Educational Impact Evaluation Report on the provision of 100Mbit/s broadband to 78 Post-Primary schools

September 2012
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1. Introduction and Educational context

Full integration of ICT resources in learning and teaching is highly dependent on the availability of reliable and high-speed broadband. In a classroom, a teacher must be confident that the technology will work efficiently and effectively when faced with a 40 minute class period with an audience of eager students. Teaching time cannot be lost through hoping that a website will download in time or that it might take 10 minutes to access and download a good-quality digital resource for learning purposes. The internet provides access to an increasing amount of highly relevant content which can enrich learning, enliven teaching and, generally, make learning a more rewarding and motivational experience. For example, online 3D simulations and animations can significantly assist the learner towards a thorough understanding of mathematical and scientific concepts. Modern languages, technology subjects, business and liberal studies are equally enhanced through access to well chosen digital content and communication platforms.

School access to reliable and high speed internet services raises student motivation, increases attention and application to study. Given the speed and reliability of the 100Mbit/s connections it is not surprising that the response from the 78 schools selected for this demonstration has been very positive.

2. Project background

In June 2008, the Government approved the Consultation Paper on Next Generation Broadband. This consultation paper stated that "A new phase of broadband in schools will be instituted. Every second level school in Ireland will get 100Mbit/s of broadband delivered to its door, so that students can learn and collaborate online simultaneously."

The Minister for Communications, Energy and Natural Resources, in collaboration with the Minister for Education and Science, announced the 100Mbit/s broadband initiative for post-primary schools on 25th June 2009. This initiative was announced following the submission of a multi-criteria analysis (MCA) proposal to the Department of Finance. This analysis was drawn up by the Department of Communications, Energy and Natural Resources (DCENR) in collaboration with the Department of Education and Skills (DES), HEAnet and the National Centre for Technology in Education (NCTE).

3. Project Methodology and Timelines

The initiative planned to provide high speed broadband. i.e. 100Mbit/s, to all post primary schools following the completion of a demonstration project. In June 2009 an advance group of 78 schools was selected for this demonstration project. Schools were selected in accordance with the following criteria:

- **Geographical location** – subject to technological access such as proximity to existing HEAnet broadband services at regional level, a balanced national spread of schools was sought.
- **Technology** – as a pilot scheme it was necessary to utilise a number of existing broadband technologies
- **Social inclusion** – representation from ‘Delivering Equality of Opportunity in Schools’ (DEIS) schools, schools with ‘Special Educational Needs’ (SEN) students and island schools
- **Adequate mix of schools** - schools were identified under the following headings:

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1 The NCTE became part of the Professional Development Service for Teachers with effect from 1 June 2012.
a) Size of schools (while large schools were prioritised, small schools were also represented)
b) Gaelscóileanna/Gaeltacht schools
c) Gender mix (single boys, single girls, mixed)
d) School type – secondary, vocational, community/comprehensive
e) Schools with significant numbers of special education needs students
f) Existing levels of ICT adaption in schools
g) Mix of urban, rural and remote area schools.

The 100Mbit/s initiative is being delivered in conjunction with DCENR, DES, HEAnet and the NCTE.

A national procurement process was conducted by HEAnet to select the telecommunication service providers who would competitively provide 100Mbit/s internet connections to the 78 schools. Installation began in March 2010 and all 78 schools were connected by June 2010.

Planning began with the selected schools in October 2009 with the first meetings called by the NCTE with the principals and ICT coordinating teachers of the schools. Throughout the programme schools were provided with advice and support by the NCTE.

In December 2009, DCENR funded the procurement of laptops and digital projectors for the 78 schools following a review of the ICT equipment in each school by the NCTE. The technical configurations were in line with the recommendations of the ICT Strategy Group report (2008) to the Minister for Education and Skills.

During the project, data was gathered using a Mixed Methods Research Methodology.

- NCTE registered ongoing observations and feedback from schools from October 2010
- An online survey was designed and issued to all schools in June 2011 which elicited a 100% response rate
- School visits – 8 schools (ie. a sample of 10%) were visited and extended interviews carried out with:
  - The School Principal
  - Two Teachers
  - The ICT Coordinator
  - Students

4. Scope of Evaluation

The educational impact of the 100Mbit/s project, in terms of the period being evaluated, (ie from September 2010 to June 2011) must be considered in the light of the short time-frame that schools have had access to the 100Mbit/s in classrooms. In less than one academic year, the levels of teacher professional development required to benefit fully from the project could not be fully assessed. Similarly its benefits could not have been fully applied and experienced in classrooms. Also some schools have not yet been able to develop their local area networks (LANs) to fully exploit the 100Mbit/s capability and, in these instances, are limited in their ability to fully utilise the available additional bandwidth.

In essence, this report provides an interim view of how well schools have utilised the 100Mbit/s service in the early stages of provision but also indicates that schools have been strongly motivated, have e-Learning plans in place and have a commitment to bring about greater integration of ICT in the daily life of the school over the immediate and medium term futures.
5. **Key questions addressed in this report**

Based on the data collected from 78 schools this report focuses on the impact of high speed reliable broadband on learning and teaching and on the integration of ICT. The following questions are examined in different contexts to determine the level of impact.

1. Are schools carrying out e-Learning planning and do they have plans for further ICT integration?
2. Is there greater collaboration among teachers within the schools and beyond the schools?
3. Do schools see more clearly the potential of ICT in learning and teaching and in particular the potential for online resources and tools?
4. Has there been an increase in teacher confidence in using ICT?
5. Has the use of ICT by teachers for learning and teaching increased?
6. What type of resources do teachers now have access to and what difference is it making?
7. Have teachers engaged in professional development and have they been motivated to acquire more professional development in order to make greater use of ICT?

6. **Findings**

The findings are given under a number of areas:

**6.1. School vision for e-Learning planning and ICT integration**

Principals are ensuring that e-Learning planning teams are in place in the schools and there is strong evidence of whole school engagement with ICT in learning and teaching activities. Schools have a clear vision on how to enhance ICT integration for the future (Refer to Fig. 1). Teachers are benefiting from the 100Mbit/s programme and are implementing their collaborative e-Learning plans.

![Fig. 1: Vision for e-Learning across a wide range of areas](image-url)
Schools report a significant increase in teacher awareness of digital resources for learning and teaching and high levels of e-Learning planning by individual teachers.

The confidence levels of teachers in using ICT has increased significantly. Heretofore, many barriers to ICT use by teachers have revolved around slow and unreliable internet availability. Such barriers no longer exist in these schools. High speed bandwidth has motivated teachers to plan for ICT use in terms of planning their ICT professional development and in sourcing, building and using learning resources.

### 6.2. Integration plans for broadband in learning and teaching

Principals report that their schools wish to capitalise on the positive influence that the 100Mbit/s project has had on their schools and 100% say that ICT integration will be a priority objective for the future (Refer to Fig. 2). The vision for high-speed broadband usage in e-Learning is integrated in the whole school plan.

