RM Seminars
spring 2013

Collaboration in the digital classroom
Introduction

Teaching in schools is changing, where once the classroom was designed for ‘chalk and talk’ lessons, many classrooms are now designed around using technology – it started with the introduction of interactive whiteboards, (you could say ‘electronic chalk and talk’) whereas now many students use, or have access to, a device in a classroom which they use as part of their learning.

In some schools, the entire model of teaching is changing. They are starting to adopt the ‘flipped learning’ model of teaching where blended learning, encompassing the use of technology to leverage student’s learning in a classroom is being adopted. The traditional pattern of teaching has been to assign students homework, for example to read part of a textbook after-school, which is then discussed the next day in class. Students would then be assigned an assessment for homework to demonstrate their mastery of the topic. In flip teaching, the student first studies the topic by themselves, typically using video lessons created by the teacher, or from another source. In the classroom, the student then tries to apply the knowledge by solving problems and doing practical work.

This is changing the role of the teacher whose role, rather than to impart knowledge, is to facilitate the learning, helping students if they are having trouble understanding a subject and helping them to understand what they have learnt through practical assignments. Research has shown that schools adopting models such as this increase student attendance, see improved results and more enthusiastic students.

Our students in school today are used to collaborating, but they do this outside of school and when they are learning teachers should be looking to adopt and make use of these skills that our students have. We will look at some free resources that Intel have made available that allow teachers to devise, plan and implement lessons around collaboration in the digital classroom.

For this to work though, schools need the technology to hand, and this is the role of the network support team – to advise, support and implement the technology that allows students and teachers to use these skills to reap the benefits of the 21st century student. In this session we will be looking at some of the benefits of Intel technology that allows all of this to happen.

Of course, we all know school budgets are decreasing, and that will have an impact on the technology that schools can purchase and use. In this white paper we will be looking at how you can get the most out of the technology you have today and are looking to purchase in the future so you can get the most value out of it.
Choosing the right equipment will ultimately make the network support team’s life easier by having technology that is easy to support and manage, and will have a realistic lifetime so can be used in your school for many years.

**The 21st century school**

Today, technology is as ubiquitous as the chalkboard was when many of us went to school. In the 21st century school, technology is everywhere – in the classroom with computers being used in lessons; in our pockets with many people (including students and teachers) owning smart phones, and even in our walls with many modern schools using swipe cards for room and locker entry. Our 21st century users expect technology to be available all the time, whether it’s hardware devices to use during lessons, or the Internet so that resources created outside of the school’s boundaries can be accessed for teaching and learning.

The 21st century school also has 21st century users – students, teachers and you, the network support team, whose role it is to advise and support most of the technology that is used in a school today.

**The 21st century student**

Our students today have grown up with technology - They are often termed as ‘digital natives’. *Wikipedia describes a digital native as:*

> “… a person who was born during or after the general introduction of digital technologies and through interacting with digital technology from an early age, has a greater understanding of its concepts.”

Marc Prensky, a speaker, writer, consultant and game designer in education, first used the term ‘digital native’ in a paper titled ‘Digital Immigrants’ which was published in 2001. Our students are no longer “little versions of us,” as they may have been in the past. They are so different from us that a teacher can no longer use either their 20th century knowledge or their training as a guide to what is best for them educationally.

If you want to see a digital native in action, this YouTube video shows a three-year old using a Windows 8 computer!

[http://www.youtube.com/watch?v=dI7ZgcAacJxU](http://www.youtube.com/watch?v=dI7ZgcAacJxU)

As digital natives, our students are already busy adopting new systems for communicating and collaborating. A few examples of this include:
• Searching using services such as Bing.
When you want to find out about something most people who have access to the Internet won’t reach for a book, they will use a search engine such as Bing from Microsoft to search for the answer. This is second nature to a digital native that wouldn’t even think of using a book to search for the answer, they would “Bing” it.

• Instant messaging tools such as Skype.
In many instances, using tools such as Skype has replaced the telephone. Instant messaging has been available for many years and digital natives will naturally use these tools to communicate instantly with other people either through text messaging, voice or face-to-face calls.

• Sharing thoughts and opinions on Twitter.
Twitter allows anyone to ‘micro-blog’ – post short statements on the Internet that almost anybody can read. A digital native uses these tools to share thoughts, reviews or opinions on almost any subject.

• Reporting using camera phones and services such as Instagram.
Services such as Instagram have enabled almost anyone to instantly publish digital photos online.

• Evaluating using reputation services such as Yelp!
Reputation services are becoming the go-to place when you are considering using a service, booking a restaurant or thinking about going to watch a film. Sites like Yelp! allow anybody to become an instant reviewer.

• Collaborating using wikis.
We’ve all almost certainly used Wikipedia. A wiki allows many people to collaboratively share knowledge, whether it’s to the entire world or amongst groups of students, using wiki services such as RM wikis, which is available through RM Unify.

• Learning by surfing the Internet.
The great thing about always-on devices is that you can learn about new things on-demand. If you want to learn about something you see whilst outside then the answer will be out on the Internet. Digital natives have the skills to use the Internet to enhance their knowledge through any of the tools we have already looked at.
This list isn’t exclusive and there are many other systems digital natives are used to using for downloading music, films, books and so on. These skills could be invaluable in the classroom if students and teachers have the technology that allows them to use them.

Digital natives have an expectation to use technology and for it to be available whenever they need it. No longer do schools need to teach IT skills to their students, they have it already and because of this the 21st century school doesn’t need to teach these skills – they have it already, almost from birth!

Later in this white paper we will look at how the network support team provide the hardware to allow our digital natives to put the skills they have in to practice, whilst providing peace of mind to the network support team that the hardware and software they provide is robust, reliable and can be managed.

The 21st Century teacher

As we can see, our students are used to using the technology, however, it would be fair to say that in a lot of instances, the teaching staff in a school may not consider the use of technology as something that can be an enabler for learning and collaboration by students. This could be because they only see it as a set of tools for use outside the classroom, or they don’t understand the benefits of using tools to collaborate inside and outside of school.

To help with this, Intel has provided a range of free, online, professional development courses called Intel® Teach Elements.

Intel Elements helps teachers of all subjects learn to engage students with digital learning, including digital content, Web 2.0, social networking, and online tools and resources. Intel Teach professional development empowers teachers to integrate technology effectively into their existing curriculum, focusing on their students’ problem solving, critical thinking, and collaboration, which are precisely the skills required in the high tech, networked society in which we live.

Intel Teach Elements are free, just-in-time professional development courses that teachers can experience now, anytime, anywhere. This series of compelling courses provides deeper exploration of 21st century learning concepts.

Each course has a full syllabus (which can be downloaded), and teachers taking the courses are fully supported through the use of documents and collaboration through Intel Engage which is a community for educators dedicated to transforming the classroom.
Teachers can view and create an account and participate in discussions on Intel® Engage by registering at the following website:

http://engage.intel.com/welcome

Intel Elements includes training available in the following areas:

- Inquiry in the science classroom:
  Transition from textbook science to authentic inquiry. Explore ways to develop your students' scientific thinking and practices.

- Thinking critically with data:
  Examine critical thinking with a focus on data analysis. This course will help you prepare students to think analytically in our global, knowledge-driven world.

- Project-based approaches:
  Explore the features and benefits of project-based learning with classroom scenarios that help you to engage students with self-directed learning.

- Assessment in the 21st century classrooms:
  Learn how to plan, develop, and manage student-centred assessment strategies that can benefit your teaching and your students' learning.

