



VIRTUAL SCHOOLS AND COLLEGES

Providing Alternatives for Successful Learning

VOLUME 1

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VOLUME 1

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1. INTRODUCTION

Practically everyone has the same understanding of a school or college as a place where students go to learn. But what about the students who find it difficult simply to go to a place of learning? What if they are scared of school, ill, or unable to access the school for some other reason? What about students who want to take subjects which they cannot access in their local school or college, or young people who are incarcerated and who want to find a way into further or higher education to increase their life chances?

Virtual schools and colleges are an increasingly important alternative for these students and are becoming more and more prevalent all over the world – including Europe. But little is known in Europe about how they operate or what makes them successful. Many people are suspicious of these new structures particularly when they are offered as a replacement for compulsory-level education. Yet a lot now exist and they have been the subject of an investigation during 2011–2012 supported in part by the European Commission.

This two-volume handbook will provide you with a sound understanding of virtual schools and colleges, provisional policy recommendations to support effective virtual schooling and information about where you can find out more.

We have also included a selection of different examples of virtual schools and colleges, mostly from Europe, to illustrate the types of virtual schools that already exist.

Outline of the Handbook

The handbook is divided into two volumes. This book is Volume 1. It contains an introduction and four main chapters:

- The Virtual School Phenomenon across the World
- Case Studies of Virtual Schools and Colleges
- Innovative Pilots
- Policy Challenges and Opportunities.

Volume 2 of the handbook contains chapters on:

- Innovative Good Practice for Virtual Schools
- Teacher Training in Virtual Schools
- Critical Success Factors for Virtual Schools
- Specific Policy Recommendations
- Conclusions.

Detailed Outline of Volume 1

The Virtual School Phenomenon Across the World

This chapter begins with a brief description of the typologies we apply to virtual schools and colleges – that is, the way we classify them. It continues with a ‘World Tour’ of the countries in which we do and do not find virtual schools and colleges.

In summary, virtual schools are found in every continent in the world. There are large numbers from the USA, several hundred. There are also many in Canada. Virtual schools are also found in many countries throughout Latin America. They are prevalent in Australia and New Zealand.

It is only in Africa where we found fewer than we expected, except for some across Mediterranean Africa and in Southern Africa. It seems that despite much rhetoric and many advances in school education in Africa (including low-cost and innovative solutions from business and social

entrepreneurs), there is little actually on the ground. The current needs of many countries and their issues with infrastructure (especially electric power) are more intractable in some ways than networking, due to advances in mobile communications.

There are also virtual schools in Asia in several countries including Korea and Japan. Surprisingly to us, there are few in the Middle East, and appear to be few in India. There appear to be some in South East Asia. Mainland China has a wide range of developments, with a rapidly growing amount of virtual education but there appear to be no virtual schools in any of the other Chinese-speaking states. However, across Asia we can mainly report only on such evidence of virtual schools as appear (often tantalisingly) in English or languages automatically translated into English. Our suspicion is that we have a reasonably good grasp of the numbers of such schools in Asia, but little grasp of how they work.

There are very few virtual schools in the Caribbean, Pacific (Oceania) and Indian Ocean islands, apart from some out-of-country provision from US (in the Caribbean) and New Zealand (in Oceania). The reasons for this remain unclear.

In contrast with the beliefs in ministries and advice from experts prior to the VISCED bid, there are many virtual schools in Europe; at least 70 – and more in the wider Europe, perhaps even 100. However in no country in Europe does the percentage of children in virtual schools reach even 1% of the school population.

This finding is in contrast to widespread activity in most European countries in virtual universities and colleges. We suspect the reason is primarily the restrictions on or outright prohibition of home-schooling in most European countries (except for a few like the UK). Secondary reasons may be the conservative nature of school ministries; a focus in schools on nation-building not only on education; and obsession with outputs and grades (driven in part by PISA) rather than a more holistic

view of education, including grades but encompassing other factors as well. The case of Finland, where there is a network of virtual schools, seems to demonstrate this.

Case Studies of Virtual School and Colleges

This chapter contains eleven case studies of virtual schools and one of a virtual college. The first eight are virtual schools within the European Union:

- Bednet (Belgium) – a schooling provider for ill children;
- Ensino a Distância para a Itinerância (Portugal), formerly Escola Móvel, a distance learning project of the Portuguese Ministry of Education & Science aimed at ensuring regular schooling of travelling children whose families work in circuses and fairs;
- InterHigh (Wales) – a general junior secondary school (up to GCSE), now extended with A level courses and specific provision for disadvantaged learners;
- iScoil (Ireland) – run by the Presentation Sisters, which grew from the UK online learning model Notschool.net;
- Nettilukio – a division of Otava Folk High School (Finland), an upper secondary school;
- Rīgas Tālmācības Vidusskola (Latvia) – a general secondary school, which has now started to offer primary education as well;
- Sofia Distans (Sweden) – a junior secondary school with a focus on expatriate children and the disadvantaged;
- Wereldschool (Netherlands) – founded in 1948 initially to provide education for the children of Dutch nationals living in Indonesia, now split into two separate sister-schools: Wereldschool for children overseas and IVIO@School for children in the Netherlands who are not considered well-suited to the traditional Dutch education system.

Outside Europe, four mini-case studies from outside Europe are included for contrast:

- Credenda (Canada)
- Open High School, Sydney (Australia)
- Brisbane School of Distance Education (Australia)
- Open Polytechnic (New Zealand) – a virtual college.

Innovative Pilots

The aim of the pilots was to test out innovative ICT-based approaches to virtual schooling and produce recommendations for wider use across Europe based on the pilots' outcomes. The chapter describes four pilots and the conclusions we drew from them:

- Ross Tensta Gymnasium in Stockholm, Sweden
- Notre Dame High School in Sheffield, England
- The Sheffield College in Sheffield, England – blended learning provision of online GCSE in English
- Network for School Innovation – supporting 16 schools in different areas of Greece.

Policy Challenges and Opportunities

The chapter begins by observing that it is clear from the evidence presented elsewhere in this publication that virtual schooling has huge potential to widen choice for learners and families alike, to contribute to improved attainment and to reach learners who may otherwise be unable, or unwilling, to access high-quality education. However, if one stands back and reflects on both the individual Member Countries and the European Union as a whole it is equally clear that, on both levels, policies to protect students, whilst encouraging and supporting innovation, often appear perilously inadequate.

In many European nations, education reforms proclaim that decentralisation and heterogeneity will drive improvement through innovation, and that student choice will be facilitated through the funding 'following the learner'.

It would, thus, appear that the climate is fertile for virtual schooling. There are clear analogies between, for example, those Charter schools in the USA which have already diversified into virtual learning and/or the Swedish Kunskapsskolan or English Free Schools and Academies. Whilst this philosophy is by no means ubiquitous throughout Europe, most countries have invested heavily in the state educational ICT infrastructure and appear essentially supportive of innovative new ways of learning. There is now significant pressure to obtain maximum benefit from this investment and to enhance education systems to meet the needs of the 21st century learners and the challenges of the 21st century economies.

However, as stated above, it seems likely that policy makers within individual European nations and at Commission level are yet to fully grasp the profound nature of the changes afoot. Consequently there exist policy fault lines which could a) seriously restrict the expansion of virtual schooling and b) allow inherent weaknesses to become embedded – which could be damaging for learners, Governments and public perceptions of virtual schooling – and could result in the misuse of significant public and private sector investment.

The chapter concludes with a number of potential policy challenges and opportunities for consideration:

POLICY CHALLENGES

- Validation of courses across borders and boundaries;
- Bringing virtual schools into national accountability and inspection regimes;
- Ensuring the legality of virtual schools;
- Establishing common standards for online teaching;
- Supporting early adopters and encouraging widespread roll-out;
- Constructing informed assessments of performance of virtually schooled students;
- Virtual schools owning the qualifications achieved by their students.

POLICY OPPORTUNITIES

- Raising levels of literacy and numeracy and increasing the take-up of modern foreign languages and Science, Technology, Engineering and Mathematics (STEM) subjects;
- Tackling early school leaving;
- Supporting migrant children and families;
- Collecting rich pupil data;
- Raising levels of digital competence;
- Promoting broadband uptake;
- Harnessing the potential of Open Educational Resources.

The VISCED Project

This work is a direct outcome of VISCED, a European collaborative project that carried out a transnational appraisal of virtual schools and colleges with a systematic review at international and national levels of fully virtual schools and colleges. The outputs of this work have been analysed and compared to identify relevant parameters and success factors for classification and comparison. VISCED is a two year project that began in January 2011 and is part-funded by the Lifelong Learning Programme of the European Commission.

VISCED supports a website where all public project outcomes are published. This also provides a news service on the topic of virtual schools and colleges and publishes a newsletter on a regular basis. To date more than 700 people receive this newsletter. The website also contains a full report, including interviews, with many of those who took part in the Virtual Schools and Colleges Colloquium which was held in Sheffield in May 2012. Interviewees include many of those operating virtual schools and colleges as well as researchers and others interested in the virtual school phenomenon.

<http://www.virtualschoolsandcolleges.info>

The VISCED Wiki on Virtual Schools and Colleges

Most of the data used in this handbook is available on the VISCED wiki which is open to all interested researchers and policy makers. An inventory of virtual schools and colleges worldwide has been publicly available on this wiki throughout the project. The idea behind the wiki is to make available an open and public space where researchers can share information about virtual developments in various different educational sectors. It is supported and maintained by a growing community of researchers and is aimed at stakeholders, researchers and practitioners who would like to have easy access to the latest information about how the virtual phenomenon is manifesting itself in schools, colleges and universities around the world. Contributions are welcome from researchers.

<http://www.virtualschoolsandcolleges.eu>

2. THE VIRTUAL SCHOOL PHENOMENON ACROSS THE WORLD

Introduction

The text for this chapter draws on five of the VISCED public deliverables:

- D2.4 – Final Country/Region Reports
- D2.5 – Final List of Exemplars
- D3.1 – Typology of Virtual School and College Services
- D3.2 – Influence Maps for EU Countries
- D3.7 – Case Studies.

All the source material for D2.4 and D2.5 can be found on the VISCED wiki.

Developing a Typology for Virtual Schools and Colleges

The project plan for VISCED states as its aims *"to make an inventory and to carry out a systematic review of international and national levels of innovative ICT-enhanced learning/teaching 'Exemplar' initiatives and 'e-mature' major secondary and post-secondary education providers for the 14–21 age group (including Virtual Schools and Colleges)."* These aims have led to extensive debate between project partners and within the International Advisory Committee in clarifying the different levels of online learning relevant to VISCED.

Levels of Virtual Education

The project settled on a five level description for classifying the initiatives and organisations we have found:

- Fully virtual school/college – this includes bricks-and-mortar schools offering a full distance education in parallel with f2f classes;
- Semi-virtual school – extra learning available outside school timetable (see discussion of Supplemental Schools later in this section);
- Virtual school-in-school – virtual school within a school or college which does not offer a full curriculum;
- e-Mature school or college – making good use of blended learning;
- Informal school/college – organisations such as Notschool or Mixopolis.

Dimensions for Tagging Virtual Schools and Colleges

Within these five levels, virtual schools and colleges are tagged along 5 main dimensions:

- Geography especially continent, country and region
- Catchment area (international, national, state, school district, etc.)
- Full-time or supplementary
- Ownership and flow of funds (state, foundation, company, etc.)
- Size band.

Our debates during the project have affirmed that typology and classification are not absolutes in an area of education that is developing and changing rapidly. We would emphasise that these descriptions of levels and dimensions are fluid; they are merely the labels which we have found most informative in classifying our research.

Virtual Schools and Colleges Across the Continents and Regions of the World

It has been considerably more straightforward identifying virtual schools – and virtual schooling across the typology – than it has been to identify virtual colleges. For example, the UK has a highly developed structure of colleges in the further education sectors of the four home nations and many of these offer an extensive range of courses fully online or use blended learning. However, no publicly funded UK colleges operate exclusively online, although they may brand themselves separately for their distance learning programmes, and we have identified only a very small number of privately funded fully virtual colleges.

The UK model of further education colleges offering a broad range of programmes (much of which address vocational training) is not widely replicated in other countries: only in some countries of Latin America are there similar colleges. In Europe and other parts of the world, some online vocational training may be available but the institutions are different in nature. To complicate the picture further, in many parts of the world universities may offer vocational courses for young people aged 18+ and some of these programmes are online and hence within the scope of VISCED.

This section summarises the current state of research shown on the project wiki. It comes with a number of provisos: like all 'world tours' it cannot claim to be comprehensive and the project team is still finding flourishing examples of virtual schools, even within the Lifelong Learning Programme (LLP) countries. The subsequent sub-sections give a brief overview of the main continents.

North America – the USA and Canada

THE USA

Online education in the US has gained considerable traction over the last 15 years – seemingly more so than in any other country. A major report from the International Association for K-12 Online Learning (iNACOL) estimates that over 1.5 million American students from kindergarten to twelfth grade (K-12) were engaged in online and blended learning for the 2009–2010 school year (out of approximately 55.2 million students enrolled). This represents roughly 3% of the US K-12 population.

This relatively small figure belies the scope and nature of the programmes now available. Options vary from state to state, school district to school district, and even from school to school. Whether a student has the option to participate in ‘supplemental’ (i.e. single) courses or full-time online programmes remains a matter of state policy and local laws; with a few states providing opportunities for most students, a few states providing almost no opportunities, and most states falling somewhere in the middle. Moreover, iNACOL and others acknowledge their on-going struggle to survey data in this relatively new and rapidly changing arena; there is no single authority to whom any of the schools listed in this survey must report and relevant data is not always made available to the public.

As of 2010, supplemental or full-time online learning opportunities were available to students in 48 of the 50 US states. 38 states had state virtual schools or state-led online initiatives (with a 39th set to open in 2011); 27 states plus Washington, DC had full-time online schools serving students state-wide; and 20 states were providing both supplemental and full-time online learning options state-wide (but not as part of a state virtual school). This can be compared to 2001, during which approximately 10 states had state virtual schools and even fewer offered other online education options.

The three main types of US virtual schools can be summarised as follows:

- **State virtual schools** operate in 38 states and are state-led online learning initiatives, with course enrolment numbers ranging up to 16,000 for 2009–10. They often provide local school districts with supplemental online courses, as well as online learning expertise and thought leadership for their own schools. They include students who study online part-time only, taking 'supplemental' online courses while physically enrolled elsewhere. Between 2008/09 and 2009/10 enrolments increased by nearly 40%, though most gains came from the two states of North Carolina and Florida. State virtual school enrolments exceed 10,000 for 2009–10 in eight different states (Alabama, Florida, Georgia, Idaho, Louisiana, Michigan, North Carolina and South Carolina) and the schools are usually funded by legislative appropriation.
- **Multi-district full-time online schools** have at least one example in 27 states. They have few or no part-time students; most have enrolments of a few hundred to several thousand. They usually attract students from across an entire state, so are found in those states that permit students to enrol across district lines and are typically charter schools (i.e. special publicly funded schools operating under their own charters/standards, attended by student choice). They are usually affiliated with a private national organisation e.g. Connections Academy, K12 Inc., Advanced Academics, or Insight Schools and are often funded via state public education funds that follow the student.
- **Single district programmes** are represented by only 11 well-established programmes nationwide; they serve mostly supplemental students and are often focused on credit recovery or at-risk students. They make up the fastest growing segment of K-12 online learning.

CANADA

Distance learning is a feature (to a variable degree) of the education systems in all thirteen territories and provinces. In 2011 it was estimated that just over 200,000 students were enrolled in distance learning courses and/or programmes. This constitutes between 2.8% and 3.4% of the total K-12 student population. Unsurprisingly, given the vast land area and regional autonomy, there is an extremely broad spectrum of distance learning provision varying by cities, districts, provinces and territories.

The highest level of activity appears to be in British Columbia, which also has the most comprehensive legislative and regulatory regime. The only area that does not have its own K-12 distance education programme is the very small province of Prince Edward Island, which relies upon programmes from other jurisdictions (similar to the three northern territories). The only jurisdictions that continue to maintain single province-wide systems are Newfoundland, Labrador and New Brunswick.

Other trends include a high level of district-based cooperation in the Provinces of Ontario and Saskatchewan. One of the Saskatchewan virtual schools – Credenda Virtual High School – is a particularly interesting initiative, which is described in more detail in the Case Studies chapter.

Europe

There are currently over 70 virtual schools and colleges listed on the VISCED wiki – distributed across 19 European countries. Some of these are not strictly ‘schools’; however there are also indications that there are a number of virtual schools yet to be identified (mainly in Turkey, Eastern Europe and Russia). The total number of European virtual schools is likely to be well in excess of 80 and perhaps approaching 100. It should be noted that the scope of VISCED does not include primary schools and we are aware that there are virtual primary schools in Europe.

On the basis of the evidence available we estimate the split between those established by *public* or *private* providers to be approximately 50:50.

