



# PATHWAYS FOR CHANGE

Model Examples

*T – Route School Model*

# T-ROUTE SCHOOL MODEL

The following pages provide a detailed description of the T-Route (T1, T2) model. The objective is to illustrate by way of examples what a school might look like in these models. The description, particularly of the technology, should not be considered prescriptive but only to indicate some of the school's characteristics and capabilities and types of empowering technologies.

## The Near-Term Vision of a 'T-Route' school (T1)

A school with base-level technology

### **Overview**

- A T1 school is likely to be comparable to one currently viewed as an example of best practice in e-confidence.
- The school uses a traditional curriculum, based on the National Curriculum.
- specification and funding constraints. The school has a device-student ratio of better than 1:4, plus wireless and wired network coverage capable of supporting a class using laptop computers effectively in any school location.
- This school model is included to challenge the model of what is possible within traditional structures, within the current BSF ICT output

### **Learning and Teaching**

- All teaching areas have Internet-linked presentation capability, with a data projector or large plasma screen display.
- T-Route schools use technologies that support the teacher working in a front-of-class teaching position, such as electronic whiteboards.
- The school is assumed to have: classes of between 24 and 30 students in each subject; specialist rooms for art, design and science subjects, and a standard day.
- Non lesson-based structures may include:
  - An annual activity week, when the timetable is suspended, and a variety of activities occur.
  - Occasional 'off-timetable' days, such as industry days or citizenship days, when the timetable is suspended for a day to cater for visiting speakers and demonstrations.
  - Extended school facilities – out-of-hours clubs and activities that are typically optional, serving a smaller number of students.
  - Some lunchtime and break time clubs, run by staff who wish to take the time to do so.

### **Administration and ICT systems**

- The school has a Learning Platform) used as an e-portal, including assignment delivery to students, and limited automation in marking.
- The school has all the infrastructure and technology described in the current PFS strategy, and follows the guidelines set down by Becta for services.
- The management information system (MIS) system is integrated with the other systems in the school, and supports electronic registration and tracking, plus a lesson-driven timetable.
- Community and Extended Provision
- Community links mainly take place out of school hours. They merge with the extended school provision, to an extent.
- Primary and tertiary links. The school is assumed to have a specialist school status, and there is a degree of joint working between the local primary and secondary schools. In broad terms, this amounts to an annual investment that can be used to create links consisting of visits by primary students to the secondary school – the most common ‘traditional’ approach.

### **Design Implications**

- The DfES Building Bulletin 98 sets out the structure and room requirements for a traditional post-BSF school, in terms of rooms and floor areas.
- Becta guidelines for BSF schools determine the expectation for ICT infrastructure. These guidelines are presented as a way of future proofing the building and are more essential for the T2-school because of greater dependency on school building. Design solutions to this problem include:
  - Placing the services around the edge and placing trays at the back of student desks to hold the cables.
  - Desks that plug in to each other to extend services.
  - Floor boxes.
  - Overhead services with drop-down leads.
  - Service islands.

# THE FUTURE VISION OF A 'T-ROUTE' SCHOOL (T2)

A school with advanced pedagogy and supporting technology

## Overview

- A T2 school incorporates best practice from the most e-confident schools from around the world that share the 'T-Route' philosophy. It represents a collection of the most effective examples of how ICT can be incorporated into the traditional classroom. This is the assumed future aspiration of the traditional school philosophy, sometimes called 'embedded' or 'blended' learning.
- The school still uses ICT to deliver a traditional curriculum, arranged around a timetable of lessons.
- The school provides 1:1 access to an ICT device of at least the capability of a current mid-range laptop computer, meaning that, whenever a learner wishes to use ICT, he or she will not be stopped from lack of access.
- Students move for lessons in various specialist departments, as they do in the T1 school; all the other structures described in T1 are the same, or enhanced.
- This model attempts to envisage what may be possible to achieve within traditional pedagogy and structures. It assumes that the pace of technological advancement and teacher skills development are both maintained for five years after the T1 school is completed.