![Fig. 2: ICT Integration is a priority or major objective for 100% of the schools](image)

In 2010, ICT infrastructure grants were provided to schools by the DES and as a result post primary schools focused on carrying out ICT infrastructure upgrades and on ICT equipment purchase and renewal. From 2011 onwards schools have had an increasing emphasis on implementation of their e-Learning plans where the focus is more on the learning and teaching in classrooms and in developing subject-level department plans for ICT integration.

Schools indicate that they have plans in place for the coming year in the following areas:

- Online sharing and collaborating within their own schools, with other schools, with universities and with others in curriculum areas
- Video conferencing and use of Skype or other online communication tools
- Online learning and teaching spaces such as VLEs and blogs
- Many schools are also looking at introducing digital textbooks and as the 100Mbit/s service will facilitate classroom access
- Use of digital media tools including digital video editing
- Development of the e-Learning plan
- Continuing Professional Development
- Purchasing ICT equipment
- Improving the school network, including provision of wireless access throughout the school

![Fig. 3: e-Learning Planning benefits peers and students](image)

Building capacity within the schools to implement e-Learning plans (Refer to Fig. 3) continues to be a strong priority. This also means looking at the skill set in the school to deal with basic troubleshooting.

### 6.3. Teachers’ view and use of high-speed broadband services

The introduction of high speed broadband has had a strong impact on how teachers now use ICT in their teaching, and teachers are taking their own initiative at school level to up-skill on the use of ICT in their own subject areas. There is widespread evidence across all 78 schools, that teachers are using ICT more in classes, are engaged in using ICT for collaboration, are sharing resources and are engaged in inter-departmental planning for ICT integration. The introduction of 100Mbit/s has empowered teachers to explore and use ICT in the learning and teaching process. (Refer to Fig. 4)

One ICT coordinator observed about the teachers in her school - “we are using a lot more applications in a cross curricular way”. From the evidence gathered, the introduction of 100Mbit/s is putting a focus on teaching methodologies and has brought about “a renewed focus on teaching and learning – it is changing the way teachers look at methodologies and possibilities in the class.”
Teachers are becoming more innovative and creative in how they use the technology, resulting in a very positive impact on the learning environment that students now experience, and in broadening their access to learning beyond their own school.

For example,

“In video conferencing they linked up with the school in the USA, a second-year history class that were studying the area of politics throughout the USA, interacted with the class in the States. The amount of learning and communication that went on was incredible.”

![Fig. 4: Positive change in teacher attitudes to ICT Integration due to 100Mbit/s service](image)

Teachers are keen to further develop the use of fast broadband in their school and learn about what new things they can do with the higher-speed broadband. Teachers referred to the spontaneity it brings to their classroom in that they can access information quickly and in so many different formats in their class.

One teacher referred to the teaching of “the periodic table using a rap video I found on YouTube as it is very hard for some students to get the periodic table. It is fun and a more interesting way to teach it.”

It was strongly felt by teachers that the high-speed and reliability of the new 100Mbit/s broadband connection are the key essentials in bringing this type of learning and teaching to the classroom.
6.4. Use of ICT in the classroom

There has been a significant increase in teachers’ engagement with ICT related professional development. In addition, as teachers have begun to use the high speed internet in their classroom, their confidence levels have increased and they are more willing to seek help and share ideas, digital materials and know-how with colleagues. 70% report a growing confidence in the integration of ICT in their classrooms with 26% stating that ‘majority of staff are confident in the integration of ICT in their daily teaching and willing to share their expertise with other staff members.’

Some quotes from principals include:

“The project has transformed the use and integration of ICT in our school.”

“Teachers never imagined that they would use ICT in teaching and learning to the level they are using it. This is a direct result of the 100Mbit/s.”

“It has made an incredible difference to the school over the course of the time it has been installed. Teaching and learning have been enhanced greatly….it would be difficult to do without it now.”

“Opened our eyes to what’s possible. All about how students learn. It offers them huge potential.”

Stronger emphasis on ICT in new syllabi has resulted in greater use of 100Mbit/s broadband in particular subjects. Teachers have availed of the NCTE professional development programme, which is accessible outside of schools hours. Where new syllabi have been being rolled out, for example, t4 (Technology subjects) and Project Maths, greater emphasis is being placed on the use of ICT and the development of ICT subject related skills and one can see greater integration and use of ICT and the internet in these syllabi.

Teachers no longer have to depend on the textbook to teach and can now provide a richer learning environment for their students by accessing a diverse range of online resources. One innovative use of the high-speed broadband is in subject sharing between schools. This occurs when one school cannot offer a particular subject but can make it available to their students via online video conferencing facilities. This model of subject sharing is already underway in Co. Meath between Dunshaughlin Community College and St. Fintinas post-primary school, Longwood and has proved very successfully, providing students with a broader access to curriculum subjects. Other schools are also interested in developing their use of the 100Mbit/s service to provide access to subjects that are not available in their schools and see huge potential for different models of peer teaching with other schools.

The introduction of high speed broadband has had a major impact on how teachers now use ICT in their teaching. There is widespread evidence across all 78 schools that teachers are using ICT more in classes and engaging in greater collaboration. They are sharing resources and are engaged in interdepartmental planning.
When asked about their vision for learning for the school “sourcing, creating and sharing of online resources” rated very highly at 77.4% (Refer to Fig. 1). In addition, 81.5% of schools reported that teachers are involved in customising their own digital content (Refer to Fig. 5). Examples of this customisation of digital content includes activities ranging from inserting a video clip sourced on YouTube into a Powerpoint, to editing a blog, to uploading a customised file to a Virtual Learning Environment (VLE) or to editing a photo or short video.

“Teachers are now searching for resources themselves and discovering their own sites.” In some schools computers in staff rooms which previously lay idle are now always in use and “you cannot get your hands on them”.

“Teachers are enthused and empowered to use the technology that now exists at their fingertips.”

**Teachers feel empowered**
The introduction of 100Mbit/s broadband has empowered teachers to explore the use of ICT in the learning and teaching process. Teachers in these schools are now asking questions in relation to what resources are available to them and how best to use them. For some this constitutes an enormous development, as they were not previously convinced of the value of ICT and were impeded in their use of online resources due to the slow download and upload speeds. Very often, they had a negative opinion of using ICT in the classroom but as a result of faster 100Mbit/s speeds teachers are changing their practice in a positive way and as one ICT coordinator observed about the teachers in her school - “they are using a lot more applications in a cross curricular way”. From the evidence gathered, the introduction of 100Mbit/s broadband is putting a focus on teaching methodologies and has brought about “a renewed focus on teaching and learning – it is changing the way teachers look at methodologies and possibilities in the class.”

