Living Schools Lab

# Mainstreaming change in schools

## Link Observation Visits Final Report

European Schoolnet

UNIVERSITY OF WOLVERHAMPTON
KNOWLEDGE • INNOVATION • ENTERPRISE

Co-funded by the 7th Framework Programme of the European Union


Author **Diana Bannister MBE**
University of Wolverhampton

Editors **Dorothy Cassells**, **Jim Ayre**
and **Roger Blamire**
European Schoolnet

Publisher European Schoolnet (EUN Partnership AISBL)
Rue de Trèves 61
1040 Brussels, Belgium

Picture credits Manfred Fleck, Diana Bannister, Shireland Collegiate Academy, Eugenija Krasauskiene, Virginija Birenienė, Fernando Franco, European Schoolnet, Angelo Bardini

Design and printing Hofi Studio, CZ

Published September 2014



The work presented in this publication is supported by the European Commission's FP7 programme – project Living Schools Lab (Grant agreement N° 317587). This report fulfils a contract commitment (deliverable D3.3) to provide a final report on Link Observation Visits for public consumption. The content of this document is the sole responsibility of the consortium members and it does not represent the opinion of the European Commission and the Commission is not responsible for any use that might be made of information contained herein.

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.

Living Schools Lab

# Table of Contents

# Executive Summary

Living Schools Lab was a two-year project ending in September 2014 funded by the European Commission and co-ordinated by European Schoolnet. It included 12 Ministries of Education and was about:

- Creating a network of primary and secondary schools to showcase and demonstrate innovative use of ICT;
- Gathering evidence of innovative practice in classrooms across Europe;
- Providing new professional development opportunities for teachers;
- Mainstreaming innovative practice via pan-European and regional collaboration;
- Building a network of schools for validation pilots and a turnkey validation service.


The final report of the Link Observation Visits builds on the interim report at the end of year one. This final report is based on the Link Observation Visits across 12 countries to Advanced Schools within the LSL project: Austria, Belgium, Cyprus, Czech Republic, Finland, France, Ireland, Italy, Lithuania, Norway, Portugal, and United Kingdom. It is presented with 12 case studies about the Advanced Schools, this includes one from each Ministry of Education or partner organisation involved in the project.

Section A of this report outlines the purpose of the Link Observation Visits and details how the evidence was collected. It is a fundamental part of the Living Schools Lab project that schools understand that the observation and documentation of practice is 'based on a typical school day' and whilst schools are asked to showcase their practices, they are also encouraged to share the everyday working life of the school.

Section B takes a closer look at the evidence collected under these main headings: Infrastructure; National and International Initiatives; Leadership; Training and Professional Development; Integration of ICT across the curriculum (including personalising learning); Student Involvement; Evaluation and Research, and Partnerships and Networks. At the beginning of the project, schools submitted an application form to join the network against each of these headings and it is therefore appropriate to address each of these in turn. At the end of the section, key actions have been highlighted.

Section C of the report presents a framework for mainstreaming practice developed as a direct result of the Link Observation Visits describing schools as 'Reactive', 'Responsive', 'Connected' (Investigative) or 'Interconnected' (Collaborative). The descriptors show the notable differences between schools and begin to outline the key recommendations that can be addressed to mainstream change across the whole school.

The report concludes with a series of recommendations for policy-makers and teachers showing how schools benefit from the effective use of ICT to enable technology supported change.

# Overview:
# Reflections based on observations of Advanced Schools

We need a different kind of vision that demonstrates how education in school is connected and interconnected to the outside world more than ever before. Technology is not our biggest challenge in enabling whole school change.

Almost two decades after technology began to be adopted and used by subjects apart from informatics or computer science, the observations show that schools across Europe are making innovative use of technology across the whole curriculum.

Furthermore, the dedication and commitment to whole school development exists not only in the technological evangelists, but through teachers building professional learning communities by showcasing, demonstrating and validating practice. However, there are fragmentations throughout the ecosystem and some schools depend heavily on the next emerging technology to promote change, hoping to find solutions and new ways of engaging students focussing on the technology, rather than the change it facilitates in learning.

## Synthesis of Technology and Pedagogy

This report documents the findings from the observation of practice across 12 countries in Europe: Austria, Belgium, Cyprus, Czech Republic, Finland, France, Ireland, Italy, Lithuania, Norway, Portugal and United Kingdom. It draws on the dialogue held over the two years with the Advanced Schools, the Advanced Practitioners and the National Co-ordinators within the project. The case studies show there are widespread differences in the technologies available in classrooms; they also show that simply having the technology is not enough; the focus has to be on changing practice across the whole school. Advanced Practitioners in the project point out that not all schools have the same level of infrastructure as the Advanced Schools. Most schools still depend on access to a PC and data projector in the classroom and therefore it is not surprising that teachers deliver the lesson from the front to the whole class. Yet, the observations have shown that even where Advanced Schools have the technologies (e.g. interactive whiteboards, mobile devices and a range of learning platforms); they still need to link this to the pedagogical changes. There needs to be a **synthesis of technology and pedagogy**. Advanced Schools now take technology for granted, expecting it to be available and reliable. The Link Observation visits have been used to encourage the Advanced Schools to define their 'showcase', reflecting on their changing pedagogy and to document the practice that they are able to 'demonstrate'.

There are also differences between primary and secondary schools in relation to infrastructure, curriculum and teaching practices. Furthermore, it becomes evident that the interpretation of the word **"innovation"** and "**innovative practice"** can vary enormously. Throughout the project there has been a growing awareness of the definitions adopted by the iTEC project (Innovative Technologies for an Engaging Classroom) because it is anticipated that these schools will want to participate in the **sustainable collaboration** from the Living Schools Lab project.

A distinction is made in iTEC between technological and pedagogical innovation (Béchard 2001). Technological innovation refers to widespread use of an invention or a technology, for example the presence of ICT in schools regardless of its use or possible innovative practices with it. One example is the use of interactive whiteboards which can either reinforce traditional teacher-centred practices or innovative ways that support learner initiative. Pedagogical innovation is at the heart of iTEC and refers to fundamentally transforming practices in order to improve learning. From this perspective ICT is a means to enable the teacher to achieve pedagogical outcomes and optimise innovative pedagogies (but does not per se bring them about (Lebrun 2002)).

## Living Schools... Real Practice

One of the main aims of this project was to capture the work of **Living Schools; real schools that exist all over the world**. Whilst these schools have been identified for their use of ICT; a key aim in the project was to encourage the schools to share how they used the technology in everyday practice and to understand how this can be mainstreamed. The online blog created as part of the Link Observation Visits documents practice that can be replicated by any teacher and has attracted over 10,000

readers throughout the project. The network of **Regional Hubs** in the project has encouraged Advanced Schools and Advanced Practitioners to **share and demonstrate how to put new ideas into practice**.

## Classroom Ambassadors

The observation visits have been organised in conjunction with National Co-ordinators. In most of the countries, these national co-ordinators are based in national agencies which exist on behalf of the Ministries providing much needed advice and guidance for many schools. However, the innovators who are ahead of the curve are the classroom practitioners in schools, and it is important that they are supported and encouraged to take greater **professional responsibility** for demonstrating **exemplary practice** across other schools too.

There needs to be classroom practitioner ambassadors at a national level, showcasing practice and demonstrating to other practitioners. Schools need to understand how national initiatives become a reality and to make the connection between policy and practice. While additional funding is still provided by some Ministries of Education to address national priorities; the global recession has led to the demise, or restructuring of many government agencies with schools taking more autonomous decisions about technological and pedagogical changes. There are a growing number of models of clusters of schools forming with 'lead' schools taking responsibility for training groups of teachers. This complemented the Regional Hub model established within this project.

## Connectivity

For schools, it is no longer just a 'desirable' for teachers to be able to **access the internet in lessons**; it has become an 'essential' expectation of teachers and students. Teachers connecting to live data, accessing information for research topics, connecting to another group of students across the globe or bringing in the expert have all become an everyday reality that students depend on. As the numbers of mobile devices continues to grow, this expectation embraces students who have their own devices and access the virtual learning environment; this accentuates the growing demand on **wireless provision** in schools.

## Changing role and expectations of students

Advanced Schools have recognised the **power of student leaders** and embraced them to move the school forward. Students need to be involved in the change processes, and given the responsibility to determine how learning could improve, students can provide solutions.

Students increasingly expect to be able to access their learning from any device wherever they are. They want to be able to **communicate** with their teacher, to **ask advice** and to **get feedback** on their latest assignment immediately. In some countries, learning platforms have been provided at a national level, but schools still face an enormous challenge trying to ensure that all staff are able to use them sufficiently. Furthermore, individual teachers are still making their own decisions about which learning platform to use and this creates inconsistency. Some schools have enforced management systems that mean **access to information** and **data is transparent**; **resources are shared** and **digital portfolios collate evidence of students' work throughout the school**.

## Future Classrooms

Change has to start somewhere and some Advanced Schools have identified one space within the school to model how classrooms might be different as a **'Future Classroom'**. Yet, there is still much to be done to develop learning spaces in school for students in the classrooms of the present day. Cosmetic changes are not enough and mainstreaming change is a lifelong commitment. Providing regular access to technology, appropriate training and implementing the curriculum requires a moving vision, innovative teams, a willingness to experiment and a plan beyond the pilot phase. Teachers have to work together, involving students and the school community to define whole school change.

## Framework for Mainstreaming Practice

The report draws together the observations and presents a framework for mainstreaming practice, outlining some key changes that schools can begin to implement. The framework underpins a new training course for schools on developing a whole school approach (ref D.5.3) with the ideas tested and discussed in close consultation with the National Co-ordinators, Advanced Schools and Advanced Practitioners from across the Living Schools Lab project.

The infrastructure is only ever one part of being able to mainstream change; a wealth of access does not automatically mean a wealth of best practice. **Professional development matters** and there has to be a more systemic approach to teaching practice. Teachers have to get beyond the next technology, of wanting the latest supposed solution, and focus first on understanding the intended learning outcomes for students and the changes in pedagogical practice to support this.

## Teachers as Researchers

Not all teachers consider themselves researchers; in fact many believe this is the job of the academic, yet the connection between theory and practice needs to be nurtured for the pedagogical change to be determined effectively. **The Living Schools Lab Project has developed and used the STEPS plan** for teachers to view themselves as action researchers and consider 'evidence' to inform their practice. Teachers and academic researchers need to work together; connecting to other schools and undertaking investigations should become commonplace. **Schools need to get better at understanding why they are doing something in a particular way**.

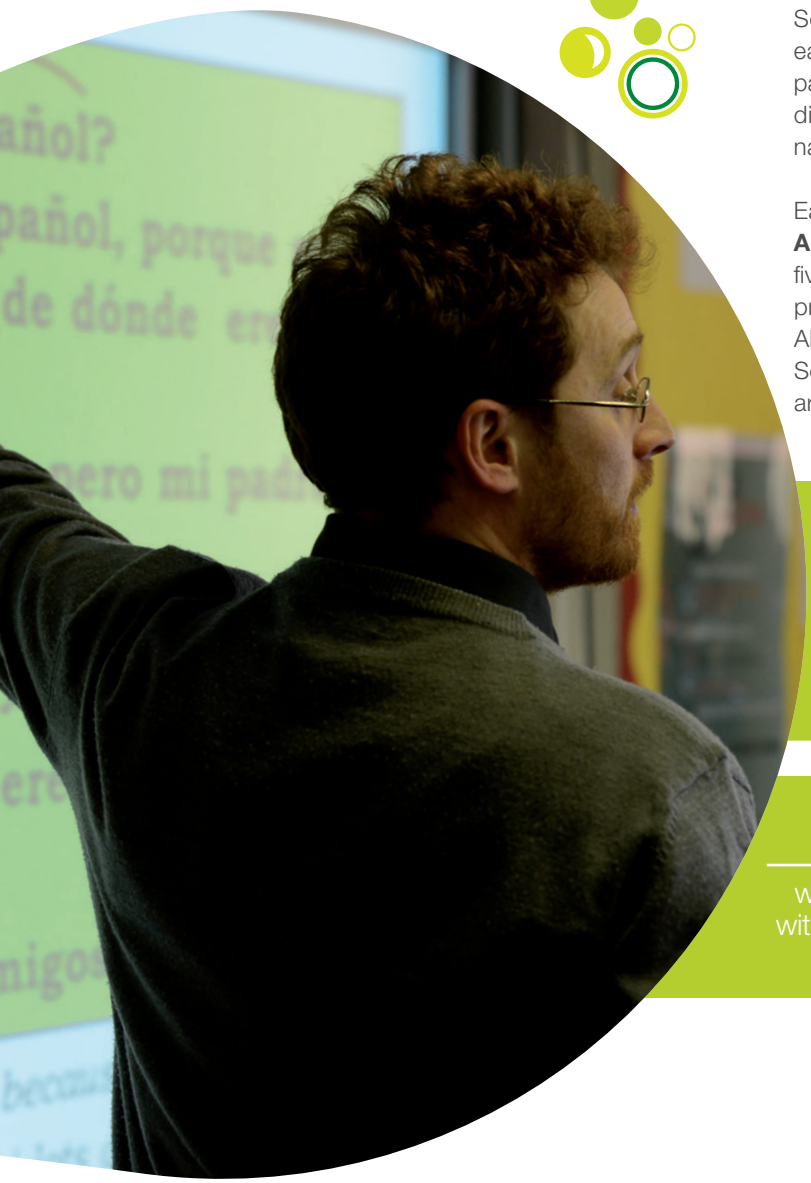
Professional development is changing and whilst teachers still need training to know how the technology works, they are equally dependent on seeing colleagues demonstrate practical ideas that will work in tomorrow's lessons. Commercial suppliers can take more responsibility for providing products and ongoing training; not just a technical induction. Technology has allowed training to be done anytime and anywhere, with access to online materials and courses delivered by likeminded individuals all over the world. However, **school leaders have recognised that if there is going to be change across the whole school, then this needs to be planned and driven**. It also needs to be highly focussed and clearly communicated to everyone. Andrew Hargreaves and Michael Fullan (2013) argue the difference between a business capital approach and professional capital approach, suggesting that the latter requires "technical knowledge, high levels of education, strong practice within schools, and continuous improvement over time that is undertaken collaboratively…" Professional development then becomes continual and far beyond the implementation of technology to a deeper analysis of how teachers teach and how students learn. **Every school should have a plan for professional development and training**.

**Advanced Schools** can lead the way, connecting to other schools, showcasing their practice and demonstrating the steps for mainstreaming change. **Collaborative Schools** have a vision that connects teaching and learning with the effective use of technology. Collaborative Schools provide access to learning not just in the classroom, but everywhere. Collaborative Schools have built a profile of **exemplary teachers** who can **motivate others, demonstrate best practice** and **lead professional development communities**.

**Diana Bannister MBE**
University of Wolverhampton

# Introduction

This final report is based on the Link Observation Visits across 12 countries to Advanced Schools within the LSL project. The visits have all been undertaken by Diana Bannister, University of Wolverhampton between June 2013 and February 2014 travelling over 45,655 km across 12 countries observing and documenting practice. During this time, it soon became clear that schools have very different approaches to school development and technology is only a small part of influencing the whole school change. Mainstreaming practice is an ongoing challenge that is continually under review. Schools are faced with new curricula, ever changing technologies and staff are under constant pressure to implement technology within learning and teaching.



From the outset, it is paramount to define that the Advanced Schools were identified by a National Co-ordinator in each country for their use of ICT, but regardless of the parameters set, schools are mainstreaming change in different ways, this is not necessarily determined by the national influence.

Each Ministry of Education within the project identified two **Advanced Schools** (one primary and one secondary) and five **Advanced Practitioner Schools** (across a range of primary and secondary schools) to be part of the project. All schools submitted an application form to join the Living Schools Lab project; this was separated into different areas and these will be revisited as part of this report.