- Education leadership in the 21st century:
  Learn how school leaders can better use technology to help support teacher effectiveness and improve student achievement.

- Collaboration in the digital classroom:
  Plan and manage collaboration activities that integrate online tools, which are increasingly an integral part of our digital, global world.

It is the ‘Collaboration in the Digital Classroom’ Intel Elements course which shows teachers how they can use the collaboration skills students already have in the classroom to learn.

More information and access to this training material is available on the Intel website here:

Collaboration in the Digital Classroom

Collaboration in the Digital Classroom is an interactive e-learning course that offers an in-depth look at collaboration with a focus on online collaborative tools. In this course, teachers see how collaboration helps students develop 21st century thinking skills, deepen content understanding, and prepare them for the global world. Teachers learn how to plan and manage collaboration activities that integrate online collaborative tools increasingly part of our globally connected workplaces.

There are five modules teachers can work through covering the following areas:

- Collaborative classrooms.
- A framework for digital collaboration.
- Tools of collaboration.
- Collaboration strategies.
- Collaborative classroom management.

These resources can be accessed from an Internet connected device and provide advice and guidance on using web-based tools to use in the classroom and task students with collaborative working. The course also provides resources such as a framework for embedding these collaborative tools into lessons. These tools include:

- Seeing Reason Tool.
- The Intel Visual Ranking Tool.
- Showing Evidence Tool.
The tools provided for free by Intel are accessed through the Intel Education Teaching Tools workspace. A login ID is required for using the above tools which can be accessed following login.

After logging in to the Intel Education Teaching Tools Workspace, all of the tools are available in the Manage Project areas:

Before the tools can be used by groups of students, team accounts need to be set up within the tools for them. This is carried out in the Manage Teams section:

To add, (or delete), student teams, a teacher can:

1. In the Manage Teams section, click ‘Add or delete student teams’.
2. To add a new student team, click on Add New Student Teams.
3. Enter a team ID, the names of the students in the team, and a team password.

4. Click on Submit to create the team.

You are returned to the Add New Student Teams screen.

5. Repeat steps 2-4 until you have added all your teams. Once all the teams of students have been created, click Done to return to the Manage Student Teams list where the teams the teacher has created are listed.

Teams access the assignments provided to them by the students navigating to the Intel Thinking Tools Workspace at the following link:

https://educate.intel.com/workspace/student/loginpage.aspx?&LID=en

In order to sign in, students needs the following information:

- Teacher ID:
  This is the teacher’s Login ID.
• Team ID:
  This is the team identifier the teacher created when setting up the teams.

• Password:
  This is the password the teacher provided the team when setting them up.

After clicking the Sign In link, the student is presented with the list of projects that have been assigned to the teams the student is a member of:

The Seeing Reason Tool

At its most simple, the Seeing Reason mapping tool allows students to create diagrams or "causal maps." These maps help students understand the information in the investigation of a problem. Students organise the factors that influence or affect a problem and show how these factors interact with each other in cause-and-effect relationships. The tool supports cycles of investigation where students gather what they know, organise that knowledge into a map, and then investigate whether their initial concepts are supported by evidence. Some systems are so simple you don’t even have to think about them (for example, in a car you turn the
key and the engine starts), and other systems need some thinking, and then some more thinking. A causal map helps teams of students talk about their ideas, plan their investigations, and organise their results. It is useful at several points during an investigation - at the beginning when initial ideas about a problem are conceived, during research phases as knowledge and insight grow, and finally, as a presentation of students’ fullest understanding of the problem.

Teachers can create a seeing reason project in the Manage Projects section of the Teacher Workspace:

1. Click on ‘Set up a new Seeing Reason Project’.

2. In the Create A New Project section, add a project name, description and the question students will need to answer in this project.

3. Once the project has been set up, clicking on Submit allows the teacher to assign the project to teams of students by ticking the teams and clicking on ‘Assign checked teams’.
4. Once the teams have been assigned, click on Done to return.

The project will now be displayed in the teachers Active projects:

<table>
<thead>
<tr>
<th>Seeing Reason Projects</th>
<th>Create A New Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Teams</strong></td>
<td><strong>Project Name</strong></td>
</tr>
<tr>
<td>(Click to Review)</td>
<td>(Click to Edit)</td>
</tr>
<tr>
<td>2 Teams</td>
<td>Habitat conflict: How can we all live together?</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>In this project you will use the Seeing Reason Tool to look at what happens when foxes and humans come in to conflict.</td>
</tr>
</tbody>
</table>

**Accessing the Seeing Reason project as a student**

Once assigned to teams of students by a teacher, those teams will be able to access the project through the seeing reason tool and can collaborate and work together on creating a seeing reason diagram.

After signing in to the student workspace, the project is available as an active project for the students to collaborate together on.

When the project is opened the students can use the Seeing Reason tool to create a diagram and add relationships.

The toolbar along the top of the Reason Tool:
allows students to add factors and relationships. Those relationships can reflect the effect of that relationship which is displayed on the diagram as relationship arrows of different widths.

Once the diagram has been created, it can be saved, printed or added to the team’s portfolio.

If the students need any help working independently using the Seeing Reason tool then Intel have provided simple, guided help for the students, which is accessible via a link on the Seeing Reason tool webpage.

**Reviewing students Seeing Reason projects**

Teachers can review team projects from their teacher workspace. In the list of active projects clicking on the link in the Student Teams column allows the teacher
to review the team’s collaborative efforts. Clicking on Map in the Current Work column allows the teacher to see the work the students have carried out:

Students and Teachers can add comments to the work in the project, (and indeed all projects), and it’s in here a teacher can add comments to the students work.

The Intel Visual Ranking Tool

The Visual Ranking Tool brings focus to the thinking behind making ordered lists. Students identify and refine criteria as they assign order or ranking to a list. Items in the list may be represented by images. Students must explain their reasoning and can compare their work with each other in a visual diagram. This tool supports activities where students need to organise ideas, debate differences, and reach consensus.

Most students naturally understand how to make lists. They draw up lists for everything from ranking their favourite songs to planning which colleges to consider. When a student ranks one college higher than another, for instance, they do so by creating a personal set of criteria, narrowing the list of all colleges to a few that meet their criteria, then ordering the final list by evaluating how a particular college ranks relative to the others in the list.

Teachers can incorporate list-making in a variety of disciplines and with students of all ages. In a science class, students might analyse the significance of factors involved in human activity on the environment. For a writing project, students might
rank the elements of a good mystery story. Students in a primary classroom might list and order their favourite foods to begin to understand the nutrition value of foods.

The Intel Visual Ranking Tool makes the process of ranking items and comparing lists easy. With a simple click and drag, students move items to any position in a list. Working in teams, they collaborate and negotiate their reasoning. The comment feature of the tool gives them a place to record this rationale. After the teams have finished making their lists, they compare their results with their classmates' versions and discuss the differences and similarities. The Intel Visual Ranking Tool displays how closely the lists match and shows the correlation between two rankings.

In the Teacher Workspace, a new Visual Ranking project can be configured in the Manage Projects section.

To create a new Visual Ranking Project:

1. In the Manage Projects section, click on ‘Set up a new Visual Ranking project’.

2. To the project, add a Project Name, Project Description, Prompt for Students and the ‘List to Sort’.

3. Once the project has been completed, click Continue.

The Project and the list will be displayed.
4. Click on Submit and in the next screen, add the teams of students who will complete this project. Once the teams have been checked, clicking on ‘Assign checked teams’ will make this available to users.