Teachers are becoming more innovative and creative in how they use the technology resulting in a very positive impact on the learning environment that students now experience and in broadening their access to learning beyond their own school. Teachers are keen to further develop their use of high-speed broadband in their school. Some teachers commented:

“The area of Skype and videoconferencing should be developed further. They also want to develop the area of using Moodle over the next few years. There are 10 teachers involved now in various subject
areas and the hope is that there will be further CPD sessions next year to help more teachers become involved.”

“The ‘Scratch’ project is majorly successful over the last few years and it was offered as an option in transition year. It offers a lot of diverse skills - problem solving, art, music and creative skills. There is an ethos of sharing online and they have their own school Scratch area. They like to look at other projects and upload their own projects and the high-speed broadband has made a big difference to uploading projects.”

Teachers referred to the spontaneity the access to the 100Mbit/s connectivity brings to their classrooms, in that both teachers and students can access information in multi-media rich forms in their class in an instant.

**Bringing real-life scenarios into the classroom**

Schools are excited and enthusiastic about the possibilities that they can now exploit, enabling the depiction of real-life learning scenarios in their classrooms. An innovative use is in subject sharing between schools where one school can access a teacher from another school via video conferencing service. For example, ‘Applied Maths’ is a subject which cannot be offered in many schools and some schools are hoping to offer this subject in future via video-conferencing. This is particularly relevant for the island schools. In Gairmscoil Éinne, Inis Mór, the possibility of offering Chemistry to their students via a video conference link with another island school is being explored.

For example, in the Design and Communications Graphics (DCG) subject, where a teacher may be explaining a 3D construct in class and is having difficulty getting it across, they can go on the web and quickly find a construct that illustrates their point more clearly and readily for the student in a real-world setting.

Another example of innovative use in DCG and engineering is in building design, since site visits by the pupils are no longer possible, is: “bringing the design of a building into the classroom via 3D or virtual buildings and so helping the students to understand and make this topic much more authentic. Students are much better placed to puzzle things out when they can walk around the site but now they can do this virtually.” This is a practical example of using ICT to support visual learners and learning through visualisation.

Other examples of bringing real-life learning into the classroom via the high speed broadband were evident during the lifetime of this project.

In Geography, the recent Japanese Tsunami and subsequent disaster could be discussed as it happened in ‘real-time’ as well as the Queen’s visit to Ireland in May 2011. Live footage of the Chilean miners dramatic escape, in October 2010, was also accessed and used to realise educational outcomes.

“In biology there are clips on mitosis on YouTube, visually they can see after explaining .. this helps to explain DNA in an instant.”

In language learning there are immense possibilities. Schools have already begun exploring the use of Skype to support the development of Gaeilge and foreign languages. Podcasts and other online audio recordings are proving really useful for teachers in language classes, however in order to be easily used it must be available ‘on demand’ during a class, and high speed broadband is required to ensure this can happen.

Where schools are involved in eTwinning programmes students have introduced themselves to their overseas student colleagues via Skype. This has really helped in the development of oral language skills and the building of confidence.
Some schools have accessed visiting experts via the web for science and other subjects. Current affairs websites and news websites, for example, TG4, RTE, New York Times, RSS feeds, YouTube are also hugely important in bringing real-time news to the classrooms and in ensuring that the teacher does not have to relay outdated information. In the teaching of Irish to students teachers have found that it helps revitalise the language and make it seem more modern as it is mediated over technologies that are both ‘up to date’ and that are used by students outside of schools. Some teacher comments:

“*Connects the students with the language and boosts the profile of Irish in students’ minds*”

“For CSPE, having access to current affairs at our fingertips is wonderful and students too can do their own research. Not dependent on me to provide current affairs which in the past would have been really quite limited. So, they learn to assess what sites are valid and what sources are valid, these are key research skills for 21st century learning and use of the internet.”

Another creative and modern example is the use of a Katie Perry video clip on YouTube by a teacher in English to help teach the concept of similes. This brings a fresh approach to teaching and creates a different dynamic in class. Again high speed reliable internet access is pivotal in bringing about this change in how teachers teach, and the wide range of online resources of different media they can choose from to support their teaching and learning.

High speed internet and reliability of service are essential to bringing this type of learning and teaching environment to the classroom. Students are more engaged and there is more interaction time with their teachers, providing a more efficient and effective learning experience. In this model teachers believe that students are more engaged and stimulated to learn.

This contrasts with past experiences where the internet often failed and or was very slow leading to students becoming distracted and teachers frustrated with unreliable and slow download speeds.

A student quote: “*Broadband was so slow and was holding us back. You would be on an engineering website trying to access a simulation loading up and it would stop loading before it even started to play, this was very frustrating and a waste of everybody’s time, but now it’s different.*”

**Enhanced participation and more thorough learning**

Students refer to classes being more interactive whereby they are more involved in questioning and in dialogue with the teacher.
Fig. 6: Access to new online resources improve engagement and attention in class.
Fig. 7: Students present and develop learning in new ways

Students repeatedly commented on the fact that having access to some of the highly visual and interactive learning objects online, meant that some areas/topics could be covered more effectively, as students could grasp the concept more quickly. It led to more time in class to engage in questioning with the teacher and also gave the teacher more time, and so topics could be moved along more efficiently. Teachers also felt that in many cases they could press ahead with a topic or deal with a question in a topic more effectively in class by having access to online resources.

Career Guidance and Examination Preparation

Students, principals and teachers invariably commented on the immense value the internet has been in relation to career guidance and preparation for examinations. The teacher can download exam’ papers in class very quickly, go though marking schemes or check questions that have been previously asked. In addition teachers can take students through a virtual tour of a university campus, pull up interviews online for different careers and access application forms and other relevant information quickly and easily.

“The marking scheme is so informative for the student. Student can see that they can do part of a question and that they will get marks... very important for student struggling... encouraging for them to see how many marks they get for answering parts of question and giving them confidence to attempt the next part. This was not really possible before... So, it’s a case of having the examinations website so well updated and the broadband speed in the class. Having both makes the difference for me as teacher.”

Teachers can access a variety of personality tests readily online and students can then access these in their own career research. These types of activities are so much more efficient than printing out tests and spending time in administration related activities.

Some schools are making use of webmail to communicate with students when they are on work experience. Students can email work reports or concerns to their teacher. Plans are afoot in some schools to complete the employer evaluation form online.

Self-directed learning

Students referred to the importance of the teacher now being able to give them the links of websites they are using in class for further research and follow up at home or in the library where most students have access to broadband. A teacher comment:

“On the Moodle in the school they are able to do different exercises, quizzes; I can direct them to specific sites relevant to the topic. They see the topic in a different way from the moment you mention Moodle.”

In addition, students are working in groups or individually to prepare presentations using PowerPoint, blogs and other tools. This is particularly obvious in the transition year programmes where students are involved in more project work and in Leaving Certificate Applied (LCA) activities.