The smallest school has 25 students and the largest has 1,400. Some of the virtual schooling initiatives are much larger than this e.g. ELukio is an online consortium of 22 municipalities and their schools. There is also the Russian school which lists 5,000 participants but this includes students, teachers and administrators so the figure has been excluded from the calculations about average school size. Average size (where enrolments are quoted) is 475 students. Removing the outliers leaves an average size of 470.

Around half of these schools offer a full, or broad, curriculum and a significant proportion of these schools (extrapolated to be between 30–50%) were initially established to address issues of pupil exclusion. At least ten European virtual schools were initially established to support expatriates and/or the children of military personnel serving overseas.

Characteristics of pupil exclusion addressed by European virtual schools include:

- Students who are long-term sick and/or hospitalised
- Students with disabilities
- Young parents or pregnant young women
- Travellers
- Students who have been bullied or are school-phobic
- Students who left school with no or few qualifications
- Students who are imprisoned
- Geographically isolated students
- Students with specific language needs (immigrants with poor host-nation language skills).

In several European countries there appears to be a growing interest in virtual schools providing supplementary, specialist and/or revision courses and lessons. In many cases the virtual schools reflect

local/national circumstances – either in support of local/national policy priorities or to meet demands not sufficiently catered for in their host region/nation.

There is a broad pedagogical spectrum – from 100% online through to significant face-to-face interaction. There are many varieties of ‘blended learning’ employed, including at least one model where the technology is deployed to link home or hospital based students with classes in their own physical schools (Bednet) and a variety of communication tools including Skype and commercial videoconference systems, email, telephone and learning platforms.

Australasia

AUSTRALIA

As might be expected in a very large country with many isolated communities, there are a significant number of virtual schools in Australia. The largest numbers are in New South Wales (nine) and Queensland (seven), with three in Victoria, two in Northern Territory and one each in South Australia and Western Australia. It appears from publicised enrolment numbers that the School of Isolated and Distance Education (SIDE) in Western Australia is the largest, with ‘thousands’ of enrolments. The Case Studies chapter includes mini-case studies of two Australian schools: Brisbane School of Distance Education and Open High School, Sydney.

NEW ZEALAND

Whilst there are several very active e-learning organisations in New Zealand – e.g. Virtual Education Networks, the New Zealand Virtual Learning Network and LEARNZ, there appear to be currently only three virtual schools other than hospital schools:

- Te Kura/The Correspondence School is New Zealand’s largest, with more than 24,000 students a year studying full or part-time, and staff based around the country;

- The eTime Virtual School, which provides opportunities for children aged from 10 to 15 to learn in an online environment;
- The New Zealand Virtual School (NZVS), which allows students to study courses contributing to NCEA (National Certificate of Educational Achievement – the main school-leaving qualification) and industry based National Certificates. Thus it is a virtual college as well as a virtual school, although its current status is uncertain.

There is also the Open Polytechnic of New Zealand (OPNZ), which functions as a virtual college. More details of this are given in the mini-case study in the Case Studies chapter.

Asia

INTERNATIONAL VIRTUAL SCHOOLING ORGANISATIONS

We have not had the resources to conduct research across Asia in the same depth as the three continental regions described above. It would appear that whilst there is much activity in distance learning in higher education, there are relatively few indigenous virtual schools in any of the major Asian countries. However, the NESA Virtual Schools Project – a co-operative venture between the Near East South Asia Council of Overseas Schools and the US Department of State – manages online learning in 25 schools across the Near and Middle East, North Africa and South Asia. Six of these are in South Asia: three in India and one each in Bangladesh, Pakistan and Nepal. Enrolment numbers are not available; it is likely that most of them are expatriates.

INDIGENOUS VIRTUAL SCHOOLING IN MAJOR ASIAN COUNTRIES

- **Japan** – whilst there is legislation promoting e-learning and distance learning in higher education and junior colleges, there are currently just three virtual school wiki entries: the NHK Academy of Distance Learning, the Super English Language Virtual High School and the Nagoya International School. Whilst it is likely that terminology, language and the alphabet

have masked some virtual schools from the researchers, it should also be noted that all three are identified as 'national' schools.

- **China** – whilst we have not studied China in any detail there is evidence of significant developments in the field of 'online learning'. Without dedicated native language speakers it is difficult to be unequivocal (particularly about the definition of 'online learning') but research elsewhere indicates as many as 200 'online schools' in China serving some 600,000 students. In terms of student numbers these (understandably) appear to be clustered around Beijing with one-fifth of all 'online students' native to the capital. Beijing No. 4 school is reported as having 60,000 students. There is also plenty of evidence of distance learning projects for remote rural communities. Further research would be illuminating not only to discover whether this is indeed the full extent of online (pre-HE) education in China, but also to investigate and compare the PISA high-achieving city states of Shanghai and Hong Kong – given their culture of supplemental and/or intensive extra-curricular education. This is particularly pertinent since, whilst national and regional governments were initially the prime funders of school-level online learning, it is now private schools which seem to be driving the development.
- **India** – there are a number of distance learning programmes in higher education, but we have not found evidence of indigenous virtual schools except for the National Institute of Open Schooling (NIOS). There are, however, a number of private companies providing lessons and courses either to individual learners or to schools. With its culture of supplemental learning, growing wealth yet vast poorly educated population, and the Indian government's stated commitment to developing online learning, it is reasonable to assume that there will be significant growth in the coming decade. There are also three international virtual schools within the NESAs network.

- **Indonesia** – there is evidence that online learning is being deployed to provide students with access to courses normally not available to them at their physical schools and self-directed advanced and college preparatory courses.
- **Mongolia** – a set of initiatives and projects have been developed in the country to support mainly non-formal rural distance education. The initiatives and experimentations undertaken so far try to build on the well consolidated network of non-formal education centres. In 2001, the International Development Research Centre of Canada (IDRC) funded the Internet Based Distance Education Project in Mongolia. The project offered experimental web-based instructional courses on specific subjects such as English language, IT and computer skills, gender issues and legal rights.
- **Singapore** – the K12 International Academy Singapore is a private online American school. The school offers a wide range of courses for full or part-time study. There are a number of online learning vendors operating in Singapore but these tend to offer supplemental online resources. Despite its technological sophistication, pure online learning is not common in Singapore perhaps due to the compact nature of the city state.
- **South Korea** – alongside a wide range of digital online services to teachers and schools, we have found at least four virtual schools: The Air and Correspondence High School (ACHS), Cyber High School, Hanse Cyber High School and Kyungbock High School.
- **Thailand** – the national government Educational Development through E-Learning Plan (2009–2012) made provision for significant development of online and distance learning for schools in Thailand. The focus of the investment is on the provision of hardware and online learning resources; specifically for Science, English and Mathematics. Building on its long tradition of distance learning through television,

Thailand now has two key organisations operating in the field: Distance Learning Television Station (DLTV) and the Distance Education Institute both of which are involved with both school and continuing education.

- **Vietnam** – anecdotal evidence suggests that whilst the internet is used for teaching, there are no virtual schools. However, the Ministry of Education website suggests that there are some virtual vocational training courses, linked to the college network.

The Middle East and North Africa

THE ARAB MIDDLE EAST

For the purposes of VISCED, we take the following 12 countries as this region: Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen. There is a significant amount of virtual activity at HE level, but not yet at schools level; though several of the countries, particularly the oil-rich Gulf States, have ambitious long term plans for e-activity. Perhaps the most developed are Qatar and the United Arab Emirates, with national e-strategies extending to the end of the decade.

Whilst we have not found evidence of indigenous virtual schools in the region, the American influence is represented by 15 schools in the NESAs Virtual School Project (see the previous section on Asia), with two in each of Qatar and Lebanon, three in the UAE, four in Saudi Arabia, and single examples in Oman, Jordan, Syria and Kuwait.

NORTH AFRICA AND THE NEAR EAST

We have found at least one virtual school in Egypt: a NESAs network school in Cairo. There is also evidence of online learning being available to some students at school-level, in Israel (ORT Aviv Virtual School) where school-level online learning generally tends to be of a supplemental nature and Tunisia (Tunisian Virtual School), but none in any of the other countries. Given recent political disturbances and

changes well recorded through social media, it is likely that the unrest and instability across much of the region has hindered the development of virtual schooling.

Sub-Saharan Africa and Southern Africa

SUB-SAHARAN AFRICA

Whilst there is evidence of ICT capacity building initiatives in many Sub-Saharan African countries, we have not found evidence of any indigenous virtual schools. Telecommunications infrastructure is generally weak and in countries with high school dropout rates and low levels of literacy, there are more pressing priorities.

Rwanda appears to be the country with the best developed infrastructure and evidence of significant capacity building.

There are a number of international organisations providing online resources, training for teachers and, in some cases, online classes, but none of these operate as a fully virtual school. Our evidence from internet searches suggests that international organisations are most visible and active in Francophone Sub-Saharan African countries: the websites of ACTE, ORIDEV and iEARN are all in French.

There is an international commercial company, The African Virtual School, which offers online examination courses in West African countries such as Sierra Leone. The parent organisation is based in London, although the website features the Stars and Stripes.

In some Lusophone countries (e.g. Guinea-Bissau) there are HE links with Brazilian universities, but no such links are evident in the schools sector.

There are a number of relatively small scale ICT projects in individual countries, e.g. Under the Kapok Tree in Guinea.

SOUTH AFRICA AND NEIGHBOURS

It is not surprising that we have found a wide of range of ICT in education initiatives in the Republic of South Africa, the most developed and economically powerful of the Sub-Saharan countries. Whilst an e-education White Paper in 2004 set a goal of making every learner in both primary and secondary schools ICT-capable by 2013, the existence of well over 30 separate ICT initiatives, several of which are commercially sponsored and driven towards one product range, has meant that progress has been patchy. Although there are projects involving the use of mobile classrooms and remote online resources, there do not appear to be any examples of full virtual schools.

We have identified two examples of virtual schooling in countries bordering on South Africa: in Namibia, the Namibian College of Open Learning (NAMCOL) offers a range of upper secondary courses online and in Botswana its sister organisation, the Botswana College of Distance and Open Learning (BOCODOL), is a private provider offering both secondary and further education through distance learning.

Latin America

Spanish and Portuguese are the predominant languages of Latin America (with Portuguese spoken only in Brazil, the most populous country in the region).

We have found substantial numbers of virtual schools in this supra-region and, interestingly, a number of colleges in some of the countries offering virtual courses in vocational education.

Whilst much of this virtual activity is thriving indigenously (albeit on a fairly small scale in most countries), the origins of a number of the virtual schools and colleges have been influenced by Spain and the USA; e.g. Wilostar which appears to be the only organisation marketing online education in Paraguay. A number of international schools and universities offer a Bachillerato Virtual across Latin American countries; one example of this is the Instituto Friere, whose Latin American base is in Colombia, but which offers virtual education in

several countries, e.g. Panama. There are also virtual courses offered in single subjects: Telecentre.org is based in Mexico and offers online mathematics education to primary and secondary school pupils in Mexico, Bolivia and Peru.

In several countries there is a mix of privately funded and state funded schools.

Project Ceibal is an ambitious plan to transform education in Uruguay through issuing an individual laptop to every child – although there appears to be only one virtual school in Uruguay (see below), the country has one of the most developed technical infrastructures of any Latin American country.

VIRTUAL SCHOOLS IN LATIN AMERICA

- **Argentina** – (1) ORT Virtual Campus; (2) La Escuela Virtual, El Surco.
- **Bolivia** – Escuela Porvenir.
- **Brazil** – although there is a federal law prohibiting online learning at the primary and secondary levels, we have identified at least five publicly funded organisations that purport to offer some online programmes at upper secondary level, and certainly to young people within the VISCED age range: (1) Colégio Militar de Manaus; (2) Escola Virtual de Programas Educacionais; (3) Fundação Bradesco Escola Virtual; (4) INED - Instituto Nacional de Educação a Distância; (5) PROCEFET - Programa de Iniciação Tecnológica e Cidadania do Rio Grande de Norte.
- **Chile** – (1) Think Academy; (2) Yo Aprendo.
- **Colombia** – (1) Escuela Virtual de Caldas; (2) Colombia Virtual Iberio de America.
- **Mexico** – (1) EDUSAT - Telesecundaria; (2) Red Escolar
- **Peru** – (1) Institucion Educativa Virtual del Callao; (2) Sanquira Virtual.
- **Uruguay** – Escuela 20.

VIRTUAL COLLEGES IN LATIN AMERICA

We have found virtual colleges in four Latin American countries:

- **Brazil** – (1) Escola Técnica do Brasil; (2) Fundação Bradesco Escola Virtual; (3) INED - Instituto Nacional de Educação a Distância; (4) Projeto Bem Receber Copa 2014; (5) SENAI Distance Education Network - Serviço Nacional de Aprendizagem Industrial; (6) SEBRAE - Brazilian Support Service to Micro and Small Businesses; (7) SESI - Serviço Social de Indústria.
- **Chile** – CEVADD - Centro Virtual de Actualización y Desarrollo del Diseño - is one of a number of examples of private organisations offering virtual courses in vocational areas.
- **Colombia** – There have been major developments in virtual programmes for vocational training since 2007. The three major technical colleges offering virtual training programmes appear to be: (1) SENA; (2) CESDE; (3) INCAP.
- **Uruguay** – (1) Centro Nacional de Educacion a Distancia; (2) The Labour University of Uruguay offers a range of virtual training courses in industrial processes in association with local institutes and vocational training providers; (3) CEIBAL – Centro Tecnológica Educativa de Tacuarembó offers two online programmes.

The Rest of the World

We have found little evidence of significant virtual schooling in the parts of the world not covered in the earlier sections of this chapter. Many of the countries included here are relatively remote and often sparsely populated islands and island chains, especially in Oceania, though there are some more densely populated islands in the Caribbean and Pacific.

There is evidence of a number of relatively small scale distance learning at school levels; in contrast, some of these territories have better

developed distance learning access to higher education, notably in Lusophone islands linked with Brazil and Portugal.

THE CARIBBEAN

There is little virtual schooling of significance in any of the Caribbean islands, whether they are Anglophone, Francophone or Dutch speaking. In some of the Anglophone islands, revision lessons are available online from Notemaster.com, a commercial company. There is some distance schooling on small islands, e.g. Little Cayman – and small scale initiatives on other islands – e.g. St Kitts & Nevis and the Trinidad & Tobago Virtual Classroom.

OCEANIA

The two most significant developments are both in the Philippines: the Open High School Program & Internet-Based Distance Education Program (iDEP). These are largely targeted at the more remote communities; the same targeting of remote communities can also be found in Vanuatu, where the Correspondence School of New Zealand offers distance learning courses. There are similar local initiatives for remote communities in the Solomon Islands and the Cook Islands.

OTHER ISLANDS AND ISLAND CHAINS

We have found little evidence of online or distance schooling in any of the other Pacific, Atlantic or Indian Ocean island chains, except for a small number of initiatives in Mauritius – e.g. the Cyber Caravan.

A Summary of Virtual Schooling Across Europe

This section summarises our current knowledge of ICT in 14–21 education initiatives in each LLP country and gives brief details of virtual schools and colleges that we have identified.

None of the LLP countries has an openly positive government policy towards virtual schools and in some countries virtual schooling is either illegal or strongly discouraged, except in exceptional circumstances.

Austria

We have not found any fully virtual schools in Austria, although the country has developed a broad range of e-learning initiatives since 2000 which have potentially created appropriate conditions for the growth of virtual schooling.

The most significant of these have been:

- eFit – largely concerned with infrastructure development;
- Futur Learning – stimulating the development of online pedagogy and content and providing Moodle platforms;
- eLSA – a major e-learning project launched by the Austrian Ministry of Education, Science and Culture to test the nationwide introduction of e-learning and blended learning in secondary schools.

Belgium

The linguistic divide between the Walloon (French speaking) and Flemish (Dutch speaking) communities has led to parallel initiatives in the different parts of the country.

ICT INITIATIVES IN THE FRENCH COMMUNITY

As early as 1959, the Ministry of Education Le Service de L'Enseignement à Distance (SED) in the Belgian French Community, had already initiated self-learning through open and distance education (ODE). The aim was to democratise studies and life-long education and to prepare learners for examinations equivalent to the diploma of secondary education. The Open and Distance Education centre also offers services to children living outside of Belgium at primary school level and to teachers' continuing professional development. Courses also include computer literacy and languages. Special courses are also offered to address different target public special needs such as patients in hospitals and prisoners.

- The WIN project, established in 1998, developed a major plan both in Wallonia and in the Brussels Region to provide ICT facilities and the training of young people in the use of new technologies. The project supported the creation within each school of a Cyber Media Center fully equipped for individual and collective use for both students and teachers.
- Take Off is a regional project in the French-speaking Community of in Belgium which enables virtual learning to enable children who are suffering from long term and chronic diseases to lessons and interact with their classmates and teacher through videoconferencing (from home or the hospital). There is also the option for individualised teaching in which the pupil only interacts with the teacher.