When the project has been assigned, click on Done to return to the Your Projects screen. The visual ranking project will now be displayed in the active projects section of the screen.

Accessing the Visual Ranking Tool as a student

Once a project has been set and the student logs on with the team details as configured by the teacher, the student, (or team of students who are collaborating together), are presented with the list to sort.
The team can then drag the options into order after collaborating together. Once the group have ordered the list there are several options available:

- **Save**: Save the ordered list for the teacher to review.

- **Show Report**: Produce a report of all the teams list as they have ordered it.

- **Print**: Print the report as evidence of work.

- **Compare**: This option allows the group to compare their answers with either the class or another team who are carrying out this project.
The teams can add comments for the teacher to see when reviewing the team’s work.

For the Visual Ranking Tool, Intel have produced a tutorial for teachers, and demonstration videos which can be accessed through the Visual Ranking Tool information page on the Intel website:


The Showing Evidence Tool

The Showing Evidence Tool helps students learn how to construct well-reasoned arguments and prove their case with credible evidence. The tool provides a visual framework to make claims, identify evidence, evaluate the quality of that evidence, explain how the evidence supports or weakens claims, and reach conclusions based on the evidence. This thinking tool supports activities where students debate differences, make and defend decisions, and analyse conflicting information. The tool and related resources are available for free, from any computer that is connected to the Internet. Students may work on their claims and evidence at home or at school, and can collaborate with another team to review their ideas.

Like the other tools we have looked at so far, the Showing Evidence Tool is available from the Intel website and teachers initially set projects through their Teacher Workspace:
1. In the Manage Projects area of the Teacher Workspace, click on ‘Set up a new Showing Evidence project’.

2. In the Create A New Project screen, enter the following details for the project:

   The name of the project.

   A description of the project.

   The question the students will answer in the project.

   The Showing Evidence version – This has two options, Standard or Simplified. The standard version is designed for secondary school students and requires them to rate evidence, explain each rating and rate how strongly evidence supports or opposes a claim. The simplified version can be used by pupils in primary schools and only requires the pupil to describe the evidence, provide sources and connect evidence to a claim.

3. Click ‘Set up initial Student Workspace’ to create the showing evidence workspace.

   A blank Showing Evidence Tool appears at the bottom of the screen. The teacher can choose to pre-populate the case workspace with claims or evidence, or leave it blank. The teacher decides to add evidence to help demonstrate how to describe and rate evidence. With the Showing Evidence case set up as desired,
the teacher scrolls to the bottom of the screen, and clicks the Submit button. Once teams are assigned to the project, students can begin their exploration of the project evidence.

4. Optionally, you can click on Change Showing Evidence Labels to set the labels for the project you are creating.

5. Once they have been set, click on Submit.

The next stage is to assign the student teams to the Showing Evidence project.

6. Assign the teams to the project, (or create new ones if required), and click on ‘Assign checked teams’.

Accessing the Showing Evidence Tool as a student

As with the other tools we have looked at student’s access the Showing Evidence tool by signing in to the tool from the Student Log-In and providing the Teacher ID, Team ID and Password.

1. In the Student Workspace, the student can click on the Showing Evidence project they are working on with their classmates.
2. When accessing the tool, the students working collaboratively are presented with the tool where they can add new predictions and observations. Once they have completed the work they can add a conclusion and any comments.

Once the students have added their evidence clicking on the disk icon in the toolbar saves the work.

Intel has produced a helpful tutorial for teachers who want to use the Seeing Evidence tool in lessons. It can be accessed here:


**e-safety in the 21st century school**

The applications and services being used in schools is changing at a breakneck pace with more services moving to “the cloud“ with applications and resources
being accessed through a web browser. Services such as Microsoft® Office 365™, or the Intel resources we have already seen being able to be accessed from almost any Internet connected device at school, at home or even on the bus! With the move towards online, cloud-based services, schools need to revisit e-safety ... again. e-safety keeps raising its head every few years, (whilst still remaining important in the meantime). General Internet and email access was the first time being safe online was talked about, and again with the rise in popularity of Web 2.0 services like social networking websites, and it is something that needs looking at again with the advent of cloud services.

e-safety is one of the biggest concerns in schools for teaching staff and the network support team. Schools have a duty of care for students and this extends to using technology and more specifically the Internet.

In 2007 the government commissioned from Dr Tanya Byron a review of the risks that children face when using the Internet and video games. As part of the review, which culminated in a report called “Safer children in a digital world”, schools were visited and the e-safety policies they had in place were examined. The report had a number of key findings:

• In the schools where provision for e-safety was outstanding, all the staff, including members of the wider workforce, shared responsibility for it. Assemblies, tutorial time, personal, social, health and education lessons, and an age-appropriate curriculum for e-safety all helped pupils to become safe and responsible users of new technologies.

• Pupils in the schools that had ‘managed’ systems had better knowledge and understanding of how to stay safe than those in schools with ‘locked down’ systems. Pupils were more vulnerable overall when schools used locked down systems because they were not given enough opportunities to learn how to assess and manage risk for themselves.

• In the outstanding schools, senior leaders, governors, staff and families worked together to develop a clear strategy for e-safety. Policies were reviewed regularly in the light of technological developments. However, systematic review and evaluation were rare in the other schools visited.

• The outstanding schools recognised that, although they had excellent relationships with families, they needed to keep developing these to continue to support e-safety at home.
• Few of the schools visited made good use of the views of students and their parents to develop their e-safety provision.

Following publication of the Byron Review in 2008, Ofsted produced a set of recommendations in a report called “The safe use of new technologies” which set out recommendations for schools on the subject of e-safety.

One of the key recommendations of this Ofsted report is that schools should be evaluating the extent to which schools teach pupils to adopt safe and responsible practices in using new technologies. The safe use of new technologies also assessed training on Internet safety for the staff in the schools visited and considered the schools’ links with families in terms of e-safety.

Ofsted now review a school’s e-safety policy when carrying out their inspections, and look at:

• Whether teaching staff have received appropriate online safety training that is relevant and regularly updated?

• The mechanisms a school has in place to support students and teaching staff facing online safety issues?

• How the school educates and supports parents, and the whole school community, with online safety?

• Are e-safety and acceptable use policies in place and have they all been understood and agreed by all users of technology in school?

This is an incredibly fine line to walk, the network support team may filter inappropriate content or other content, (such as social network websites) from being accessed on the school network. However, as we have already seen, more and more of our students own smart phones. If they can’t access Facebook on the school’s devices then all they have to do is access it from their smart phone rendering all the protection the school has put in place useless.

Perhaps the more sensible option is to offer guidance to our users on appropriate and safe use of the Internet. We would never let a child operate a lathe in a woodwork class without showing them how to use it properly so it would make sense for schools to be teaching students how to use the Internet appropriately rather than simply just blocking anything that could be considered unsuitable.
Of course, that is just a simplistic view, and in a school appropriate filtering must be in place on the devices used in the classroom however this should be used alongside appropriate education rather than using it as a fire-and-forget tool.

A paper detailing the findings from the Byron review, titled ‘The safe use of new technologies’ can be downloaded from the Ofsted website and amongst its recommendations was that schools should seek ways to reinforce the importance of e-safety in all schools and homes, ensuring that families and schools work together to support the e-safety of students.