## Advanced School

where technology is embedded in teaching and learning across the whole school

## Advanced Practitioner School

where technology is only partially embedded within the school

**Section A** of this report outlines the purpose of the Link Observation Visits and details how the evidence was collected. It is a fundamental part of the Living Schools Lab project that schools understand that the observation and documentation of practice is 'based on a typical school day' and whilst schools are asked to showcase their practices, they are also encouraged to share the everyday working life of the school. Ultimately, it is this evidence that needs to be captured to enable everyone to understand what can and should be **mainstreamed or replicated** across other schools.

**Section B** takes a closer look at the evidence collected under these main headings: Infrastructure, National and International Initiatives, Leadership, Training and Professional Development, Integration of ICT across the curriculum (including personalising learning), Student Involvement, Evaluation and Research, Partnerships and Networks. At the beginning of the project, schools submitted an application form to join the network against each of these headings and it is therefore appropriate to address each of these in turn. At the end of the section, **key actions** have been highlighted; these are to guide schools to break down the different tasks that are involved in mainstreaming change and to show that it can take time. It is also a never ending process and Advanced Schools know that it is about changing the culture of the school.

Across all of the schools there has been a significant investment in ICT for the whole curriculum and also administration in schools. In some countries, these changes have been as recent as the last three years. Change is much more dependent on localised intervention. Analysis of the information gathered as part of the visits shows that there are similarities between the Advanced Schools, but there are dramatic differences too; this is frequently evident in the vast difference between the ratio of technology to students, but equally important is to look at the types of tasks the students are engaged in and whether or not the student can access learning beyond the lesson.

**Section C** of the report presents a framework for mainstreaming practice developed as a direct result of the Link Observation Visits describing schools as **'Reactive', 'Responsive', 'Connected' (Investigative) or 'Interconnected' (Collaborative)**. The descriptors show the notable differences between schools and begin to outline the key recommendations that can be addressed to mainstream change across the whole school.

Not surprisingly, there are 'advanced' schools that, while earning a reputation for being innovative and constantly introducing the next technology, are 'reactive' in their approach; the Link Observation Visits suggest that some schools have only introduced these technologies at surface level with enthusiastic teachers, with little evidence to show how strategic decisions are made. Some schools have responded to government guidelines and because

the school leader has been involved in the use of technology for a number of years, there is evidence to show that the school has introduced some innovative ideas, but these are dependent on external guidance. By comparison, there are schools that have a whole school focus; developments across the school are connected and staff are encouraged to collaborate with other schools to build new ideas. Mainstreaming change is not an easy process and some schools are engaged in research to inform their school development. These schools collaborate with others as part of the professional culture of the school developing new pedagogical approaches together. Michael Fullan (2006) states: *"Professional learning communities are in fact about establishing new collaborative cultures. Collaborative cultures, ones that focus on building the capacity for continuous improvement, are meant to be a new way of working and learning. They are meant, so to speak, to be enduring capacities, not just another program innovation."*

Throughout the LSL project the main focus has been to **build a network of schools**. Schools have been encouraged to identify a focus and practitioners have been given opportunities to **collaborate**. From the outset, there has been a shared understanding that advanced schools cannot work in isolation. Equally, Advanced Practitioners within a school must engage with colleagues not just to develop their own practice, but to build capacity. Katz and Earl (2010) suggest that for networked activity between schools to be effective, there has to be a significant amount of staff within each school to be actively engaged to *"leverage sufficient change to influence classroom practices in significant ways"*.

The LSL project itself has also implemented professional practices within the network activities that can be replicated both within and beyond the school:

- **Classroom Observation:** Providing opportunities for teachers to observe another teacher using ICT within lessons. This should be encouraged within the school, but teachers should also be given opportunity to observe practice in other schools.

- **Regional Hubs** can bring together schools to collaborate with a single focus underpinned by the use of technology. A STEPS plan can exist at all levels at network level, school level and for the individual teacher. Advanced Practitioners can lead CPD and share practice. New skills can be demonstrated. Evidence can help to define the lessons that others have learnt. Schools can build innovation teams and develop a showcase of exemplary practice. Innovation teams can lead the school in collaborative initiatives including national competitions, collaborative projects involving students, e.g. eTwinning, and joint projects involving other schools with external funding.

- **Collaborative Themes:** teachers from different schools can work together on an agreed theme to provide practical examples and demonstrate real practice using videos, presentations and multimedia to discuss how ideas have been mainstreamed in their own school helping others to see the processes that have been implemented.

- **Webinars:** online seminars or meetings that allow teachers to listen to a pedagogical expert, and communicate with one another. These can be delivered using various online tools.

- **Learning Snacks:** short 15 minute online presentations that can be heard live and also recorded for teachers to listen to in their own time. These are created by teachers for other teachers demonstrating practical hints and tips. The Living Schools Lab project has encouraged the development of a LSL professional learning community through workshops, followed by the "Learning Snacks" series. These have proved popular, with over 25 'Learning Snacks' delivered in the project. Some of the Advanced Schools collaborated at a pan-European level on a common theme (e.g. Virtual Learning Environments), to share experience across the community.

- **Social Media** groups allow teachers to continue communication on a social basis and share ideas. This can be a good place to ask questions, seek opinions or access further information.

The Case Studies of the Link Observation Visits are available at **http://fcl.eun.org/lsl**.

A blog of the school visits has been available on the project website[2], attracting over 10,000 readers. The blog highlights key aspects of the visit, but time and again identifies practice that could be mainstreamed across the whole school. The purpose of this was to enable people to connect with the journey of the observer across all 12 countries, but also to connect a community of teachers, researchers and those working in education with real practice in real classrooms.

2 http://lsl.eun.org/observation-visits

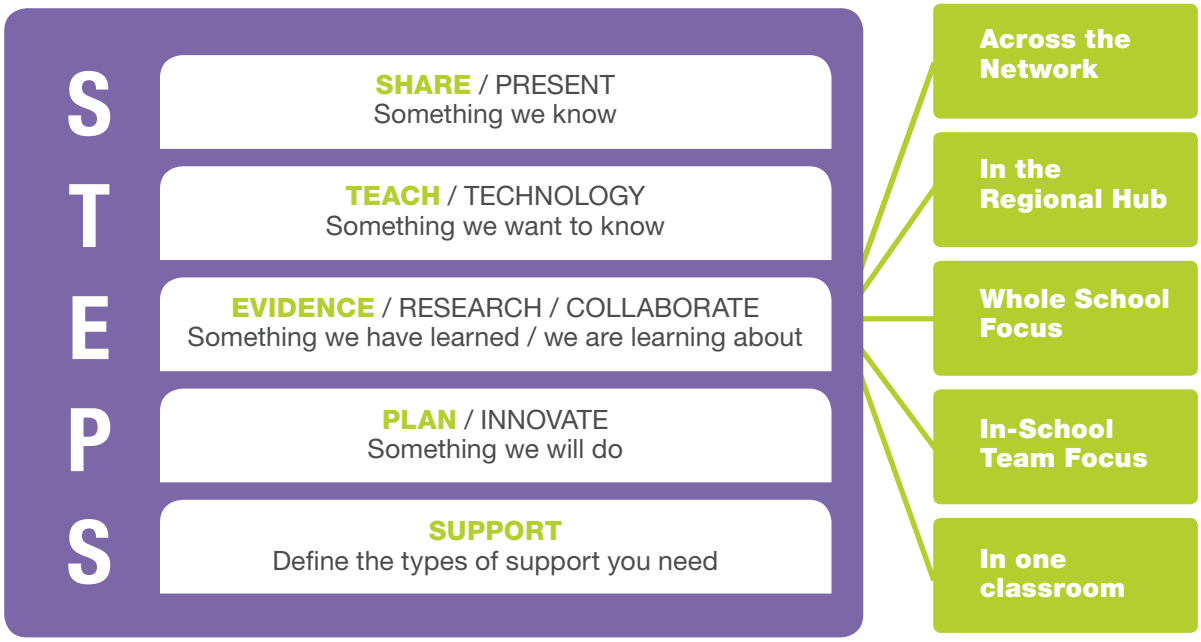
# Section A:
# Link Observation Visits

During the course of the project, each Advanced School received one observation visit from the University of Wolverhampton. Each visit gave the Advanced School the opportunity to showcase their best practice in the use of ICT across the school. The purpose of the observation was to document innovative practice in schools; it was not about making judgements or inspecting practice. However, the intention was to collate evidence helping to inform future work.

## STEPS Plan

In January 2013, lead teachers from all of the Advanced Schools attended a workshop to meet with each other and to discuss some of the possibilities in the project. The initial aim was for each Advanced School to work with their National Co-ordinator to establish a Regional Hub. A framework called the **STEPS plan (Share, Teach, Evidence, Plan, Support)** was developed to allow Advanced Schools to share a common language for ICT development and to enable the schools across the project to collaborate easily with each other.

The STEPS plan was created as a simple planning document and a framework to enable teachers across the project to describe the processes that they were using. At the beginning of the project, the Advanced Schools were asked to define one part of their school development plan that they were able to take forward. The STEPS plan also gave the observation visits a focus area for discussion. Each Advanced School was asked to develop a STEPS plan to outline their work. Advanced Schools were also encouraged to work with the Advanced Practitioners to create a STEPS plan for the development of ICT within their classroom too. This common framework was used to support discussions and the sharing of practice across Advanced Schools and Advanced Practitioner Schools within the regional hub network created within the project. However, it became evident at a very early stage that even some of the Advanced Schools did not have a plan or vision – they were simply dependent on the next source of funding with no direct strategy for change.




## Purpose of the Link Observation Visits

**The purpose of the observation visit was:**

- To look at whole school development in the use and implementation of ICT.
- To look at practice in the two Advanced Schools and document ways of working that have been implemented across the school.
- To help define exemplary practice for the project.
- To consolidate leading examples.
- To interview practitioners.
- To understand how effective practice in the use of ICT can be mainstreamed.
- To collate ideas that can be replicated.
- To share European practice at a national level.
- To provide the teachers with the opportunity to share practice.
- To feed into the focus group with the Advanced Schools and the Advanced Practitioners.

Each of the visits took place over a five day period including travel. All of the school visits included a tour of the school, lesson observations, interviews with the head teacher or someone from the senior leadership team and the LSL advanced lead teacher(s).

## National Focus Group

The purpose of the focus group was to bring together the Advanced Schools and the Advanced Practitioners that were involved in the project with other schools at a National Level. The schools were already meeting through the **regional hub network** meetings. The National Focus Group gave the Advanced Schools the opportunity to share their school across a wider network of schools and to look at the areas of focus within the project. It gave other schools an insight into the work of the project and encouraged them to join the network. (The Italian focus group was held on line because of the significant challenges identified with teachers travelling to a single location.)

## Lesson Observations

During each school visit, at least one **lesson observation** took place and in most schools it was at least two lessons. The aim of the lesson observation was to collate more evidence about the use of technologies within learning and teaching. The teachers who were observed were generally lead teachers in the LSL project or teachers who agreed to take part with arrangements made prior to the visit. The teachers agreed to have their whole lesson observed as this gave the opportunity to understand more about the structure of the lesson and the types of

activities that the students were engaged in. The teacher did not need to deliver the lesson in English, however the National Co-ordinator or another staff member translated the key points of the lesson for the observer. Ultimately, the observation aimed to capture the use of technology, the role of the teacher and the role of the students. In preparation for the observation, it was significant to encourage the teachers to present a 'Living School', emphasising to them that as the project aims **to mainstream practice and to look at whole school change**, it is about understanding the usual practices of the school day. Teachers were encouraged to teach the lesson without trying to change everyday practice just because the lesson was being observed. Another aim of the lesson observation was to encourage the teachers to consider how innovative practice could be introduced on a more regular basis at a local level, either within the school or between schools.

In most cases, the observer had the opportunity to meet with the teacher prior to the lesson to understand more about the context for the students' learning. The observer also met with the teachers after the lesson to address any points requiring clarity and to discuss specific details. E.g. Use of particular resources, organisation of students, learning materials and outputs within the lesson.

## Interviews

A lead representative from each country was interviewed at the beginning of the project to provide information about the national context for the case studies. During the Link Observation Visit, the observer met with all head teachers of the Advanced Schools to discuss the key areas of the case study framework and to ask further questions about the implementation of technologies across the whole school.

Some visits included interviews with small groups of students who talked about the use of technologies within different aspects of the curriculum, access to technologies at home and discussed some of their ideas for school development and future classrooms.

## Establishing the Showcase

Throughout the project, schools have been encouraged to establish a showcase for their school. Part of the Link Observation Visit was to encourage the school to take a step back and reflect on their showcase. The visit involved a tour of the school; this was to enable the Advanced Schools to **consider how learning and teaching in the school is 'connected'**. This helped schools not only to consider the physical aspects of the school, but it also enabled the school to identify where the examples of innovative teaching practice are within the school. Schools realise that what is key is not the number of 1:1 devices, or the smartest furniture, but whether the school can connect this to the changes in the curriculum and the vision for the anticipated developments. Where the teacher can openly present and discuss the key aspects of the school and how the use of technology has been implemented, it can provide further evidence that there is a whole school approach to changes within learning and teaching.

The Link Observation Visits were a pivotal part of the project because they exposed a reality for some of these schools; it is not often that senior leadership teams and practitioners take time **to share practice and receive feedback from a pedagogical expert**. This mirrors the findings of the TALIS 2013 Survey (2014). Nor do schools often share their development plans. The role of the observer as a critical friend served to challenge the school leaders.

# Section B:
# What the Evidence Shows

This chapter is based on the main evidence gathered during the Link Observation Visits. It also draws upon the interviews conducted with a lead representative from each country at the beginning of the project and the various dialogues held throughout the two-year project with teachers, head teachers and National Co-ordinators. The evidence has been collated under headings that have been used since the start of the project, from the application and selection of the schools identified to be part of the network. The evidence is drawn into a series of actions and recommendations **to help schools reflect on the key elements of a whole school approach**. These are summarised and illustrated at the end of each sub-heading within this section.

The observations have shown that while Advanced Schools have similar features, there are different timelines to mainstreaming the changes across the whole school. National initiatives, involvement in projects and additional regional funding have all helped the Advanced Schools to implement new ideas, but **at the heart of whole school development** is the **school leader and the leadership** team who **connect ideas under common themes and build opportunities for collaboration**, first within the school, and then, **change the professional culture by interconnecting developments**.

## 1. Innovation and Whole School Change

The Link Observation Visits showed that some of the Advanced Schools in the LSL project have been implementing the use of technology continuously within teaching and learning for more than a decade. School leaders have gradually increased the provision over a number of years and discussions about whole school change undoubtedly connect to the use of technology. However, the observation visits showed that some of the schools, even though they are considered Advanced Schools at a national level, did not have a vision for the development of the use of technology; instead they have ideas that are dependent on future funding from the regional board or municipality. In some countries, there is a direct connection between the regional activity and the developments in schools with considerably varied annual funding for schools. For example, some schools receive funding from the regional authorities on an annual basis and they can decide how this should be spent; whereas other schools receive funding, in response to a 'bid' or particular local action identified in the regional plan. Schools can therefore find it difficult to plan their own developments as they do not know how much funding they will receive. Equally, they are sometimes faced with last minute bids and are not prepared.

> School leaders need to meet with those responsible for regional funding on a regular basis to understand what might be in the pipeline and to enable regional leaders to understand how students' learning opportunities would be enhanced with the implementation of technology.

Across the Advanced Schools, the 'principal', head teacher or deputy head teacher or the combined efforts of school leaders were responsible for ensuring the funding and securing opportunities for teachers to be engaged in activities that will lead to developing practice. The need for the use of technology in schools is considered paramount as head teachers want practice to evolve, developing the 21st century skills required by learners.

The head teachers have recognised that the provision of ICT equipment is on-going and schools need a **'funding line' to reflect this within their whole school development**, rather than an ad hoc approach. In some schools funding is still based on 'one-off projects involving small groups of students' and offers no solution to mainstream change.

> Schools need a separate funding line specifically for ICT. This includes the need to replace, refurbish or refresh existing equipment. There is a direct need for schools to plan for change beyond the pilot phase.