VIRTUAL INITIATIVES IN SCHOOLS IN FLANDERS

- Bednet is a regional project in Flanders, Belgium, which enables virtual learning for 6 to 18 year old children who are suffering from long term and chronic diseases who can then follow lessons and interact with their class through videoconferencing (from home or the hospital). Its predecessor is the ASCIT project. A more detailed account is given in the Case Studies chapter below.

- Junior College is a cooperation between K.U. Leuven and more than 70 secondary schools in Flanders. K.U. Leuven offers participating schools (at least) an introductory and a concluding seminar where students get the chance to attend and participate in lectures. In between the face-to-face sessions professors, teachers and students together build up a strong knowledge base using a wiki which consists of academic articles, documentaries, expert interviews, web lectures and interactive learning materials.

Bulgaria

We have identified three potential virtual schools. The most prominent of these is the Elika Virtual School and there are also the First Bulgarian Online School and a virtual community centre in the town of Blagoevgrad, though this does not offer a full curriculum and covers a wide age range.

Croatia

There appears to be at least one virtual school – Kartelo – but we have been unable to source any recent information on this.

Cyprus

We have not identified any virtual schools in Cyprus.

Czech Republic

The use of ICT in school education is one of the priorities of government curriculum reform. We have not identified any full virtual schools (although the Finland-based Enoprogramme has a Czech website), but there is significant development of infrastructure, repositories and training for teachers.

Denmark

Denmark has a national ICT strategy which is aimed at increasing the use and quality of e-learning 'to make Denmark a leading country in e-learning'. At least 5% of instruction in schools is meant to be ICT-based.

The situation with regard to virtual schools is patchy: Danes Worldwide is a well-documented virtual school for expatriate children; but the current situation at VUCFlex, the possible indigenous virtual school, is not completely clear.

Estonia

ICT in education is now widely developed, with the Open Estonia Foundation (OEF) and the Estonian Information Technology Foundation (EITSA) as two of the key driving forces. EITSA manages the Estonian e-Learning Development Centre (ELDC), which co-ordinates the activity of Estonian e-Vet in facilitating co-operation and implementing e-learning solutions in vocational training. There appears, however, to be only one fully virtual school: Audentes e-Gymnasium.

Finland

Finland has a highly developed technological infrastructure and a wide range of virtual schooling initiatives. In support of the National Board of Education ICT strategy for 2020, TIEKE, The Association of Finnish eLearning Centre and Sometu (Social Media Supporting Learning) all contribute to driving the strategy.

There are at least 76 upper secondary schools that arrange distance learning, often forming networks and partnerships with vocational schools.

We have identified four major schools sector projects:

- Virtual education projects in hospital schools – eSKO which concentrates on developing virtual education in hospitals. The project is funded by the National Board of Education and the municipality of Masku. LUMI is a similar project for sick students of Rantavitikka Comprehensive School, funded also by the National Board of Education (NBE). AntiVirus is also funded by the NBE, coordinated by Viikki Teacher Training School of Helsinki University and partnering with Teacher Training School of Jyväskylä.
- Coordination project for distance learning, City of Turku – this aims to collect and spread good practices of distance learning and collaborate with different distance learning projects, developers and creators; form new kinds of networks and create new operation models to support different distance learning needs.
- Virta – virtual regional resources, a development project for learning environments in Tampere region.
- ENO-Environment Online (ENO) – a global virtual school and network for sustainable development and environmental awareness.

Three of the most significant and well-established virtual schools are:

- Kulkuri ('Tramp') – a distance school for Finnish children living abroad. In the distance school they study together with students from other countries. The main subject is Finnish language, but if needed, students can complete the whole comprehensive school syllabus.
- Verkkoperuskoulu (Virtual comprehensive school) – a comprehensive school for adults, young people who no longer belong to the compulsory education age group and for people that cannot study full time.

- Nettiperuskoulu and Nettilukio – distance learning schools maintained by Otava Folk High School. Further details are given in the Case Studies chapter.

France

France has an extensive range of development programmes for digital infrastructure and resources, ICT in education, technology training and support for teachers and quality management of ICT projects.

We have identified several virtual schooling developments, of which the two most significant are:

- The CNED (Centre Nationale d'Enseignement à Distance) – created in 1939 and now offering home learning packages for subjects not taught in school, together with support courses and summer schools from pre-primary to university level;
- Académie en Ligne – created by CNED in 2009 is developing free online courses in all subjects, covering the compulsory years of education.

Germany

Home-schooling is illegal in Germany in all but exceptional cases and ICT in education initiatives are largely focused on the provision of teaching materials and resources, learning platforms and portals. Mapping ICT initiatives in education is complicated by their determination at Land level, resulting in a highly fragmented picture.

Given the restrictive legislative framework, it is unsurprising that there appear to be very few full indigenous virtual schools, but the Web-Individualschule which was founded in 2002 and now caters for up to 60 High School and College Level students, has had over 110 graduates. The school is private and charges tuition fees for its students who tend to have experienced difficulties with traditional schooling. There is also the Deutsche Fernschule which caters for expatriate children through correspondence education, but this is largely targeted

towards the 6–10 age group and, until very recently, eschewed the use of the internet.

Greece

The Greek government has a Digital Strategy for the years 2006–13, but we have not identified any virtual schools in Greece.

Hungary

Hungary has had active e-inclusion and e-accessibility strategies at a national level since 2003, but we have not identified any virtual schools in the country.

Iceland

We believe there are online learning initiatives in Iceland, but we have not yet identified them at schools level.

Ireland

The National Centre for Technology in education (NCTE) promotes and supports the integration of ICT in teaching and learning in first and second level schools.

We have identified two virtual schools in Ireland:

- Bridge 21 – a joint venture of Trinity College Dublin and Suas Educational Development and it is a virtual school initiative offering a new model of learning that can be adapted for use in Irish secondary schools.
- iScoil (previously NotSchool Ireland) – a virtual school offering blended learning to students between the ages of 12 and 16 who have disengaged from the school system. More details are given in the Case Studies chapter.

Italy

The Ministry of Education has adopted several projects to develop the use of IT in the teaching/learning process: the most important is the Digital School action plan (2010) which concerns the support and spread of ICT tools and methodologies for innovation in schools and modifying the learning environment.

We have identified five initiatives which fall within the VISCED scope of virtual schooling. All of these are targeted at isolated communities, or sick children in hospital:

- cl@ssi 2.0 – aimed at exploring the potential of ICT in transforming learning environments and implemented through pilots in school at lower secondary level across all Italian regions, funded by the Ministry of Education.
- Islands in Network (Scuole in Rete) – a project aimed at ensuring the integration and combating the isolation of insular schools in Sicily by networking them with mainland schools.
- HSH@Network (Hospital School Home) – this national portal is aimed at maintaining the relationship between institutions and families to facilitate study for students in hospital, in house therapy or in day hospital. The portal includes a platform which is targeted at teachers who can create ad hoc virtual learning groups for their students.
- @urora – aimed at providing a parallel service for young people in prison and custodial institutions.
- Scuol@Bardi – a project of the province of Parma of a consortium telematic school aimed at reducing the problems of isolation faced by students living in remote areas of the Appenines and combating drop-out.

Latvia

Latvia has made substantial progress during recent years in the provision of online services and this is reflected in ICT in education initiatives. There is one fully virtual school, together with three colleges which provide a range of courses online:

- The flourishing virtual school is Rīgas Tālmācības Vidusskola: the only distance education secondary school in Latvia which has been accredited for six years. The school gathered initial ideas from discussions with a school in Lithuania. Further details are given in the Case Studies chapter.
- The three colleges offering a range of online programmes are: (1) Rīgas Komerckola Tālmācības Vidusskola; (2) College of Business Administration; (3) Latvian Business College.

Lithuania

Although we have not found any fully virtual schools in Lithuania, some schools have started to develop online courses; the initial development of Rīgas Tālmācības Vidusskola in Latvia was assisted by a secondary school in Lithuania.

Luxembourg

We have not identified any compelling evidence of virtual schooling in Luxembourg.

Malta

We have not identified any indigenous virtual schools in Malta. There are at least two international schools: Verdala International School, which does not appear to offer any parts of its programme online or through distance learning; and QSI Malta, which offers supplementary courses online.

Netherlands

In the Netherlands, the developments in ICT policy have evolved into a strategic approach to ICT as a means of stimulating and supporting the learning process. ICT and ICT policies are seen as a part of educational policy and no longer as a separate policy.

A key element of Dutch government support has been directed towards learning platforms for teachers and students. Wikiwijs is probably the best known of these.

Three of these learning environments come within the VISCED parameters of virtual schooling:

- Acadin.nl – this is largely geared towards gifted students and their teachers in primary education;
- Virtual Music School – developed by the Utrecht Conservatoire and now incorporated into the school curriculum;
- The Edufax Virtual Classroom – a private Dutch company which offers language courses and distance education to expatriate children and adults.

There appears to be one full virtual school: the Wereldschool, which is a private company providing teaching programmes for Dutch-speaking children between 3 and 16 years old who are going abroad with their parents for an extended period of time. More details of this are given in the Case Studies chapter.

There are two programmes providing virtual education for sick children in hospital: Ziezon and Stichting Digibeter, and there is a college-based project (the Eminus project at the REA College) which provides a virtual classroom for vocational training for students with disabilities.

Norway

Whilst there do not appear to be any full virtual schools in Norway – in contrast to neighbouring Sweden – there are at least two providers of secondary education through distance learning:

- proNKI – a major international distance learning provider, claiming over 12,000 enrolments on over 400 courses, with about 50% of students involved online;
- NKS – a smaller distance learning provider, with over 100 courses delivered online.

Poland

Poland has one virtual school – Szkoła Online – and two virtual-school-like portals focussed at students abroad – Otwarta Szkoła and Polska Szkoła

Portugal

The national digital technology plan intends to place Portugal among the five most advanced European countries in terms of schools technology and use of ICT. The main areas of intervention of the PTE are Technology, Contents and teacher Training. Although implementation of the Plano Tecnológico da Educação (Technological Plan for Education – PTE) has been hindered by recent and current economic difficulties, the main elements are still in place and Portugal demonstrates several innovative virtual schooling initiatives.

In addition to the development of a national repository of digital content for teachers (Portal das Escolas), we have identified two significant virtual schools:

- The Escola Virtual (EV) – an e-learning platform owned by the publishing group Porto Editora, a Portuguese private company. EV works with two different options: (1) Particular: as a service subscribed by students, teachers and parents who are individually self-study learners. (2) Institutional: as a service to

the school where all content can be used by teachers and students in their classrooms.

- The Escola Móvel project (Mobile School) – now called Ensino a Distância para a Itinerância. It uses Moodle to support learning for students of the 3rd cycle of basic education. It targets children of occupational travellers in order to meet the specific needs of this community in terms of basic education. Further details are given in the Case Studies chapter.

Romania

Romania has developed significant distance learning for adults, but we have not yet identified any full virtual schools or colleges. E-scoala is a well-developed open platform with learning resources for teachers, students and families, but does not operate as a virtual school.

Russia

Online and distance learning in Russia has tended to be aimed at those physically unable to attend schools. However, there is at least one officially sanctioned virtual school (Телешкола) which has 11,000 students as evidence from a recent iNACOL study suggests.

Slovakia

We have not identified any virtual schools in Slovakia. A collaborative venture facilitated by the Ministry of Education in co-operation with two commercial organisations, developed an online e-learning course about the new national currency and the basics of banking and finance in 2008, in preparation for the country's entry to the Eurozone. More than 9000 students from 240 schools completed the course.

Slovenia

Although Slovenia has a strategy for the development of the information society and some nascent virtual learning initiatives in higher education, we have not identified any virtual schools at present.

Spain

Although Spain has a central government and education ministry, the 17 autonomous communities are fully responsible for the schools in their territory and that includes the promotion of ICT in schools. ICT policies vary in emphasis and depth among the seventeen Autonomous Communities; it is worth mentioning, for instance, that Extremadura has become known worldwide for its commitment to open software and its excellent rates of computers per pupil, and that all communities have their own plan to promote connectivity and hardware deployment.

Escuela 2.0 is a nationwide ICT plan for schools, building on the developments already achieved in each region and going further, trying to provide open access to hardware and digital content in schools in order to promote the integration of ICT pedagogically into school life.

Within this rich and complex picture, we have identified at least eleven schools and colleges which are either full virtual schools or offer the Bachillerato (the Spanish matriculation qualification) online in addition to their physical provision:

- Epysteme – a virtual school offering support for home-schooling from primary through secondary education for young people unable to attend school physically. It is a collaborative project with the Orange School of California and is linked to US qualifications.
- CIDEAD (Centro para la Innovación y Desarrollo de la Educación a Distancia) – it offers distance learning for primary, secondary and high school students, with adults also able to access its courses.
- CEAC (Centro de Enseñanza Privada de España) – a private organisation offering the Bachillerato online.
- Aula Aragón – a project of the Aragón government offering an online Bachillerato and vocational training.

- Bachillerato a Distancia Colegio de Madrid – it is linked to the National Autonomous University of Mexico, but its online Bachillerato is available in Spain.
- IES Isaac Peral – a public centre, joined to the Department of Education of the Murcia region.
- IES J. Ibáñez Martín – a Murcia secondary school offering the online qualification.
- IES Juan Carlos 1 de Murcia – another Murcia secondary school offering the online qualification.
- IES José L. Castillo Puche de Yecla.
- IES San Juan de la Cruz - Caravaca de la Cruz.
- IES Francisco Salinas – a secondary school in the Junta de Castilla y León.

The Bachillerato can be taken online by under 18 year olds through the Institut Obert de Catalunya, but only in exceptional circumstances. There are similar online arrangements through the Colegio Virtual de Andalucía. Interestingly, the Bachillerato is available online through a number of international organisations in several Spanish-speaking countries of Latin America – see the earlier section on Latin America.

This list is almost certainly incomplete, as four of the eleven listed schools come from only one of the 17 autonomous communities and one of the smaller ones at that; this suggests that Spain has some of the most highly developed virtual schooling provision at upper secondary level within the EU, alongside Finland and the UK.

Sweden

Sweden has a system of state-financed free schools competing alongside the existing state schools. In order to differentiate themselves, some of the free schools have chosen to focus on digital tools in pedagogy, but this has not been a particular driver of a move towards virtual education.

The national government has an ambivalent attitude towards virtual schooling, with funding generally limited to supporting expatriate students.

Nevertheless, a combination of geography and innovation has led to the development of at least four virtual schools:

- Värmdö Distans – an upper secondary school for 16–18 year olds.
- NTI – largely dealing with adult education, but open to 18–21 year olds.
- Korrespondensgymnasiet i Torsås – an upper secondary school.
- Sofia Distans – for 12–15 year olds, and providing for expatriate children at the Swedish School in Moscow. See the Case Studies chapter for more details.

Switzerland

Whilst there are a number of virtual learning programmes in HE, we have not identified any virtual schools.

Turkey

Turkey is included in this section as one of the four non-EU countries included in the LLP programme.

Turkey has a surprisingly long history of distance education, with projects going back to the late 1920s in an attempt to improve literacy rates and every Turkish citizen can participate in distance education courses. In 1992, the Open Education Faculty (OEF) was established through Anadolu University and the model was developed by the Ministry to establish the Open High School, which now attracts over a million enrolments annually.

We have identified two further examples of virtual schooling:

- The Open Primary School – this falls within the scope of VISCED as it accepts enrolments up to age 14;

- The Open Vocational High School.

Both of these follow the model established by the Open High School.

United Kingdom

The management of education in the United Kingdom is devolved to the four separate governments of England, Northern Ireland, Scotland and Wales and their varying attitudes and policies towards ICT initiatives in education, together with geographical differences, have led to contrasting developments in schooling in each of the four home nations, which are treated separately in the four sub-sections below. Developments in virtual vocational and recreational learning in the further education sector are relatively similar in the four 'home' nations: each of them has a brief reference to virtual colleges and the picture is summarised at the end of this sub-section.

ENGLAND

Whilst home-schooling is legal in England, no English government has developed positive policies towards virtual schooling. Nevertheless, we have identified at least eleven virtual school initiatives, together with two which existed up till 2010 but have now disappeared:

- The Bridge Academy – a pupil referral unit managed by the London Borough of Hammersmith and Fulham which caters for 175 boys and girls aged 11 to 16 who are not accessing mainstream schools.
- Briteschool – it appears to be unique in the UK in offering live Primary support (from age 9 onwards, sometimes from age 8). It falls within the scope of VISCED as it offers both Primary and Secondary education for home-schooled and expatriate students.
- ConnEct Home Learning – an online teaching service hosted by Loughborough College, originally designed purely for hospitalised children, but now open to all.
- Nisai Virtual Academy – an online learning community and real-time teaching environment.