How does a school, with the help of the network support team achieve this? The first thing that a school can do is look at the acceptable use policy which most schools issue to students and members of staff. Historically, an acceptable use policy has covered the use of school equipment and the services that are offered, including email and Internet access.

If you haven’t revisited your acceptable use policy for some years now is probably a good time to do this. Not only should you consider hardware and software supplied by the school but also personal devices such as smart phones or tablet devices, and how they should be used responsibly when accessing Internet services inside and outside of school. There are lots of examples of schools’ acceptable use policies available on school websites so using these as resources to update, (or ensure your existing policy is up to date), is a useful resource.

Of course, sometimes it’s a case of “how do you know what you don’t know?” This is understandable because like many things, e-safety is a vast area that is constantly evolving. Schools have an enormous responsibility and are continually fighting an uphill battle. There are many people out there who can help and a huge range of resources to call upon to prevent you from reinventing the wheel.

The right device for the right tasks

It would be fair to say that the way technology is used in schools today is completely different to only a few years ago and completely different to a couple of years before that. The skills of our users have also changed in the last five years with touch devices becoming common place: in the pocket, sitting on the sofa in a house and, as we will see later in this white paper, now arriving in school.

When computers were first introduced in to a school, there was usually one or two for the whole school to use, which would have been in a fixed location or wheeled around on a computer trolley. Many school’s first computer was the RM 480z which was our first computer designed for education.
Slowly though, the number of computers in a school grew until there was suites of computers, such as the RM Nimbus, based on the Intel 186 processor, but even then, they were often only used for ICT lessons in the same way protractors are only used in maths lessons.

There was some rationale to this twenty five or so years ago, students didn’t have the skills to use computers, and teachers, with the exception of those teaching ICT, didn’t have the skills to teach using them, so the use of ICT had its place – in the ICT suite, for ICT lessons taught by ICT teachers.

As a richer array of applications, and the advent of the Internet began to grow, computers started to move out of the ICT suite and started to appear in libraries and the classroom. Students and teachers could use computers in the library to carry out research on the Internet and in the classroom, either the teacher would use the computer connected to an interactive whiteboard or students would use it to carry out research either individually or when collaborating on group work.

With the advent of stable, fast wireless networks becoming available, schools began to purchase notebook computers that could be used in a classroom connected to the network using a wireless network. These notebooks were often managed centrally by the network support team and could be moved around school in a
notebook trolley such as the RM MoveIT trolley. Notebook trolleys offer lots of features that are beneficial to schools:

- Allow notebooks to be stored and moved around schools so they can be used in classrooms, not just the ICT suite.
- Have the ability to charge notebooks when being stowed meaning that overnight the notebooks can be charged ready for the next school day.
- Allow network support teams to apply software updates to notebooks stored in the trolley without having to remove each device for the software updates to be applied.
- Can be secured so that the notebooks stored in the notebook trolley are safe and secure when not being used.

Indeed, some schools are now getting rid of their ICT suites in favour of using notebook computers and a managed wireless network to embed ICT in the lessons, in the classroom – in these schools there isn’t the need to move the classroom in to the ICT suite, the ICT suite comes in to the classroom.

Many schools have ICT suites for particular tasks, normally where high-powered computers are required. Where film editing or graphics-intensive applications are needed, these are often carried out in suites where high-powered, desktop computers are used. The latest generation of Core Processors from Intel offer high-performance-computing for desktop computers.

In the not too distant future it would be fair to say that all of our users – students and teachers - are likely to have access to their own device, either one provided by the school or one that they own. At RM we are seeing more schools asking questions about BYOD, (Bring Your Own Device), and what a school should be considering in order for users to use their own devices.

**The 21st century network support team**

We have already seen the needs of our 21st century students and our 21st century teachers but what about you - the network support team?

It is the network support team that are responsible for providing the tools and the services that allow teachers to embed collaboration in to lessons and provide the hardware and software that our digital natives expect to use.
With challenging budgets in schools, the network support team need to balance the availability of technology against the budget available.

The network support team need to provide:

- Engaging (for this you could read ‘cool’) technology.
- Technology that will provide value for money.
- Technology that can be centrally managed.

**Touch devices**

As we have already seen, primary school students have grown up around touch technology. The latest touch devices offer some great advantages for schools:

- Easy to use. Almost anybody can pick up and start using a touch device. The user interface is very simple to use and even people with very little computer literacy skills are able to use these devices. This is an important consideration for younger students in a school who may have not had much exposure to devices before. With touch devices they can start using them straight away and get to work in lessons.
- The latest touch devices offer all day use. This is of paramount importance in a school for all users. Once a device has been charged overnight it should last a whole school day.
- Touch devices are very thin and very light. For a device that is being used by students and teachers this is an important consideration because they can be moved from trolley to desk, or moved around school easily.
- Instant on. The latest touch devices are powered on all the time and have powerful sleep features that help to preserve the battery life and allow the touch device to be used straight away.
- Always connected. Many touch devices have the option of having cellular connectivity to 3G, (and in the not to distant future 4G networks). This means that these touch devices can be used away from the school wireless network, perhaps outside of school or on field trips.
- Apps. One of the most powerful features of touch devices is the availability of apps that can be downloaded and installed straight on to the device. Launching apps is significantly easier on a touch device as the icons are
often available straight from the desktop – no need to go searching through lists of icons – they are available straight away.

So touch devices have lots of advantages for students and teachers to use during lessons, and away from the school.

All of these advantages are user-centric however but for many of the touch devices they present some problems for the network support teams:

- **Usage in a school**: Many of the touch devices available today are designed for personal use not in a one-to-many relationship as we traditionally use devices in a school.

- **Manageability**: Because these devices are designed for personal use, there isn’t any central management available for them. Where there is, there is often the requirement to purchase additional software or learn new skills and, in some cases, it is compromise – the devices can’t be fully managed in the same way we can with a computer.

- **Incompatibility**: Many of the touch devices run on their own operating system. Almost all computers used in schools are based on the Windows operating system. Applications that are available on the Windows network aren’t available on these touch devices and where alternative apps are available they don’t offer full compatibility with their Windows counterparts.

Schools are moving towards roaming devices where computers will be used in the classroom, outside of school on field trips and at home. When evaluating which device would be best for users to have access to in a school these factors should be considered, even if the device isn’t being used like that today.

**Microsoft Windows 8**

The latest operating system from Microsoft, Windows 8, was released in October 2012. From the ground up Microsoft have developed Windows 8 with touch devices in mind – the biggest change apparent to users is the new Start Screen which allows access to Windows desktop applications and the newer Windows 8 style apps.
Microsoft released several different versions of Windows 8 – one designed for ARM processors, (Windows RT) and versions for x86 and x64 CPUs, (Windows 8 Professional and Enterprise), such as processors from Intel. Windows 8 Professional and Enterprise is likely to be the best choice for schools because it offers the most benefits for schools looking to use their existing hardware, and looking to purchase new devices, including touch ones, in the future.

Windows 8 touch devices

Windows 8 touch devices are now available based on Intel processor architecture. These devices offer all the benefits of touch devices but present lots of advantages to the network support team and users:

- Designed for multiple device types
  Windows 8 has been designed by Microsoft so it can be used on multiple device types. Windows 8 can be installed on desktop computers, notebooks, tablets, convertibles, (notebook and tablet convertible devices) and detachables, (tablet device which can be docked to a keyboard so it can be used as a notebook computer).