**Having a vision for the use of technology** is not as simple as buying the latest technology on the market. It is crucial that the head teacher and senior leadership team work with staff and students to determine what would be of most benefit. For example, it may be more effective to focus on specific departments or year groups, rather than spreading the equipment across the school with less access available. Jonathan Bishop, the head teacher of Broadclyst Academy in the UK says: *"Students need access to a range of devices to enable them to learn that technology is for different purposes. We have to provide technology that is fit for purpose."*

> All schools should have a written and communicated vision that considers the kinds of whole school change envisaged, and give examples of scenarios showing how technology is part of this. A school plan needs timelines, with key dates for review. It also needs defined actions with key staff assigned responsibilities. It is helpful for schools to have actions for 12 months, 2–3 years and longer plans which might take 5 years to realise. The school should have a learning and teaching strategy that embeds the use of technologies across the curriculum for all students.

There is evidence from across the project that where schools have a **'whole school focus'**, it can be helpful in providing the direct reason to bring staff together. Everyone is aware of what the school is trying to achieve and all staff consider how they are involved. **Planning for change within learning and teaching requires short term and long term goals.** There will be some teachers who are more able to take the lead and it may be helpful to have pilot phases, but this needs to be with a clear plan for review. Schools have to consider that there needs to be time to embed initiatives, having a whole school focus means that all staff can be trained together and there is potential for team teaching or finding time to share practice. Schools have displayed the focus or at least included it within whole school information. This helps to present clear messages about commitment. The whole school focus might be on improving student response or developing digital literacy; it is not about the introduction or better use of a specific technology or device. In the Link Observation Visits, this was seen clearly in Middenschool Campus Minneplein, Belgium; Lycée Pilote Innovant International, France; and Coláiste Bríde, Presentation Secondary School, Ireland.

Advanced Schools have developed a **showcase for their school**; this documents the best practice around the school. In the first stages of developing a showcase, it can sometimes feel like there are not enough good examples. The head teacher should begin by asking each department or head of each subject to write down or **create a short presentation of how technology is being used**. This can be shared internally and gradually teachers will share ideas and develop the showcase further. **The school should then give teachers the opportunity to observe colleagues teach and to share practice**. Advanced Schools can provide evidence of change connected to the whole school data, and it is critical that this is beyond the timeline of simply introducing a different technology. For example, the school could **engage with a research partner** at a local university or an independent consultant to document the evidence of change in school.

> The processes of 'Showcase–Demonstrate–Validate' have worked well within the Living Schools Lab project to enable the Advanced Schools and the Advanced Practitioners to consider how the school development plan is moving forward. This could be continued and replicated by other schools.

Advanced Schools within the LSL project have demonstrated **the importance of a "team" approach**. This means that rather than a single ICT champion, there is usually more than one person who has some responsibility to demonstrate the use of ICT within their teaching and to share their practice with other colleagues in school. Some of the schools have a head teacher who has been in post for more than ten years and the implementation of technology has been continuously layered over that time to reflect the changing types of technology available. However, there needs to be further consideration to the pedagogical changes within the school.

In the Advanced Practitioner Schools the change has been at classroom level and is more concerned with the integration of ICT across the curriculum. **Advanced Schools believe that they benefit from being able to align their integration of ICT to a whole school development**. School development is the continuous change built upon the professional reflection and action plans of the leadership and innovators within the school community. It needs to be focussed on the curriculum and connect to the wider world of education.

The role of ICT co-ordinator does not formally exist in all countries. However, the Advanced Schools have identified a lead teacher to take developments forward for the use of ICT across the school. In some schools this is focussed on training, whereas in other schools the individual is responsible for the decisions about purchasing and the implementation of technology at a whole school level. **One of the advantages of schools identifying a team is there are more opportunities for group discussion and dialogue about innovation and subsequently there is an immediate involvement of staff** across the whole school, rather than an isolated enthusiast trying to convince other staff.

> Schools should identify a teaching and learning team with time to discuss and implement innovative practice. There needs to be a clear distinction between technical and pedagogical support.

Most of the Advanced Schools have **involved students with making decisions about change in schools**. This can be through a student council, but equally there are examples of student consultation, online surveys and appointing student leaders to gather feedback on specific ideas. It is useful for school leaders to gather ideas from students as they can provide further insight into how current practice needs to be changed. Students are also part of a wider community and it is advantageous for schools to know whether there might be parents who can provide support with whole school change, for example connecting to a local business or joining the school board or parent forum.

> Schools should involve students in whole school development. This should include gathering feedback on the use of technology.

## Summary of best practice actions for schools to follow: **Innovation and whole school change**

- Establish a teaching and learning team
- Write a vision for whole school development integrating the use of technology
- Ensure that the funding plan includes how to refurbish, refresh or replace equipment
- Decide on a whole school focus and define a development time
- Develop a showcase for your school
- Include opportunities to involve students
- Engage with a university or independent consultant as a research partner for the school to track progress

## 2. Infrastructure

There is a considerable variation in the level of equipment and resources that are available to schools across the project, with a mix of older and newer technologies. This is to be expected as all the schools have invested in technology over a period of years. This spread was reflected in the results of the LSL ICT audit of schools that took place within the project, and echoed in the wider picture captured by the Commission's "Survey of schools: ICT in Education" published in 2013[2] which took place across 31 different countries. **Some of the Advanced Schools have made sure that all classrooms have a minimum specification of equipment.** This includes at least access to a PC, the internet and a data projector to enable the teacher to share digital resources with all students.

The cost of purchasing hardware continues to be a difficult equation to calculate; it is only the schools that have defined the use of ICT as a separate and continuous necessity that can truly justify the need to refresh and replace equipment. Some of the Advanced Schools have also engaged with national initiatives to provide resources and used involvement in projects to justify the purchase of new equipment; but this is not a sustainable plan. **School leaders are faced with a huge challenge with regard to the replacement of existing technologies.** In some schools, there is no direct strategy for how new equipment will be provided; schools are simply dependent on the next opportunity for funding and schools do not necessarily know when this will happen.

In some countries, the Ministries of Education have issued guidance on the levels of infrastructure that each school should provide, yet this is difficult to monitor and the numbers of resources does not readily reflect the specification quality or appropriateness of use. **Teachers need to know that access to technology is reliable and consistent across the school.** This is to ensure that teachers can use the equipment regardless of the subject they are teaching.

> Schools need a minimum specification of equipment for all classrooms. This should include at least a desktop or laptop computer, reliable and fast internet connection and the means to share digital resources with all students.

However, even in the Advanced Schools there are examples of equipment that has been poorly installed and needs to be updated or replaced completely. In most of the Advanced Schools, there is a central resource with at least one computer room equipped with enough PCs for pairs of students, i.e. 14-16 computers. The quality of these varies dramatically, as does the level of use. Some students have access to equipment that is dated, and in desperate need of replacement. Teachers are given timetabled access to the computer room, but this is not always monitored and schools admit that some teachers may use this more than others.

In some schools there has been a conscious decision to reduce the number of computer labs and distribute the equipment across the school to ensure more regular and consistent access for all students. In primary schools, there are positive examples of computer labs being multipurpose shared with access to books and science facilities to allow teachers to enable students to adopt a project based approach; 'computer labs for ICT' have become 'learning centres'.

> Schools should audit and monitor when and how technology is being used. The computers in the lab (particularly with younger children: 6–12 years) may be accessed on a more regular basis across the curriculum if the equipment is distributed. Schools that have a high ratio of computers for students should look at how other resources are used within the computer lab.

2 Survey of schools: ICT in Education https://ec.europa.eu/digital-agenda/node/51275

Internet connectivity is expected across the whole school and increasingly the evidence shows that schools need to provide wireless access. As mobile technologies become less expensive, schools have invested in at least one class set of individual devices, but where schools have planned a growing number of devices this is dependent on robust wireless access. In some schools there have been innovative schemes to allow students to bring technologies in from home or to allow students to use their own device. In Austria, the secondary school students bring in their own devices for use within the classroom, whilst in other countries there have been national initiatives to enable students to have their own device provided (Portugal, Norway).

However, schools need to consider the capabilities of the network and ensure the technology is insured, or at least appropriately maintained. It can also be problematic for teachers who want students to access a particular programme or application on a certain operating system. At present schools want to say that they have engaged with 1:1 learning and are therefore making quick decisions to buy a number of devices. However, they have not necessarily considered some of the bigger problems that this can create for the schools. Another aspect of the mobile infrastructure is the charging of the devices. Schools have invested in cabinets to allow students to charge devices and to ensure the safe storage in between lessons.

> Internet connectivity should include robust wireless access in all main areas to allow staff and students' access to individual devices. National authorities should ensure that schools are given advice and guidance about this provision.

**Teachers have devices provided by the school;** at present this is usually a laptop but there are examples of Advanced Schools providing tablet devices for teachers to use at home to prepare lesson materials. There is growing amount of evidence of teachers having access to online data outside school, this includes the ability to be able to download and upload resources, provide electronic feedback on submitted work and update individual student performance data. At individual school level, there are some teachers that communicate with students via electronic messaging outside of school hours, but this is at the discretion of the individual teachers. Head teachers of the Advanced Schools agree that teachers must also be provided with access to the same technologies as the students. In some cases the examples show that this needs to be before the students to ensure appropriate training and time to experiment with the technology. In Norway, the head teacher of the Primary School provided all teaching staff with access to tablets at least nine months ahead of the students to allow them time to learn how to use the equipment and prepare lesson materials, but also to become confident users. One of the most critical parts of the infrastructure is to plan for staff access both within and beyond the school day and this was high on the agenda of most of the Advanced Schools, particularly at secondary level.

**Technology is used for communication across the school**, with an expectation that staff, students and parents will usually communicate via email, SMS, the school's learning platform or in some cases through social media. The implementation of a learning management system has been identified by Advanced Schools to provide an important part of ensuring consistency and transparency across the school. However, this is complex to implement and it is imperative that **leaders set clear expectations about sharing of resources, access to relevant and up to date learning materials, communicating with students and providing high quality electronic feedback.** The school infrastructure should allow teachers and students to share resources and learning materials easily. Parents can be included in supporting the progress of children with greater access to immediate data and evidence. Students highlighted in the Czech Republic that whilst there is access to a PC at home, it can sometimes be difficult to print and therefore it is useful to have a resource area in school that is available for students to use. However, the Advanced School in Norway shows the move towards the paperless classroom, resulting in savings on printing costs.

> Schools should consider how learning materials and digital resources are made available and shared to allow synchronous communication.

School are moving towards cloud based services to enable access to become less dependent on being in a particular location. Teachers can provide more immediate responses and updates. Students can receive real time electronic feedback and the virtual learning environment becomes a working reality, not just a storage space.

## Summary of best practice actions for schools to follow: **Infrastructure**

- Establish a baseline level of access for all teaching rooms
- Use of learning platforms in school needs to be consistent by all teaching staff
- Consider distributed access - know how and when technology is being used
- Ensure minimum standard of internet connectivity in all teaching rooms
- Implement wireless access and show how mobile devices can be used effectively
- Identify cloud-based solutions
- Explore options for 'Bring Your Own Device'

# 3. National and International Initiatives

Across the different countries within the LSL project, there are various examples of national ICT agencies and government departments. In some cases these are linked to funding or additional financial support for schools. In some countries there are pedagogical institutions or advisory departments co-ordinating training and professional development. However, for some schools there is no direct separate authority offering guidelines or support for ICT and schools make their own decisions on ICT purchase, deployment and use. Financial cuts have led to the demise of some ICT agencies and schools consider this to be detrimental as the feeling is that the use of technology in schools warrants some kind of dedicated support. For example, direct liaison and consultation with commercial suppliers at a national level reduces the time for individual school leaders to find solutions and to ensure that the appropriate level of questions are asked.

**New curriculum guidance** has been issued across several countries and this now widely embraces the use of technology across all subjects. National initiatives have allowed schools to provide increased access to technologies and given the ability for schools to upscale quickly. There is a continued challenge for all Ministries of Education and that is to **sustain the level of provision** to align with the types of technologies available.

> Schools benefit from advice and guidance at a national level. Schools need to see examples of good practice and understand how to access appropriate training and professional development.

In Cyprus, the system is centralised; schools receive information, advice and guidance about the implementation of ICT directly from the Ministry of Education and Culture. However, the Advanced Schools believe that they retain their autonomy while knowing that they have the support at a national level. In France, the schools are heavily dependent on the actions of the inspectorate who largely determine their next course of action.

At a national level, one of the biggest challenges is to **ensure regular and consistent use of ICT** across all schools. This can be difficult to enforce and even more difficult to monitor. In Austria, the Ministry have an established professional network for schools that have achieved a defined level of access and use of ICT within learning and teaching.

National agencies realise that the **benefit of collaborating with other countries is enormous** as it creates opportunities for additional funding and more significantly allows a rich and diverse knowledge exchange. This means that national decisions can be influenced by the actions of others collaborating on a larger scale.

> National agencies or pedagogical advisory groups should work with schools to establish regional hubs and networks to share practice and work collaboratively.

The regional authorities who are responsible for funding need to recognise that the key to school development is not about investing in equipment in isolation. It requires a strategy to engage the school in collaborative development. This means that the regional authorities have a duty to connect to the change management processes being implemented by the school. For example, the regional authorities need to understand the implications of the funding that they are providing.

Some of the Advanced Schools have developed a policy for working with other schools at a national/international level. This means that there is a **clear expectation for staff to be engaged with joint projects and to seek opportunities for collaboration.** These initiatives provide opportunities to explore additional funding and more significantly enable schools to cooperate on a particular topic. This means resources can be developed together, costs can be reduced and teaches can benefit from shared professional development and increased opportunities for ongoing dialogue. This includes the use of technology. The use of the internet has helped schools increase the profile and raise awareness. Across the Advanced Schools, there are examples of schools that believe in maintaining a high media profile to publicise the school's use of technology.

Advanced Schools recognise that they have **a professional responsibility to profile the work of their own school.** In some cases, these schools recognise that they have an internationalisation agenda and regard it as part of their own "showcase" to share the work of the school at a national level. Advanced Schools are not just recognised for their use of technology; this can be because several key staff are readily engaged with a range of initiatives. At a national level, the same school can be profiled for many opportunities.

Teachers have benefitted from access to training that is implemented at a national level. In some countries there are examples of regional support for the implementation of technology. This includes the provision of pedagogical experts who are able to work directly with schools to provide bespoke support for the whole staff or individual teachers on specific aspects of the curriculum. This includes the secondment of teachers to support others and provide training.

Across the Advanced Schools, there are examples of schools that have a **connected whole school focus.** This means that the teachers and sometimes the students share a common goal. This helps to ensure that **professional development is planned** and training becomes centralised. The whole school works together towards a common outcome. There have been national initiatives to provide training to teachers but this is usually associated with a specific technology. There are examples of pedagogical experts working with teachers and these are considered particularly helpful when the expert goes into the classroom to **team teach** or deliver bespoke training sessions.

There are examples of the development of portals, and online communities offering access to teacher resources. These are largely concerned with lesson materials, although during the project, the LSL teachers have benefitted from using online activity for professional development. This **access to training and collaboration with peers** is something that can be replicated at a national level.

The national provision of learning management systems has encouraged schools to adopt a more transparent approach. There is evidence across the different countries of how schools need to connect the administration and data systems with the curriculum to enable the student to access a portfolio. The implementation appears to be more embedded across the school when school leaders structure the whole school training and establish ways to encourage staff to share resources.

There are also examples of **video material** being created at a national level to support teacher development (Ireland, Norway, Portugal and Italy). This is something that has been encouraged and developed further across all countries within the LSL project.

Schools should use the school website and the learning management system to provide a virtual showcase for the school.

### Summary of best practice actions for schools to follow: **National and International Initiatives**

- Establish a showcase for learning and teaching
- Ensure the school website is a virtual showcase for the school
- Share with your community how you are working on national initiatives
- Explore additional funding streams from projects
- Share your practice with other schools
- Join national networks to be aware of current thinking

## 4. School Leadership

School leaders and teachers should observe practice within the school on a regular basis. There should also be opportunity to observe practice in other schools.