- Notschool.net – an online learning community offering an alternative to traditional education for young people who, for a variety of reasons, are unable to engage with school or other complementary provisions such as home tutoring or specialist units.
- Oxford Home Learning – it provides Key Stage 3 courses and a range of IGCSEs and a wider range of GCSEs and GCE A Levels to support parents who wish to home-school their children.
- Periplus Home Education – it provides live, online teaching for young people aged 11–18. Students can choose to do a full taught curriculum, individual subjects at any level or intensive, short-term tuition prior to exams.
- vision2learn for schools – it operates as a supplementary school, providing a wide range of courses at KS3 and KS4 and vocational qualifications online.
- The Web School – it offers full time tuition to learners aged 11 to 19 in virtual classrooms led by live, qualified secondary teachers.
- Wolsey Hall – it uses a learning management system to provide online learning for 14 to 18 year olds studying A-Levels and IGCSEs through personal tutorials, rather than classes.
- Pamoja Education – an education company, based in Oxford, England. It is dedicated entirely to providing top quality online courses for the International Baccalaureate.

Apart from The Bridge Academy, none of these is fully state funded and the others all rely to a greater or a lesser extent on fee income.

Two failed initiatives – Accipio Learning and The Digital Learning Community – targeted challenging young people who had been excluded from mainstream schools. Although these initiatives (and probably others) have ceased, most local education authorities in England discreetly provide some form of virtual schooling for excluded pupils, or pupils who are unable to attend school for other reasons.

We have so far identified only one fully virtual college in England: the specialist Open College of the Arts (OCA), which offers both degree level and sub-degree programmes in the visual arts and design. However, in addition to virtual schools, several general further education colleges offer substantial programmes online, which are available to learners within the VISCED age range. In some cases (e.g. The Sheffield Online College) this part of a college's operation is separately branded, but none of the general further education colleges at present operates as a full virtual organisation.

NORTHERN IRELAND

We have not identified an operational virtual school in Northern Ireland. A considerable amount of planning took place between 2001 and 2004 to establish The Northern Ireland Virtual School, but the project seems never to have come to fruition.

SCOTLAND

Scotland has had online schools education projects which have run out of funding or ceased operations (e.g. SchoolsOutGlasgow.net) and an initiative by North Ayrshire Council which was linked to, but not part of GLOW, the national online platform.

We have not identified any currently operational virtual schools in Scotland. There is, however, one major development in online learning: SCHOLAR, which operates as a supplementary school; offering a range of fully online courses at Scottish Intermediate, Standard and Higher levels. The most recent development involves pre-university courses developed by Lews Castle College.

Whilst there do not appear to be any full virtual schools in Scotland, the college sector has been active in online education for many years. The UHIMI (University of the Highlands and Islands Millennium Institute) has operated a full videoconferencing system linking eight of Scotland's FE colleges and enabling students to undertake a full programme of study, wherever they are physically based.

The Interactive Design Institute (IDI) is a distance learning provider of online qualifications in Art and Design from City & Guilds levels 1 and 2 up to full honours degrees. Based in Scotland, it has enrolled students from almost 50 countries and its degree level qualifications are awarded by the University of Hertfordshire in England.

WALES

Although Wales does not have any fully state funded virtual schools, there are at least two private organisations that offer a complete secondary curriculum online:

- InterHigh School – it has been established for 7 years and is currently expanding and diversifying its programme offer. Full details can be seen in the Case Studies chapter.
- First College – a small independent online high school, rather than a college. It also offers a full secondary curriculum, albeit on a smaller scale than InterHigh.

One of Wales' largest FE colleges, Coleg Sir Gâr (Carmarthenshire College) offers some 80 courses at post-16 level entirely online. It also runs the Virtual College, one of the UK's most successful online education providers and its range of short courses can be studied from anywhere in the world.

SUMMARY OF VIRTUAL COLLEGE ACTIVITY IN THE UNITED KINGDOM

Although there are no publicly funded further education colleges in any of the four 'home' nations which have only a virtual programme, many of the general further education colleges offer substantial ranges of online courses, often branded separately from the conventional college programme – the 'college-within-a-college' level in our typology. Online courses, in common with conventional college courses, are available to any learner aged 16 or over and are thus in scope for VISCED.

Virtual college activity in the UK has several distinctive characteristics:

- Courses cover the full spectrum from blended learning to the entirely virtual;
- Most are recreational, but may also include basic skills;
- They are more likely to be found in colleges that offer higher education programmes;
- A substantial amount of vocational and general online courses available to the VISCED age range are provided by national organisations that are mainly targeted towards adult learners – e.g. Ufi (the LearnDirect brand of the original University for Industry) and NEC (the National Extension College); and the commercial colleges, especially Stonebridge and ICOSA.

3. CASE STUDIES OF VIRTUAL SCHOOLS AND COLLEGES

Introduction

With the largest number of virtual schools in the USA, their development there is well documented and the different approaches are summarised in the previous chapter. This chapter illustrates the different ways in which virtual schools have developed in Europe, through eight case studies of European virtual schools.

We have also included four mini-case studies from outside Europe for contrast: two from Australia and one each from Canada and New Zealand.

Most of the European virtual schools came into being to address inclusion issues: children with behavioural problems, school phobics, sick children, travelling children, elite athletes, teenage mothers, expatriate children, etc. Each country also has families who want their children to receive home-schooling. In some countries this is illegal and in very few European countries is virtual schooling viewed positively by education Ministries. The case studies from Portugal and Latvia are exceptions in this respect.

All of the case studies involve significant innovative practice, much of which is potentially scalable and transferable: for instance, whilst there is provision for the education of chronically sick children in most LLP countries, Bednet's highly integrated solution for children with long term diseases is considered unique at present.

The case studies demonstrate that European virtual schools form a very diverse constituency – ranging from quite sophisticated and high-tech through to what many would consider fairly basic, low-tech solutions; and through the spectrum of blended learning (from significant face-to-face to primarily online) to pure online learning. We might be so

presumptuous as to suggest that what they all have in common is that they have developed pragmatic solutions to meet existing learner needs.

The case studies are presented in alphabetical order of institution – this does not imply any ranking order.

Bednet (Belgium)

Bednet is a regional project in Flanders through which children who are suffering from long term and chronic diseases can follow lessons and interact with their own class through videoconferencing. It is currently catering for around 160 children aged between 6 and 18 at all levels of education. Approximately 50% of all the children are cancer patients and in any one year, between 5 and 8 have terminal illnesses.

Bednet was first established in 2005 and started to provide a service to children in March 2007. Its twin aims of ensuring that children can keep up with their school work and remain in contact with teachers and classmates are central to its philosophy.

There are 9 FTE staff, including two IT support technicians. None of the staff are teachers, but there is a pedagogical lead person, who is responsible for directing and managing the coaching service alongside the director and office manager. Bednet has a very specific recruitment policy related to the sensitivity of the context in which staff work: most come from human sciences backgrounds and include former teachers and nurses. This focus on sensitivity and maturity extends to the IT support staff. Staff development is a core concern, with a full day staff meeting for training and peer support each month.

Bednet is a tailor-made system with a personal approach. Students are at home when they use the Bednet system to connect to their own school. The system can be used in hospital; but treatment issues, internet problems and security often make this unrealistic.

The child is linked to his/her class via the internet. A Bednet set consists of two laptops (one with the child, the other in the classroom), two webcams, two scanner-printers and a camera focused on the blackboard. Thus children can participate in lessons in real time, using sound or light signals to ask questions and interact. Both teachers in the school and children receive training in how to use the equipment.

The technology has remained virtually unchanged since the service started and staff acknowledge that its systems may need updating.

The learning outcomes for the Bednet students are exactly the same as for their peers in normal classes; the overall objective is to ensure students return to their own school as soon as they are able: 90% of Bednet students move on to the next school year with their peers. The school remains responsible for the child's schooling; the Bednet staff describe themselves as facilitators.

There is no inspection regime as the service is not technically a school, but Bednet is working on a strategic plan to increase its service to 500 Flemish students annually and to become a fully integrated – and therefore supported – ministry service.

At present, 50% of the funding comes from the Flemish Ministry of Education and the other 50% is private funding from a mix of donors and sponsors. Students and schools are not charged for the service; in the present harsh economic climate Bednet is currently carrying out a detailed review of its service to see how it can become more cost-efficient without damaging the level and quality of the service it provides.

Ensino a Distância para a Itinerância (Portugal)

Ensino a Distância para a Itinerância (ED) – previously known as Escola Móvel – is a distance learning project of the Portuguese Ministry of Education & Science aimed at ensuring regular schooling of travelling children whose families work in circuses and fairs. The project has recently broadened to include hospitalised children, teenage mothers and other young people who cannot function in bricks-and-mortar schools.

The project has grown and developed from an initiative started in 2005/06, which offered 13 travelling children and teenagers the possibility of daily school attendance through a virtual environment. From these early beginnings, the project has expanded to cover upper secondary education up to 17 years old, building on growing numbers (up to 100 students) and high success rates.

In 2009 Escola Móvel moved from being an experimental project to a state school; but a year later, with resources constrained by the economic crisis it once more became a pedagogical project of the Ministry, changed to its present name and started expanding into other vulnerable groups beyond travelling children. The project moved from the Ministry department into the school community, hosted by one school in the Lisbon region. The school hosts teachers and provides logistics and organisational infrastructure for the project. In the future, it is planned to base it in an additional school in the north of Portugal, where there is the largest concentration of travelling children.

Although online and ‘at distance’, the virtual school is largely based on the Portuguese national curriculum and follows a traditional approach involving subjects, timetables, assignments and grades. The underpinning approach and pedagogy is, however, adapted to the needs of the particular target group.

The project relies on 23 teachers and a project co-coordinator, with each teacher responsible for tutoring 3–5 students and establishing close relationships with their families. The staff of the host school provide logistics, administrative and financial support.

Currently teachers are assigned to the project on the national criteria, for a year at a time. They do not have any specific profile or preparation, but working together from the same space in the host school, there is continuous dialogue and peer support providing all the necessary training. Teachers may stay with the project for one or more years and new teachers are supported and mentored by experienced staff.

Teaching is given through online communication and interaction; teachers have a set of teacher-developed resources as a basis for addressing subject-based and cross-curricular competencies. The curriculum covers all compulsory years of schooling from 5th to 12th grade.

Teaching is subject based and it is left to the creativity and motivation of teachers to develop inter-disciplinary projects, blogs, etc. Individual learning plans are designed when necessary and the pedagogy is student-centred, aiming at personalising learning based on continuous feedback.

The distance learning environment is felt to render some subjects impractical – e.g. music is substituted for physical education.

The school uses a Moodle platform, with chat as the main instrument for interaction during lessons. A blog is used for project work and cross-curricular activities and students are encouraged to use other online resources, such as YouTube. There have been experiments with videoconferencing using Adobe Connect to improve the teaching of languages and mathematics, but this has not yet been fully integrated into daily practice. Classes are mostly synchronous, but students are free to use the full range of ICT tools available to them for asynchronous work.

Although learning is student-centred, experience has shown that the target group needs strong central direction, particularly as their own lives are often unstable.

Students follow the same practices and procedures as conventional pupils in the national school leaving examination.

The school is subject to the same inspection regime as normal schools: this means that inspectors can arrive without notice and ask for a login to observe what is happening in the virtual classroom.

Students do not pay any tuition fees and staff are paid by the Ministry of Education at the same rate as teachers in the conventional system. Because the project depends in part on the funds available to the host school, the initiative is looking for additional private funding.

The project is currently undergoing a further phase of transformation. It is planned to capitalise on the lessons learnt and establish a system of school level distance education across the whole of Portugal, based on a network of six partner schools. Teaching would be networked, not linked to a specific school, but relying on the school partnership.

InterHigh (Wales)

InterHigh was established in 2005, initially for students aged 11–16, up to GCSE level.

The catalyst for the launch of the school was the nationwide roll-out of broadband, although the school's technology worked equally well with dial-up internet connections.

From an initial enrolment of 23 students, the school has grown each year since 2005. By 2009, it had more than 200 pupils spread across its five year groups. After five years of steady growth, InterHigh leaders felt they had reached a crossroads; they wanted to build on their success but decided to limit pupil numbers to 300, believing significant further expansion would have a detrimental effect on the quality of

personalised education offered to each child. They decided to grow laterally by launching three new business divisions: joint ventures with local authorities and individual schools in the public sector, independent schools and tuition businesses.

The main new business is Academy 21, which caters for pupils excluded from conventional schools and referred by their local education authority.

In addition, in response to demand from parents, they launched a sixth form – InterHigh Advanced – in September 2010.

InterHigh is a private school and, as a registered not-for-profit company, all monies are ploughed back into the school. Fees are approximately 20% of the average amount charged by conventional private day schools in the UK.

Most of the pupils live in the UK; the remainder are expatriate children living across the world. Within the UK, the school has proved particularly beneficial for children who, for a variety of reasons, are unable to settle at mainstream schools, including children with Asperger's syndrome and other forms of autism and the full range of inclusion issues described in the introduction to this chapter.

Students study mainly from home and staff do most of their teaching from home. All studying is done virtually. Lessons are very similar to those taught in any typical English or Welsh secondary school, following the National Curriculum with internal tests to assess progress. Lessons are held every morning, starting at 9.30 am and finishing at lunchtime, with the afternoon largely free for students to complete homework, work together on projects or undertake extra-curricular activities. The school can demonstrate that, even with only ten hours of direct tuition per week, they are able to cover the same amount of material as in the 30+ hours in a conventional school. IGCSE examination results are very similar to the average recorded by conventional schools; the school will put any pupil forward for examinations, not just the best students.

The development of InterHigh has coincided with the rise of Facebook, MySpace and other social networking sites. Pupils are encouraged to use these to chat to friends, help each other with work and make new friends in the same way as the rest of their generation – texting, blogging, emailing and tweeting.

Extracurricular activities include an annual play, where rehearsals and performance take place over the internet. One of the highlights of the school's calendar is the annual InterHigh Weekend, where pupils and parents gather for a weekend of activities at a residential college in Wales.

As it has expanded, InterHigh has recruited highly qualified experienced teachers who have worked in both the state and private sectors.

The virtual classroom is built around an interactive whiteboard and uses customised web and video conferencing software provided by Voxwire, an American company.

InterHigh is not inspected under the Welsh national inspectorate regime, as Estyn (the Inspectorate) does not recognise it as a school. Like all pioneers, InterHigh has faced an uphill battle to gain acceptance from the authorities. However, projects with children placed by local authorities have been singled out for praise when the local authority's education support services were inspected by Estyn, the Welsh Inspectorate. The school has been granted 'New Provider' status by the Open and Distance Learning Quality Council and is working towards full accreditation.

iScoil (Ireland)

iScoil is run as a private not-for-profit organisation funded by the Presentation Sisters in Ireland. It grew from the UK online learning model Notschool.net, the brainchild of Stephen Heppell.

iScoil caters for young people aged 13–16 who are out of mainstream school, largely referred for school phobia and refusal or disaffection and mental health issues. The usual number of students is around 45–50 at any one time.

Students are referred to iScoil through an established process by welfare officers working with the National Education Welfare Board (NEWB). Criteria for referral include having been out of school for at least 6 months, having tried other provision and having at least one supportive parent or guardian.

The original approach was fully online, but this has now been broadened to include a centre-based element with a blended learning approach. At present there are 3 centres in operation in Roscommon, Limerick and Longford.

The original platform was FirstClass, but this has now changed to Moodle, which offers greater flexibility for learning materials and pedagogy.

iScoil staff are made up of mentors, subject specialists and central team members. Both mentors and subject specialists are qualified teachers who work part-time. The central team comprises a manager, an administrator, a learning and support technician and a full-time education officer and this team manages and co-ordinates the delivery of the programme. Central team members are the first point of contact with the student, family and referral agencies.

Staff members are recruited on the basis of normal recruitment policies and are also required to have appropriate ICT skills. They are supported through a continuous programme of staff development, including a significant amount of training and support in IT.

iScoil operates an individualised online learning programme and whilst it does provide opportunities for students to collaborate and work together, it does not insist on this.

iScoil commissioned a thorough interim evaluation of the first two phases taking into account the results of the first 85 students who had participated up to the end of 2010. The evaluation identified considerable learning gains in personal effectiveness, interpersonal and social development and functional skills. Gains related to ‘working with others’ were strongest in those who had attended centres and there were also very positive gains in ICT, literacy and mathematics.

The approach taken to progression is to support students to move on to an appropriate situation. The evaluation showed that 65% of students either returned to mainstream school or went on to further education or training.

iScoil has been recognised as a provider within the Further Education & Training Awards Council since 2010. It has an in-house accreditation system linked to the external National Framework of Qualifications.

iScoil does not yet have an official status within Ireland; the concept of the virtual school is new to the Irish system. However, it has been specifically mentioned in the recent Programme for Government as an innovative initiative for tackling the problems of early school leavers in Ireland.

Nettilukio – Otava Folk High School (Finland)

Otava Folk High School was established in 1892 and in 1994 received the status of ‘upper secondary school for adults’. In 1996 it launched a project Internetix and within this project Nettilukio, a fully virtual upper secondary school, was founded. The first 13 students started in January 1997. Otava Folk High School now consists of the actual physical Folk High School, Nettilukio (virtual upper secondary school) and Nettiperuskoulu (virtual basic education).