For music performance, students are in some cases recording their performance using digital video technology or other audio software and playing it back as a self-critique exercise. This gives them confidence and seems to enable them to be prepared to perform again and improve. This has also been noted by teachers in other areas where ICT presentations are involved. Students are less likely to be offended and more open to critique and comment on their work when presented using an ICT tool or
application for example, PowerPoint, a blog etc. than if it was presented in their copy book. This seems to be particularly true in Leaving Certificate Applied (LCA), where students are involved in using ICT for many tasks and activities. Being able to use visuals and other media rich content to support their presentation or assignments seems to give them more confidence and helps build their self-esteem. It allows students to tap into their own learning style as they are no longer dependent on their copy book/handwriting or textbook to present their view. They can personalise and genuinely present their own perspective in a creative manner.

**Replacement of the textbook**

Students commented on the lack of reliance on the textbook as the sole means of presenting learning by the teacher. They often referred to the static nature of the textbook in how it presented a topic. Some related student comments:

"Access to online resources was much faster, this opened up a whole new world and we are not just depending on books”.

"Teachers use audio and other things instead of just highlighting things in the book so our classes are more interesting."

"Rather than reading it out of the book they can actually see it”

"In German we play an online game to help us with our vocabulary”

There is a vast range of online resources used in schools and some schools are using Video Conferencing and Skype to facilitate learning. In particular, students reported using the following online resources in class:

- Interactive tests and quizzes
- Video content sites – YouTube, RTE realplayer, TG4
- Scoilnet, www.scoilnet.ie, The Portal for Irish Education
- Qualifax – Ireland’s National Learners’ Database
- ECDL tests online
- University prospectus and campus online – careers research
- Exam preparation support online
- Internet for research in many different areas of the curriculum
- Geogebra for Project Maths.
- Wikis
- Art – online or virtual tours of museums
- Discover Sensors science project

**Project Maths**

The roll-out of Project Maths has coincided with that of the 100Mbit/s roll-out and the Project Maths support service is placing a strong emphasis on the use of ICT. NCTE and Project Maths have worked together to provide additional courses on ICT & Maths. Some teacher comments:

"Hugely because all of the staff have now come to the second tranche of training for Project Maths and all they've learned from the training days that have been integrated into the curriculum. Project Maths stimulated the maths department to demand data projectors in all of the room, and every maths teacher will have one no, and it enables them to explore all that is in Project Maths as part of the package.”
“Able to use some of the interactive websites to help conceptualise a problem for students, this is very helpful. During the in-service of Project Maths ICT is integrated. This is so important as teachers can see the value-add but we have a long way to go with it.”

“Can see huge potential in maths especially as the new curriculum has a very different approach and wants to make maths real where possible. For example, I think it will be great if we can get another teacher in via video conferencing to teach a particular topic in maths, ie. peer teaching online as they might teach something better than I do. Can you imagine the possibilities this would be bring to schools where maths departments are small.”

“I have been teaching maths for a long time and well, never had any problems. Got good grades and students enjoyed my classes and we had a lot doing honours too. Was not convinced that the internet could make a big difference but it has. I am now also using an interactive whiteboard and visualiser and the combination works superbly. Now, I’ve trouble with the technology but I’m getting over that. At this stage in my career it is wonderful to approach things differently especially when I thought I had it all worked out!”
6.5. Importance of faster and reliable download speeds

The fast and reliable download speeds has had a major impact on use in schools as teachers can now rely on accessing online content that they are confident can be effectively integrated into the flow of the class. Some of the comments from teachers give a clear picture of this:

“Can bring up animations to explain something, and it can be seamlessly integrated into my class because I’m not waiting for it to set up with students getting distracted in the meantime. It greatly adds to what I can bring to my class.”

Principals and teachers place very high priority on the reliability and speed and as illustrated in the comments below from different schools.

“Teachers know it will work if there are 25 or 30 students accessing it at one time. Before the 100Mbit/s connection there was a reluctance to try things, now that things are functioning well they are more willing to try things out”.

“Broadband should be there all the time or not at all. When working with teenagers in school their time is limited with the teacher and a teacher cannot say, well ok we will come back to that again whenever the broadband works. It’s simply is not like that. Time is of the essence especially in exam years. Better it is switched off completely rather than have slow or unreliable broadband.”

“Pointless if not reliable”

“Reliability is paramount”

“The ability to have Internet connectivity available for all users throughout the day is different. Prior to the fast broadband connection, Internet connectivity was a resource that was limited to 20 – 30 concurrent users in the entire school and therefore had to be managed according to needs”.

“I am now 100% willing to use any technology in my classroom because I have the confidence that it will work.”

“Yes because I wouldn't really have used much Internet access before because it was so painful and slow.”

All schools report that having access to a diverse range of media rich content is adding immense value to the topics being taught. Teachers have noted that students are very often more engaged and motivated to question when topics are presented using ICT. For many teachers using ICT in their work is a relatively new phenomenon. Some are still fearful of ‘this phenomena’ and feel they lack the necessary skills and confidence. However, it is clear from Fig. 8 that teachers in the 100Mbit/s schools have begun to overcome these difficulties and their awareness of the potential of online resources has increased significantly. Many still believe that their awareness of what they could be using, is still limited and that more professional development is required in order to achieve greater learning outcomes.
6.6. Collaboration & Sharing

Teachers are sharing resources more than before but many commented that they are not yet aware of the full potential that 100Mbit/s can offer. They expressed a need to develop awareness of different online resources in the coming year, now that their confidence levels have increased and that they “are more comfortable with the digital projector, laptop and 100Mbit/s in their classrooms”.

Schools are using various different platforms for sharing and collaboration ranging from Skype, Google apps, email, and local school server resources. Quite a number are using or planning to use VLEs such as Moodle. An ICT coordinating teachers comment:

“They also want to develop the area of using Moodle over the next few years. There are 10 teachers involved now in various subject areas and the hope is that there will be further CPD sessions next year to help more teachers become involved. The teachers involved now can impart the knowledge to their colleagues.”

Schools are also sharing information with the wider school community via their website, email and other online platforms. In some schools students can access teacher’s notes, study notes, exam’ timetables. This became extremely important during the period of particularly heavy snow in January 2011 where some schools had to close for long periods and were able to provide students with access to learning via email and other online platforms. Albeit a difficult time in schools, it did illustrate how the internet can be used to facilitate learning beyond school hours and school walls.