The Link Observation Visits have emphasised that Advanced Schools place a particular emphasis on the role of the school leaders within developing the use of ICT in schools. Some of the head teachers readily admit the school's focus on the use of technology began with personal enthusiasm, but realise that they rarely hold singular responsibility for the mainstreaming of whole school change; ultimately they are dependent on the commitment of the leadership team and teachers across the school.

Within the LSL Advanced Schools a significant number of head teachers have been in post or held leadership positions in their school for more than 15 years. These school leaders can readily track the implementation of technology, associating that with significant change in the quality of learning and teaching, although this is not always evidenced.

There is a contrast between the centralised and decentralised systems, but these are difficult to analyse, because the Advanced Schools are keen to demonstrate their autonomous approach and drive forward their own success. Equally, the schools that cannot depend on central support believe that they are the beacons guiding others.

The dichotomy becomes evident when there is a gap between national guidance and regional development or conflicting priorities between sustaining current provision and focussing on constant innovation that is not scalable. Unfortunately, **the person who decides the changes is not the person who is responsible for implementing them.** At a regional level, there are decisions made about the next technology that schools would benefit from; however this needs to be connected to the pedagogical practice and the impact on student learning. School leaders have to know their own plan.

**There is a need for schools to understand the difference between ICT infrastructure and developing a learning and teaching strategy.** Some schools have been focussed on the next technology without really considering the implications for the students. Where there is a direct connection between the planning for change in student learning and the implementation of the hardware, it becomes clear that staff are better prepared and in most cases there is an expectation that a defined group or the whole school will be involved. This then means that the outcomes are tracked before the next cycle of planning is determined.

**ICT is an ongoing commitment for schools both as a resource and for professional development. School leaders need to connect their technological innovation with pedagogical developments.** It is no good assuming that this will happen automatically. Head teachers have given responsibilities to some key staff in schools. Schools have realised the benefit of involving a range of people not just those with technical expertise. It is essential for schools to leverage the skills of **project managers, curriculum experts and those who are willing to share practice.** School leaders identify with

having an initial focus on particular departments before implementing new ideas. Across the project, Advanced Schools have understood the need to affirm their showcase across the school and to understand how this influences whole school change.

There is not a formal recognition of the role of ICT co-ordinator in schools across Europe. This is reflected in the diverse skills and experience of those who take responsibility for the implementation of ICT equipment in school. In some cases, there is no additional provision for technical support. Equally, there are examples of where there is technical support, but little or no consideration of how this connects to pedagogical developments. School leaders should be mindful of the demands placed on some individuals and ensure that there is an appropriate level of technical and pedagogical support without impinging on dedicated teaching staff.

There are examples of schools that benefit from being part of a cluster. In some countries, this is happening naturally, with clusters forming around secondary schools and feeder primary schools. In other countries, such as Portugal, the formation of clusters of schools, sharing joint school leadership has been accelerated as a result of the financial crisis. The cluster can lead to joint decisions about procurement of hardware/software, access to training or opportunities to share practice. **School leaders have worked together and formed regional and national networks to discuss new technologies and applications.** The project has actively encouraged schools to belong to a cluster, in the form of a Regional Hub providing opportunities for Advanced Practitioners to explore how to develop practice across the school working alongside their colleagues from Advanced Schools.

School leaders should work with other schools to develop ideas for innovation. Schools may find it helpful to work together on a similar theme(s).

Advanced Practitioners have been identified as evangelists or champions making use of ICT within their own classroom. However, the LSL project has shown the benefit of teachers working together in teams. This means that different members of the team can meet to discuss potential developments in schools. It also means that there are more relevant examples to share with other staff.

Advanced Schools have formalised the role **of students leading change** within schools. This is demonstrated through examples of student support provided to teachers in the form of specific training, but also being the first line support within lessons. In some schools, students support their peers and there are also student councils where technology features regularly on the agenda.

School leaders understand that it is **essential to work with parents**. The recent introduction of mobile devices into schools has presented an ideal opportunity to re-engage with parents on the use of technologies within learning and teaching. Leaders have taken the responsibility to engage families in lessons on **e-safety** and protection of digital identity.

Schools should establish clear e-safety guidance for staff and students.

## Summary of best practice actions for schools to follow: **School Leadership**

- Integrate ICT development as part of whole school development
- Observe teaching and learning within your own school and in other schools
- Define the next three innovative ideas for your school
- Ensure an appropriate level of technical and pedagogical support
- Establish clear e-safety guidance
- Find partner schools to work on a similar theme
- Join national networks to be aware of current thinking
- Develop opportunities for learning beyond lesson time

# 5. Training and Professional Development

Evidence from the interviews undertaken as part of the Link Observation visits, highlights significant differences in the training and professional development that teachers have to complete. There is provision of mandatory and non-mandatory training, but the quality and relevance of this varies according to individual teachers. In some countries, teachers are expected to have a number of hours certified Continuing Professional Development (CPD) each year for all subjects and this is at least part way towards ensuring that teachers upgrade their ICT skills. There is inconsistency in the training that is available for teachers; whilst most can access 'technical' training to learn how to use the technology, there are fewer examples of training with a focus on pedagogical development. There is a lack of systems in place in the Advanced Schools to monitor the types of professional development that teachers have undertaken. There is also a variation in the standard of courses being completed and the accreditation assigned. There are examples of **regional training centres or pedagogical institutions that employ ICT experts.** In some cases this training is provided directly within the school and this is preferred as teachers get to see their own equipment being used. The maximum number of hours for CPD is in Portugal where teachers have to undertake 25 hours per year across all curriculum areas including ICT. In other countries, for example in Cyprus and Czech Republic, teachers comment that CPD leads to opportunities for career progression. An entitlement to a **number of hours for ICT CPD** is something that could be standardised across the European schools community.

> Teachers should be given an allocated number of hours for ICT training and professional development each year. European guidance with a standardised entitlement to training would support all schools that are trying to mainstream the use of technology.

In the last decade, qualifications such as the European Computer Driving Licence[3] (ECDL) have been funded for all teachers. One of the challenges is ensuring that teachers can access training for the use of technology within a specific subject. The Advanced Schools have used subject specific support networks for staff where these are available. Training has been provided for specific technologies or applications. A significant amount of teachers refer to the ECDL as a standard.

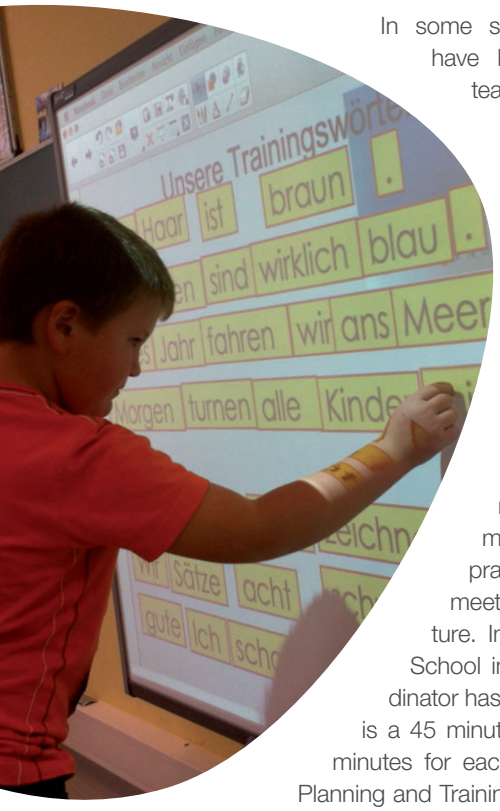
Some schools have implemented a range of technologies over a short period of time and therefore it is not easy for non-specialist teacher to keep abreast of developments. It is paramount that at the time of purchasing new equipment that schools consider and plan for the costs and time commitment connected with appropriate training.

The observation visit interviews have highlighted that not all of the Advanced Schools involved in the project have a particular strategy for formally training staff. This varies enormously across the project schools. In some of the schools, the staff are dependent on the existing knowledge of one teacher and will ask the teacher for advice or help as they need more knowledge. However, in other schools there is a more formal and regular schedule of training that is linked to the whole school development. In the majority of Advanced Schools, there are opportunities to share practice and examples of lesson ideas both formally and informally. This includes activities within staff meetings or specific time that is allocated to all teachers to look at examples of practice, i.e. a 'market-place' for staff to share ideas. One of the main challenges for schools is finding the time to attend training and professional development either within or beyond the school day. Again, this echoes the findings of the TALIS 2013 Survey (OECD 2014).

Schools have taken responsibility for more day to day professional development of their own staff. In some cases this is orchestrated across the whole school and becomes etched in the mind-set of teachers to collaborate and teach each other. For example, some schools have introduced a regular time to share practice. Within the Advanced Schools, there are those who provide opportunities for external schools to attend their professional development activities on a regular basis, and give opportunities to share practice.

> Schools should audit staff development needs and understand how the training of individual teachers supports the whole school focus. Schools should identify at least two staff trainers who can share practical ideas with other colleagues on a regular basis demonstrating the use of technology across the curriculum. This should include opportunities for team teaching.

3 http://www.ecdl.com/




In some schools expert teachers have been given a reduced teaching timetable to team teach and coach other staff to use technology (Belgium, France, Ireland, Norway). The Advanced Schools have devoted specific time to formal training, but equally, schools have encouraged regular informal training, for example, 10 minutes at the beginning or the end of staff meetings for staff to share practice, or informal team meetings with a defined structure. In the Advanced Primary School in Ireland, the ICT co-ordinator has introduced FPT45 which is a 45 minute team meeting with 15 minutes for each section of 'Feedback, Planning and Training.' This is led by the ICT co-ordinator with representative staff from different year groups.

Generally, there is no additional funding for these roles. In the Advanced Secondary School in France, the lead teacher Xavier Garnier tells that "teachers don't just talk about sharing practice, teachers plan together and subsequently practice is shared". In this school two teachers have been given a reduced teaching timetable to support colleagues and training has been linked to a 4-year whole school project called "The Living Cloud" – implementing the use of 1:1 technologies for students across the whole school with access to resources using cloud based applications and services.

Some Advanced Schools in the LSL project have taken responsibility for ensuring that where there is a need for **whole school implementation then whole school training is given.** This is particularly evident with the provision of VLEs or large scale implementations of specific technologies, e.g. interactive whiteboards. Some teachers want very practical training in the use of technology with ideas that they can implement quickly. However, school leaders are recognising that there is a huge benefit to the whole staff when groups of teachers work with colleagues across the whole school.

Training needs to be connected to a whole school focus, this enables the school to plan and schedule whole school training. For example, the school may choose to focus on particular aspects of learning and teaching for a specific period of time. Equally, schools have focussed on key software or applications and realised that it can be effective to offer a core list of training at the beginning of the school year to provide introductory or refresher courses for teachers, rather than constantly trying to provide an endless list of training to meet individual requests.

**National curriculum reforms** have led to training provision with the implementation of technology but as technology has become more accessible and affordable; schools have purchased their own technologies and become more likely to provide 'in-house' expertise, this is particularly evident with interactive whiteboards and tablet devices. Levels of funding vary and teachers acknowledge that they sometimes have to find their own money to attend courses.

Schools across the project have shared that they are faced with the challenge of providing replacement teachers to allow teachers to attend training. Some Advanced Schools have identified key teaching staff to be responsible for training other teachers and this is a model that could be replicated. This means that the member of staff is also responsible for training other teachers in a cascade model. This has also included giving staff the responsibility to be part of a network of teachers that meets regularly to discuss the latest developments and resources. In some cases, these teacher experts have taken responsibility for not only training their immediate colleagues in the same school, but in other schools. Schools have also been able to generate additional income for teachers providing training. There are examples in the LSL project of Advanced Schools encouraging more than one person to lead the training, this distributes the workload, and it also enables the school to have experts with different training styles. For example, some teacher trainers may be more at ease with working on a one to one basis, whilst others are happy to work in large groups.

**Staff have also used projects as a way to upskill.** eTwinning enables two or more schools to work together; groups of students and staff have learnt to use particular technologies to support activities. For example, in the Advanced Primary School in Norway, the teachers have learnt to create animations of fairy tales and swap these with schools in two other countries.

Across the project, there are a number of examples of teacher experts delivering training at the local university to teach trainee teachers. Some of the Advanced Schools are themselves, centres of excellence responsible for teacher training to networks of local schools. This is taken one step further in the UK with the development of Teaching Schools.

Commercial suppliers deliver training to teachers and there are examples of incremental schemes allowing certification through different levels. Some of these have been promoted at a national level to encourage schools to take advantage of free training. The big challenge for suppliers is a sustainable commercial model to provide

training for teachers that addresses the pedagogical implications for change, as well as technical training pointing out the features of hardware or applications. An on-going challenge for schools is to **ensure that systems are updated** and training is put in place so that teachers are using correct versions of software with full understanding.

Some commercial suppliers have introduced **ambassador schemes or partnership opportunities** with a formal agreement to engage schools in supporting the delivery of professional development across a wider group of practitioners. This is particularly evident of those Advanced Schools who have invested in the technology being willing to share practice and could be further connected with whole school development. There is huge potential to connect this to the validation service being developed in the LSL project by encouraging teachers to give feedback and contribute evidence developing the use of ICT in learning and teaching.

**Teachers place a high value on being able to attend face to face professional learning networks and seminars to collaborate with others as a method of formal training.** This is because the teacher is able to access relevant examples and share resources with other like-minded teachers. These professional learning communities have become increasingly popular in the last five to ten years with teachers continuing to liaise with colleagues online after an initial face to face meeting. (Katz and Earl, 2010; Timperley and Robinson, 2003; Stoll, 2006; David Jackson, 2006; Fullan, 2006)

Katz and Earl (2010) conclude: *"Networks can provide the forum for colleagues to address genuinely new and often difficult ideas in a safe environment, away from the risk of retribution or censure in their daily place of work."*

At a national level, across several countries, there are examples of numerous online portals, whilst most of these focus on sharing resources, there are also examples of social communities and spaces where teachers can ask questions of like-minded colleagues. At present, there is still a lack of cohesion between these types of communities and whole school development; this is partly due to the prevalence of subject specific communities, the expertise and experience of the teachers involved, and the particular challenge of engaging school leaders. Teachers themselves have initiated change within the profession by the use of technology. Social media such as Twitter and Facebook groups allow teachers to be connected to professional global communities.

During the course of the LSL project, Shireland Collegiate Academy in the UK has developed the concept of Flipped CPD, adopting a similar approach to Jonathan Bergmann and Aaron Sams' Flipped Learning for students (2012); instead of the students, the teachers are given videos to watch prior to staff training sessions. This means that staff can watch the videos in their own time, and use the staff training for more direct hands on support.

There are an increasing number of schools across the LSL project that have actively encouraged students to be responsible for training and professional development. In Cyprus, one of the Advanced Practitioners has introduced student leaders who have trained staff and students to use key software that everyone needs to know how to use.

Some schools have identified particular students to provide more bespoke training or support within the lesson. This enables the teacher to **know there are specific students who can resolve problems and other students who will take responsibility during the lesson.** This is helpful for the less confident teacher.

## Summary of best practice actions for schools to follow: **Training and Professional Development**

- Define an annual whole school CPD plan
- Appoint at least two staff trainers who can share practical ideas
- Appoint lead teachers who are willing to share practice with other schools
- Audit staff development needs and establish a CPD plan for each teacher
- Observe teaching and learning
- Consider opportunities for team teaching
- Be part of a Regional Hub sharing practice: share expertise and training opportunities between schools

# 6. Integration of ICT across the Curriculum

The Link Observation Visits showcased a wealth of ideas that can be mainstreamed or replicated. Some of these are lesson activities for individual teachers to try and share with colleagues, whilst others require a more formal plan to be integrated across the whole school. Some examples are perhaps best suited to a particular age group of students, i.e. primary or secondary, but equally could be adapted for different groups. It is notable that some of the Advanced Schools have only recently implemented new ideas themselves and these will continue to be up-scaled. There are some financial implications to mainstreaming, but many of the ideas suggested within the case studies can be considered and achieved by all schools to some degree. There is a mixture of central direction and support in this curriculum change, and there are schools leading on the initiatives themselves in the absence of any central/ regional direction.