When the Internetix project first started the emphasis was on producing e-learning materials that students could use whilst taking upper secondary school courses. Over the years the emphasis moved towards learning platforms and Nettilukio developed its own learning

platform, Muikku, designed to support both study and evaluation. The growing emphasis by the Finnish National Board of Education on virtual schooling encouraged the development of the fully virtual school.

There are now more than 500 students from all over the world in Nettilukio, covering the main categories of 'exclusion' described in chapters 1 and 2. At present, people with learning disabilities, or who have been bullied or found it difficult to cope in physical schools form the largest group of students. In 2011, 374 students left, with 39 graduating and the school received 739 new applications with almost 450 students actually starting.

Whilst the physical Otava Folk High School is small, Nettilukio is medium-sized by Finnish virtual school standards.

Staff members at Otava Folk High School may work across all three sections of the organisation. There are 23 part-time teachers at Nettilukio, who may live anywhere inside or outside Finland and work alongside their full-time job elsewhere. Four e-learning instructors are responsible for guiding student groups and there is a small central staff, including a principal and training manager. There are no school-specific staff recruitment policies; there is a strong emphasis on continuous staff development.

Students at Nettilukio may choose between three different methods for completing their courses:

- Non-stop courses involve independent study and can be commenced at any time. There is no fixed pace – students manage their own time.
- Collaborative courses are offered several times through the year and begin and end on fixed dates. When participating in a virtual class, students work together on issues and use each other as resources in a closed environment. Discussion forums, wikis and virtual conferencing tools are widely used.

- Phenomenon-based learning takes a topic (e.g. hunger and thirst, the welfare state, the Web 2.0 world) and integrates subject areas, according to students' personal choices. These courses are offered in an open, public online environment and often involve external experts. Web 2.0 technologies (e.g. blogs, wikis, video conferencing and social networking) are extensively used, together with Ning, Adobe Connect, instant messaging tools, email, Skype and Google. Students have also founded a closed Facebook group for peer learning.

Students are free to combine the three methods across their chosen programme.

There are no examinations or testing regimes. Evaluating individual tasks is the key point of assessment; this contrasts strongly with the physical Otava Folk High School. Formal course grades are provided according to the national curriculum and students who cover the whole upper secondary curriculum receive an official High School Diploma and are able to take the Matriculation examination – a qualification that has international acceptance.

The drop-out rate is high. However a single figure is difficult to calculate as many students return to study after initially stopping as students can start and stop at any time, and some take only one or two courses, whilst others tackle the full curriculum. Two main causes of drop-out are a misconception of the amount of work involved in independent study and changes in life situations which make studying impossible.

Studying is free for students tackling the full upper secondary curriculum if they are not registered at another upper secondary or vocational school. Students undertaking single courses pay a fee, but this is often paid by another school or employer.

The school receives a state grant for each student with the amount depending on the extent of the individual programme.

Rīgas Tālmācības Vidusskola (Latvia)

Rīgas Tālmācības Vidusskola (RTV) was established in 2009, with the support of the Ministry of Education and Science. Initially offering general secondary education, it has now started to offer primary education as well. The school was established with advice and guidance from a secondary school in neighbouring Lithuania.

RTV is the first distance learning school in the Baltic states to be accredited by its national ministry. All of its programmes have been accredited for 6 years, which is the maximum period allowed.

Student numbers have increased each year and there are now around 450 enrolled. The numbers change each week, since enrolment is continuous. Students currently live in 22 different countries and are aged from 14 to 57. They include most of the categories as described in the introduction of this chapter, including a considerable number of older people who for one reason or another were not able to complete their secondary education at the usual age.

More than half the students are full-time. They are admitted based on their previous school report, or on an individual assessment if they are older and do not have this available. The smaller proportion of part-time students use RTV as a supplementary school to complete subjects they want to improve. Most of their study is done at home, or in the case of elite performers, wherever their role has taken them.

RTV has 29 teaching staff delivering lessons, of whom 20 also work with students on the internet. The central staff team consists of a principal, a deputy director, two educational technologists and an accountant. There is strong support for professional development.

Communication between students and teachers is carried out on the school's e-study environment and may involve Skype, phone, email or any web-based programme that they agree to use. Interestingly, students are encouraged to recommend teachers for the school and several have been recruited in this way.

Every class has a schedule created by the central team, with tests each month. The academic year is divided into two terms. Teaching and learning takes place in a range of modes: around 50% is independent study with supplementary online materials; 30% independent study with compulsory textbooks; and the remaining 20% is split between online group tutorials (6%), individual online tutorials (2%), individual correspondence tutorials (3%) and tests (8%). Study materials are provided through video lectures, Ministry-prepared interactive materials, private lessons and Skype lessons.

Students take the same examinations as in conventional schools. Outcomes match those from conventional schools, but with fewer top grades and fewer bottom grades. The examination period of two weeks in May is the only time that students are required to attend the physical school. The school is currently negotiating with the Ministry to make it possible for students in Ireland and England to take examinations at the Latvian embassy in these countries.

The school is a private school with its own financial base. Students pay fees, unless they have a disability. The state pays the salaries of the teachers.

Sofia Distans (Sweden)

Sofia Distans was established in 1994 to enable expatriate Swedish students to study within the Swedish school system. The Swedish School in Moscow uses Sofia Distans for its grade 6–9 children, which is the age range covered by Sofia Distans. The school follows the basic Swedish school curriculum and grading criteria, with students graded in school year 8–9.

Funding is a mixture of public and private: the school has a deal with the Swedish government that gives some money for the students living abroad and the students have to pay the rest for themselves. For students living in Sweden, the municipality in which the students

live pays the fee. In total, around 40% of funding comes from the state, 20% from the municipalities and the remaining 40% from fees.

There are 500–600 enrolments in each year. There are 20 teachers and every student has a parent or tutor in their home location. Over recent years, the number of overseas ‘missionary schools’ for expatriate Swedish children has reduced dramatically and this has impacted on the numbers at Sofia Distans. Furthermore, Sofia Distans now includes students *within* Sweden who are not able to attend conventional schools, largely for medical reasons. Such students study half the time at home and half the time in their main school, whilst staff teach from the Sofia Distans base.

Pedagogy is conducted through online blended distance learning. Most students are engaged in self-study, following Sofia Distans prepared study plans. Teaching is subject-based. Distance learning is the core teaching method. The school sends the planning, paper books and material needed for the course via mail and teachers put online material and assignments on the learning platform (FirstClass) and then the students send their work and questions back to the teachers via the platform. The material provided from the school varies from paper copies to all kind of digital formats: video, sound, and text. The school guarantees answers within 24 hours. The teachers only work daytime (Swedish time), so the interaction is usually asynchronous. When recruiting staff, Sofia Distans looks first for flexibility and ICT skills for all categories of staff. Extensive in-service training is provided.

Every student has a tutor assigned to them who helps them following the study plan, but the student is responsible for time management of his/her studies. There is very little drop-out.

Student outcomes are similar to physical schools: Sofia Distans conducts the national tests in Swedish, English and mathematics. The qualifications are recognised in Sweden and the school is subject to the normal Swedish inspection regime.

Sofia Distans has quite a high level of autonomy. Future plans for the school envisage an increase in numbers. The main barrier is the Swedish government's ambivalent attitude towards virtual schools.

Wereldschool and IVIO@school (Netherlands)

Wereldschool was founded in 1948, initially to provide education for the children of Dutch nationals living in the former Dutch colony of Indonesia – to ensure they were not disadvantaged if/when they returned to the Netherlands. The school has changed radically from the initial 'Correspondence school' model to the point where all contacts between students and teachers are now facilitated through the internet, typically using email and Skype.

In 2011, it split its operation into two separate 'sister-schools'. Wereldschool continues to support children overseas and another school – IVIO@school – has been developed to support children in the Netherlands who are not considered well-suited by the traditional Dutch education system: this may be because they have learning difficulties or disabilities, school-phobia, illness or are incarcerated in a young offender institution. Amongst the IVIO cohort are some very academically gifted students.

Both the Wereldschool and IVIO philosophies are founded on meeting the individual needs of the students. However, the models have some critical differences. Whilst home schooling is usually legal for Dutch children living overseas, it is not legal for those educated in the Netherlands. These children (excluding those in prison who attend prison schools) are expected to attend a physical school where they work through the IVIO materials and are supported online by IVIO teachers.

The IVIO@school works together with regular schools in the Netherlands. Some schools timetable specific 'IVIO' subjects, but most schools create time for IVIO lessons and in this time, each student works on their own subjects. The mentor of the children is in the class

and helps all the students to plan the lessons. The IVIO teacher guides students from a distance and responds to questions about a specific subject. IVIO@school already has 600 students of whom 90% are full-time.

The Wereldschool offer covers pre-school (3 years) through to upper secondary (18 years). Wereldschool itself currently supports approximately 700 students overseas – across 128 countries – 15% of whom study a full online-curriculum.

Since its main goal is to (re)integrate students into their home-nation school system, Wereldschool prefers teachers who maintain their curriculum and pedagogic knowledge through current employment at traditional Dutch schools. These teachers often combine their work at Wereldschool and a traditional physical school.

There are 10 primary teachers and 35 secondary teachers, all working part-time, with 12 support staff. An individual full-time teacher will support approximately 80 students. Wereldschool does not specifically recruit teachers for their ICT skills, but seeks good teachers who are willing and capable to adapt to new techniques. They then receive support in developing ICT and online teaching skills and are closely monitored. Every month the school checks the pace and quality of the feedback supplied by the teaching staff: teachers have to respond to messages within 48 hours, correct every test within 5 days and send stimulating feedback to their students to keep them motivated. Most Wereldschool teachers work primarily from home but get daily support from the head office, twice-yearly catch-up meetings, professional development workshops and an annual official appraisal.

The students' engagement with Wereldschool is tailored (in consultation with the family) to the individual's needs. Some students register at a local school in their new country of residence and enrol with Wereldschool for supplementary courses (e.g. Dutch) which will help their re-integration when they return to schooling in their home country. Other students opt for the Wereldschool full-curriculum and are essentially home-educated. Most of the students following the

complete curriculum are looking for a more social environment. Sometimes they work on their programmes at a host school so that they can participate in subjects such as gymnastics or art-classes. Other full-time students study together with fellow homeschoolers, perhaps in a library or at home.

Students and their families choose the model which best meets their own needs. The majority of students following only a few subjects study at home so that they can easily combine the self-study with other (home) work.

Students are supplied with a comprehensive manual and package of learning materials (books, CD-ROMs, etc.) The manuals contain a lesson planner and all lesson materials. For primary students the manual is written for the parents whilst for secondary students the manual is written for the students. Parents of primary school children are expected to work with their children. Secondary school students are expected to work independently with these materials and use web technologies to contact their teachers for support. Their parents are encouraged to act as mentors. The students periodically have to take online tests, which are supervised by the parents. The student/parent sends the answers to the teacher. In the final year of secondary school, the students have to return to the Netherlands to take the official finals which are administered by an independent, national institute responsible for all official school exams that do not take place at a school.

Wereldschool is planning to replace the current learning materials with online resources and to include multimedia content such as video. However, digitising the curriculum content looks demanding since cooperation with publishers is proving somewhat problematic. Similarly, another 'bottleneck' is to find an appropriate and affordable digital platform: most platforms are designed primarily for 'classes' whereas the Wereldschool model is highly personalised.

Wereldschool has chosen an approach based on meeting the specific needs of the individual. The students work at their own level in their

own space. Because the students live in different time-zones, peer learning is not always possible. However, Wereldschool intends to investigate the feasibility of integrating peer learning in its programmes. Currently, students are encouraged to participate in local sport clubs and other social situations and to communicate with each other through an electronic message board.

Wereldschool sees personalisation as the critical factor for sustainability. Today the main communication channel is email. Whilst email is very quick, it is also impersonal. The challenge for Wereldschool is to integrate modern techniques that enable an even more personalised approach to its learning programmes.

The Wereldschool is recognised as a school by the Ministry of Education. Every year Wereldschool has to provide its learning outcomes to officials and every three or four years they visit the school to inspect all learning materials, policies, etc. However, its funding mechanism is totally different from other national Dutch schools: Wereldschool is privately owned. The only funding received directly from the Dutch government is for 'Dutch' as a subject and students or their guardians have to pay for the rest of their education themselves.

Mini-Case Studies

In addition to the main case studies, several briefer case studies have been completed. The four described here provide a contrast with the eight European case studies: the Open Polytechnic of New Zealand is included as one of the relatively few examples of a fully virtual college; the Canadian virtual high school is a useful example of a supplementary school to meet ethnic minority needs; and the two Australian schools are good examples from a continent where virtual schooling has been developed for many years.

The Brisbane School Of Distance Education (Australia)

The Brisbane School of Distance Education (BSDE) is located in the quiet suburb of Coorparoo, not far from the legendary Gabba cricket ground. BSDE is an Education Queensland (the educational arm of the Queensland Government) distance education school which supports students from pre-primary to 17–19 year olds (Year 12) and which also includes adults in its Year 10–12 cohort.

The school site is a revelation. In 2011 BSDE moved into a purpose-built, AUD \$30 million, new facility: a brand new school comprising both junior and secondary schools with playgrounds and classrooms, family rooms and a library which would be the envy of some new build physical schools in Europe and elsewhere.

What differentiates BSDE from traditional schools is the large 'distribution centre' which is required to manage the substantial amount of materials provided to support learners and their families. BSDE is by far the largest distance education school in Queensland with over 300 staff members (215 of whom are teachers) educating over 3800 students. The executive principal also plays a leadership role with the other 6 schools of distance education, which are located across Queensland. Most students study almost fully online but they, and family members, also attend the school at least once a term or attend workshops and activities held in Queensland regional centres.

Parents are encouraged to become 'home educators' and are offered support to achieve a recognised vocational qualification as such. In common with other Australian states, Queensland has a system of rotating staff around its schools and all teachers are appointed to schools by the state, resulting in no 'cherry-picking' of staff by the school. BSDE has had to prioritise staff development and is now recognised for its expertise in this area.

No proprietary online materials are used by BSDE. All materials are Open Educational Resources (OER) and/or teacher created. BSDE employs a Curriculum Development Team of specialists – graphic artists, developers, etc. All online materials are then provided through the Queensland state learning platform 'One School'.

BSDE's results match, and exceed, those of the best schools in Queensland and the school has evolved from "...the last point of call, to leading staff" across the entire state. Queensland is at the forefront of the development and testing of the Australian national curriculum; and BSDE is leading the state through 'wrapping' the new curriculum and providing it for schools state-wide. The school was the outright winner of the Excellence in the Senior Phase of Learning Award in the Queensland 2011 Showcase Awards for Excellence in Schools.

Open High School, Sydney (Australia)

Open High School is a New South Wales (NSW) Department of Education and Communities (DEC) distance-education secondary school which offers courses in 13 languages to students aged 14–19 (Years 9 to 12). The school is located in a former 'physical' school site in the Sydney suburb of Randwick.

Open High School provides single courses which form part of the students' core curriculum, with students being enrolled full-time in both NSW state or private (non-state) schools. It receives NSW state funding and state-school student places are subsidised, with private students paying fees. Senior Language courses are offered at five levels: Beginners, Continuers, Extension, Background Speakers and Heritage.

Junior students are offered a single course which is differentiated by teachers to cater for students with differing abilities and language backgrounds.

Whilst students are physically based at their home schools (where they have a dedicated home-school supervisor), and may undertake additional learning at home, they also attend the Randwick Open High School site at least one day per term for students in Years 11 and 12 and at least one day per semester for students in Years 9 and 10. There are some 1,800 students studying at Open High School supported by more than 80 teachers (approximately 65 full time posts). As with other Australian states, staff are allocated to schools by the NSW Department of Education and Communities – Open High School does not recruit its own teaching staff. The school operates in-school CPD support for all of its teachers and this may be supplemented with support from the NSW Department of Education and Communities.

Teachers of Senior courses typically support approximately 33 students whilst those teaching Junior courses may expect to support around 50 students. The staff are keen to emphasise that this model allows them to individualise each student's learning programme and that staff are expected to be 'on call' to support students at times well beyond the 'traditional' school day. Whilst this places a considerable expectation on the staff, it guarantees students a level of support relatively rare in physical schools.

Depending on the specific course, students will receive CDs, printed and/or online materials; however, the school is rapidly moving to online delivery of all courses and, in the near future, all materials will be delivered via the learning management system. Home schools are expected to provide their students with any text books or equipment necessary. Budgetary pressures mean that Open High School has, for some time, been moving away from printed materials. This was one (although by no means the only) factor in the introduction of the Open High School's Moodle site in 2005. Development of the Moodle site has

continued and it is currently undergoing further tailoring to suit the needs of students and staff.

Even though the students at Open High School are far from socially isolated (being located within a home school community), the school is keen to encourage and nurture physical communities amongst students. This has proved to be a notable success with groups of 'dispersed' students making arrangements to meet face-to-face, supporting each other through social networking platforms and, in the case of one French group, setting up a dedicated Facebook site.