Schools are using email and their schools website as a means of communicating important messages with parents. Students are publishing work on their school websites in formats such as blogs and multimedia. ‘E-portal’ (a school administration package) has been introduced in some schools to record student attendance and other student data. E-portal operates online and so teachers login every morning and record attendance which has placed further demands on the 100Mbit/s connectivity in schools.
There is a considerable amount of collaboration in schools for professional development, and teachers are involved in resource sharing via their local network or often via an online space such as a VLE. In addition, many schools are involved in projects with other schools where ICT and internet are used as the central means of communication, collaboration and sharing, for example, e-twinning. One school participating in the ITEMS (Improving Teacher Education in Mathematics and Science) project reported that now that there is fast and reliable broadband access that:

“The emphasis has shifted to the suitability of the resources rather than access speed. This teacher intends to customise the VLE courses she receives through this project to suit her classes and her approach in using them. It is questionable whether this would have been the focus of the teacher without 100Mbit/s broadband. It shows a shift away from focusing on the reliability of the technology towards tailoring the learning resources to the needs of the school. The teacher concerned intends to extend her use of the school VLE using the resources she gains from participation in the ITEMS project.”

Many of the schools have also embarked upon or plan to embark on the provision of access to students to class work beyond the classroom via for example a VLE, blogs, email, online shared working areas, as a core part of their teaching and learning methodology.

There has been an increase in the use of ICT in how students present their learning and students are adamant in their views that access to 100Mbit/s is critical in developing this further as:

“So many of the applications are online that we need to publish and access media rich content.”

“Access to computers is not enough. You can prepare a PowerPoint but we need to be able to link to an online blog, or YouTube clip in the presentations we are making and so if we are standing up presenting this we need to know that the link works and is not slow. In the past we could not put in these links because it never worked and would destroy the flow of the presentation and you would be cringing. The 100Mbit/s is so fast and so reliable now that we don’t have to worry about this. We just have to worry about the presentation itself!! You have to have 100Mbit/s. All schools need to have it... if you don’t have it you’re deprived!”

6.7. ICT used more in classes

Principals, ICT coordinators and students noted that ICT was used in a lot more classes. When teachers reference online material in class, students often access such material at home or in the library, thereby improving their access to learning beyond the school. Students referred to teachers’ growing confidence in the use of the internet and in accessing websites with media rich content. Students also have greater expectations in terms of teacher usage of ICT, expect to see greater use of ICT as teachers’ skill sets grow, but students were impressed by teachers’ use and understand that there is a steep learning curve for many teachers. The students do help teachers with some of the technical issues that might arise and this is received very positively by teachers. Interestingly, students were more impressed than teachers themselves with how teachers have embraced the use of the faster internet in the past year and respected teachers more for their efforts in this regard. Students also referred to classes being more interesting and fun.

Teachers are now using a range of digital technologies in class from interactive whiteboards, visualiser, and digital video to internet. For example a teacher of Design and Communications Graphics (DCG) stated that:

“the use of visualiser has help transform the student experience in the classroom... whilst demonstrating every step in class, I can record every step using the visualiser and play it back, then upload to
Moodle so that students can watch it at home or whenever they wish. I would be doing the demonstration in class anyway but recording it adds great value as it can be re-used”.

“Using the interactive whiteboard, you can pull up some of the Interactive text-book...eg. A diagram... you can explain it, write on it and change it. This is really useful in maths, science and DCG.”

“In an e-twinning project with a school in Italy, students make a video here, and the Italian students also made a video. We uploaded it and then ‘Skyped’ each other, and it gave students something to talk about, and we plan to use more of Skype as it really helps develop their aural and oral abilities.”
6.8. ICT Professional Development

‘Teacher confidence has been identified as a key factor in terms of how teachers integrate ICT into their practice. Teachers require the technical skills to use technology and the pedagogical skills to integrate ICT into their teaching. Where teachers have attended ICT professional development there is a strong correlation between their adoption and integration of ICT.’ (NCTE e-Learning Handbook, 2009)

It is evident from comments made by several of the principals and teachers surveyed that there is a strong awareness of the need for ICT professional development for teachers, and a recognition that this is a key factor in the development of e-Learning in these schools.

The evaluation found that the vision for e-Learning in the school is most likely to focus mainly on the provision of professional development and upskilling. 75% of respondents stated that the majority of teachers have availed of school based ICT professional development. In addition to school based ICT professional development, it was reported that 80% of teachers have engaged with or are engaged in accredited study. 61% of respondents state that most teachers have participated in NCTE or other ICT professional development.

![The majority of teachers have availed of school based ICT Professional Development courses]

In relation to CPD and special educational needs, more than half of respondents (54%) stated that teachers have completed professional development courses on ICT and special educational needs, with a majority (74%) agreeing that teachers have acquired the skills to use some assistive technologies in their teaching and in supporting students’ learning.

Greater emphasis on ICT in new syllabi has resulted in greater use of 100Mbit/s broadband in particular subjects. More recently, emphasis is being placed on the use of ICT and the development of ICT subject related skills where new syllabi have been rolled out, for example, in T4 or Project Maths, and one can see more integration and use of ICT and the internet in these syllabi. Professional development for ICT to support these syllabi mainly takes place outside of schools hours. During the in-
service CPD for these new syllabi, clear connections with ICT and the subject area have been made so that teachers are more inclined to attend “after school” professional development to support the in-service.

“Teachers must be able to engage in CPD that connects with the subject area they teach – a generic approach to CPD is not adequate”

Some principals and teachers commented on the need for more ICT professional development for teachers and it was suggested that professional development for ICT in learning and teaching be made mandatory as it is for other in-service.

“Make sure it is nationally mandated as with recent in-service such as Geography, History, Sciences and Project Maths where the focus has been ICT for the classroom. Many other subjects have had no in-service so it’s hard for these teachers to make connections with the subject and ICT, or connections that are deemed appropriate and useful. ”

“The second part to the answer is confidence. Teachers need to gain the confidence in using the new technologies. In the past, the technology was unreliable and that was a confidence killer but reliability is better now and confidence now lies around the issue of teacher training. It can take years of in-service teacher training and support to change from being the reluctant teacher to the teacher who is partly computer literate to the teacher who knows quite a lot...there should be in-service training available there.”

6.9. Confidence levels of staff
It is clear from Fig. 10 that the majority of teachers in the schools surveyed are engaging and are willing to engage. More importantly, 70% reported that ‘there is growing confidence among the staff in the integration of ICT into the curriculum’ with 26.3% reporting that the ‘majority of staff are confident in the integration of ICT in their daily teaching and willing to share their expertise with other staff members.’

![Image of chart](image-url)
The ICT CPD needs tend to be identified by teachers themselves (45%), with the e-Learning team being the next most likely (at 26.3%) to identify needs.

Teachers are taking their own initiative and, as one ICT coordinating teacher reported from her school:

“One of the teachers wanted to introduce an accounting package to transition year and now all of the transition year students have an opportunity to take an accounting module and that’s new this year. This is an example of a teacher who took the initiative on board as a result of the 100Mbit/s faster connection”.