At a regional level, in Norway, the curriculum has been **matched to specific software** and key descriptors. In Finland, the national curriculum is being rewritten. In France, priority is being given to digital workspaces, where the digital homework notebook and lesson plan is compulsory across the country. In the UK, the new primary curriculum for England will see the introduction of teaching students computer programming and coding skills.

There is a mix in the **growth of online portals with teaching and learning resources**, with some at national level, and others at school level. The largest online community for teachers in the Czech Republic is a methodological portal that is run by an organisation under the Ministry of Education, with the materials on this portal reviewed by peers. There is growing use of **virtual learning environments** and **cloud based applications**, e.g. Dropbox and Google Drive.

> Schools should look to use cloud based services to support access to learning materials, communication and feedback beyond the lesson time.

There is evidence that the use of free software apps, cloud-based applications and communication technologies such as Skype, supports increased work outside the school and growing collaboration with other schools through networks, e.g. eTwinning. During the observation visits, only one school used technology to connect to another school as part of the lesson observations. In Coláiste Bríde, Presentation Secondary School, Ireland, the mathematics teacher connected to a school in Dublin to deliver higher level mathematics. In the Italian lesson, the teacher used Padlet to allow the classes to collaborate and then connected the Irish students via Skype to a school in Italy for a discussion with Italian students.

There are a broad range of examples to show that ICT is being used across the curriculum and evidence from Advanced Schools of the desire to provide more project based learning (Belgium, Italy, and UK). This includes providing access to schedules that enable the student to be more self-organised, various self-paced tasks, working in teams with specific roles, and using technology to achieve creative outputs that are published to a worldwide audience. Some of the schools have specialised in multimedia broadcasting (Finland, Portugal and UK) or digital publishing (Italy).

In secondary schools ICT computer labs are being used for mathematics lessons and ICT. In some primary schools, there are still main teaching rooms without access to technologies and therefore the teachers are dependent on timetabled access to the computer room. Where schools have introduced 1:1 devices such as tablets, these are being "reserved" for certain teachers. However, in some schools, specific teachers have been identified to work with the technologies to ensure that they are appropriately trained.

**Throughout the Advanced Schools, there is evidence to show that technology is being used across all areas of the curriculum.** However, there are fewer examples of how the curriculum has been changed to reflect the individual student needs. Where access to 1:1 technology is not fully implemented, this can affect the personalisation of student learning; however, students who have access are sometimes still given undifferentiated tasks. At Shireland Collegiate Academy, UK, the use of technology has been embedded into a new curriculum called Literacy for Life where year 7 and 8 students receive additional literacy lessons in the mornings. In Istituto Comprensivo di Cadeo and Pontenure, Italy, there has been the introduction of a different curriculum in the afternoon that allows the students to follow their own interests. It means that students have a longer period of time to study a particular area in more depth. In some lessons, students are given different responsibilities or roles within the task. For example, one student is the lead writer, whilst another student is the lead presenter for the task; the roles can vary according to the tasks. In the Link Observation Visits, this was seen in Cyprus, Italy and Belgium.

**Teachers are using technology across the curriculum to help with evidence gathering**, specifically in subjects like Physical Education where the student can gather evidence to improve performance. For example in Austria, the secondary school students capture video clips of

themselves or peers within sport to help them improve their technique. There are also increasing examples of e-portfolios to encourage the students to keep their digital evidence in one place in order to show continuity and progression, but also to allow students to have a profile that can be taken with them when they leave school as a record of achievements.

> Schools should ensure that students can receive electronic feedback and develop a digital portfolio for each student.

### Summary of best practice actions for schools to follow: **Integration of ICT across the Curriculum**

- Document how ICT is being used within every subject and plan next developments
- Provide standardised templates or frameworks for planning across the school
- Use online learning platforms to provide access to learning materials and assessment
- Use technology to capture student response in lessons and make formative assessment visible
- Use technology to communicate with the students and parents beyond the lesson time
- Establish how students receive electronic feedback and develop a digital portfolio for each student
- Identify cloud based services to support access to learning materials
- Use technology to collaborate with another classroom and another school

## 7. Student Involvement

The Link Observation Visits have shown that Advanced Schools across the project try to involve students to support with mainstreaming change in the use of ICT in school.

Advanced Schools recognise that it can be a challenge for teachers in the classroom to use technology when they are less confident than the students themselves and therefore see it as a huge benefit to appoint student digital leaders. **Advanced Schools at both primary and secondary level have appointed students to be first line support within lessons.** This means the teachers know which students have been trained to provide support or solve common problems.

> Schools should establish student digital leaders who can provide support to other students and staff. Digital leaders can also be involved in the decision making process about innovative developments in schools.

There are examples from some of the Advanced Schools of developing new opportunities for students by trusting them with the role of **digital leaders**. Specialist multimedia equipment is being used by students to **'open up the school' to an external audience** through regular broadcasts. This promotes a clear message about the school's use of ICT and helps to share the school vision. For example, in Broadclyst Community Primary School in the UK, Wäinö Aaltonen School in Finland and Escola Secundária Eça de Queirós in Portugal, there are students creating high quality broadcasts and taking responsibility for interviewing external guests and capturing the school's progress through digital media. This is then used to **showcase the schools' work and promote the**

**achievements of students.** It enables the students to know that someone is interested in their progress and connects the schools to the external world. Where schools cannot afford to invest in specialist equipment, it is worthwhile looking at how students are involved in using technology to raise the profile of the school.

> Schools should give students the opportunity to support the development of the school showcase promoting the profile of the school with student work. This may include the development of a student media team.

Advanced Schools have identified that where the initiatives involve students, this can help the teachers to raise their ICT skills. This is because the teacher has to learn to do something for the benefit of his or her own teaching.

There are several examples of schools participating in national competitions on a regular basis; some schools have integrated the competition skills with curriculum activities to embed the initiatives. For example First Lego League[4] and Apps for Good[5].

Some of the Advanced Schools have engaged students with whole school development. This has been achieved in a number of ways. Students have been involved with the decisions about how learning could be different, for example in ITIS Majorana in Italy students have helped to design a 'Future Classroom'.

Advanced Schools at both primary and secondary level show evidence of putting the development of **ICT as a regular agenda item for the student council discussions.** Students are involved with contributing ideas for how the use of ICT could be implemented further within learning and teaching. Advanced Schools have recognised the need to collate regular feedback from students about the use of technology and understand the kinds of improvements that would support them. For example, students want to receive more immediate feedback on their work, to be able to ask their teacher questions beyond the lesson time and to discuss their learning with their peers.

In some of the Advanced Schools there are large digital display screens around the school and these are currently used to share the timetable, daily activities and photographs of activities. In some of the more Advanced Schools there are regular updates with students' work, video clips and celebration of recent achievements. This celebrates the work of the students and provides a live currency to the information. These examples help to **demonstrate the use of ICT across the school and engage all staff and students in whole school development.**

## Summary of best practice actions for schools to follow: **Student Involvement**

- Establish digital student leaders
- Encourage the student council to have ICT on their agenda regularly
- Showcase student work in school and online
- Collate regular feedback from students about learning, teaching and the use of ICT
- Provide curriculum opportunities for older students to create resources for younger students
- Develop a student media team to create a digital materials to promote the school

4 http://www.firstlegoleague.org/
5 http://www.appsforgood.org/

# 8. Learning Spaces

The Link Observation Visits have shown that some Advanced Schools have made considerable changes to learning spaces to enhance the use of learning technologies. In most schools there has been investment in the development of computer labs to enable all the students to have individual or paired access to a PC. However, there are some rooms that are in need of updating and equipment does not provide adequate resources for students' learning.

Schools need to know the **learning spaces** that they have available and consider how they are being used. Lesson observations have been actively encouraged. This involves regular auditing and monitoring to understand how other areas could be exploited to support learning and teaching. Students can be involved in this review process and given opportunity to design new classrooms. Schools within the LSL project have been inspired to develop new learning and teaching spaces within their schools. In Brindisi, ITIS Majorana has developed a Future Classroom after teachers visited the Future Classroom Lab in Brussels. The plan is to develop similar spaces within certain departments across the school. **The teaching space has been adapted in different zones.** Students are able to gather around an interactive whiteboard for the first part of the lesson. The students then move to collaborative tables, but they are also given opportunity to work on their own individual devices too.

> Schools need to exploit the use of all spaces within school to support learning and teaching. Students should be involved in the review and design of learning spaces.

There are examples from the Link Observation Visits that show how schools are **looking at other spaces around the school to adapt and make further use of them.** This includes the **use of corridors for interactive displays and outdoor spaces** that have seating sufficient for a whole class to work together. In Czech Republic, an eco-classroom has been created outdoors. Teachers have to be prepared to adapt the space to enable better use of technologies, but this may also mean changes to the curriculum and teaching timetable and this involves more complex whole school decisions.

Some schools have fewer technologies available and have therefore made reservation systems for teachers to book the computer lab. However, this can result in some teachers not booking the equipment at all. Some schools have more practical sessions for teachers to share ideas. In primary schools, there are examples across the project where the use of computer labs has been challenged because teachers and students want regular and consistent access to technology as and when required, rather than on a timetabled basis. In fact, Advanced Schools have begun **to distribute the technologies in the main teaching rooms** and this could lead to the demise of computer labs as the demand to access technology is met by more affordable devices in classrooms.

Whilst the observations in the Advanced Schools highlighted classrooms with students sitting in rows or horseshoe style with the teacher delivering the content of the lesson from the front, there are notable examples of new learning spaces being created, for example, in the UK Broadclyst Primary School has equipped one room as a lecture theatre to allow all year 6 access to a PC. Two teachers work in the same classroom with access to a PC and three projection screens. In the UK secondary school, the year 7 and 8 students remain in one area of the school throughout the day. The students sit at round tables and the active movement of students is encouraged within the lessons. In Italy, in Istituto Comprensivo Cadeo and Pontenure, the students have access to a **number of areas within school that have been readily adapted to embrace the use of technologies and it is important to note that the curriculum has been adapted too.** In the library, the students can sit on large cushions and be mobile at work with their tablet devices.

The introduction of learning platforms emphasises the opportunities to ensure that access to learning is continuous. There are growing examples of students communicating with the teacher beyond the lesson time and outside school hours. **Virtual learning spaces are equally as important as physical spaces.** In the Advanced Schools observed, this has been achieved through the use of digital screens in the reception area, but also around the school in areas where students or visitors may go. Some schools present static information; however, there are schools that readily promote student success using short videos, TV channel information and further weblinks. Schools have also published information via Youtube or similar channels.

> Schools should use digital media to share examples of students' learning.

## Summary of best practice actions for schools to follow: **Learning Spaces**

- Establish a dedicated area to model future thinking
- Know how and when additional spaces around school are used including outdoor spaces
- Develop interactive displays in corridors or places where students or visitors go
- Know how and when technology is being used
- Provide digital displays of student success around the school
- Involve the students in a review of learning spaces and to design new ideas

# 9. Evaluation and Research

Throughout the LSL observation visits, teachers have communicated that there are few direct examples of schools engaging with research activities, although much of this discussion, is dependent upon the definition of what constitutes 'research'.

Not all teachers consider themselves researchers; in fact many believe this is the job of the academic, yet the connection between theory and practice needs to be nurtured for the pedagogical change to be determined effectively. The Living Schools Lab Project has developed and **used the STEPS plan for teachers to consider themselves as action researchers** and reflect on 'evidence' to inform their practice. Teachers have identified a particular topic and work with students or staff to document practice within the school. This then leads to a review and series of STEPS required to implement necessary changes. This action research is being undertaken in varying degrees across all twelve countries. At this stage, some of the Advanced Schools have used the LSL project as a first stepping stone to research beyond their own school projects. There are teachers involved in investigations across many of the Advanced Schools. Building this approach has been used to form the basis of the LSL course that has been developed as part of the project. **Teachers and academic researchers need to work together; connecting to other schools and undertaking investigations should become commonplace.** Schools need to get better at understanding why they are doing something in a particular way.

> Teachers and schools can use the STEPS plan developed as part of the Living Schools Lab project to support their whole school development planning process. This includes the expectation for schools to showcase, demonstrate and validate examples of practice.

Schools look to the national government agencies to provide access to evidence from research and development. The Advanced Schools have often strived to be exemplary role models in these studies, but this does not necessarily help them define their own actions.

Amongst the Advanced Schools, there are examples of teachers who have visited other schools to observe practice and to look at classroom organisation. At the beginning of the LSL project, these were usually identifiable as one off visits, but there is understanding of the mutual benefit to both schools in undertaking regular visits to provide opportunities for colleagues to explore how they can work together.

The findings from the TALIS 2013 Survey support this further, OECD (2014) comment: *"Teachers who report participating in professional development activities involving individual and collaborative research, observation visits to other schools, or a network of teachers are also more likely to use these practices."*

The LSL Advanced Practitioners have been encouraged to undertake their own research in school to enable them to determine how to mainstream the ideas that they have been trialling in one classroom across the school. The teachers have recognised the value in working with other colleagues in their school to share practice. Evidence

from the TALIS 2013 Survey (OECD 2014) supports these findings: *"the more teachers engage in individual and collaborative research, observation visits to other schools, and participation in a network of teachers, the more likely they are to apply innovative pedagogies. However, 51% of EU teachers say they never observe other teachers' classes and 17% of EU teachers never take part in collaborative professional learning."*

> Schools should identify staff with responsibility for disseminating useful research evidence and promoting opportunities to engage with research and development activities.

The Link Observation Visits show that Advanced Schools are involved in local, national and international projects and keen to be at the forefront of initiatives involving the implementation of technology. However, some of the schools have connected whole school development to a whole school focus and use this as a determining factor for engaging in projects. This shows that there are **"connected" ideas** across the school and teachers are less prone to work in isolation. There are opportunities for discussion and professional dialogue.

Across the Advanced Schools, there are examples of teachers within the school engaged in external projects. In some cases, these have been developed by individual teachers with a particular passion or interest; however, there are examples of projects that have been initiated by the leadership to attract funding for the school. One of the challenges is to ensure that the external projects are beneficial to the school and help the school to make progress. **School leaders have recognised how the value of being involved in developmental projects can influence whole school change.** This is because there can be funding available to account for staff time, and some projects give staff the opportunity to upskill as the tasks require activity with the students. In the Czech Republic, one teacher has been identified as a project manager across a number of innovation projects in school to secure funding and co-ordinate European projects within school. This role allows a single teacher to have an overview of how the ICT can be connected to potential collaboration and funding sources. Earl and Katz (2007) consider the different roles within networks and identify the role of the "connector" as the teacher who makes the formal links between their school and the network. In the Living Schools Lab, this role has been undertaken in the Advanced Schools by the lead teachers or the Advanced Practitioners.

There are also examples of **schools working with the local university**; this often begins with one teacher undertaking a higher level qualification. School leaders should look to formalise these links and consider the potential benefits of working with a researcher to support whole school development. Some teachers are involved in ICT research (e.g. use of tablets) as part of their Master's level degree (e.g. Norway, Finland).

> Schools should develop a partnership with a University or independent consultant to support the connection to evidence and research as a regular part of whole school professional development.

## Summary of best practice actions for schools to follow: **Evaluation and research**

- Prioritise a whole school focus
- Identify staff with responsibility to explore research funding
- Attend conferences to hear and disseminate school development and visit other schools to observe practice
- Connect with other schools to work on a common theme
- Consider a partnership with a University or independent consultant to support school research
- Provide regular opportunities for staff to share research/project ideas
- Make copies of research/evidence based publications available

# 10. Partnerships and Networks

The Advanced Schools in the project can demonstrate different ways in which they are working with partners. These are largely separated into three groups: parents and the community; other schools; businesses and commercial suppliers. It is a significant expectation for the school principal to hold sole responsibility for developing partnerships and networks. However, there are also lead Advanced School teachers who have additional responsibility as part of their job description to work with one or more of these types of partners. The benefit of **developing partnerships for the school** is not always financial, but it brings added value to improve the quality of educational provision for the students and the local community.