The school faces a continuing challenge in raising awareness (amongst NSW schools and parents) of its programmes but many schools use the link with Open High School as an attraction to potential students and some schools can be keen to take credit for the qualifications achieved by students studying at Open High School. This is understandable since Open High School students' results are consistently equal with, or exceed those, of physical schools in the state and year after year Open High School students feature amongst the highest achievers.

Credenda (Canada)

Credenda Virtual High School (CVHS) is a private school, established in 2005 by the Prince Albert Grand Council initially to serve the needs of the geographically isolated – and typically First Nation – communities of northern Saskatchewan, where high drop-out rates and low attainment levels were evident. CVHS was created to meet a specific need and acts as a supplementary school, not a complete replacement. It was designed to support schools through partnership working to meet student needs wherever class sizes were too small to justify offering a course (or where the course was best delivered by a subject specialist) and students study both at home and in their community's host school.

Initially established for the high school and adult students of northern Saskatchewan, Credenda now proactively promotes itself as a "First Nation school that welcomes everybody". It has expanded its reach and

now caters for students from school districts across Saskatchewan province and beyond – with some students studying from overseas. There are around 500 students each academic year.

CVHS provides fully online courses which are predicated on high levels of personal support and interaction between teacher and student – this includes daily instruction and encouragement, easy access to technical support and help desk personnel, guidance counselling services, and administrative support combined with the on-site teacher interaction for moral support and accountability. This role of the on-site teacher is considered by CVHS to be critical (e.g. ensuring that students are on task). Consequently, Credenda requires participating First Nation schools to have a qualified teacher on-site (at the students host school) teacher to supervise and monitor students when they are taking their online CVHS courses.

Each live classroom session is recorded and archived for eStudents to access later for review or completion of their assignments.

Credenda provides a curriculum for Grade 10, 11 and 12 students as well as various continuing education courses for adult learners. Courses are taught by provincially qualified teachers in a live online environment – one not influenced by issues of race, gender, personality, appearance, and socio-economic status. Students have regularly scheduled classes daily in an online classroom setting with their eTeacher. Each course is structured with a common template for achieving learning outcomes.

In addition to academic and pedagogic support for students, CVHS is committed to high levels of pastoral support. eTeachers spend a great deal of time following up with students. If an eStudent is absent, they are referred to the principal and guidance counsellor who follow up with the eStudent and on-site eTeacher. Academically, Credenda has high expectations that are outcome-driven.

OPNZ (Open Polytechnic of New Zealand)

The Open Polytechnic is a specialist institution of distance learning based near Wellington, New Zealand, in the area of Lower Hutt, with Learning Centres in Auckland and Christchurch. It now has around 34,000 students, but very few under 20. There are more female than male students (57:43) and around 13% of students declare themselves to be of Maori ethnicity. There are 180 full-time academic staff and over 300 adjunct faculty (mostly off-campus) with relevant expertise.

Open Polytechnic began life as the Technical Correspondence School in 1946, providing resettlement training for returned servicemen and women following World War II. As part of wider education reforms, the institution was renamed The Open Polytechnic of New Zealand in 1990, becoming the specialist national provider of open and distance learning at tertiary level and adopting internationally proven models for distance learning course design, student support and quality control.

Course materials are still largely produced in hard copy as student surveys continue to show that that is what they prefer. Faculty contribute to the writing of courses and teach them using a range of teaching media from phone to email to correspondence. Course materials are designed by expert teams, which include external experts, and instructional designers and editors.

For secondary school students, Open Polytechnic can provide quality vocational and higher education programmes to senior secondary school students through a selection of courses that can be funded through the STAR and Gateway programmes. For most courses, enrolment is open, which means students may enrol at any time of the year.

Open Polytechnic offers a variety of courses at Levels 1–4 on the National Qualifications Framework for students still attending school. These courses are for students wanting to prepare for pre-vocational, vocational and tertiary studies. Successful students will leave school with credits towards industry or tertiary qualifications.

The programme can also give students the opportunity to try out an area of interest or develop general skills that will stand them in good stead when they leave school.

It also offers school students access to courses at Levels 4 and 5 on the National Qualifications Framework. These are generally not unit standard-based and therefore cannot be credited towards the National Certificate of Educational Achievement, but they give advanced students the chance to get started on higher-level educational qualifications whilst still at school.

4. INNOVATIVE PILOT STUDIES

The aim of the pilot studies was to test out innovative ICT-based approaches to virtual schooling and produce recommendations for wider use across Europe based on the outcomes. The key issue which the pilots were designed to address was the extent to which innovative ICT-based approaches to learning might improve learner results.

Four pilot studies were undertaken in three LLP countries:

- Ross Tensta Gymnasium in Stockholm, Sweden
- Notre Dame High School in Sheffield, England
- The Sheffield College in Sheffield, England
- The Network for School Innovation supporting 16 schools in different areas of Greece.

Brief descriptions of the Swedish and English institutions are given in the appropriate sub-sections in this chapter, together with a description of the Greek network.

The main research took place during the first two school terms of the calendar year 2012, though in the case of the Swedish pilot it was possible to start during the autumn term of 2011.

Pilot at Ross Tensta Gymnasium

About Ross Tensta Gymnasium

Ross Tensta Gymnasium (RTG) is a public school in Stockholm. The school is located in a low social status suburb inhabited mostly by immigrants or people with immigrant background. Almost all the students have immigrant backgrounds, most of them from the Middle East and eastern Africa. Ross Tensta Gymnasium is an upper secondary school with about 750 students aged 16–18. It is a general school which prepares the students for higher education, although it also delivers two vocational programmes.

ICT is built into the curriculum. From 2003 onwards, the school has provided every student with a personal laptop, and it has a wireless network. The laptops are used in different ways and methods depending on the subject. The computers are as central a tool for learning as books, paper or pencils. They are used for research, creating and publishing, storing and administrative tasks. The school moved from Microsoft Class Server to Fronter as a Learning Management System (LMS) in 2005, and considers itself to be an e-mature school.

Background to the Pilot Study

The main issue was to see if there was a benefit for the students by replacing the traditional textbook with online material created by the teacher. The study sought to investigate if teacher-created multimedia learning material enhanced the learning process and if it was easier for the students to learn if they have their learning materials online.

The development and outcomes of the study were assessed through interviews with the teachers involved, a questionnaire with open and closed questions for the students and a summary of the grades in the subjects graded this year.

The class chosen is both a typical and an atypical one for Ross Tensta Gymnasium: typical in that it is a social science class with typical grades for the students in Ross Tensta Gymnasium, but atypical because

almost half the students had not achieved all the grades from earlier school years. The pilot manager also had quite close contact with the students and was sharing the mentorship with another teacher.

The First Pilot

The study was at first focused on one innovative teacher, whose specialist teaching subjects are Mathematics, Biology and Natural Sciences. He was scheduled to deliver the behavioural science section of the social science programme to a class of 24 students.

In this course, the teacher created his own digital material, consisting of PowerPoint and Keynote presentations with embedded sound and video. The digital material was then placed on Fronter and all the material structured within appropriate folders related to the national curriculum for the course. The students could then access the material from any device with an internet connection and the teacher ensured that the material could be viewed by any device, no matter what the operating system. The presentations were also organised according to operating system.

The piloting started with a misunderstanding that may have influenced the outcomes. A rumour that the school could not afford books started among the students and they grew angry, not knowing that the teacher never intended to buy books.

The teacher habitually works quite traditionally in that he gives lectures, using the presentations and conducts traditional tests in the classroom. All his material is accessible from any device with an internet connection and the students can often watch the films in the classroom after the lectures. To meet students' demands, he quite often made paper copies from books as well. The innovation was that they could now watch a film created especially for them for this course, independent of location and time.

The students did not visit the room in Fronter very often. Some hardly visited at all and others more frequently. Everybody opened the documents at least twice; the most frequent visitor visited the room

180 times and the least just once. All read at least one document and this was identifiable in the analysis. Outcomes in this subject were no better or worse than the average, compared to other subjects this class studied at the same time. However, the students often got paper copies and this may have limited their logins to Fronter as they continued to study in their traditional manner.

The Second Pilot

During the piloting we discovered another course in which the same students did not have any textbooks and it was decided to bring that course into the pilot as well. The new course was Sociology.

There were two teachers delivering one lecture each, every week. All material was uploaded to Fronter. It consisted of Power Point presentations, documents and links to educational films. During the course, the students worked with presentations and assignments on documents. They could read the presentations and the articles and then they discussed them in the classroom. They also wrote reports, uploaded them to Fronter and used role playing as well.

All the material was organised and structured in folders in the same way as with the Natural Sciences course, meaning that the students could easily find the relevant material.

More students in Sociology visited the room in Fronter and opened the documents than in Natural Sciences. The student who visited the room most often, made 1312 visits and opened documents 161 times. The student who visited the room least, made 101 visits and opened documents 32 times. This showed in the results as this subject got the highest average grades for the class. No alternative paper copies were given.

Input from Students

At the end of the course, the students were asked to fill out a questionnaire with twelve questions, of which six were open questions, allowing them to answer in their own words.

Out of the 24 students, only twelve answered the questions, and the answers ranged from fully positive to wholly negative. It is not possible to draw any statistically valid conclusions from the responses, but the students clearly valued being given a voice.

All except one of the respondents were initially quite disturbed to hear about not having a textbook. The students were positive about the structure of the materials on Fronter, as this suited them and they were positive about the capability to access the material from anywhere and that they did not need pen and paper.

Two who disliked not having a textbook said they liked books and thought that it was harder to keep track of hard copies than of a book. It seems like they did not use the uploaded films but the paper copies. These students also commented that the technical environment did not always work properly. One student did not like that they were not allowed to take their laptop out of school because this made it harder to study at home.

The wireless network and Fronter are reliable, so students could watch the films at any time. One student reported being unable to open the documents, but this is likely to be related to student or computer error. Another student pointed out that it could be a problem when all students tried to watch film at the same time as they are connected to the same access point.

Seven out of the twelve students said that they primarily watched the films in the classroom, during class. Three said that they primarily watched the films outside of school. Interestingly enough, the student who was most negative in the questionnaire was one of them.

The student added that he/she did not understand anything of the films because he/she did not have a book. Nine students watched the films in the classroom and five also watched at home. No one said that they were watching the films on the public transportation system.

Nine said that they watched the films on a laptop and not on any other device. This is not surprising given that the students mostly watch the film in the classroom and they are provided with a laptop from the school. One of the students said that they used a tablet and two said that they also used mobile phones.

After the course, students were substantially more positive than before about not having textbooks. All but one said their initial reaction had been negative at the start of the course, but by the end of the study only two students remained negative.

The students did point out that you need good teachers, especially when you do not have any books. The teachers must be proficient in providing good explanations and in creating and structuring learning materials. They also thought that active participation enabled them to demonstrate their knowledge. A positive illustration of potential flexibility is that some said that they learn best by watching film while others said that they still learn best from books. The students' different responses showed that the potential strength of having all materials available online is that different media can easily be mixed.

Discussion

It seem as if most students in this class at Ross Tensta Gymnasium are still more dependent on traditional teaching methods than handling online learning when the material is uploaded to a learning management system (LMS). In natural science and in maths they tend to work quite traditionally with lectures and tests: these subjects lend themselves readily to this kind of teaching as they are highly factual and are long established in the school curriculum. Several students say they like this method but they seem to have a hard time learning from it. Whilst it is easy to fall into a traditional way of teaching and learning,

this is less effective in Sociology and Swedish which are based more on learning different skills rather than facts.

The rumour that the school could not afford books seems to have affected Natural Sciences more than Sociology. But Sociology was a new subject for the students, so it may have been easier for them to accept an unfamiliar pattern. However, the teachers did have long conversations with some of the students about not having books.

An LMS can be used effectively as long as the teachers use it with good and thoughtful pedagogy. Planning needs to be thorough and the teachers must be skilled in both using ICT as a pedagogical tool in school and having good subject knowledge. The students and teachers must feel confident with the technology and the technology must work. Only then does it provide you with flexibility at almost any level, in a way that textbooks never can. The teachers do not have to be completely pedagogically innovative; they just have to introduce technology into accepted good pedagogical practice. A wide range of media can be used in virtual schooling to achieve good learning, including effective testing. As an example, role plays can be filmed, linked and saved for detailed analysis.

It seems that the students in this pilot at first were quite conservative. But in actuality they were not: they showed that they can change their minds about different ways of achieving knowledge and that they are able to shift from paper books to digital learning materials as long as they feel comfortable.

With such a small sample population, it is not really possible to say with complete confidence that the students learn better from online digital content than from textbooks. However, an examination of the grades of the different subjects that this class studied showed that the subjects where the highest grades were achieved were those with no textbooks.

The Sheffield Pilots

Introduction

There have been two VISCED pilot projects in the UK: at Notre Dame High School and The Sheffield College. Both of these are located in Sheffield and both have looked at extending virtual school/college activity into mainstream teacher activity in a bricks and mortar school and college.

Notre Dame High School in Sheffield makes use of its Moodle VLE to encourage students to extend their work outside of the classroom, particularly in Maths.

The Sheffield College's 'Online College' delivers a number of courses online, especially GCSE English. It is now also training teachers of face-to-face classes to make use of the online resources with their students, both in-class and outside.

Both approaches allow students to access learning when and where they choose, so that they can work at their own pace. This is particularly beneficial for students who are progressing faster or slower than the rest of the class.

The Notre Dame Study

ABOUT NOTRE DAME HIGH SCHOOL

Notre Dame is a Catholic secondary school (now an Academy) in Sheffield, catering for around 1,400 11–18 year olds. Although the ethos of the school is Roman Catholic, it admits pupils who are not Catholics from all over the city of Sheffield, both at Year 7 (11 year olds) and into the sixth form at Year 12 (16 year olds). For some years, it has specialised in Technology (operational) and is one of the leading English schools for the use of ICT in teaching and learning. It is a bricks-and-mortar school, but makes increasing use of virtual teaching and learning.

The web-based systems in place at Notre Dame mean that virtual schooling goes well beyond just e-learning. It also encompasses teachers working from home on all aspects of their work, parents engaging with their children's progress, governors carrying out their duties and community groups accessing projects and services they are using all through logging into web-based tools without visiting the school site. All stakeholders can access a range of communication tools that bring the community together in virtual space.

THE MATHS DEPARTMENT AT NOTRE DAME

The Maths department at Notre Dame School prepares 16 year olds for the step from GCSE to the much tougher demands of A level study through access to virtual teaching, self-generating questions with teacher video clip support and automated e-assessment, and virtual access to teachers through instant messaging and other communication tools.

Over the course of the academic year 2009–2010, the Maths department's VLE page was developed. The site was made available to students in September 2010, with the Maths department being the first department in the school to create a full departmental site. It was found to have significant benefits immediately following and prior to examinations in the summer of 2011.

The 15–16 year old students (Year 11) were presented with a list of topics they should spend time revising. The idea of this list was to be able to direct students to focus on revising the material most likely to come up in the external examinations. The Maths department also adapted some of their Excel-based interactive practice worksheets, in order to provide students with a mix of questions on these topics to practice and revise from. These again were published via the Maths department's VLE page. The interactive sheets provided have self regenerating and marking questions. Students are encouraged to work through the question and then use the 'show answer' button to check if they have got the answer right and see what the correct answer should look like.

In order to direct students to this essential revision material, the information was broadcast from the school's Twitter account. As the gap between the two external examinations was only 44 hours, it was important that the information was communicated and disseminated quickly. The school also uses Twitter for reminders, highlighting mistakes, posing questions and providing students with guidance and material on what to revise. The teachers saw clear benefits as it kept maths in the forefront of the pupils' mind. But the teachers were worried of what might happen if all teachers start to use Twitter on a daily basis with their students. Would this be an information overload for the students?

The statistics show that the students accessed both the worksheets and other online revision materials available during their study leave period immediately prior to the external examination.

THE PILOT STUDY

Although other factors were influential, the Maths General Certificate of Secondary Education (GCSE) results of the 2011 cohort of Year 11s were the best the department ever had. It was felt that the introduction of the Maths VLE site played a role in this. For 2012, the pilot has built on this as a new tool entitled 'School+' was developed and the use of Twitter was further expanded, in order to provide extra learning and support in the hope that students would replicate if not improve on the already high success rates. The pilot resources have also been used to develop a Virtual Textbook, which was launched in September 2012.

The department's Moodle site is shared by all teachers in the department and was originally created with built-in flexibility so that teachers could take ownership of differing sections. Due to this, the site is constantly evolving with different staff members using the site in different ways.

SCHOOL+

The idea behind School+ is very different to that of the Virtual Textbook, being designed to focus on delivering specific 'virtual lessons' within designated virtual courses. The main course was set up specifically for the current Year 11 group in the run up to their GCSEs. The idea behind the course is that it delivered self-contained lessons, with detailed notes and examples provided, with students then being able to test their understanding and ability by completing lesson-specific interactive assessments.

