pt>

The school has also participated in an eTwinning project with schools in the Czech Republic, Portugal, Poland, Lithuania and Hungary. Entitled “An Apple”, the project enabled the students to share culture and customs across the different countries.

The secondary school leads a number of partnerships across the cluster of schools. The cluster works with Microsoft and was invited to present at a national “Innovative Teachers” conference with over 300 participants.

The school is involved with a European and national project called Youth Parliament and EUROSCHOOL which identifies a number of winning schools in each country every year. This has led to the school developing several initiatives including:

- a) Closed group on a social network (Facebook), where in a "Learning Community" everyone involved (students and teachers), debates and produces materials. An example is “The Travel Book to the European Parliament in Strasbourg” (November 2012).
- b) *Companheirismo Europeu* Internet blog⁸², open to the public is the presentation of texts, files, videos, photographs (the vast majority consisting of work done by the group participants). The blog wishes to promote interactivity among parents, teachers, other students and the general community.

The Advanced Secondary School is able to show that they have been participating in several Comenius projects.

Across the cluster, teachers have participated in the Microsoft Innovative Teachers programme.

The lead teacher believes that working with commercial partners enables the sharing of knowledge, e.g. Microsoft offered training in e-safety for teachers and students on the international Safer Internet Day.⁸³

8. Are there particular areas that could be mainstreamed or replicated?

- Students in the primary school have access to 1:1 devices, but currently only use them on certain days of the week. This could be increased to allow the students to have continual access.
- The schools work together as a cluster to provide training and technical support with a regular set of courses always available at the start of the school year.
- The cluster of schools participate in European projects to enable the sharing of knowledge.

Ensure staff and students are involved in the Safer Internet Day and access resources about e-safety.

⁸² <http://companheirismoeuropeu.blogspot.pt>

⁸³ www.saferinternet.org/safer-internet-day