**Teachers can belong to a prolific amount of networks but these are only likely to enable the whole school to mainstream change when the network activities are interconnected to the school development plan.** This leads to the teacher engaging in follow up activities and sharing practice.

At a national level, there are other examples of successful networks, for example in Austria, schools can apply to be part of the ENIS[6] network; this initiative encourages the schools to showcase the use of technologies and provides opportunities for the teachers to meet together.

Some schools have drawn upon the skills of students using technology to build the partnerships with others beyond the school. For example, students have created videos promoting school achievements; students create newsletters or other digital resources. In some cases, these are led by an identified staff member, as part of a curriculum activity, but equally, there are schools that ask students to apply for the role of student reporter or media team member. These students can potentially help to promote the activities of the school and present a valid opportunity to increase partnership activities.

## Working with parents

Some schools have long established good links with parents and indeed, listened to suggestions for development and change. Across the Advanced Schools, technology is in use daily to provide increased levels of communication with parents. The information on the school website can promote the success of the school and share exemplary practice to a global audience. The website can be the initial link to building new partnerships. Parents welcome the provision of SMS services, email communication and social media. In some schools there are learning management systems or virtual learning environments that enable parents to access immediate information about attendance, learning materials and give detailed evidence of assessment and evaluation data. The challenge for schools is to ensure that staff engaging in the use of such resources is consistent. Parents can monitor progress, and provide further support as and when necessary, but only if the relevant data is made available.

Parents are providing funding to the school so that to their own children can have access to tablets, laptops or netbooks. This may be a single donation or an annual amount of funding.

Schools work in partnership with Parent Teacher Associations to provide additional funding for resources. There are examples of open days or **'digital learning days'** to enable the teachers and students to profile the use of technology within the school. Schools believe that this may help them to attract further funding. Schools invite local stakeholders to these events to raise awareness of what students are doing.

Some Advanced Schools that provide adult education classes in the use of technology; this may be with training to use a specific technology, but equally language classes or business administration where access to the technology is part of the experience. In some cases, this helps to generate additional income for the school. There are examples of activities to support families, in the secondary school in the UK, there is a scheme called "iFamilies" where parents and students attend classes together. This increases their knowledge of using the technology, but it helps to build student, parent and teacher communication within the school.

## Working with other schools

Schools recognise that it can be a challenge to work with local schools because there can be competition over student numbers.

However, within the Living Schools Lab project, the Advanced Schools have worked with local schools to build a Regional Hub. The aim of the hub is to encourage practitioners from the schools to work together to improve and develop their use of technologies within learning and teaching. The schools have been actively **encouraged to meet at a school** to give the teachers opportunity to share practice. As part of the project, the Advanced Schools have been asked to showcase their practice. This means that several teachers are willing to have their lessons observed, meet with other practitioners and demonstrate why they teach in a particular way. **Some schools have liaised to design common policies.**

The advantages can outweigh the disadvantages as schools can explore the benefit of joint procurement, joint training and CPD and increased professional dialogue. There are examples of primary and secondary schools

6 www.enis.at

working together and using technology to demonstrate successful transition activities. This includes regular swapping of staff with specific expertise. It includes examples of older students creating resources for younger students. (Italy, Lithuania) In Austria, the Advanced Primary School has been able to take up the offer of joint technology training because there are only a small number of staff.

One Advanced School shared evidence of working with another school to deliver higher level mathematics via Microsoft Lync. This is something that could be replicated or upscaled to include different subjects. It would also be possible to involve external experts, i.e. a University lecturer or a curator at the museum. There are technologies that allow written collaboration and this would enhance this type of work further.

Advanced Schools demonstrate considerable experience of working on projects with schools from different countries. Schools have **accessed additional money from European project funding.** However, this involves dedication and commitment as the processes of securing partnerships, deciding on appropriate tasks and deliverables, as well as completing demanding application forms can all take significant amounts of work alongside a teaching schedule. There are examples among the Advanced Schools of teachers who have been given a reduced timetable to secure project funding, but this does require a specific set of skills and experience. In the Czech Republic, the Advanced Secondary school has appointed a project co-ordinator with a 0.25 role to lead bids and co-ordinate projects. In the UK, the Broadclyst Primary School has secured US $25,000 funding from Microsoft to **establish school entrepreneurs** through a global project to create 10 international enterprises; whilst not directly an ICT project, it is dependent on communication and collaboration via the internet as it will connect a minimum of 20 schools in 20 countries.

**eTwinning**[7] is cited by several Advanced Schools as a useful place to establish links with other schools. This can be an opportunity for teachers to find partner schools and form the basis of future projects. Teachers can use the shared Twin Space to enable staff and students to communicate. Teachers have commented that this can also help with encouraging those who are less confident with technology to upskill because they can see the benefit for their students.

## Working with Businesses and Commercial Suppliers

**Schools have worked with local businesses to seek sponsorship** for particular equipment or to ask them to donate older resources to the school. Schools have developed partnerships with companies to provide technical support. In Belgium, a cluster of primary schools has jointly employed a technical support person so that each school is able to access the support for the equivalent of one day per week.

In some countries, the schools themselves do not work with the commercial suppliers and these partnerships are determined at a regional or national level. However, there are good examples of Advanced Schools that are working with the local audio visual (AV) company to provide technical support and to advise the school about ICT infrastructure.

A few Advanced Schools are involved in **ambassador programmes with commercial suppliers.** These enable the school to showcase good practice, but there is subliminal promotion of products. There is sometimes a mismatch between the schools that have been identified at a national level by the Ministry of Education and those that are identified by particular companies because they have made significant investment in particular equipment. It would be beneficial to give further consideration to how these different types of schools can support the mainstreaming of change across other schools. Commercial suppliers could connect with Regional Hubs and establish a more direct link to leading practitioners to develop new scenarios. This strategy has been adopted within iTEC, and it could be expanded to encourage teachers to engage in action research to ensure commercial suppliers are developing the pedagogical examples to underpin their products.

The financial and economic challenge has meant that schools have found it hard to purchase new equipment. There are examples of Advanced Schools who have worked with local businesses to either sponsor new equipment or to take their older equipment which is usually adequate for most classroom activities and accessing the internet. In addition, schools have had equipment sponsored by particular companies, particularly when the school is in a nearby location to the business. There is an opportunity for some schools to look at joint procurement options to identify local businesses that may be willing to sponsor new equipment or to allow schools to have technology that is being replaced.

There is evidence of schools using facilities and resources beyond the school day to generate additional income for the school. There are also schools making resources available to the local community.

7 http://www.etwinning.net

# Section C:
# Mainstreaming Change

In this section, the observations and documentations that have been captured as part of the Link Observation Visits or shared by the Advanced Schools during the course of the project have been categorised within a Framework for Mainstreaming Change. The Framework is not a panacea, but aims to provide all schools with some key recommendations that can be introduced to mainstream the use of ICT across the school.

There is an initial outline of four types of Advanced School defined and these are cross referenced against the key headings from the evidence within the project. After reading the descriptors, schools should refer back to the **summary of best practice actions** at the end of each of the section above, and consider how they can develop some of the practices that have been implemented across the LSL network.

## Reactive Schools

**Reactive schools showcase** the use of new technologies, but the implementation of new equipment has not been directly connected to whole school developments in learning and teaching. There is evidence of technologies being introduced to the school on a regular basis, but developments are connected to enthusiastic teachers or technologists in school. The school may have been involved in a single initiative or attempted to raise the profile of the school through the implementation of technology. The practitioners in the school may be familiar with the potential benefits of research, but at this stage the practitioners contribute to developments as and when opportunities arise. The work of the school may have been captured by an external consultant and published to a wider audience.

## Responsive Schools

These schools will be able to plot a series of technologies and initiatives on a timeline, but at the same time, the school has recognised a need to be able to respond to outside influences at a local and perhaps national level. Notably, this type of school tries to respond to top down changes and seeks opportunities for enthusiasts to engage in projects that may support staff interests or benefit the students within the school. **Whole school change is largely dependent on external guidance** or influence. This can include a competitive response where schools implement particular technologies because it is current or because other schools have begun to do this. However, there is not enough evidence of a collective vision from the whole staff and the changes are too dependent upon the technologies alone. The school may have been involved in projects and some of these may have been at a national or European level; however these are not specifically linked and may be sporadic across the timeline of activities. The projects are frequently linked to one or two individuals within school with particular interests or partnerships.

## Connected Schools (Investigative)

**Connected (Investigative) schools have a strategic approach** to the implementation of technology. The head teacher and senior leadership team recognise the benefits of using technology for learning and teaching. There is a shared understanding that technology will be used to explore whole school developments and begin a process **that supports more systemic change.** Some staff in school will be involved in **collaborative projects (investigations) both within and beyond the school. There is evidence of shared themes and connected discussions about professional development** of teachers and whole school innovation and development. Connected schools consider technology as a solution and an enabler to whole school development and continuous improvement.

The school has understood the need to be involved in national and pan-European projects as these offer opportunities for schools to collaborate to explore identified themes.

The school understands the need **to use media** to share the developments about learning and teaching using technology.

The **students are able to contribute** to the developments within the school. The students have the opportunity to express their opinions.

## Interconnected Schools (Collaborative)

Staff throughout the school will **understand the shared focus across the school.** This means that staff at all levels know the key themes for innovation and development within the school. There are shared timelines and project activities for whole school development. The senior leadership team will coach and mentor other schools to investigate identified aspects of school development with an understanding of the need to produce evidence and outputs.

There is a team in school who are engaged in external activities outside the school to promote the school profile in the development of learning and teaching. These are not necessarily dependent upon technology; however, there is a shared understanding within the school that **technology plays a significant role in the pedagogical changes** that are continually evolving in school.

There is an expectation that **staff will be involved in action research or projects** that require investigation and demonstration of outputs. Staff are **regularly involved with innovative developments** and are keen to be at the forefront of change where they are exploring new ideas.

Schools use their data to inform the developments within their own school. The school recognises the benefits of working with other schools is to build knowledge within the ecosystem, to develop new concepts and gather evidence to support thinking.

The **school works with commercial suppliers** and **understands the need to validate new products** and **materials to inform school development** and to **provide evidence that will continue to build the showcase for the school.** Teachers believe that it is part of their responsibility to improve educational products before they are mainstreamed. **Staff are able to lead validations and contribute to research.**

## LSL Course

The framework underpins a **new training course** for schools on developing a whole school approach (ref. D.5.3) with the ideas tested and discussed in close consultation with the National Co-ordinators, Advanced Schools and Advanced Practitioners from across the Living Schools Lab project.

# Framework for Mainstreaming Change using ICT

The framework provides some key descriptors for each of the four defined profiles. School leaders can use these descriptors to identify gaps and use the best practice actions outlined within the report to plan how technology could enhance the development of learning and teaching, supporting whole school improvement.

## Key descriptors based on observations: REACTIVE PROFILE

### Innovation and whole school change

- A single teacher or very limited numbers of staff are able to demonstrate a particular focus on the use of technology. Not all staff in school make active use of technology within learning and teaching.
- The school actively promotes the use of ICT, but there needs to be a direct connection to the development of learning and teaching within school.
- An expert group in school work with each other, but there focus is on the use of technology rather than the development of pedagogy.
- The school may have developed a showcase within the school, but this is perhaps centred on one area and does not involve the majority of staff.
- The funding plan needs to include a strategy to refresh and replace existing equipment, rather than implementing pilot ideas.

### Infrastructure

- The school has succeeded with the implementation of at least one specific technology and is considering how new technologies will influence other potential changes to the learning and teaching.
- Technology is being used by experts or enthusiasts, but sometimes access for students is inconsistent.
- The school is keen to be involved with piloting new technologies but does not always consider how they are mainstreamed across the school. Staff would benefit from additional professional development opportunities that consider the pedagogical implementation of ICT.
- The school has implemented connectivity, but not necessarily considered the impact as the number of devices will grow.

## National and international initiatives

- An individual member of staff is enthusiastic in a particular area and has been able to establish connections to other like-minded colleagues. This may have led to shared activities and in some cases work on a project. However, the developments are not necessarily linked to the whole school developments and may be dependent upon staff or resources.
- The school may have a desire to connect with others and work at a European/International Level.
- School is aware of national developments. However, at this stage, the school will do what is necessary to be able to deliver the current curriculum.
- The school actively promotes its use of ICT in local or national publications.

## School Leadership

- The school has implemented a range of technologies, but change in school is highly focussed on one specific technology
- Innovation is at classroom level or highly focussed on one particular aspect of technology or a specific area of the school.
- There is at least one enthusiast for the development of ICT.
- Advanced Practitioners take responsibility for ICT with support from the head teacher.
- There is a lack of clear vision for how ICT is connected to developments in learning and teaching.

## Training and professional development

- Teachers organise their own professional development in school. This is usually led by an enthusiast or proactive user.
- There is a small group of enthusiasts who share ideas across the school on an adhoc basis.
- Whole school training is given by commercial suppliers and this is usually a technical introduction to using the equipment.

## Integration of ICT across the curriculum

- The school is able to show how they are using specific technology/technologies.
- This is now happening across more than one department in school and colleagues are also aware of developments.
- Students expect to use ICT for their learning and teaching in certain classes in school.
- There is evidence of classroom management or lesson ideas being introduced across some groups or departments.
- There is access to a range of digital resources in school.
- Resources are stored and accessed systematically by staff and students, but this may not be a whole school approach.
- Some staff belong to professional learning communities to discover good ideas and share best practice.


## Student involvement

- There is no direct policy for involving students in developing the use of ICT in school.
- The school shares student work and promotes how the students are using ICT.
- The students recognise the school commitment to the use of technology and can make suggestions about how it could be developed.

## Learning Spaces

- There may have been changes made to one room or area of the school, but this is only used by enthusiasts/small group of staff.
- Most learning spaces have not been adapted.
- The technology has been placed in the existing learning space.

## Evaluation and research

- At this stage, the involvement of the school or individual teacher is based on interest.
- The practitioners in the school may be familiar with the potential benefits of research, but at this stage the practitioners contribute to developments as and when opportunities arise.
- The work of the school may have been captured by an external consultant and published to a wider audience.

## Partnerships and networks

- The school may have some examples of partnership working, but these are limited.
- Staff attend events, but these are often related to their personal interests.
- Details from partnerships could be shared further across the school to benefit more staff.
- The school may work directly with one particular supplier who has provided equipment to the school.
- Individual teachers may be involved in projects, but these are not always cascaded to other staff.

# Key descriptors based on observations: RESPONSIVE PROFILE

## Innovation and whole school change

- The school is trying to make progress in the use of technology and responds to government guidelines. Technology has been introduced consistently over a number of years.
- There is a small team of ICT evangelists in school and there is usually someone who takes overall responsibility. This person may have been allocated a reduced teaching timetable to support innovation and the use of ICT in school.
- There is a whole school focus on developments in learning and teaching;
the school has defined a clear pathway for innovation. Staff in the school share their ideas/ findings with each other.
- The school has worked with at least one other school on the use of ICT within learning and teaching, but this could be formalised as a project idea.

## Infrastructure

- The purchase of equipment is focussed. The school has responded to the changing environments anticipated within education. The school understands the need to refresh and replace technologies, however at present technology is not always the most significant priority.
- The school demonstrates access to a range of technologies; but the school is not able to provide evidence of access and current levels of use or evidence of a broad range of activities.
- There may be some technologies in school that could be used more effectively. Whilst there is a learning platform to connect school and home, this is not yet used consistently across the school.

## National and international initiatives

- The school has been identified by an advisor or inspector at a regional or national level because of the work of one or two members of staff within the school. This does not necessarily involve the whole staff in school.
- The school may have a desire to connect with others and work at a European/International Level.
- Certain staff are keen to demonstrate practice in relation to regional /national developments.
- The school addresses the latest guidance and most staff work towards being appropriately skilled to deliver the National Curriculum.
- At a regional level, there is an awareness of the activities the school is involved in and a desire to build upon these, however, it is dependent on individuals in the school and at a regional level to remain in close contact and continue to seek new ideas.
- There are teachers participating in subjects networks or online communities, but the activities are not always shared with other staff.
- The school actively shares through publications how it is involved with national and international initiatives.