- Carry on using x86/x64 desktop software
  Schools have a wide array of applications that are used in different subjects across the curriculum. Windows 8 provides backwards compatibility so most 32-bit and 64-bit applications that are used in school will work on Windows 8 touch devices. Windows 8 has what could be described as two modes – legacy applications run in the desktop environment as they did in previous versions of Windows. When a desktop application is opened from the Windows Start Screen it launches and opens in the desktop environment.

- Great for multi-tasking:
  In many tablet operating systems, working with multi-tasking isn’t impossible
but doesn’t prove easy. In Windows 8, the ability to snap applications to the side of the screen makes working in desktop and Windows 8 apps easy.

Whether users are working with a desktop application or a Windows 8 app they can sit side-by-side and used in a more productive way.

- **Works with all your existing hardware**
  The school will have invested a lot of money in peripherals to be used with computers – from printers to visualisers. Because Windows 8 is backwards compatible, all the existing hardware already being used in school will work with Windows 8 and the latest touch devices.

- **Domain join and Group Policy management**
  The management of computers in the school environment is one of the major tasks of the network support team. Our users are “inquisitive” and want to understand how computers work and the impact of making changes to them. This inquisitiveness can result in a lot of work for the network support team, having to reinstall operating systems and applications if damage is made to any of these. Management tools such as Community Connect 4 make the management of computers in school simple – it’s possible to rebuild computers and centrally deploy applications from the RM Management Console.

  On a Community Connect 4 network, we use Group Policy objects to protect the system and restrict what users can and can’t do on the network. For example, preventing them from installing their own applications which may have a detrimental effect on the performance of the computer. For Group Policy object application, computers need to be part of the Windows domain and with Windows 8 Professional and Enterprise devices, these can
be joined to the domain and have Group Policy objects applied to them allowing full management through the RM Management Console and centralised application deployment.

Windows 8 apps are deployed in a slightly different way to ‘traditional’ desktop applications. The Microsoft recommended way to deploy Windows 8 apps centrally is for the application itself to be downloaded from the Windows App Store after the computer has been instructed to do so using Group Policy objects. This may not be the best way to centrally deploy applications in an educational environment so we are currently looking at a way to centrally deploy Windows Store apps using a technology called AppX, which allows Windows 8 apps to be packaged, potentially for deployment from the RM Management Console in Community Connect 4.

- Device security
Windows 8 offers new security features built into the operating system. Windows 8 supports a new BIOS replacement feature called UEFI and computers that use this allow Windows 8 to use a new feature called Secure Boot. Secure Boot prevents unauthorised operating system and malware from running at computer start-up. It also prevents bootable discs or flash drives from accessing files stored on the local hard drive. It also prevents root-kits, a type of malware that’s difficult for anti-virus programs to detect, from infecting a computer during start-up.

BitLocker was introduced with Windows 7 Ultimate and Enterprise and allows the contents of internal and external hard drives to be encrypted. With the release of Windows 8, BitLocker is now available for all the versions of Windows designed for x86/x64 processors. BitLocker is entirely transparent to the user and is an excellent security consideration for Windows 8 devices which are used away from school and may contain sensitive information, for example teachers’ computers.

- The best power management
The better power management features a device has, the longer it will last through the day, something we have already seen is of paramount importance on a device used in a school. In Windows 8, Microsoft introduced the Power Management Framework, (PoFx) which allows a device driver to register with PoFx to independently manage power usage in the individual components in a device. The device driver registers supply status and capabilities information about the components in a device. This
information includes current activity level, the time required by the component to change from one power state to another and the amount of latency that can be tolerated by clients of the device when the component wakes from a low-power state.

Based on this information, PoFx makes intelligent decisions about when a component can enter a low-power state and which of the available low-power states it can enter. PoFx uses information from all the components, as there may be interdependencies with other components in the system.

When a Windows 8 computer is shut down, it no longer shuts down completely. When you choose to shut down a Windows 8 computer it actually enters hibernation mode. On a desktop or mobile computer this means that when the device is needed again and is powered on then it could be available again in as little as eight seconds because Windows doesn’t have to perform a cold boot.

Compare the following illustration:

It’s clear to see how the new fast start-up of Windows 8 dramatically reduces the amount of time it takes to start a device. Earlier we looked at UEFI and how this can help increase security on computers using Intel Architecture with Windows 8. With a UEFI computer, Windows 8 fast start-up can decrease the amount of time it takes a device to start-up.

* Windows 8 apps designed for education
We’ve already seen that Windows 8 contains a new type of application – Windows 8 apps. These apps are downloaded and installed on a Windows 8 device through the Windows App Store and the number of education-specific apps in there are growing on a weekly basis. There are apps from RM, including RM Books which is an e-book solution designed especially for schools, and other apps that help students to work. These apps can be
searched for in the Windows Store, which is available from the Windows 8 Start Screen and installed on Windows 8 devices.

- Works on a range of Intel processors – new and old
One of the strengths of the Windows 8 operating system is that it will likely work on the existing computers you already have in school. The system requirements for Windows 8 can be found on the Microsoft website and even if the hardware is a few years old the benefits of Windows 8 can be used on these devices.

Windows 8 contains lots of exciting new features with an emphasis on being designed for touch-enabled devices. Windows 8 combined with Intel architecture gives students, teachers and network support teams the best experience from a usability and manageability prospective.

**Intel 3rd generation Core processors**

For desktop, or all-in-one computers like the new RM Profile, the Intel 3rd generation of core processors, (often referred to as Ivy Bridge processors), offer the following features:

- Intel Turbo Boost Technology 2.0:
  Intel Turbo Boost Technology is available on the latest Core i5 and Core i7 processors and provides even more performance when needed in 3rd generation Intel Core processor–based computers. Intel Turbo Boost Technology 2.0 automatically allows processor cores to run faster than the base operating frequency if they’re operating below power, current, and temperature specification limits.

  Intel Turbo Boost Technology 2.0 is activated when the operating system, such as Windows 8, requests the highest processor performance state. When the processor is operating below its limits and the user’s workload demands additional performance, the processor frequency will dynamically increase until the upper limit of frequency is reached. Intel Turbo Boost Technology 2.0 has multiple algorithms operating in parallel to manage current, power, and temperature to maximize performance and energy efficiency. Intel Turbo Boost Technology 2.0 allows the processor to operate at a power level that is higher than its rated upper power limit (TDP) for short durations to maximise performance.

- Intel Hyper-Threading Technology:
  Intel Hyper-Threading Technology, which is available on the latest Intel Core processors.
i3 and Core i7 uses the processor resources more efficiently, enabling multiple threads to run on each core. As a performance feature, Intel Hyper-Threading Technology also increases processor throughput, improving overall performance on threaded software.

A video demonstrating how Intel Hyper-Threading Technology works can be seen on the Intel website.

- **Intel Quick Sync Video:**
  Intel Quick Sync Video uses dedicated media processing to make video creation and conversion faster and easier. An example of where Intel Quick Sync Video is useful is where a group of students have been working collaboratively on a project and have recorded video using a camcorder. When the camcorder is connected to a computer with a 3rd generation Intel Core processor, the recorded video can be converted in to a different format, for uploading to a website for example, twice as fast as on a computer without one of the latest Intel Core processors.

  A video can be seen on the Intel website showing how Intel Quick Sync Video works.

- **Intel HD Graphics and Intel Clear Video HD Technology:**
  Before the Intel 3rd Generation Core processors were released, if high-definition graphics were required, an add-in graphics card was often needed in the computer, increasing its cost. With the latest generation of Core processors from Intel, HD graphics are embedded in the processor meaning that high-definition video plays smoothly and applications which require 3D graphics can be used without any additional cost.