## Learning and Teaching

- As T1, plus:
- Paper is used where there is a pedagogical advantage in doing so.
- ICT rooms, suites, and 'clusters' no longer exist for distinct subject areas. Instead they may form part of the provision of teaching within subjects, usually in a 'hot desk' scenario in which the mobile device held by the student or his/her identity will respond to a virtual or physical PC-like device around the school.
- Students use digital video, sound manipulation and expressive media in all subjects, as the tasks set for them dictate.
- All classrooms support multimedia working, and specialist facilities have evolved to meet the new demands set by ICT. For example:
  - Technology uses computer-aided design (CAD) as integral to the design process, computer-aided modelling (CAM) for prototyping, testing and construction in all fields, including textiles, food, and electronics.
  - Science subjects use real-time monitoring and wireless sensing devices, consistent with technologies used in the field.
  - Specialist media includes broadcast quality TV and radio, used internally and for external pod casting.
  - Specialist art facilities include 3D graphics, modelling and animation.
  - Humanities and science employ global positioning system (GPS) location data, including data taken by learners on field trips and researched using existing databases.
  - Brief descriptions of the T-Route interpretations

- Language teaching and other subject areas will employ collaborative real-time technologies, working with groups of students from different schools, countries and academic levels. Supporting technologies include multicasting, multipoint video conference, voice, application sharing, and presence such as instant messaging (IM) software.
- Sports teaching uses video technology to compare student performance with the actions of professional athletes.
- Maths is dynamically delivered. It supports personalised learning and automated marking, ensuring that students are set appropriate challenges. Work will tie in with numeracy across the curriculum, by providing appropriate links when maths-related challenges occur in other lessons.
- Students use their mobile learning device across the curriculum to provide themselves with guidance on how to gain marks in assessments, as well as accessing their current targets.
- E-portfolios will empower children to share their informal and formal learning, also serving as a storage and recording facility for their work. Such a work store will be considerably more reliable and secure than paper-based versions, and will replace paper as a working medium.

#### **Administration and ICT systems**

- As T1, plus:
- Access control, proximity detection and biometric technologies supporting the full automation of attendance, access, inventory, and ordering.

All school functions are Web-based, and working practice provides paper-based output to parents only if specifically requested or required by legislation. The school ensures families have access to school systems through home systems, such as TV, telephone and broadcast technology, or by providing devices and connectivity.

#### **Community and extended provision**

- As T1, plus:
- A 'wired community', supported by WiMax and similar technologies, means all resources—including transmitted media—are available wirelessly throughout the school catchment area. This supports off-site community provision at multiple locations, using collaborative and video meeting systems.

#### **Design implications**

- In addition to a T1 school, the design implications depend upon the way in which effective 1:1 access is managed. The most likely solutions and their design implications are:
- **Solution 1** – All learners have their own laptop computer or Tablet-style device. This requires secure storage to be available outside classroom areas, so laptops can be collected without disruption. Such lockers require individual doors, power supply, and remote activation over a local area network (LAN). The area requirement for such lockers is considerable. The model school would require a minimum of 35 square metres of accessible space to house them.

- **Solution 2** – All learners have their own PDA-sized device and ‘hot desk’ screens: such a solution has not yet emerged, so the design implications can only be estimated. A battery-charging area will be needed in each classroom, so PDA batteries can be swapped. Thin Client computer terminals are available in most classrooms to allow half the children in each class access to a computer and keyboard. The PDA contains the main processor, and connects using a wireless link.
- **Solution 3** – Each classroom has a bank of laptops or Tablet PCs, which learners collect when they enter. This requires each class to be fitted with a locker that can house, charge, and connect 30 laptop devices. Space for a laptop battery-charging block will be needed or central power supply islands.
- **Solution 4** – Students are equipped with a ‘thin-client laptop’ device. Whilst looking like a laptop, it uses servers to run applications across a wireless connection. This device could be lighter and cheaper than a standard laptop, and can be taken home by students in their bags. The device is worthless to anyone outside of the school, minimising the risk of theft. The long battery life means individual charging lockers are not required. The school would require a significantly larger server room, as this is where most of the computing power would take place. This solution is untested in terms of impact on students’ multimedia creativity.
- **Solution 5** – The school has widespread PC provision, so students can use them where and when they need to. This model requires additional space built-in to most areas across the school, and a larger server room compared with the other solutions.
- Several of these solutions will require a large service desk area provision, for ICT technicians to deal with technical issues for both students and staff. This service desk must be directly accessible to the students and available in break, lunch and after-school times. A solution that does not include a service desk arrangement is likely to be inoperable, because of the number of minor maintenance issues that will require support and the critical nature of students use of technology to support their learning.