“For certain teachers, change can be difficult. The way to overcome that is to take small steps. She is amazed at how teachers who ‘shied away’ from it are now a little less sceptical. Reluctance to change is the biggest barrier but with small steps and the support of colleagues change can happen.”

6.10. What type of CPD is underway and planned?

Much of the professional development that has take place in 2010-2011 has been school based. Schools indicated that this was one of the more effective ways and it ensures that teachers are:

- Working with colleagues and so can seek support and help
- Working within the school’s vision and plan for e-Learning
- Using the equipment available in their own school.

Invariably schools have stated the need for ICT professional development in order to maximise use of ICT and the use of 100Mbit/s.
In one example, when asked about the focus of CPD in different areas, it was clear that teachers are still availing of the opportunity to acquire basic skills. At the same time, the schools also focused on the development of other areas. At present, results indicated that the ICT professional development being availed of currently focuses on:

- Resource creation and sharing and using the internet to find resources (81%)
- ICT skills and creating resources for teaching using software e.g. PowerPoint (86.3%)
- Peer mentoring (42.5%)
- Teachers acquiring basic ICT skills (71.3%)

Some schools expressed a need for examples and ideas on effective use of technology and how best to explore it:

“Like to know more about what teaching methodology I apply when using particular resources and would really need to see someone doing this in class to see how best I could do it.”

6.11. Informal CPD

There is evidence from the evaluation results and comments of the principals and teachers surveyed that informal CPD and peer mentoring plays an important role in supporting the integration of ICT in their school. This takes place in the context of an e-Learning culture where there is awareness of the potential of ICT and the confidence to use it, as well as to share ideas and resources with colleagues.

Teachers’ awareness of the potential of online digital resources in learning and teaching has increased in that 59% stated that they are now “very aware”. Almost 84% of respondents reported that teachers now regularly share new e-Learning ideas and good practice with each other in subject department meetings, staff meetings and via email, while many (48.8%) also used a school network or VLE. This results in informal learning, which clearly complements other CPD in place.

“Teachers sharing their own knowledge with other teachers has been very successful. They've had three or four sessions where a member of a department has given the presentation on how they use ICT. In the English department they had a Skype project where they were discussing with the class in another country and she gave a presentation on this. Teachers teaching other teachers is the best way.”

It is clear from the survey that the ICT coordinator, and in many cases the e-Learning team in the schools, play an important role in supporting teachers in using the 100Mbit/s connection to best effect. However, the role of the individual teacher in identifying his or her own needs and continuing to take up opportunities for CPD outside of school hours remains an important part of CPD provision.
6.12. Leadership and ICT Integration

As outlined in ‘Planning and Implementing e-Learning in your school’ (NCTE, 2010) effective leadership within the school is essential to the development of a coherent e-Learning strategy. The following statements from the schools reflect the positive outcomes from effective leadership and associated ICT integration.

“The project has transformed the use and integration of ICT in our school.”

“Teachers never imagined that they would use ICT in teaching and learning to the level they are using it. This is a direct result of the 100Mbit/s.”

“It has made an incredible difference to the school over the course of the time it has been installed. Teaching and learning have been enhanced greatly. It would be difficult to do without it now.”

“Opened our eyes to what’s possible. All about how students learn. It offers them huge potential.”

Professional development rates highest in the development of the schools vision for e-Learning but other factors are still of very high importance and it is clear from Fig. 13 that schools feel the need to develop areas in parallel in order to achieve their vision. Schools have reported changes in the teaching resources and methodologies being used. The response below is particularly relevant in this regard.

“A lot of project work is done using ICT and the 100Mbit/s broadband, although much of this was done using the slower internet connection previously. What has changed is that the quality of the work submitted has improved as students spend their time productively in front of the computer as opposed to waiting for images etc. to download”

Fig. 12: Increased use of ICT by Teachers

Principals wish to ensure that all teachers are gaining from the 100Mbit/s and so must progress their e-Learning planning in such a way that supports all teachers. One principal commented on the “need
to categorise staff into levels and skill sets and that one cannot raise all ships at once” and a “systematic approach that is paced to suit all, with super-users helping others.”

In developing their vision for ICT integration principals invariably stated the need to watch and listen to what others are doing, so that they can make informed decisions and lead their own school in the direction which best suits their school, their teachers and their students. This is so important in relation to ICT as there is such a level of investment involved on all levels.

As one principal clearly put it:

“We need to avoid any ICT gimmickry. A sustained and developmental approach is the way to go. It has to make a difference in the classroom otherwise we don’t need it.”

Another principal highlighted that ‘each school needed to find their own starting point’, whether it already had a well embedded culture of ICT integration or alternatively was beginning from a lower base. ie:

“Adding to what’s already there. Now we want to know how to move it along and how can we learn from it.”

6.13. Developing the e-Learning plan in the school – Plans for the future

Many schools spent a lot of time focusing on technical and purchasing matters during the first year and so are still in the process of developing their e-Learning plan, where the focus is more on learning and teaching in classrooms and in developing subject level department planning for ICT integration.

![Fig. 13: Vision for e-Learning across different areas](image-url)
The vision for broadband usage in e-learning is integrated and is evident in the following areas to what level?

![Bar chart showing integration levels for different planning areas.](image)

**Fig. 14:** Vision encompasses planning across different levels

The school now facilitates whole school and subject department planning to explore new approaches to using ICT in learning and teaching.

![Bar chart showing responses to the facilitation of planning.](image)

**Fig. 15:** Increased levels of whole school and departmental planning
6.14. Realising the vision

E-learning planning and an e-Learning team are important in the development of the vision.

“Things are moving faster. Teachers are anxious to get involved or update themselves and interested to see where it could help them.”

Given the time constraints for actual use of 100Mbit/s in the classroom it was important to gather some perspective on plans for the future and the coming academic year. 100% have said that the integration of ICT will remain a high priority. Building capacity within the school to implement the e-Learning plans continues to be a strong priority for schools. This also means looking at the skill sets available to deal with basic troubleshooting.

Schools have plans for the coming year in relation to the following key areas:

- Sharing and collaborating online within their own schools, with other schools, with universities and other external parties, and with expertise in curriculum areas
- Video conferencing and use of Skype or other online communication tools
- Availing of enhanced online administration and IP “telephony”
- Online learning and teaching spaces such as VLEs, Blogs
- Introducing digital textbooks (eg. ebooks)
- Use of digital media tools including digital video editing
- Greater use of video conferencing facilities
- Development of the e-Learning plan
- Professional development to support ICT integration
- Purchasing ICT equipment and providing wireless access throughout the school
- Improving the school network
6.15. Concerns
Whilst schools are very positive and have plans for further development of ICT use, the need for a more comprehensive provision of technical support and adequate funding to provide for this is invariably raised as a key issue. Schools have deployed a range of models for the provision of supports.