The course, trialled by the pilot, focused on specific topics in the GCSE syllabus which were of the greatest difficulty. The idea was that with a set of the Year 11's ability level, these topics would usually not have been covered, meaning that students were essentially provided with an extra hour a week of Maths, delivered solely online on a voluntary opt-in basis. Although the length and content of the course was bespoke in nature, the underpinning idea of targeting set students and delivering specific content online can very easily be transferred across ability levels, topics and subjects. The teachers made sure that navigation was simple and that all instructions and information were clear.

As this School+ course was an opt-in initiative it was always going to be interesting to analyse the participation figures. As would be expected, there was an initial surge in interest upon launch, with participation rates slowly dropping over time. Although participation figures towards the end of the online course had significantly dwindled, they were still encouraging; as any level of engagement by any student with the content provided, represented progress. This was due to the fact that the course had not replaced homework and so any extra time students were spending on the course represented an addition to their normal Maths work. Although individual lessons were presented week by week, all the lessons were left open over the study leave period. In terms of actually assessing the impact on attainment, the aim was to use the detailed exam paper question breakdown which is accessible through the exam board after the results have been published.

For every question on the paper, analysis is provided of individual questions and how marks were achieved for the question.

Following the results in August 2012, the project initially tried to analyse the effect of School+ by comparing the scores students obtained on the most difficult (grades A/A*) questions in comparison with last year's results. Unfortunately, it was rather difficult to draw any clear conclusions from this analysis, since there were fewer A* questions on the 2012 paper, and more of the A grade topics were encompassed within the new 'thinking skills' style question which had been brought in for the first time that year. Consequently, the project has to wait for at least another cohort, with access to the online tools, to go through; in order to have enough information to start effectively analysing results.

When comparing the pilot class results to other sets, it appears that the extra online support has had an effect. For the year 2010/2011, all students in sets 5 and 6 achieved at least a C grade, with many achieving significantly higher, and the difference in results between the groups being minimal. For the year 2011/2012, the pilot set (set 5) achieved predominantly B grades with no students failing to get at least a C, while the other set (set 6) contained eight students who were awarded a D grade. It is obviously impossible to measure the effect that the pilot's online support had on students, as there are so many other factors which can contribute to a student's final grade; however it does seem to have made a positive impact. In particular it was felt that the use of Twitter during the study leave period had a significant impact, in helping to remind students of key facts and update them with when in-school revision classes were available.

VIRTUAL TEXTBOOK

Resources provided by the VISCED pilot enabled the Virtual Textbook to be developed throughout the academic year 2011–12 with the aim of it being ready to launch at the start of the new school year in September 2012. The idea behind the Virtual Textbook was to replace the department's current 'blue books', which students used for note-taking.

When discussing the use of the textbook with the department the intended benefits were outlined, which include:

- The ability to replace the need for students to copy from the board, which appears to be a very inefficient way of communication.
- The ability to access their notes anytime, anywhere. This subsequently increases learning opportunities.
- No more lost books. No more incorrectly copied notes.
- The inclusion of multimedia content, which allows students to be able to replay a lesson over and over. Such capacity will hopefully allow for students to learn at their own pace.

The virtual textbook has now just been launched within the school's Moodle VLE, to help provide students with a set of notes of the differing topics covered. This has already had an impact within the department with teachers now not needing students to copy down important information, which has subsequently freed up more time for students to practise the skills they have learnt.

CONCLUSIONS AND SUMMARY

Throughout the pilot, it was imperative to constantly pause, take stock and review how new systems and approaches would be viewed and used by students and staff alike. In particular, it was important to scrutinise the costs and benefits of any use of a VLE, as simply because there is the capacity to utilise it in a certain way, it does not mean that any benefit necessarily derives from this. The rapid developments in technology have made it is easy to fall into the trap of constantly implementing new systems, just because there is the capacity to do so. Only once staff and student consultation has taken place alongside cost benefit analysis, should an informed decision be made on how new virtual initiatives should be developed and introduced. The fact that much of the pilot work acts to provide *additional* learning resources, rather than representing a *replacement* of them, helps to overcome such issues. For instance, the department's uses of Moodle, Twitter and School+ act in a way of providing *additional* support for students, whilst they are still ensured of the same level of conventional teaching and support as they had prior to their introduction.

The use of a VLE in a bricks-and-mortar school provides the opportunity to use the virtual environment either as an extension of the classroom or as a stand-alone platform for learning. In terms of the use of Moodle, School+ and Twitter with the pilot Year 11s, it seems that a significant contributing factor to their success is due to using these tools as an extension of the teaching, with the relationship between teacher and students being transferred into the virtual environment. This was specifically the case in the use of School+ and Twitter, whereby bespoke lessons were offered as well as information that engaged students due to it being specifically tailored to their needs. Engaging students in a virtual environment, through targeting individuals and classes with bespoke lessons and activities, clearly represents an area of significant promise for the future.

The Sheffield College Study

ABOUT THE SHEFFIELD COLLEGE

The Sheffield College is a large general further education (GFE) college in the north of England, with over 30,000 enrolments annually. It operates as a federation of three separate main college sites and draws students from all over the city and the wider Sheffield city region. The college provides a wide range of vocational training, general education and adult programmes, on both a full and part time basis, and offers courses at all levels from basic education to full degrees. For many years it has been significantly involved in online learning, initially developing an award-winning course for teachers – *Learning To Teach On Line* (LETTOL) and has been delivering a fully online GCSE English course since 2002.

BACKGROUND

Although the college has been delivering a fully online GCSE English course since 2002, with learners from all over the UK benefitting from this online provision, delivery on the physical college sites, where approximately 400 students take GCSE English each year, has been traditional and entirely classroom-based.

For the last two years, the team responsible for Online Learning has also been charged with the responsibility of getting ICT used more widely in the formal classroom and has promoted the use of Moodle as a means for a more blended approach to delivery.

Resources made available by the VISCED project were used to buy additional teacher time for course development. The aim was to develop a GCSE English course in the college's virtual learning environment (Moodle) that encouraged staff to use the VLE with students in a variety of ways. They might, for example, set forum discussion activities around set pieces of work. Students would be encouraged to use the resource as part of home study, making them less dependent upon learning by listening and note taking. The developing team would recycle the detailed content from the

online GCSE English and then run training that ensured staff had the skills and opportunities to use the resources dynamically rather than just viewing Moodle as a content repository.

IMPLEMENTATION

This project began in the winter of 2011. A small team of three was put together, two of whom had considerable experience of both face to face and online GCSE English delivery and the third with considerable experience of developing courses in Moodle and training others to do so. A very experienced online GCSE English teacher was appointed to lead the team and focus upon the staff training.

The team met on eight occasions between November 2011 and April 2012 when the work was completed. They began by bringing a number of English teachers together with a demonstration of the online course. Staff could see the immediate value of what they would gain through using Moodle and 'bought in' to the project. However, it became clear that some 25 different coursework texts were being taught across the college and it was simply not feasible or worthwhile putting coursework into the GCSE English Moodle. Consequently the staff concentrated upon examination work which was common to everyone. Examination work unfortunately is largely delivered at the end of this one-year curriculum which put the project team and participating staff under some pressure in terms of training and delivering.

The team adapted the following online resources for active blended delivery:

- Paper 1 (Reading questions) including:
 - Introduction to 'Real Texts'
 - How to write about language
 - How to read the question
 - Detailed analysis of four types of question, Examples of student responses and how they are marked
 - Examination practice.

- Paper 2 (Writing questions) including:
 - Introduction to writing 'Real texts'
 - Audience, purpose and form
 - Illustrations of different styles and registers of writing (letters, articles, speeches, reviews, reports, leaflets)
 - Examples of student work and examiner comment
 - Examination practice.

These resources were put up in Moodle, in Books, with clear navigation and which included newly created material with links, sized into sections to use independently by classes and individuals.

The role of the team leader was to check all the resources and that the links worked; communicate the project to class teachers; and train a small number to participate in a pilot study and enrol participants in groups for the pilot study

All the above work was completed by mid-April 2012.

Four tutors have been trained, fully engaged with the project and have encouraged students to use the materials dynamically, including for private study. Twenty students and four staff made up the pilot study.

The success of the pilot was ultimately to be judged by a comparison of 2012 external examination result with GCSE English results from previous years. Unfortunately there were major problems with the GCSE English examination at the examination board used by the college, which have still not been resolved. This has rendered the results inconclusive and at least one more year's results will be required to assess whether the innovations have made a positive difference.

The Greek Pilot

Introduction

The Programme Guidance and Employment Studies was a VISCED partnership programme with the Network for School Innovation (NSI) and piloted during the 2011–12 school year. The programme was supported by the Lambrakis Foundation, in scientific collaboration with Professor Kalliopi Kounenou of ASPAITE (Graduate School of Pedagogical and Technological Education) and in association with IEPAS (Institute of Career Guidance and Career), KEMEL (Centre for Volunteer Managers in Greece), Future Leaders and Young Leaders.

Partnership with the Network for School Innovation was identified as offering the potential to reach a broad spectrum of schools: across urban and rural areas, throughout mainland Greece and the Islands, and those in differing economic circumstances including those in disadvantaged areas.

It should be noted that the ethos of the VISCED piloting was one of 'realism'. The Commission's own 2012 Digital Scoreboard placed Greece towards the bottom of the 27 European Union countries in terms of both home access to the internet and the 'computer skills' of its citizens. As such, the piloting was designed to identify, encourage and analyse innovation in this context. It was not sufficient to identify 'new and effective practices'; these had to have the potential to become 'mainstream' within the challenging Greek context.

The Study

The programme was aimed at high schools across the country with key objectives:

- The response to the growing needs and deficiencies of schooling on the educational and vocational guidance of students, taking into account the changing and complex aspects of work and occupations in modern societies;
- Providing opportunities for mutual connection and interaction with the school community, local and wider, and the labour market;
- The strengthening of the relationship between the world of business and the world of education.

To this end, the programme during the pilot phase offered:

- Teacher training in professional development and communication skills for career guidance and counselling;
- Support for teachers to develop activities and Entrepreneurship Orientation at school;
- Support for schools to connect them with organisations and enterprises;
- Opportunities to showcase and exploit best practice.

The VISCED pilot builds on the NSI approach to developing skills for both students and teachers and investigates how this is enhanced through the use of commonplace technologies. Schools participated with at least two teachers who were trained through the existing NSI electronic platform but also in face-to-face seminars. The learning process included the preparation activities (projects) of the schools, where teachers in collaboration with students and their colleagues planned, implemented and carried out innovative actions.

Participants undertook educational initiatives to link the school with the labour market. Project teachers were supported by trainers or coordinators, who provided the general pedagogical support.

Additional support was provided by one or more managers and associated labour market institutions, who volunteered to help teachers connect the school to the labour market. In particular, the personnel:

- Provided advice and guidance to teachers and students, in collaboration with the trainer (coordinator);
- Assisted schools to find partners;
- Cooperated with teachers and students to generate new innovative ideas;
- Assisted in the implementation of projects of schools in terms of connecting with the labour market.

The subjects of the educational school projects were chosen by the participating teachers and students according to the needs and interests of the latter.

Participating Schools

In total, 16 schools from 11 different municipalities around Greece participated in the piloting programme: 530 students, 70 teachers, 14 coordinators and 10 managers were involved.

The schools involved were spread geographically across the whole of Greece:

- Six schools in the Attica municipality of Athens: 1st Gymnasio, Aharnon; 1st Gymnasio, Kaisarinanis; 1st Arsakeio Gymnasio Psychiko; Varvakeio Peiramatiko Gymnasio; Prototylo Peiramatiko Lykeio Evangelikis; Scholis Neas Smyrnis
- Four schools in the north and north west: 5th Gymnasio, Ioannina; 2nd Epal Serron, Serres (Macedonia); Gymnasio Amyntaiou, Florina (Macedonia); Lykeio Agiou Nikolaou Chalkidikis
- Two schools in the Peloponnese: Gymnasio Levidiou, Arcadia; 16th Gymnasio Patras, Achaia
- Two schools in the Dodecanese Island of Rhodes: Gymnasio Kremastis; Esperino Epal

- One school each in central Greece (Lykeio Proastiou, Karditsa), the Ionian Islands (Gymnasio Agrou Kerkyras, Corfu) and the Aegean Islands (Gymnasio Livadochoriou, Lesvos).

The VISCED:NSI Approach

The VISCED:NSI schools and teachers met on an e-learning platform. This platform offered teacher and school development programmes, access to educational resources and interaction opportunities.

The VISCED pilot used the existing NSI Moodle platform. Teachers of the same school made up smaller groups within the learning platform. These groups started their collaborative work by preparing an extensive profile of their school. The school unit's areas of strength and areas of growth were explored and the school team then decided on the area of their activity for the initial training period. There was no limitation on the subject of the activity.

Training was offered on two tracks, each of which evolved into three training programmes, as follows:

- Track 1: Teacher Professional Development
 - Programme A: "Exploring the Innovative Teacher"
 - Programme B: "The Reflective Teacher"
 - Programme C: "Teacher Leadership".
- Track 2: School Development
 - Programme A: "Introduction to Innovation"
 - Programme B: "Targeted Innovation"
 - Programme C: "Sustainable Innovation".

Track 1 was a personalised training programme, attended by teachers who participated in the NSI Workshop as a school team, as well as by independent teachers who undertook the training as individuals. Placement in one of the three programmes was dependent on the trainees' qualifications, skills and competences. Teachers progressed at their own pace depending on the amount of time and effort they could put in and their capacity to contribute.

Teachers who joined the training programmes with their school team attended both tracks at the same. Depending on the school's competencies, it was placed in programme A or B. Placement in programme C required the completion of programme B. All participating teachers of the same school were placed in a team within the learning platform. The assignments they were asked to undertake required team work, which sometimes involved the participation of other teachers, students and/or parents from their school. The school principal was encouraged to attend, but even in cases where he/she did not attend the training programme, he/she participated in the school development procedure that the school team implemented.

Regardless of whether a teacher participated individually or as a member of the school team, they were required to plan, implement and evaluate an educational activity or project destined for use in the school. School teams could work on one or multiple activities which involved the cooperation of teachers and students from their own and/or from other schools. All school teams could only complete Programme C if they had engaged in at least one participative project in cooperation with other schools. In Programmes B and C teachers were encouraged to plan a joint activity with NSI members from other schools and implement it in their own environment. With the assistance of a network facilitator, results of the parallel implementation of the activity were compared and the teams worked together to draw conclusions and make proposals regarding good practice. Individual teachers were encouraged to search for an activity partner within the network and were all supported by a network facilitator. School teams were assigned a facilitator who coordinated and supported the team's work and provided guidance to the team's members during their course in the teacher professional development track.

Selected Examples of School Projects

GYMNASIO LEVIDIOU (PELOPONNESE)

The group of teachers and students worked with the pilot tools and methodology on an innovative product: 'extra premium honey'. They designed the identity of the product and the target audience. They researched details of the stages of production and the promotion of the product and they designed the strategic plan for development and marketing of honey along with the financial budget, emphasising the identity and marketing of honey. The product was presented to the school but also entered in an entrepreneurship competition, where students created presentations and won the second prize.

The students lived in a rural area quite far from each other and the school and only the use of the NSI platform in the pilot made it possible for them to cooperate and to succeed.

LYKEIO PROASTIOU (CENTRAL GREECE)

The activity was primarily intended to provide students with the tools to learn to approach business opportunities in the external environment (local, national and global economy) and simultaneously develop the ability to choose the profession that suits their individual characteristics and inclinations. It was also aimed to promote adequate internal and external networking of the school.

Additional objectives were:

- To create a socio-cultural dimension where students will identify and use prior knowledge and experiences;
- Network the school with society through the contact of students with local organisations, businesses, services, etc.;
- In-school communication and collaboration through an interdisciplinary approach to the issues associated with this programme;
- Long-term planning through designing follow-up programmes for subsequent years.

Using the tools and the methodology, the students developed a blog site where they uploaded all the information that they collected during the project.

GYMNASIO AGROU KERKYRAS (CRETE)

Given the limited funding to carry out the planned visits of students to local business and organisations, the students used the platform of the NSI to collect information about local professionals and to meet and interview different people virtually. Afterwards, the students created a wiki to support the programme.

GYMNASIO AMYNTAIU (MACEDONIA)

The project activity was to establish a virtual manufacturing and marketing agency of a typical local wine.

More than 50 students expressed interest in participating in the project. Students were divided into groups that undertook the following activities:

- Research on the history of the region and its wine;
- Visits to local wineries, where it was possible for the students to see at first-hand the process of wine production from the stage of the cultivation of the vine to the bottling and the promotion of the finished product;
- Development of a media promotional campaign (video and pictures);
- Development of a website and blog, through which students presented the product (using the tools and methodology of the NSI);
- Translating all the information into English, French, German and Italian.