  A video demonstrating Intel HD Graphics can be viewed on the Intel website.

Intel Clear Video HD Technology vastly improves video playback, delivering cleaner, sharper images, more natural, accurate, and vivid colours, and a clear and stable video picture. Intel Clear Video HD Technology on the new 3rd generation Intel Core processor lets you view images as they are meant to be seen. It works by using advanced video technologies that remove jitter and create crisper visuals, use adaptive contrast and skin tone enhancements that create vivid, rich colours on the display and uses intelligent colour space mapping which helps to ensure that colours are true-to-life whether the user
is watching a video, browsing the web or using applications.

- **Intel Wireless Display:**
  Intel Wireless Display (WiDi) allows HD video and sound to be wirelessly streamed to another display. This is really useful when a teacher wants to share content from their computer to a class, or students want to show work to the rest of their classmates. With an Intel 3rd Generation Core processor and a WiDi compatible device, such as the Belkin Screencast 1080P HD TV Adapter, connected to an HDMI projector or large-screen display, content can be streamed wirelessly for all to see.

  More information on Intel Wireless Display technology is available on the [Intel website](https://www.intel.com).

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**Intel vPro™ technology**

Today’s rapidly evolving education environment is creating a new set of security challenges for the network support team. To quickly respond to these needs and stay ahead of high-level security threats, the network support team need a comprehensive suite of security solutions that addresses the four critical areas of IT security:

- Threat management, including protection from rootkits, viruses and malware.

- Identity and website access point protection.

- Confidential personal and school data protection.

- Remote and local monitoring, remediation and repair of devices.

Intel vPro™ technology is a set of security and manageability capabilities built into the 3rd generation Intel Core vPro processor family, the Intel Xeon® processor E3-1200 v2 family, Intel chipsets, and network adapters that simplify and accelerate these four important areas of network support.

Intel Core vPro processors are available in most RM desktop computers and can be configured in computers on the RM website.
Intel vPro technology works in conjunction with several components of the hardware – the processor, the network card and mainboard chipset to provide security, protection and management capabilities to the computers. Many schools today use Community Connect 4 management tools to provide a lot of the functionality of Intel vPro technology, however, network support teams may look to use vPro technology alongside these management tools as they provide lots of protection at the hardware level of the computer. If the network support team don’t use Community Connect 4 and are looking for management tools that provide computer protection and management then 3rd Generation Intel Core vPro processors are a sensible choice when looking to install or refresh computers on the network.

**Hardware security**

Embedded security technologies are built in to the 3rd generation of Intel Core vPro processors that enable a level of protection not seen in education computers until now. Operating below the operating system, applications and services, these technologies provide a deeper level of threat management; identity and access authentication; data protection; and monitoring, remediation, and reporting to keep the school network and data protected. Built-in functionality even allows the computer to monitor and protect itself. This powerful protection for computers is achieved through two Intel technologies:

- **Intel OS Guard:**
  Intel OS Guard is a hardware assisted processor technology designed to prevent certain system malware attacks gaining access to the operating system kernel – the core of the operating system.

- **Intel Trusted Execution Technology:**
  Intel Trusted Execution Technology is computer hardware technology that is designed to attest the authenticity of a platform and its operating system, assure that an authentic operating system starts in a trusted environment and can therefore be considered a trusted operating system; and provide the trusted operating system with additional security capabilities not available to an unproven operating system. Intel Trusted Execution Technology uses
complex algorithms and measurements to ensure that the code being executed is proven. Lots more information on Intel Trusted Execution Technology can be found in this Wikipedia article.

There is lots of other hardware protection built in to Intel vPro processors and more information can be read in the Intel white paper 3rd Generation Intel Core vPro Processor Family Overview.

3rd Generation Intel Core vPro processors also have enhanced management capabilities built in to them. Using a management console, the network support team can access built-in manageability functions outside the computer’s operating system. Because this is outside the operating system, operating at the hardware level, the features are always available, allowing the computers to be updated, monitored, troubleshoot and secure a computer, regardless of its power, or operating system.

With computers based on 3rd generation Intel Core vPro processors, the network support team can connect to management functions over the wired or wireless network, and, in most cases, even if the computer is being used away from school and connected to the Internet. These computers can self-initiate communication with the console for management and maintenance purposes, when a threat is detected, or under other conditions specified by the network support team. Some of these management capabilities include:

- **Remote power control:**
  The network support team can remotely power off or start computers. This is particularly useful in a school where the computers may need to be shut down at the end of the school day, or started so they are ready to be used for the first lesson of the day. As operating systems and applications regularly require software updates, having the ability to remotely start up computers means these software updates can be applied out of hours.

- **System isolation and recovery:**
  Should a virus or piece of malware be installed on a computer which then attempts to spread across the network to other computers, this threat can be identified by the hardware and the network card in the computer can be disabled, effectively isolating it from the network. Even though the device is isolated, all of the management capabilities are still available to the network support team remotely. This is an incredibly useful feature when devices are being used away from the network, perhaps at home where we wouldn’t want the device to be returned to school where the virus or malware could...
then attempt to propagate around the network. Additionally, the network traffic can be monitored to detect any suspicious activity with this traffic. The technology achieves this by examining the network traffic headers and packet rate.

- **Remote hardware and software asset tracking:** Computers that are using 3rd Generation Intel Core vPro processors can have a remote software and hardware inventory taken. This records the hardware and applications installed on the computer and can be accessed at any time, regardless of whether the computer is powered on or off as it is held in non-volatile memory.

- **Disabling lost devices with a poison pill:** One of the risks with allowing devices out of school is that there is a chance they could get lost or stolen. Devices using 3rd generation Intel vPro Core processors can have a poison pill sent to them by the network support team using the management software that is used to manage these devices. When the device is powered on, the poison pill is sent to the device and it disables the device so it can't be used, and locks the data on the hard drive so it cannot be accessed. With the latest version of Intel vPro Core Processors should the device be located, the device can be unlocked so it can be used and the data can be accessed again.

  On the Intel YouTube channel, a [video can be viewed](#) showing how the poison pill works.

3rd generation Intel vPro Core processors offer lots of advantages for computers that are managed by the network support team. These advantages include powerful processing and remote management capabilities, including the ability to render devices useless if they are lost or stolen. These processors offer advantages to everyone – users and you. It is worth considering these processors the next time you are purchasing new, or looking to refresh the computers in your school.

**Shape the Future**

Shape the Future is an initiative backed by Intel, Microsoft and RM Education and is a programme aimed at helping governments invest in education technology to create jobs, drive economic growth and increase competitiveness. In the last five years, since Shape the Future was launched, the scheme has helped 42 countries bring technology to over six million students, educators and families.
The scheme was launched in the UK in November 2012 and aims to offer devices at discounted prices to under-privileged families in the UK.

Every school in the UK is awarded extra funding, called the Pupil Premium, for any child who has received free school meals in the last six years or children who have “ever been looked after continuously for more than six months, and children of service personnel”. For these children, an additional payment is made to the school of £600, (in the 2012-2013 school year), for each child that qualifies for the pupil premium. The Government hasn’t stipulated what the pupil premium has to be used for in a school however its overall aim is to raise attainment, help parents engage with the child’s school more and reduce the administration costs of the school.