6.16. ICT Coordinating Teacher
Of the schools 82% reported having an ICT coordinating teacher. However, the status and responsibilities of the role varied from school to school. In some cases the role is awarded a post of responsibility allowance (either ‘Assistant Principal’ or a ‘special duties’ post allowance and in others it is undertaken in a voluntary capacity (generally by an enthusiastic and interested teacher. The duties in the role also varies from school to school and it is still clear that many ICT coordinating teachers are responsible for managing and developing the technical support setup in the schools as well as progressing the integration of ICT in the curriculum and in particular the organisation, design and delivery of professional development. ICT coordinating teachers reported that this combination of roles is very challenging to sustain this level of support whilst carrying out their own teaching duties/hours. The development of e-Learning teams has led to a more distributed process of support and development of e-Learning in the schools. The needs in schools differ greatly. ICT coordinating teachers also noted that they had to take on new responsibilities with the project and below are some of the comments:

“Learn about the new technology themselves”

“Greater responsibility, so much to take in, passwords etc. teachers then come and ask and you have to check it up. Time involved in learning what it can do. You want to help but really hard to keep all things going including teaching your own subject.”

6.17. Greater access to and use of student devices
It was agreed that there was a need to look at how schools could use student devices, and that this will be part of the future of learning and teaching. However, most schools believed that they were not yet in a position to explore this until such time as they had settled with using the current setups in school, and in stabilising networks and technical matters. Schools raised concerns in relation to the management of the devices from a cost, technical and security perspective. Some schools are moving ahead with using netbooks, iPads and other such devices, and were pleased with how students were engaging. In these cases schools noted that extra demands were being placed on support and maintenance functions and concern was expressed regarding future funding. Most schools are in a position to provide access to computer rooms so that students have individual access.

Interestingly, some students were not overly enthusiastic with having their own devices and some felt that teachers had enough to cope with the recent introduction of technology. Students were also mindful that their assessment was still predominantly based on a written examination.

“Don’t want to be using technology non-stop but we do get access through our computer rooms and we do need that. Anyway, you still have to write in the exam and you want to hear what your teacher has to say in class.”

“First years are getting e-books in September (2011) and it will be interesting to see how that works as the plan is to provide digital textbooks. It has already been piloted in our VEC and was successful and some of the management issues have been ironed out in the pilot”
6.18. Schools Infrastructure, Networks and Technical Support

ICT equipment was provided as part of the 100Mbit/s project alongside the DES grants that were provided to all post primary schools in autumn 2010. This has resulted in most of the 78 schools now having a digital projector and laptop/or desktop computer in every classroom.

![Bar chart](image)

Fig. 17: Access to a range of ICT equipment in schools

At the time that the survey/data collection took place, (May/June 2011), it should be noted that some schools had not yet completed the installation of ICT equipment in every classroom, and this clearly resulted in lesser use of 100Mbit/s in these classrooms. Where schools had the ICT equipment in place many teachers, at the beginning, did not have the confidence in using it and had to learn very quickly. Schools did put a programme of CPD in place to assist teachers. This is an ongoing process.

6.19. Technical support & School Network

There are a range of different technical support models in place in different schools as can be seen from the Fig’s. 19 and 20 below. Only 38% of schools reported ‘A formal technical support contract with Service Level Agreement (SLA) is in place with an external provider.’ Demands on technical support are increasing as more technology is introduced, and schools are concerned that the role of the ICT coordinator in a school cannot be focused on technical support alone. At present the ICT Coordinator in most schools is the person responsible for dealing with technical support in the school including liaising with an outside contractor where such a service exists. Principals are very clear that if they cannot provide adequate, reliable and fast response to technical problems it will hinder the integration
of ICT in the school and “relying on the ICT coordinator will not work and is not a sustainable model.”

The school network is a vital part of the ICT solution in a school, and in the 100Mbit/s project has evolved considerably in terms of how teachers now use it to share resources and collaborate. However, the higher speed broadband connection ‘exposed’ other ICT infrastructure issues and some were trying to resolve these which in many cases highlight the need to upgrade their existing ICT infrastructure. Fig 18 provides information on the status of networking setups in schools.

“The poor quality of our school network has been a major barrier to us taking full advantage of the huge potential 100Mbit/s broadband offers. Our network is so unreliable, it demands so much time and effort in ensuring that it works that other important ICT developments are being neglected. For example, teacher CPD, eLearning planning etc. Teachers’ confidence on the reliability of the network has been significantly compromised. This lack of reliability has prevented teachers in fully integrating ICT into their teaching and learning. They are not guaranteed that the school local network will work when in the classroom. We hope to upgrade our ICT network and concentrate on eLearning planning, teacher CPD, having a greater online presence and using ICT more innovatively across all areas of the curriculum.”

In addition, many schools were unsure if they needed to be planning to install wireless networks throughout the school and if so how to progress this further, given the associated costs, technical (eg. security) and manageability issues involved. The majority did state that not having access to a wireless network throughout the school was limiting immediate access to online resources especially where students are using devices such as laptops in class.
Fig. 18: Status of LANs (including Wireless networks) in schools

Fig. 19: Status of Technical Support in schools

Fig. 20: Stability and Reliability of LANs to deliver 100Mbit/s throughout schools
6.20. Overall views of principals, teachers and students
Invariably principals, teachers, ICT coordinator and students have overwhelmingly stated that reliable and high speed broadband was paramount in using online resources and online applications in class and that the 100Mbit/s provided a necessary catalyst for the significant increase in the use of ICT in the schools.

Fig. 21: Priority of high speed internet access to achieving ICT integration
The 100Mbit/s project has demonstrated that when schools are given access to high speed reliable broadband that it has a very positive impact on learning and teaching in schools. The 78 schools have made enormous progress in ICT integration in their schools within in a very short timeframe. Teachers are more highly motivated than before and there is a greater enthusiasm about using ICT with teachers working in schools to share ideas, resources and support their colleagues. The data provided in Appendix 1 shows the download and upload speeds for the schools, and this evidence is consistent with the report findings.

Earlier in the report it was stated that seven key questions would be investigated and answered in order to determine if introducing 100Mbit/s high speed broadband to Post Primary schools would positively impact learning and teaching. The summary answers below are based on the detailed findings of the report and are given in response to each question as follows:

1. Are schools carrying out e-Learning planning and do they have plans for further ICT integration?
   Response: Yes, schools have definite plans to integrate the 100Mbit/s service more thoroughly in the future.

2. Is there greater collaboration among teachers within the school and beyond school?
   Response: Yes, teachers are more involved in building and sharing resources with colleagues and beyond the schools walls.

3. Do schools see more clearly the potential of ICT in learning and teaching and in particular the potential for online resources and tools?
   Response: Yes, schools and teachers are more flexible and innovative in how they access and deliver the curriculum. Also students are more engaged in class through the use of a range of online interactive content and there is greater use of learning resources outside of school times.