Summary and Lessons to be Learned

In total, 16 schools from 11 different municipalities around Greece participated in the piloting program: 530 students, 70 teachers, 14 coordinators and 10 managers were involved. This took place during a very difficult school year with school budget and teachers' salary cuts due to the Eurozone economic crisis. These numbers are a success on their own.

All students and teachers completed evaluation questionnaires aimed at providing information regarding:

- The knowledge and skills acquired during the piloting;
- The image that the participating students (but also teachers) drew of their level after the counselling programme;
- The role of the coordinators and the managers;
- The change in activities at every school.

STUDENTS

The vast majority of the participating students believe that they benefited from the project regarding the new knowledge they acquired and the increased interest in their career counselling. Most of the students also believed they improved their digital and communication skills. There were no negative views regarding the participation in the piloting.

The students believe that the piloting was not only beneficial for themselves but for the school as a whole also. It is interesting that most of the positive views of the participating students involved the new tools and methodology that were introduced into every day school activities and the development of communication and cooperation with society. Equally important for them was the creation of a spirit of cooperation between the school community and the new knowledge acquired by all members of the school community.

The vast majority of the participating students embraced the piloting programme and worked regularly on its activities. It has to be noted

that part of the preparation and the extra work required was done during extra time in breaks and after school.

The vast majority of the participating students made use of the NSI platform provided for the pilot.

TEACHERS

All participating teachers expressed a positive view regarding their participation in the piloting programme. This is a very promising outcome when the extreme difficulties of the past school year are taken into account. Furthermore, almost all participating teachers (69 of 70) noted that they benefited a lot as regards their learning design and evaluation skills.

Participating teachers seemed satisfied with their students' participation in the piloting. They believe that they acquired new knowledge during the piloting activities but most importantly (regarding the objectives of the piloting) they believe that their students showed interest in career counselling as an answer to the growing needs and deficiencies of schooling in educational and vocational guidance of students, taking into account the changing and complex aspects of work and occupations in Greek society.

Again, there were no negative views regarding the participation of the school as an institution in the piloting. The participating teachers believe that the piloting was not only beneficial for themselves but also, for the school as a whole.

Almost all the participating teachers participated effectively in the piloting programme and worked regularly on its activities. It has to be noted that part of the preparation and the extra work required was done during extra time in the same way as the pupils, and the fact that the teachers participated during a very difficult school year, demonstrates the success of the piloting on a motivational level.

The vast majority of the participating teachers (65 of 70) made use of the NSI platform provided for the pilot, a very promising outcome

regarding both the digital skills of the teachers but most importantly the usability of the platform.

Conclusions from the Four Pilot Studies

The Microsoft paper from 2003, *Learning in a Connected World: Harnessing the Potential of Technology*, identifies four kinds of users in a digital world: the student, the teacher, the parent and the administrator. In the VISCED pilot study we primarily looked at the student and the teacher.

According to Microsoft, in an effective and comprehensive learning environment, students can manage their time; work collaboratively; learn effectively outside school; access powerful tools for learning and presenting; quickly and conveniently access personal and global learning resources at any time and in any place; and query subject matter experts without limiting time and geography constraints.

Similarly, teachers can manage their time; streamline administrative tasks; plan effective curricula; meet individual and group learning needs; pursue continuous professional development; and communicate with parents, peers, and administrators.

In the VISCED pilot studies we can clearly see that teachers and students can do all the things that Microsoft suggests. But they do it to different extents. In Ross Tensta Gymnasium the students seems to choose to sit in school whereas in Gymnasio Levidiou in Greece they rely on a portal to be able to 'go' to school. The strength is the flexibility. The teachers can plan and put all the information and material in a tailor-made structure to make it easier for the student to follow the course. It is also easier to provide individualised learning.

All of the pilot studies were thoroughly planned and focused on learning outcomes. In Ross Tensta Gymnasium and in the Sheffield pilots there are systems to track the students' individual learning paths, which give the students and the teachers the opportunity to individualise the students' education. In the pilots this opportunity was most effectively used in the Notre Dame pilot and the students say that they have benefited from it.

The Sheffield pilots and the Greek pilots used Moodle as a platform and Ross Tensta Gymnasium used Fronter. Both systems are quite stable and there were no major problems with them during the pilots which has contributed to their success. The students at Ross Tensta Gymnasium pointed out that the computers provided by the external company did not always meet the expected standards and malfunctioned too often, which could be one of the reasons some students did want textbooks.

All systems require well educated teachers. They need to know how to use the technology as a pedagogical tool and to some extent they need to know how the system works. In the Greek pilot teacher training was included and a vast majority of the teachers and students said that they had benefitted from the training of the teachers.

5. POLICY CHALLENGES AND OPPORTUNITIES

Background

As is clear from the evidence presented elsewhere in this publication, virtual schooling has huge potential to widen choice for learners and families alike, to contribute to improved attainment and to reach learners who may otherwise be unable, or unwilling, to access high-quality education. However, if one stands back and reflects on both the individual Member Countries and the European Union as a whole it is equally clear that, on both levels, policies to protect students whilst encouraging and supporting innovation often appear perilously inadequate.

In many European nations, education reforms proclaim that decentralisation and heterogeneity will drive improvement through innovation, and that student choice will be facilitated through the funding 'following the learner'. It would, thus, appear that the climate is fertile for virtual schooling. There are clear analogies between, for example, those Charter schools in the USA which have already diversified into virtual learning and/or the Swedish Kunskapsskolan or English Free Schools and Academies. Whilst this philosophy is by no means ubiquitous throughout Europe, most countries have invested heavily in the state educational ICT infrastructure and appear essentially supportive of innovative new ways of learning. There is now significant pressure to obtain maximum benefit from this investment and to enhance education systems to meet the needs of the 21st century learners and the challenges of the 21st century economies. At the same time, across Europe, governments, their agencies and commercial providers are searching for new models whereby quality education can be delivered at lower costs in line within contracting budgets.

However, as stated above, it seems likely that policy makers within individual European nations, and at Commission level, are yet to fully grasp the profound nature of the changes afoot.

Consequently there exist policy fault lines which could a) seriously restrict the expansion of virtual schooling and b) allow inherent weaknesses to become embedded – which could be damaging for learners, governments and public perceptions of virtual schooling – and could result in the misuse of significant public and private sector investment.

Applying the experiences and lessons learned (although not always acted upon) from the North American and Australian virtual school experience (and, indeed, emerging lessons from within Europe) to the European context, illustrates a number of areas where, without policy refinements, the same tensions evident elsewhere will be repeated. It should be noted that we have not found evidence of legislation which *sets out* to inhibit virtual schooling. Rather, it is the case that existing legislation (designed without virtual schooling in mind) sometimes has the unintended consequence of acting as a barrier; that, and a lack of legislation or guidance in this emerging landscape leaves a vacuum in which learners are often relatively unprotected.

It is the very flexibility in terms of the time, place and differentiation of learning which makes virtual schooling so potentially powerful which also exposes the deficiencies and inconsistencies in existing policies. Of course, many of the issues may seem to mirror those already faced in the field of online learning within Higher Education and there are indeed many precedents and lessons to be learned. However, for virtual schools and colleges these issues are greatly complicated by Europe's diverse schooling systems, curricula and qualifications (with few reciprocal arrangements) and the fact that many of these learners are still children.

Key Policy Challenges

Validation of Courses

Under any kind of federated system there is significant evidence of the disincentive to both school and students where a virtual school or college is required to validate its courses in every state or country from which it takes students. This has caused (and continues to cause) considerable controversy in the USA.

Accountability and Inspection Regimes

There has been considerable criticism and debate in the US with regard to the inspection regimes for virtual schooling. Too often US virtual schools and colleges have appeared to be on the very edge of accountability in terms of the quality of education provided, the pastoral care offered and the value offered in return for large amounts of (often public) money. It seems all too common for virtual schools and colleges to escape the rigour with which the authorities challenge physical institutions. Virtual schools and colleges present particular challenges in terms of 'attendance' and 'drop-out' rates. Perceptions that virtual schooling exists in an unregulated 'wild-west' are potentially damaging to existing, excellent virtual schools, to the prospects of students currently enrolled and to future innovation.

Legality

In some European countries virtual schooling is technically illegal. Often this is because of the desire to ensure that children are exposed to adequate opportunity to socialise with their peers. However, virtual schooling does not necessarily increase a child's isolation. Many virtual schools combine face-to-face lessons with online study. Some offer supplementary courses so that students attend a host-school for most, or even all, of the time. Even where students are full-time online or distance learners, some US school districts now have multi-campus agreements whereby – based on their home addresses – students enrolled online, full-time, have access to sports and co-curricular

activities at the schools to which they are assigned. Similarly, some Australian schools encourage students to meet and socialise outside of school time and groups of students have used social media to arrange their own study and social events.

From Early Adoption to Widespread Roll-out

Whilst there has been significant growth in the number of virtual schools and colleges across the European Union these remain very much the vanguard. Unlike North America (where a point of critical mass has surely now been passed) and Australia (where sizeable, high-profile, successful institutions seem to have at the very least bridged any credibility gap) no single European nation, nor the Union as a whole, has yet fully embraced the early adopters. This does not seem to have overtly inhibited individual institutions, yet virtual schooling is still perhaps viewed in Europe as a somewhat esoteric response to niche demands. Should the disjuncture between early adopters and widespread roll-out be bridged there are potential benefits for all parties:

- For the educators – economies of scale, aggregated procurement, increased awareness, increased demand, a stronger voice with policymakers, etc.
- For the students – increased choice, horizontal mobility, progression routes, wider recognition of qualifications, etc.

Common Standards for Online Teaching

As we note further on, teacher training programmes for ICT are still very much a priority for the Commission. This issue could clearly be acute for virtual schooling. To be an excellent virtual school teacher requires not only solid ICT skills but also additional qualities with regards to pedagogy, 'classroom management' and pastoral care. At present, the European virtual schools and colleges seem confident that they can recruit and/or develop competent online and blended teachers. However, any expected expansion (particularly in this relatively unregulated environment) in virtual schooling will test this to

the limits with a strong likelihood that the student experience will suffer. We have recorded numerous instances of European students studying cross-border, and cross-border (i.e. international students) or cross-state study is commonplace in North America. As such, the lack of comparability and consistency of teacher training programmes leaves students hostage to chance.

Assessing Performance

The catchment for virtual schools and colleges is remarkably diverse: from the expatriate children of diplomats, high-level aspiring athletes or those with serious illness (of varying academic abilities) to those with no, or limited, host nation language skills and those disenfranchised or excluded from existing education systems. That virtual schooling can potentially meet these differentiated needs is amongst the most powerful arguments in its favour. However, this diversity brings its own challenges when measuring the success of both pupil and the school. If a large proportion of pupils enrol because they have already fallen out of the education system, and if they bring with them significantly lower than the *norm* attainment, then their virtual schooling performance cannot be judged simply against the *norm*. This is much further complicated when one considers that a significant proportion of the school community may be transient – they may have been enrolled as a temporary solution to illness, behavioural problems, academic problems or they may even be itinerant. They may be with the school for less than an academic year.

When one considers that these students may come from very different national education systems with varying degrees of testing, the difficulties in comparing their performance with ‘peers’ and the performance of the school become stark.

Ownership of Qualifications

Where virtual schools or colleges operate outside, or on the margins, of formal state sanctioned education systems the qualifications achieved by its students are sometimes not counted in official figures or (in the case of supplementary study) are claimed by the student's home or host (physical) school. Where the qualification has been achieved with the co-operation and support of the host school, this can sometimes be justified – however, there is potential for the distortion of data and possibly a masking of host school (and even school system) inadequacies. This is by no means unique to virtual schooling – many parents pay for their children to have ‘revision’ or ‘cramming’ programmes outside of their school hours and yet the schools receive the benefit in terms of qualifications achieved.

Key Policy Opportunities

Curriculum Imperatives

The Commission has repeatedly identified low levels of literacy and numeracy as disadvantaging millions of young Europeans (European Commission, 2012). Language learning also remains a priority as the Union expands and as new economic opportunities open up within and outside of the European Union. Throughout Europe countries, regions, cities and individual institutions struggle to provide the broad curriculum offer to which they and their students aspire. It is often the case that there are too few students to form an economically viable cohort in specialist subjects (be they basic host-nation languages for minority migrants, less popular modern foreign languages or niche, vocational or technical courses). Or it may simply be that suitably qualified tutors are not available for these subjects.

Science, Technology, Engineering & Maths (STEM)

There is also specific concern that our education systems are not producing enough young people with science, technology, engineering and mathematics skills at all levels. These are generally recognised by individual nations and the Commission as essential components for a successful modern economy – indeed the Commission has shown its commitment to this field with on-going support for the creation of digital resources, repositories, portals and professional development to support the STEM subjects.

Tackling Early School Leaving

The EC is committed (European Commission, 2012) to developing:

- Strategies to prevent young people dropping out of education.
- Strategies to offer a re-entry or second chance which meets the individual circumstances of those who have dropped out –
“... learning environments which respond to the specific needs of early school leavers, recognise their prior learning and support their well-being.”
- Strategies to improve the transition from primary to secondary education.

Supporting Migrant Children and Families

Students with a migrant background are generally more likely to leave school early; frequently disadvantaged by a lack of competence in the official, or host-country, language (often a pre-requisite for success educationally, socially and professionally). The Council has noted that many migrant children continue to fare less well educationally than indigenous children and that improving education is fundamental to reducing *“... marginalisation, exclusion and alienation”*.

The Council's suggested actions (European Commission, 2012) include:

- *"... increasing the permeability of pathways within school systems and removing barriers to individual progression through the system can help to combat segregation and contribute to higher achievement levels for migrant learners."*
- *"Offering more personalised learning and individual support"* – something which the Council acknowledges *"...can benefit all pupils in the system and lead to higher quality for all."*
- *"Raising the quality of provision in underperforming schools"* – which can *"... improve opportunities for all pupils, including migrants."*
- *"...intensive language tuition for newly arrived pupils with a migrant background, additional support for those experiencing difficulties..."*
- Encouraging and supporting the involvement and engagement of parents in their children's learning.

Throughout this handbook, the reader will see examples of how some virtual schools are already meeting the challenges of offering an enhanced curriculum, supporting students at risk of leaving education and improving the educational experiences of migrant children and learners.

Rich Data

Online and virtual schooling presents teachers and institutions with the potential to harvest and analyse pupil data at a level, and of a quality, previously uncommon – if not unknown.

Digital Competence

Virtual schooling requires and consequently encourages students to have, and to develop, both mechanical ICT skills and also the more difficult to measure online *learning* and *social skills*. Several US states now dictate that students must undertake at least one online course as a condition of graduation. This is driven by students' need for

experience of online coursework to help them in both college and workplace – where digital literacy will be an essential competency for almost all.

Promoting Broadband Uptake

It is also worth the Commission and Member States noting that evidence from the VISCED International Advisory Committee members, European virtual schools and the USA strongly suggests that in, some contexts, virtual schooling can be a driver for increasing the installation and uptake of broadband – in line with the *Digital Agenda for Europe Pillar 4: Very Fast Internet* (European Commission, 2010).

Open Educational Resources

Open Educational Resources can be defined as “... *teaching, learning or research materials that are in the public domain or released with an intellectual property license that allows for free use, adaptation, and distribution.*” (UNESCO, 2012) Clearly, since most virtual schools and colleges utilise significant quantities of digital learning materials and tools, OERs have the potential to have a profound impact. The Commission has demonstrated its commitment to investigating the potential of OERs through funding several research and development projects. As such, and acknowledging that issues of OER are equally relevant to any school and college which uses new technologies (not just virtual), it would appear that policy recommendations for OER are outside of the mandate for this project. However, it should be noted that the European virtual schools and colleges represent an extremely valuable resource for future research and development.

Practically everyone has the same understanding of a school or college as a place where students go to learn. But what about the students who find it difficult simply to go to a place of learning? What if they are scared of school, ill or unable to access the school for some other reason? What about students who want to take subjects which they cannot access in their local school or college or young people who are incarcerated and who want to find a way into further or higher education to increase their life chances?

Virtual schools and colleges are an increasingly important alternative for these students and are becoming more and more prevalent all over the world - including Europe. But little is known in Europe about how they operate or what makes them successful. Many people are suspicious of these new structures particularly when they are offered as a replacement for compulsory-level education. Yet a lot now exist and have been the subject of a recent investigation carried out by the VISCED consortium supported in part by the European Commission.

This handbook is the first of two publications in which the outcomes of the VISCED research are summarised. In these handbooks we aim to provide you with an introduction and basic understanding of virtual schools and colleges.

This first volume contains a series of in-depth case studies and a portrayal of how virtual schools and colleges manifest themselves across the world. It also contains a description of a number of innovative pilot actions that the VISCED partners have carried out in schools and an introduction to a set of policy challenges and opportunities that need to be considered when discussing virtual schools and colleges.

The second volume investigates the topic of teacher training, provides a series of success factors and puts forward a set of policy recommendations related to the further deployment of virtual schools and colleges.