One of the ways this can be achieved is by providing a device a student can use in school and at home and this is what the Intel, Microsoft and RM Education Shape the Future initiative is designed for – to provide devices to these groups of children and their families.

As the only UK technology provider working with Intel and Microsoft, RM can offer the following devices as part of the Shape the Future initiative:

- RM NB14 notebook.
- RM Notebook 320.
- Asus X401A.
- Lenovo ThinkPad.
- RM MiniBook.
- RM MiniTablet.
- Acer W510.

All of these devices, which have been designed for education, include the device itself, the Windows operating system and pre-installed software including Office Professional 2010 all at a price that is reduced by approximately 30%, everything a child would need to use the device in and out of school. Later in this white paper we will take a more detailed look at where and how these devices can be used in school.
There is lots more information about Intel, Microsoft and RM Education’s Shape the Future project on the RM website:


The Intel Classmate reference design

Two of the devices that form part of the Shape the Future initiative are the RM MiniBook and RM MiniTablet devices. These two devices are based on the Intel Classmate reference design that was created by Intel for an economical, rugged mobile computer designed for students, which it called the Classmate PC. This design met the requirements of a tough, easy to use personal device that could be used by children of all ages, in and out of school.

Now in its third generation, the Intel Classmate PC has evolved to become one of the best designed devices for use in and around school. The RM MiniBook, which is a traditional clamshell device, boasts:

- A thick, tough case and impact resistant rubber housing for the screen and the hard disk making it drop resistant from a table.

- Built-in carry handle so users can easily move between lessons in school, and to home and back with the reduced risk of the RM MiniBook being dropped.

- Built-in 802.11a/b/g/n wireless allowing it to connect to wireless networks in school, or at home without the need for an Ethernet cable.

- Ships with the Intel® Education solution software suite pre-installed. This collection of applications has been designed to allow students and teachers to get more out of the RM MiniBook. We will be looking at this software later in this white paper.

More information on the RM MiniBook, based on the Intel® Classmate PC clamshell reference can be found here:
Alongside the Intel Classmate PC clamshell reference, there is also the Intel Classmate PC – Convertible. Matching the specifications of the Intel Classmate PC clamshell, the Convertible also boasts:

- The ability to convert from to a touch optimised tablet which can be used with a stylus which can be stowed in the body of the Classmate PC Convertible.

- Dual audio jacks that allow two sets of headphones to be connected to the device at the same time – ideal for collaborative learning.

**Intel education software**

Every RM MiniBook and RM MiniTablet ships with the Intel Education software suite. This is a collection of software provided by Intel and allows for exploration and interpretation by students and teachers, tools for teachers to manage these devices in the classroom, and software that helps to protect the hardware and software. This software is either pre-installed on RM MiniBooks or RM MiniTablets or will shortly be available for download. More information on which applications can be downloaded can be found in the RM Knowledge Library.

**Intel education software for exploring**

Intel include applications which have been designed for use by users that allow them to explore content rich, interactive resources and to create work either on their own or collaboratively using RM MiniBook or RM MiniTablet devices. This software includes:
• Kno e-reader:
Kno is an interactive e-book reader that has been designed specifically for education. Kno e-books can contain rich multimedia so rather than simply being electronic copies of paper-based books, Kno books can contain sound, video, words and pictures.

• LabCam:
Teachers can ignite the imaginations of their students with LabCam by WebCam Laboratory. This hands-on set of tools for investigating the natural world help make abstract concepts tangible, because students see them with their own eyes and experience them with their own hands. Through observation and experimentation, students can explore patterns in natural processes and study everything from a free-swimming paramecium to the mountains of the moon. With the LabCam software available as part of the Intel Learning Suite, students can easily set up sophisticated experiments, the software is designed specifically to be easy to use and flexible. And because the solution uses the camera built into Intel Learning Series devices and other readily available materials, it is a cost-effective way to boost both the quality of your science curriculum and the enthusiasm of students. LabCam allows students to observe slow-based processes such as cloud movements, ice melting and plants growing. LabCam can stitch photographs taken with the built-in webcam in to a coherent video, which students can use to learn about the world around them.

The LabCam software allows the webcam built in to the RM MiniBook or RM MiniTablet in to a motion camera allowing students to capture images at just the right time. This could be a fly landing on a spider’s web or a rabbit appearing from its hole.

The Universal Element of the software allows the webcam to recognise data from numbers on an analog display, needles on a dial or even from a fluid-based thermometer. Using the LabCam software allows the RM MiniBook or RM MiniTablet to become an invaluable, cost-effective tool in science lessons rather than having to purchase separate data-logging solutions.

Finally, LabCam includes a Pathfinder module that allows the software and webcam to track movements and detect patterns. For example, using the webcam and LabCam software, students could track the motion trails of ants or the vortex created when water drains from a sink.
• MyScript Notes:
MyScript Notes is a powerful application designed to be used on the RM MiniTablet. MyScript Notes is a handwriting recognition suite that allows the user to convert and export their handwritten notes. In MyScript Notes, users can view, manage and tag notes; search for text in notes files; convert handwriting, shapes and tables in to digital text; send converted text in to other applications such as Microsoft® Word.

MyScript Notes contains a simple to use interface with a toolbar that allows users to create new documents, save and open existing files, convert notes and to search handwritten notes.

• MediaCam:
MediaCam is an application which makes use of the webcam built in to the RM MiniBook and RM MiniTablet that allows students to create videos and take pictures. Once the user has created their recording, the editor, which is included with the software, allows them to create rich multimedia which can be shared with their classmates.

• ArtRage:
ArtRage enables students to easily create digital artwork on their computers. Students use their computer to simulate a range of artistic effects including watercolour, ink pen, flood fill, "gloop" pen, sticker spray, text tool, and more. Because it’s so intuitive to use, students can spend more time nurturing their inner Picasso rather than having to learn how to use a complex graphics application.

Intel education software for teachers

Of course, teachers can make use of many of the tools that form part of the Intel education software suite, however, one which may appeal to them, especially where a classroom of RM MiniBook or RM MiniTablet devices are being used in the classroom, is the Classroom Management tool.

Classroom Management provides teachers with tools to facilitate collaboration, administer and grade quizzes, transfer files, and monitor student screens. Teachers can organise students into virtual groups for small-group teaching. They can create a quiz to assess student understanding using true/false, multiple choice, and fill-in-the-blank questions; collect quizzes; and score quizzes automatically. They can supervise student activities in real time, locking student screens to block activities
and focus their attention, and manage and control student screens to remotely assist students.

**Intel education software for the network support team**

Included with the Intel education software suite is a collection of applications for the network support team and parents, as these devices are ideal for use away from the school. These applications are designed to protect the hardware and the user when using the RM MiniBook and RM MiniTablets.

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**Note:** Some of the applications in the Intel education software suite are designed for devices that aren’t managed by the Community Connect 4 management tools.

The applications that are part of the Intel education software suite that are available to help the network support team manage RM MiniBook and RM MiniTablet devices are:

- **Theft Deterrent:**
  Theft Deterrent provides a robust solution for an asset management infrastructure in a school and allows the network support team to protect capital and operational investments. Theft Deterrent supports complex deployments of RM MiniBook and RM MiniTablet devices through a hierarchical infrastructure. The devices themselves have hardware hardened tamper resistant components to render devices that have been stolen valueless. The network support team can use an IT ready management dashboard to monitor clients and implement policies.