# BRIEF DESCRIPTIONS OF THE T-ROUTE INTERPRETATIONS

## **Achievement Tracking**

- Teachers in T-Route schools use new technology to monitor student progress and identify learning styles for each learner. This data helps teachers set more appropriate targets and personalise lesson materials, to meet the needs of individuals. The teacher is managing the relationship and making decisions on content and process.

## **Attendance Management**

- T-Route schools use technology to automate registers of attendance. Parents can be instantly informed if their child is absent. Reporting statistics are automatically generated, helping schools correlate attendance against other indicators, such as educational performance. The focus is on physical and/or virtual presence.

## **Creativity Skills**

- T-Route schools use technology to develop and support new forms of creativity. New subjects will emerge that let students create media combining traditional art and technology subjects, and new ICT courses that provide specific skills for game authoring and using mixed-media.

## **Education Development Plan and Monitoring**

- T-Route, schools will be increasingly using technology to integrate all of the information and data which they collect. This wealth of data through common standards can be used nationally as well as locally to determine which interventions and development plans had their intended effect. Development plans will be fully linked into this database so that review processes are unified around one planning cycle.

## **E-Portfolio**

- T-Route schools use technology to collate student e-portfolios, containing student work, teacher assessments and key related data and resources collected by the school. This large-scale 'online coursework folder' helps schools moderate student work. Schools can also use e-portfolios to train their employees. Administrators can interrogate the e-portfolio, using analysis tools, and link to other assessments related to the student. National-level moderation of student work and the school assessment process can also be supported.

## **Formative Assessment**

- Assessment should be used as a tool to support learning. Formative assessment aims to give students feedback on their learning progress and inform teachers of student progress. Learners gain a clearer understanding of what is expected and how they can improve. Formative assessment makes a vital contribution to improved results. At present, most formative assessment does not get formally recorded as a great deal of it is ephemeral, subjective, and difficult to capture.
- Teachers in T-Route schools use technology to record their assessments more easily, when they are with the learner.

### **Inclusion and Equality**

- T-Route schools use technology to better integrate the whole learner population into lessons including gifted and talented learners, and those facing physical, behavioural and linguistic barriers to learning.

### **Inspiration-Led Collaborative Learning**

- T-Route schools bring experts into the classroom to inspire learners. Experts can use videoconferencing and interactivity to reach a wider audience of learners, also incorporating direct input from classrooms. Learners from different schools and countries can take part in the same presentation and collaborate on related activities.

### **Problem Solving Skills**

- T-Route schools use technology to extend the range of resources available. Teachers have access to a greater range and type of problems, which they can use in their teaching. Problem-based activities requiring investigative study, group work or design activities will be used in subject-based teaching. Resource-based learning is supported by greater access to high-quality materials that guide the learner in developing strategies, for example breaking down problems into manageable tasks.

### **Student Empowerment**

- The Every Child Matters agenda highlights the importance of engaging children in decisions that affect their lives. Their views must be given the same respect as other groups in society. Schools must actively develop skills promoting responsible citizenship.
- T-Route schools bring to life the United Kingdom's political and representation structures. Courses, ranging from citizenship to history, are offered to learners and supported by ICT. Student councils promote active citizenship, with tools such as electronic voting facilities, so learners can discuss issues.

### **Target Setting and Time Management Skills**

- Teachers in T-Route schools can set more accurate targets than before, because of access to high-quality data and powerful analysis tools. Students, however, have few opportunities to develop time management and planning skills through large-scale projects, coursework being designed to take place over a longer timescale.

### **Teacher Professional Development**

- Teachers in T-Route schools use technology to network with their peers, sharing resources, teaching ideas and support. CCTV in classrooms opens up teacher observation. Feedback on classroom practice and training opportunities is available online.

### **Timetable and Organisation of Learning**

- Managers of T-Route schools control estate costs through tight planning and resource management. In this way, they ensure each curriculum activity can be catered for with sufficient, although not necessarily optimal, physical space. Successful timetabling is critical to the smooth operation of the school, particularly for popular schools, which are at full capacity. School buildings and classroom structures play central role to the delivery of the education provision.