## School Leadership

- The school has a single enthusiast/small group of staff who understand the potential of using technology to enable pedagogical change.
- The senior management team are responsive to suggestions and supportive of developments within school; however the school may have many priorities with no real direct whole school focus on using ICT within learning and teaching.
- Innovative ideas emerge largely from national initiatives or interest in global trends.
- There are opportunities to share development ideas within school.
- There is a strong focus on improving learning and teaching using ICT in lesson time.
- Occasionally, some staff may visit other schools to observe practice or gather information to support school development.

## Training and professional development

- Training is available or made accessible if required, depending upon funding available.
- The school has begun to connect the training needs with the need for whole school change.
- Trainers have been identified in school to lead sessions with small groups. There may be opportunities for team teaching.
- Enthusiasts work with colleagues beyond the school to further their own knowledge and then share these ideas with staff.

## Integration of ICT across the curriculum

- The school is able to demonstrate effective use of ICT across 3 or more curriculum subjects or school departments. There are some plans for next steps.
- Some staff are regularly producing materials at classroom level that have been demonstrated to other colleagues.
- There is an online learning platform in school and a significant group of staff provide access to learning materials for students.
- There is opportunity to share practice across the school from external professional learning communities on a regular basis.
- Some staff are using technology to capture student response in lessons to support formative assessment.
- Some staff are involved with collaborative projects with students in other schools; this is restricted to specialists/enthusiasts.
- Staff belong to professional communities about the use of ICT and use this to develop knowledge across the school.

## Student involvement

- Lesson activities provide opportunities for students to demonstrate their use of technology across the wider school.
- Students have been involved in whole school initiatives from time to time and they support teachers as and when required.
- The students could be involved in training activities or supporting the school to develop the digital newsletter or an increased media presence.
- The school occasionally seeks student feedback about the use of ICT within learning and teaching in school. However, this could be documented formally on a regular basis.

## Learning Spaces

- There have been changes made to at least one or two learning spaces in school to allow greater access to technology. This includes the provision of computer labs and access to technology in classrooms.
- Other areas of the school have been adapted to provide technology; however this can sometimes be used by more staff and students.
- There are some digital displays around the school, but these are generally static or provide limited interaction.

## Evaluation and research

- The practitioners in school have an awareness of the benefits of research and recognise that engaging with this type of activity will be helpful at an individual level, but may also support the school developments.
- At this stage, the involvement of the school is largely dependent upon a single enthusiast.
- The school/individual is likely to be known at a local/national level for the developments in the school.
- The individual has captured the intervention and is able to demonstrate the steps to replicate the ideas. The work of the school may have been captured by an external consultant and published to a wider audience.
- There is professional dialogue taking place that is linked to an action plan.

## Partnerships and networks

- The school recognises the need for external partnerships with parents, other schools and commercial suppliers, but there is room for growth.
- The school offers events for parents and the local community to demonstrate the use of technology.
- Activities are not necessarily connected, but dependent on a number of key staff.
- The school has connected with other schools to develop ideas, but there are further opportunities to connect with joint projects.
- The school is connected to other schools to gather new ideas and to inform developments. This is usually dependent on individual staff expertise.

# Key descriptors based on observations: CONNECTED PROFILE

## Innovation and whole school change

- The school works with other schools on a regular basis.
- Staff at the school are involved in local or national projects and regularly disseminate their findings at conferences.
- The school has established at least one European Project and is also linked to other national initiatives, but may not have formalised ways of collecting evidence to show the benefits of this.
- The school works with a University or external agencies to engage in research and evaluation projects.

## Infrastructure

- There is an expectation within the school that most/all classrooms will have access to the same standard and level of equipment regardless of department or subject.
- Teachers know that all areas of the school have access to technologies that allow staff and students interaction within learning and teaching.
- Teachers can readily plan for the use of technologies and know the provision is reliable.
- The school learning platform has been implemented; the majority of staff and students make active use of the systems available. Parents are able to access information about their child.
- Students and parents can communicate with the school about learning materials both within and beyond the school day.

## National and international initiatives

- The school is involved in regular collaboration with projects at a regional level with knowledge of the bigger picture at a national level. Projects may be largely technology focussed.
- The school seeks opportunities at a national and international level to engage with projects that involve a number of staff.
- The school has regular meetings to ascertain how current national initiatives or ideas will impact upon whole school development.
- Staff within the school are part of professional learning communities and cascade this information to other staff in school on a regular basis.
- Staff are involved in investigative work and regularly disseminate their findings at regional or national events.
- The school contributes to publications that promote the work of the school.

## School Leadership

- The head teacher drives the change and has identified a team of staff to work together on mainstreaming change across the school.
- A project co-ordinator or change leaders in school are connected to several developments
- The school is highly project focussed and there is a group of staff who are connected to whole school developments.
- Teachers work with other schools, but usually to develop ideas for the school, rather than wider education community.
- The head teacher and school leaders have recognised the need to connect school and home, enabling the student as a lifelong learner.
- Some staff visit other schools to observe practice and connect on the use of ICT within learning and teaching.

## Training and professional development

- There is a whole school plan for professional development; this is connected to the review of the use of ICT within learning and teaching.
- There is a regular schedule of training available as introductory and refresher courses.
- At least two staff have been identified in school to deliver training to other colleagues. There are opportunities for team teaching and lesson observation to see ICT being used with the students.
- The school is working with other schools to lead training sessions, and equally sends staff to external events for professional development activities.

## Integration of ICT across the curriculum

- There is clear evidence of how ICT is being used across all subjects and a plan for next steps within each department.
- The majority of curriculum subjects or school departments include at least one teacher who is recognised as a leading user of ICT.

## Student involvement

- There is a group of student leaders established within school.
- Staff know that they can ask certain students for support in lessons.
- Students are involved with showcasing their work in various digital formats and this is published on the school website and in other online spaces.
- The school collates regular feedback from students about learning, teaching and the use of ICT within school.

## Learning Spaces

- The school has recognised that changes to the design of learning spaces are needed to enable the effective use of learning technologies.
- The school has made changes to increase access for students and to allow greater opportunities for collaboration.
- Virtual spaces have been developed to encourage personalised learning.
- There are digital displays around the school that provide access to information and are regularly updated to include student achievements.
- Students can contribute ideas about the use of learning spaces as and when changes are made.

## Evaluation and research

- There is a whole school focus for development and research which may not involve all staff, but all staff know about the work and recognise the benefit to the school, students /community.
- One or two members of staff have engaged with investigations or research projects and have begun to document their work. Some of these ideas are connected to whole school developments to mainstream the changes. Outcomes are published externally.
- Other staff are kept informed and the school is also involved with dissemination at a local and national level to showcase the work of the school.
- Other staff are kept informed and the school is also involved with dissemination at a local and national level to showcase the work of the school.

## Partnerships and networks

- The school has developed external partnerships and sees these as valuable to the potential developments across the school. Some partnerships and networks are included within the school action plan.
- Partnership events are co-ordinated by a designated person within the school.
- There are opportunities for parents and students to work together.
- The school is working with local businesses to support development. This may be in the form of sponsorship or to ensure the use of technology in school prepares students for lifelong learning.
- The school is working with other schools to support the work of the school, but also to enable teachers/students to create new materials and resources. This is connected to the wider whole school development focus.
- There is a dedicated group of staff working with commercial suppliers to share examples of practice, develop new concepts and pedagogical approaches. The outcomes are captured by an external consultant and shared with a wider community.

# Key descriptors based on observations: INTERCONNECTED PROFILE

## Innovation and whole school change

- The school has an established internationalisation agenda that enables them to connect with other schools across the globe. This is for the benefit of both staff and students.
- The head teacher takes an active lead in promoting teachers as ambassadors and is able to draw upon several members of the staff to lead with initiatives.
- There is a recognised group of staff who are engaged in collating evidence to contribute to whole school development.
- The school contributes extensively to research and evaluation projects with a strong focus on the use of ICT in learning and teaching.

## Infrastructure

- The school has established a baseline level of technology for all teaching rooms and throughout the school.
- Staff and students have access to a range of devices to suit their teaching and learning needs.
- There is reliable and robust internet connectivity and there will be appropriate wireless access for the number of mobile devices available.
- The learning platforms have been fully integrated into school life and beyond the school day. Teaching and learning materials are fully accessible.
- The school has a clear investment strategy for existing technologies and the introduction of new technologies.

## National and international initiatives

- The school is recognised at a national level for the implementation and effective use of technologies within learning and teaching.
- The school works with other schools and supports them to improve their practice in the use of ICT within learning and teaching.
- The school regularly disseminates ideas and contributes to national conferences. The school leads or takes a leading role in a Regional Hub developing practice in the use of ICT.
- Staff within the school publish their ideas internally with other colleagues and with external audiences on a regular basis.
- The school offers new ideas to the research community and contributes to external publications.

## School Leadership

- The head teacher is driving the change with strong team of staff who are interconnected and strongly influenced by the bigger national and international picture in education. The school has defined roles for many/all staff with regard to the use of technologies.
- The vision for school development is clear.
- The school has a learning and teaching strategy. There is evidence of a whole school focus over a defined period of time.
- Staff regularly collaborate with other schools to develop new ideas and to build new knowledge on a focussed theme.
- Teachers regularly demonstrate the use of technology to other schools through lesson observation. (This may include video or remote observation.)
- Staff visit other schools regularly to observe practice as part of whole school professional development activities.

## Training and Professional Development

- There is an annual plan for CPD across the school. This is usually a blend of internal and external courses.
- The school will have identified a number of key themes or areas for development across the schools.
- There are courses available for all staff to attend.
- Most/All staff in school have an open door policy and are willing to share practice.
- Teachers are encouraged to observe other colleagues within the school and in other schools.
- Trainers have been identified in school and regularly team teach or provide pedagogical support and ideas.

## Integration of ICT across the curriculum

- There is clear evidence of how ICT is being used across all subjects and a plan for next steps within each department.
- Students in school expect to use ICT for their learning and share evidence of how ICT benefits their work.
- Students have access to a range of individual activities which demonstrate personalised learning. Student work is collated into a digital portfolio.
- There is a whole school approach to access data and lesson information. This is central to whole school development.
- There are opportunities to collaborate with other schools/external organisations to support learning and teaching. This includes live collaboration within lesson time to enrich or enhance the learning experience.
- Staff belong to professional learning communities and contribute new ideas to the wider education community about effective use of ICT within learning and teaching.

## Student involvement

- There is an established plan for developing student leaders within school. This may be through student trainers and/or student media reporters.
- The school collates regular feedback from students about learning, teaching and the use of ICT and uses this to inform school development planning.
- Students lead aspects of the school showcase by determining the content and format of certain activities or publications.

## Learning Spaces

- Changes are being made within the school to learning spaces to embrace the technological and pedagogical changes required. This is not a fixed and final change but seen as part of an ongoing plan to address student and staff needs.
- There are digital displays around the school that provide access to information, student achievements, but also reflect very current activities including video material.
- Students are involved with the review of learning spaces and there is a group of students who can contribute to ideas

## Evaluation and research

- There is a whole school focus for development and research which involves all staff and is linked to training and professional development across the school.
- The school has a number of investigations that stem from either one single theme or a number of themes that are known and disseminated on a regular basis.
- The school is able to provide support to others to look for opportunities to gain additional funding to lead investigations, research and development. The school can demonstrate to others how to mainstream change by upscaling or replicating innovative ideas.
- The school offers new ideas to the research community and contributes to external publications.

## Partnerships and networks

- The school is able to demonstrate the benefits of partnerships and networks. There is at least one member of staff who takes responsibility for establishing and developing partnership activities within the school action plan.
- The school has established strong links with parents, other schools and commercial suppliers and actively uses these for the benefit of the whole school.
- The school regularly contributes to activities beyond the school, including projects, competitions and also encourages students to be entrepreneurial.
- The school is working with other schools to enable teachers and students to develop new concepts and pedagogical approaches. The school seeks partners to build capacity and to expand opportunities to upscale findings.
- The school works with commercial suppliers to share examples of practice, develop new concepts and pedagogical approaches. The school captures the evidence and publishes findings to the wider community.

# Conclusions and Recommendations

Innovative practice in schools is hard to capture; what some practitioners take for granted in their everyday world is light years away from where others long to be. Inevitably, access defines school practice, but there are other factors that cannot be ignored and these need to be given further attention to enable schools to mainstream change: school leaders need to drive the vision; teachers can no longer work in isolation, they have to collaborate to learn from others and share examples to gather evidence of what works. Teachers need to investigate school development as part of their everyday practice, engaging in the action research process.

This section draws together the following conclusions from the Living Schools Lab project Link Observation Visits into a set of recommendations and actions related to the mainstreaming of best practice and whole school approaches to ICT development.

## 1. National Responsibility

Although Ministries restructure and the role of national agencies change; schools continue to need advice support and guidance to make appropriate decisions about the purchase of new technologies in school and to maintain the standard required to refurbish, refresh or replace existing equipment. Schools benefit from advice and guidance at a national level. Schools need to see examples of good practice and understand how to access appropriate training and professional development. National agencies or pedagogical advisory groups should work with schools to establish regional hubs and networks to share practice and work collaboratively. Identify lead schools to engage in further research about whole school development using technologies. This could include funding ambassador schools to undertake investigations and publish findings to support national developments. Regional Hubs could be given funding to support specific activities. Pilot schemes organised at a national level should be offered for schools to trial new technologies to enable schools to explore how to integrate the use and application of the technologies within the curriculum.

## 2. Funding

Schools leaders need to meet with those responsible for regional funding on a regular basis to understand what might be in the pipeline and to enable regional leaders to understand how students' learning opportunities would be enhanced with the implementation of technology. Schools need a separate 'funding line specifically for ICT. This includes the need to replace, refurbish or refresh existing equipment. There is a direct need for schools to plan for change beyond the pilot phase.

## 3. Vision

All schools should have a written and communicated vision that considers the kinds of whole school change envisaged, and give examples of scenarios showing how technology is part of this. A school plan needs timelines, with key dates for review. It also needs defined actions with key staff assigned responsibilities. It is helpful for schools to have actions for 12months, 2-3 years and longer plans which might take 5 years to realise. The school should have a learning and teaching strategy that embeds the use of technologies across the curriculum for all students.

## 4. Staffing and Professional Development

Schools should identify a teaching and learning team with time to discuss and implement innovative practice. There needs to be a clear distinction between technical and pedagogical support. School leaders and teachers should observe practice within the school on a regular basis. There should also be opportunity to observe practice in other schools.

Teachers should be given an allocated number of hours for ICT training and professional development each year. European guidance with a standardised entitlement to training would support all schools that are trying to mainstream the use of technology. Schools should audit staff development needs and understand how the training of individual teachers supports the whole school focus. Schools should identify at least two staff trainers who can share practical ideas with other colleagues on a regular basis demonstrating the use of technology across the curriculum. This should include opportunities for team teaching.

Teachers need professional development opportunities to observe practice and to develop practice with others. Teachers would benefit from European standards for professional development entitlement linked to career progression. Funding opportunities should consider collaboration within and between schools to develop teachers as investigators and researchers.

## 5. Access

Schools need a minimum specification of equipment for all classrooms. This should include at least a desktop or laptop computer, reliable and fast internet connection and the means to share digital resources with all students. Internet connectivity should include robust wireless access in all main areas to allow staff and students' access to individual devices. National authorities should ensure that schools are given advice and guidance about this provision.

## 6. Curriculum and Resources

Schools should look to use cloud based services to support access to learning materials, communication and feedback beyond the lesson time. Schools should consider how learning materials and digital resources are made available and shared to allow synchronous communication. Schools should ensure that students can receive electronic feedback and develop a digital portfolio for each student. The curriculum needs key level descriptors for the use of ICT with details of how software and applications should be accessed at a particular age/stage to show progression and achievements. This should include training videos of classroom practice and examples of students' work. Schools should establish clear e-safety guidance for staff and students.