- **HDD Protection:**
  HDD Protection prevents damage to the hard drive in the event of the device being dropped. If the application detects the device has been dropped it automatically moves the hard drive heads, away from the disk in order to prevent them touching the disk and causing irreparable damage. This application helps schools minimise hard disk replacement costs and data loss. Additionally, the Intel Classmate reference design includes ruggedness for the hard disk drive so that it can absorb the shocks caused by the device being accidentally dropped.

- **System Recovery Tool:**
  The included System Recovery Tool allows the network support team to take an image of the installed operating system and the installed applications so if there is a requirement to reinstall Windows and the applications on to
the RM MiniBook and RM MiniTablet then the System Recovery Tool can be used, rather than the network support team having to spend lots of time reinstalling everything!

- McAfee Antivirus:
  If your network anti-virus solution doesn’t support unmanaged clients then on RM MiniBook and RM MiniTablet devices you can install McAfee AntiVirus. McAfee AntiVirus enforces safe and secure computing practices by protecting devices from exposure to malware or identity theft risks. The five-year license includes Virus and Spyware Protection, Web and e-mail Protection, Data Protection, and PC and Home Network Tools.

- Access Management:
  We have already seen that e-safety is of paramount importance to the network support team, teachers and parents when students are using the Internet. The Access Management application, which is part of the Intel Learning Suite, allows access policies to be set for RM MiniBook and RM MiniTablet devices being used on the Internet. The Access Management software allows parents, or the network support team to apply policies to the devices to help prevent inappropriate content being accessed.

As you can see, devices based on the Intel Classmate reference design offer lots of advantages – a device that has been designed for education and a suite of applications that are useful to students, teachers, parents and the network support team.

Getting the most from the school ICT budget

As we have already seen, school budgets are decreasing and the network support team has to, now more than ever, consider how they are going to spend their budget when purchasing new, or refreshing the hardware in school.

The questions the network support team should be asking is:

- Does the device they are looking to purchase meet the needs of the users today, and for the lifetime of the device?

- When the device no longer meets the needs of its main tasks today, can it be provisioned for use somewhere else in the school?

- Would there be a management overhead for the network support team, either configuring the devices for the first time or when managing the
device, for example, when adding new applications?

• Will the devices be engaging for the users and enthuse them to create great work, and ultimately, leave school with good grades?

Meeting the needs of the users

When looking to purchase or refresh devices, it is important that they meet the needs of the users. If the device is going to be used for editing digital video it has to be powerful enough to allow this. 3rd generation Intel Core processors have lots of features that would meet the needs of devices that require high-power computing.

The network support team need to think about where the devices will be used. If devices are going to be used in a classroom and outside of school, it would make sense to look at purchasing devices that are light, powerful and, easily used when out-and-about. Devices such as the Acer W510 can be used as notebook and a tablet. Running Windows 8, the screen can be detached from the keyboard and used as a tablet. When the device is being used at a desk then the screen can be reattached and used as a traditional notebook. A multi-use device that fits a variety of usage scenarios.

Managing devices

The network support team will know how much management the network in a school, including the devices, require. This ranges from deploying applications and applying software updates to them through to applying policies so that the devices don’t have to be continually rebuilt with the operating system and applications reinstalled on them. The majority of schools will have a Windows client server network with Windows Server being used to manage the devices, through group policy objects and management tools such as Community Connect 4 to perform network management tasks.

When looking to manage these devices it makes sense to choose devices that will integrate in to the existing network without lots of additional work having to be carried out by the network support team. With Windows 8, devices running this operating system will integrate in to the Windows network, and Community Connect 4.4 will allow these devices to be managed through the RM Management Console.

By choosing Windows 8 devices, with Intel architecture, the risks of equipment that is already used in schools not working with these devices, such as printers or other peripherals, is reduced and will continue to work with new devices.
It’s important when looking to refresh the devices used on the network that these considerations are thought about and how these will help reduce the total cost of ownership of the devices on the school’s network.

Touch devices are becoming commonplace, and it is important that if you or your school are looking at using touch devices in the classroom then these devices should integrate in to the network in the same way as a desktop or notebook computer would. Windows 8 on touch devices meets those needs.

If devices are going to be used away from school then it is important to consider robustness. It would be foolish to purchase devices that couldn’t withstand the rigour of school use and as we have seen, devices are likely to be used away from school, for example, Shape the Future devices are purchased so they can be used in school and at home. Devices such as the RM MiniBook or RM MiniTablet have been designed for education and as such have technology built in to them so they can withstand the knocks and bumps we would expect to happen when being used by students.

**Future proofing your devices**

It’s important to consider how long you intend your devices to last. You should plan for how the devices will be used as they age. The minimum hardware requirements of Windows 8 are:

- Processor: 1 GHz or faster.
- 1 GB RAM.
- 16 GB hard disk drive.
- Microsoft DirectX 9 graphics device with WDDM (Windows Display Driver Model) driver.

As you can see, these hardware requirements are quite low and computers over five years old are likely to run Windows 8, however, you would never expect a device with the above hardware in it to be able to perform high-powered computing functions. The computers you purchase today could have many years service in school by distributing them according to what they’ll be used for. An older desktop computer would probably suffice in a school library where light-computing tasks, such as browsing the Internet or editing Microsoft Office files will be the kind of task most likely to be used on those computers.

If you are looking to move your existing computers to Windows 8 then you should find the processor is already compatible with this operating system. You can find more information on Windows 8 Intel graphics drivers in this [web article](#) and how you can download them.
Note: If you have a Community Connect 4 managed network and want to build computers as Windows 8 then you should ensure you have the relevant driver support park installed that contains the Windows 7 graphics driver for the computer you want to install Windows 8 on.

The network support team should have a strategy in place to move computers around school so the newest devices are used where high-power computing is required and the lowest-powered processors are used for light-weight tasks. By having this in place the network support team should find that it is always the oldest, lowest spec computers being removed from the network.

**Engaging users**

We have seen that having devices available to users that they find engaging will mean they produce better work and their learning improves. It is also important that there isn’t a steep learning curve required to use new devices that are added to the network. Our Digital Natives are used to using technology and can grasp this technology easily. There will always be some users though who may not have had exposure to the latest and greatest devices so reducing the learning curve for them allows them to start using the technology quickly with minimal support from the teacher or you.

**Summary**

We have seen that our 21st century students are digital natives – they have grown up with technologies such as the Internet and they are using out of school to collaborate. Teachers can ‘tap in’ to this knowledge so that students can improve their work and collaborate in the classroom.

Many collaboration tools are available online and Intel provide a range of collaboration tools to education on their website free of charge. To get the most out of collaboration in the digital classroom, Intel have also produced an e-learning training course which shows teachers how to embrace the skills their students have and how to embed collaboration in to their lessons.

With the release of Windows 8, Microsoft has brought touch to Windows devices. With Windows 8 and Intel architecture, such as the 3rd Generation of Core processors, powerful touch devices can be integrated in to your Windows client server network offering all the manageability from network management tools such as Community Connect 4 to touch devices. The total cost of ownership can be significantly reduced when choosing Windows 8 plus Intel Architecture devices. It isn’t simply the cost of the device which should be considered when looking to
replace or purchase new devices, the network support team should also consider the hidden costs of managing the devices and having to repurchase applications that are used on the existing Windows computers.

Shape the Future is an initiative between Intel, Microsoft and RM, which allows schools to take advantage of discounted devices that include Windows and Microsoft Office and can be purchased on behalf of under privileged students.

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