## 7. Students

Schools should involve students in whole school development. This should include gathering feedback about the use of technology. Schools should establish student digital leaders who can provide support to other students and staff. Digital leaders can also be involved in the decision making process about innovative developments in schools. Schools should give students the opportunity to support the development of the school showcase promoting the profile of the school with student work. This may include the development of a student media team.

## 8. Learning Spaces

Schools should audit and monitor when and how technology is being used. The computers in the lab (particularly at primary level) may be accessed on a more regular basis across the curriculum if the equipment is distributed. Schools that have a high ratio of computers for students should look at how other resources are used within the computer lab. Schools need to exploit the use of all spaces within school to support learning and teaching. Students should be involved in the design and use of learning spaces. Schools should use the school website and the learning management system to provide a virtual showcase for the school. Schools should use digital displays to share examples of students' learning.

Learning spaces could be adapted to make better use of learning technologies. There should be a European standard for the minimum expectation for access to technology within a teaching room. This should include fast and reliable internet connectivity. Some of the Advanced Schools demonstrate that for some subjects, it may be more useful to have access to a smaller number of computers for students to work on rotated independent activities. There is also evidence of other rooms being adapted to make use of technology, for example a Science room or the library. The computer lab or ICT teaching room is no longer used just for the teaching of ICT, it is being used across many curriculum subjects.

## 9. LSL: STEPS plans, Showcase–Demonstrate–Validate, Regional Hubs

The processes of 'Showcase- Demonstrate- Validate' have worked well within the Living Schools Lab project to enable the Advanced Schools and the Advanced Practitioners to consider how the school development plan is moving forward. This could be continued and replicated by other schools. The school could engage with a research partner at a local university or an independent consultant to support with documenting evidence of change. Teachers and schools can use the STEPS plan developed as part of the Living Schools project to support their whole school development planning process. This includes the expectation for schools to showcase, demonstrate and validate examples of practice.

School leaders should work with other schools to develop ideas for innovation. Schools may find it helpful to work together on a similar theme(s). Schools should explore collaborative projects with other schools as these may provide opportunities for additional funding, create opportunities for students to work together across different schools and enable staff to access professional development/training.

The Regional Hubs working within the Living Schools Lab project have highlighted the importance of creating working clusters that are located near to each other as this allows teachers opportunity to visit and work together in face to face sessions more easily.

**Regional Hubs should:**

- Have a common focus for Advanced Schools and Advanced Practitioners and bring teachers together (face to face or online) to address common issues and potential resolutions.
- Meet 2-3 times per year
- Meet with regional funding bodies to discuss access to shared support for schools. Whilst regional funding is likely to be varied, there should be a more direct link to the school leadership about how this is connected to long-term development. E.g. it is not productive to provide schools with a pot of funding that is unconnected to whole school plans.
- Explore opportunities for joint training in schools, for example, schools may be able to cluster together and share expertise.
- Seek opportunities to explore additional funding for professional development and ICT infrastructure and collaborative projects to investigate practice.
- Support schools to develop a broader focus for whole school development, rather than a technology-specific plan.
- Explore opportunities to work with commercial companies to access new resources, professional development and opportunities to undertake investigations to develop concepts and pedagogical approaches.
- Publish investigations and findings to the wider community

## 10. Partnerships and Networks

Schools should develop a specific action plan to show the priorities for developments within partnerships and networks. This should include activities with parents and the school community; local businesses and commercial suppliers. Staff should be encouraged to join face to face networks and/or online learning communities to collaborate on whole school development themes. Schools should develop a partnership with a University or independent consultant to support the connection to evidence and research as a regular part of whole school professional development. Schools should identify staff with responsibility for disseminating useful research evidence and promoting opportunities to engage with research and development activities.

The first priority for all schools is therefore the provision of appropriate access to technologies for learning and teaching. Classrooms need a minimum specification of technology and connectivity; teachers need technology to prepare lesson materials. Students will need devices to give them lifelong skills that are dependent on technology to communicate, research information and to present to an external audience. Yet, adopting a continuously reactive approach to implementing change is dangerous as it depends on the enthusiasts and rarely becomes embedded.

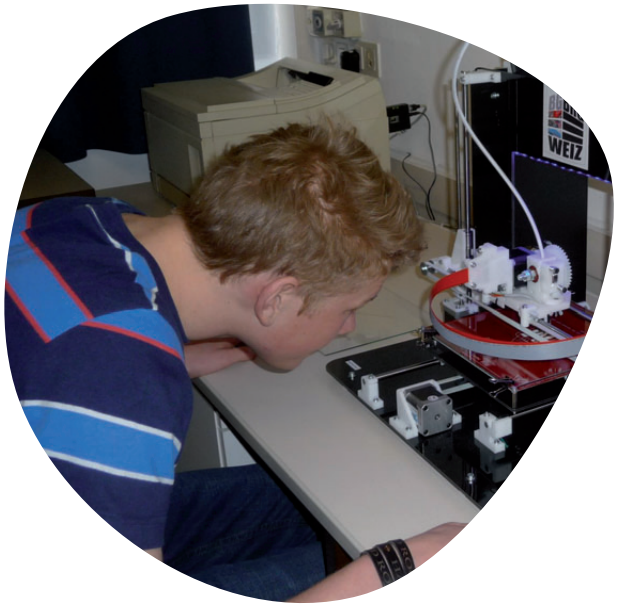
Michael Barber et al (2012) in the essay 'Oceans of Innovation' comment: *The challenge is that while education reformers are seeking to design a system for 20 years ahead, teachers struggle with the present and parents remember the system of 20 years ago: the conceptual gap is therefore 40 years – a major communications challenge which governments and educators often underestimate. You could argue that the gap is even bigger than this, given that school students of today will still be part of the global workforce 50 years from now.*

Schools need to become connected and collaborate with others. Connected schools and Interconnected Schools understand that implementing effective use of technology is central to whole school development. As Fullan and Donnelly (2013) acknowledge: *"the complex and dynamic relationship between technology, pedagogy and change knowledge will need to be developed and nurtured if we are to get whole system reform."*

The Living Schools Lab has created a network of teachers and schools that have worked together across 12 countries; developing Regional Hubs; implementing STEPS plans, working on collaborative themes to showcase, demonstrate and validate the use of technology, observing classroom practice, building opportunities for professional development and above all growing a professional learning community to show how collaborative school development can mainstream change in schools.

> "Innovation does not happen in isolation... Collaborative school-to-school development is an ongoing necessity of ALL schools so that we can demonstrate the benefits for students and teachers of working together to enable systemic change."
>
> Diana Bannister, University of Wolverhampton
> May 2014 Living Schools Lab Summer School, Dublin

# Glossary of main terms



**Countries involved in the project**
Austria (AT), Belgium (BE), Cyprus (CY), Czech Republic (CZ), Finland (FI), France (FR), Ireland (IE), Italy (IT), Lithuania (LT), Norway (NO), Portugal (PT), United Kingdom (UK)

**National Coordinators**
National Coordinators (NC): the main point of communication and contact for the LSL schools at a national and regional level, coordinating across the schools, supporting the development of the regional hubs, the observation visits and dissemination through the Community of Practice (CoP) and national focus group.

**Advanced School (AS)**
Where technology is embedded in teaching and learning across the whole school.

**Advanced Practitioner School (AP)**
Where technology is only partially embedded within the school.

**Regional Hubs**
AS/AP schools meet together to exchange practice and support each other. This can be at national/local level. Meetings can be face to face or virtual.

**Showcase, Demonstrate, Validate**
Showcase-Demonstrate-Validate are central aims of the project and this is embedded in the school STEPS plan (Share, Teach, Evidence, Plan, Support).

- **Showcasing:** where schools share/'showcase' existing practice, something they already know. Often this is linked to showing something unique about the school/classroom.
- **Demonstrating:** examples of innovative practice teachers 'demonstrate' to others in the LSL network, showing how they can be mainstreamed and replicated across other schools. This is something for others, so that they can follow an example of innovative practice.
- **Validating:** areas of innovation and change teachers are currently working on/trialling in the school. It is something that teachers in school are not ready to showcase or demonstrate to others. For the Advanced School, this might be captured the lead teacher's STEPS plan, but it may only apply to certain individuals and does not necessarily involve the whole staff.

**STEPS plan and Themes**
STEPS plan: the common framework and terminology for school development across the project (SHARE, TEACH, EVIDENCE, PLAN, SUPPORT). Each of the AS and AP schools selected a key theme to follow as a focus during the project and share with other schools in the network through the regional hubs and CoP. Using the STEPS plan framework, AS worked with AP to see how their practice can be shared and developed at a National level in the Regional Hub, but also as part of the Living Schools Lab EU network.

**Community of Practice (CoP)**
Sharing practice, knowledge and resources across the LSL network.

**Continuous Professional Development (CPD)**
Including forums, webinars/Learning Labs, workshops.

**'Learning Snacks'**
Short CPD learning events, shared through the LSL CoP.

**Primary schools**
Providing education up to 11/12 years

**Secondary schools**
Providing education 11/12 years to 19 years

# References


1. Barber, Michael. Donnelly, Katelyn and Rizvi, Saad. (2012) Oceans of Innovation: The Atlantic, The Pacific, Global Leadership and the Future of Education. (An Essay) Institute for Public Policy Research

2. Béchard, J.-P. (2001). L'enseignement supérieur et les innovations pédagogiques : une recension des écrits. Revue des sciences de l'éducation, XXVII(2), 257-281.

3. Bergmann, Jonathan. & Sams, Aaron. (2012) Flip Your Classroom: Reach every student in your class every day. International Society for Technology in Education (ISTE) Kindle Edition ISBN: 978-1-56484-315-9 (pbk)

4. Church, M., Bitel, M., Armstrong,K., Fernando,P., Gould,H., Joss,S., Marwaha-Diedrich, M., de la Toore, A. and Vouhé, C., (2002) Participation, relationships and dynamic change: New thinking on evaluating the work of international networks. (London, University College)

5. Earl, Lorna and Katz, Steven. (2007) Leadership in networked learning communities: defining the terrain, School Leadership and Management: Formerly School Organisation, 27:3, 239-258

6. Fullan, Michael. (2006) Change theory: A Force for School Improvement. Centre for Strategic Education Seminar Series Paper No. 157, November 2006. Victoria, Australia.

7. Fullan, Michael. & Donnelly, Katelyn. (2013) Alive in the Swamp Assessing Digital Innovations in Education. NESTA

8. Hargreaves, Andrew. & Fullan, Michael (2012) Professional Capital: Transforming Teaching in Every School. Routledge. London ISBN: 9780415624572

9. Hargreaves, Andrew. & Fullan, Michael. (2013) The Power of Professional Capital www.learningforward.org Vol.34. No.3

10. Jackson, David. (2006) Chapter 11: The Creation of Knowledge Networks Collaborative Enquiry for School and System Improvement. In: Harris, Alma and Chrispeels, Janet H. (Editors) (2006) Improving Schools and Educational Systems: International Perspectives Routledge, Oxon ISBN 0-415-36222-9 (Hardback)

11. Katz, Steven. and Earl, Lorna. (2010) Learning about networked learning communities, School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice, 21:1, 27-51, DOI:10.1080/09243450903569718

12. Lebrun, M. (2002). Théories et méthodes pédagogiques pour enseigner et apprendre : Quelle place pour les TIC dans l'éducation ? [Theories and methods for teaching and learning : Which place for ICT in education ?].Bruxelles-Paris: De Boeck

13. Luckin, Rosemary et al (2012) Nesta's Report: Decoding Learning: The Proof, Promise and Potential of Digital Education. NESTA. London

14. OECD (2014) TALIS 2013 Survey Results: An International Perspective on Teaching and Learning - Executive Summary p.19-21

15. Stoll et al (2006). Professional Learning Communities: A Review of the Literature Journal of Educational Change 7:221–258

16. Timperley, H., & Robinson, V. (2003). Workload and the professional culture of teachers. In L. Kydd, L. Anderson, & W. Newton (Eds.), Leading people and teams in education (pp. 151–168). London, UK: Sage.

# Acknowledgements

Particular thanks to the National Co-ordinators and representatives from the Ministries of Education and partner organisations:

- **Reinhold Hawle** and **Bernhard Racz** | Austria
- **Jens Vermeersch** and **Veerle DeTroyer** | Belgium Flanders
- **Pavla Šabatková**, **Barbora Grecnerová** and **Martina Nebeská** | Czech Republic
- **Christos Roushias** and **Dr. Costas Hambiaouris** | Cyprus
- **Karine Aillerie** | France
- **Kimmo Koskinen** and **Jukka Tulivuori** | Finland
- **Silvia Panzavolta** and **Elena Mosa** | Italy
- **Ulf Andreassen** | Norway
- **José Moura Carvalho** and **Maria Luz Encarnação** | Portugal
- **Karin Whooley** and **Gráinne Walsh** | Ireland
- **Eugenijus Kurilovas** and **Svėtlana Kubilinskiene** | Lithuania
- **Stephanie Parsons** | UK

Many thanks to all the Advanced Schools, Advanced Practitioners, head teachers, classroom practitioners and staff who were involved in the organisation of Link Observation Visits and the National Focus Groups for your hard work throughout the Living Schools Lab project.

Advanced Schools visited during the Link Observation Visits (one primary school and one secondary school were identified as Advanced Schools by the National Co-ordinators in each country):

- **Volksschule Gutenberg an der Raabklaam** | Graz | Austria
- **Salzburg Tourismusschulen** | Bad Hofgastein | Austria
- **De Klare Bron** and **De Grasmus** | Belgium Flanders
- **Middenschool Campus Minneplein** | Belgium Flanders
- **Geroskipou A' Primary School |** Paphos | Cyprus
- **Palouriotissa Gymnasium** | Nicosia | Cyprus
- **Dr Edvarda Beneše School** | Čakovice | Czech Republic
- **Gymnasium Teplice School** | Teplice | Czech Republic
- **Wäinö Aaltonen School** | Turku | Finland
- **Puropelto School** | Turku | Finland
- **Eppu Ingrandes** | Sur Loire | France
- **Lycée Pilote Innovant International** | Poitiers | France
- **Scoil na gCeithre Máistrí** | Athlone | Ireland
- **Coláiste Bríde, Presentation Secondary School** | Clondalkin | Ireland
- **Istituto Comprensivo di Cadeo** | Piacenza | Italy
- **ITIS Majorana** | Brindisi | Italy
- **Kaunas Varpelis Primary School** | Lithuania
- **Simono Dacho Progymnasium** | Klaipedos | Lithuania
- **Skjelnan School** | Tromsø | Norway
- **Tromstun School** | Tromsø | Norway
- **Escola Básica Parque das Nações** | Lisbon | Portugal
- **Escola Secundária Eça de Queirós** | Lisbon | Portugal
- **Broadclyst Community Primary School** | Exeter | UK
- **Shireland Collegiate Academy** | Sandwell | UK


SCHOOLS LABS
YAMAHA

Living Schools Lab

Future Classroom Lab

# Mainstreaming change in schools

## Link Observation Visits Final Report

futureclassroomlab europeanschoolnet #FCL_eu

## Linked documents and resources

The following linked documents provide further background to the framework of the observation visits and are published on the LSL website: **http://lsl.eun.org/about**. Also published, is

- D3.1 Observation methodology handbook: includes the STEPS plan framework
- D3.2 Interim Report on Link Observation Visits
- Observation blog, **http://lsl.eun.org/observation-visits**: sharing practical ideas from each visit
- D5.3 Living Schools Lab CPD Course – Using Technology to enable Whole School Change: a new training handbook, drawing on the observations and developed in consultation with teachers from across the project
- iTEC project: a major, 4 year, strategic FP7 EC project developing and testing future classroom scenarios in over 2,000 classrooms across Europe. **http://itec.eun.org**

http://fcl.eun.org/lsl

European Schoolnet

University of Wolverhampton Knowledge • Innovation • Enterprise

Co-funded by the 7th Framework Programme of the European Union