4. Has there been an increase in teacher confidence in using ICT?
   Response: Yes, teachers are more enthusiastic, confident and participative in their use of ICT in the classroom, and this has been highlighted by specific examples in the findings of this report.

5. Has the use of ICT by teachers for learning and teaching increased?
   Response: Yes, teachers make greater and diverse use of ICT in learning and teaching across a wide range of subject areas. Also classrooms can be more flexible and innovative in how they access and deliver the curriculum.

6. What type of resources do teachers now have access to and what difference is it making?
   Response: Teachers have widened the range of online resources they are using. They are using more rich media sources which more effectively bring real-life learning scenarios into classrooms via online access to rich media.

7. Have teachers engaged in professional development and have they been incentivised to acquire more professional development in order to make greater use of ICT?
   Response: Yes, teachers willingly engage in professional development and peer mentoring. Levels of whole school ICT related CPD has increased as they see the value of using their own school ICT infrastructure to best effect. They are also more highly motivated and effective when they have appropriate ICT tools such as reliable high speed internet access.
The speed and reliability of the 100Mbit/s service is a strong catalyst for change in practice and attitude to ICT which most schools have not experienced in the past. Teachers are seeing the value of ICT and of using a wider range of online resources that they can quickly and reliably access.

Given the developments currently underway for reform of the Junior Cycle Curriculum, the development of e-portfolios, online assessment, online learning environments such as VLEs, and greater access to digital devices for students, there will be greater demands for the provision of high-speed broadband in schools.

Quote from a teacher: “the 100Mbit/s has opened up a whole new world of learning and teaching for me. Although I have much to learn about actually using it in class, I feel compelled to do so as the potential for both me as a teacher and how I can now work with my students is exciting and possible”.

7. Recommendation

This report shows consistently the very positive impact that the provision of high speed 100Mbit/s Broadband service is having on learning and teaching across the 78 schools. Enormous progress in ICT integration has been demonstrated by the schools in a very short timeframe. As a result of this positive impact this reports recommends that an equivalent high quality 100Mbit/s broadband service be provided to all Post Primary schools in Ireland as a priority.
Appendix 1- Supporting Broadband data from schools
This appendix includes supporting broadband download and upload data graphs for each of the 78 Post Primary schools for the period Dec 2010 to Dec 2011.

The following graph provides aggregate broadband download and upload data graphs for the combined 78 Post Primary schools for the period Dec 2010 to Dec 2011.

![Graph showing SHS Traffic with inbound and outbound data, with current and average values provided.]
Individual download and upload data graphs for each of the 78 Post Primary schools

**School Name: Loreto Secondary School, Balbriggan, Co Dublin**

Roll Number: 60010P

**School Name: Colaiste Bride, Clondalkin, Dublin**

Roll Number: 60122D

**School Name: St Benildus College, Stillorgan, Dublin**

Roll Number: 602261R
School Name: St Joseph’s College, Lucan, Co Dublin
Roll Number: 60263V

School Name: St Dominic’s College, Cabra, Dublin 7
Roll Number: 60731F

School Name: Presentation College, Warrenmount, Dublin 8
Roll Number: 60792C
School Name: St Paul’s Secondary School, Greenhills, Dublin
Roll Number: 60902G

School Name: St Leo’s College, Dublin Rd, Carlow
Roll Number: 61140K

School Name: St Kieran’s College, College Rd, Kilkenny
Roll Number: 61560J
School Name: Salesian College, Celbridge, Co Kildare
Roll Number: 61661P

School Name: Colaiste Naomh Mhuire, Naas, Co Kildare
Roll Number: 61730I

School Name: Loreto Secondary School, Bray, Co Wicklow
Roll Number: 61820J
School Name: St Flannan’s College, Ennis, Co Clare
Roll Number: 61920N

School Name: Christ King Secondary School, South Douglas Rd, Cork
Roll Number: 62692I

School Name: St Eunan’s College, Letterkenny, Co Donegal
Roll Number: 62830R
School Name: Loreto Convent, Letterkenny, Co Donegal
Roll Number: 62840U

School Name: St Columba’s College, Lifford, Co Donegal
Roll Number: 62861F

School Name: St Joseph’s Patrician College, Nun’s Island, Galway
Roll Number: 62960H
School Name: presentation College, Headford, Co Galway
Roll Number: 63040Q

School Name: Calasanctius College, Oranmore, Co Galway
Roll Number: 63100I

School Name: Our Lady’s Bower Secondary School, Athlone, Co Westmeath
Roll Number: 63210P
School Name: Good Counsel College, New Ross, Co Wexford
Roll Number: 63610I

School Name: Mercy Secondary School, Ballymahon, Co Longford
Roll Number: 63710M

School Name: St Mary’s Diocesan School, Drogheda, Co Louth
Roll Number: 63841E
School Name: St Vincent’s, Dundalk, Co Louth
Roll Number: 63900R

School Name: Presentation Secondary School, sexton St, Limerick
Roll Number: 64250J

School Name: St Angela’s Ursuline Convent, Waterford
Roll Number: 64990D
School Name: Summerhill College, Sligo
Roll Number: 65170Q

School Name: Kilina Presentation Secondary School, Tullamore, Co Offaly
Roll Number: 65630B

School Name: St Nathy’s College, Ballaghaderreen, Co Roscommon
Roll Number: 68067P
School Name: Colaiste Iosagain, Portarlington, Co Laois
Roll Number: 68068R

School Name: Mercy Secondary School, Tralee, Co Kerry
Roll Number: 68070E

School Name: Collinstown Park Community College, Clondalkin, Dublin 22
Roll Number: 70041J
School Name: St Mac Dara’s Community college, Templeogue, Dublin 16
Roll Number: 70260V

School Name: Ballyfermot College of FE, Ballyfermot Rd, Dublin 10
Roll Number: 70342A

School Name: Carlow Vocational School, Kilkenny Rd, Carlow
Roll Number: 70420R
School Name: Maynooth Post Primary School, Maynooth, Co Kildare
Roll Number: 70700A

School Name: Colaiste Choilm, Ballincollig, Co Cork
Roll Number: 71103K

School Name: Cork College of Commerce, Morrison’s Island, Cork
Roll Number: 71120K
School Name: Gairmscoil Mhic Diarmada, Araíonn Mhór, Co Dhún na nGall
Roll Number: 71244F

School Name: Gairmscoil Einne, Inis Mór, Co Galway
Roll Number: 71300M

School Name: Colaiste Ghobnait, Oileáin Arann, Cuan na Gaillimhe
Roll Number: 71370K
School Name: Athlone Community College, Athlone, Co Westmeath
Roll Number: 71410T

Inbound Current: 3.33 M  Average: 14.60 M  Maximum: 66.71 M
Outbound Current: 197.33 k  Average: 1.32 M  Maximum: 29.20 M

School Name: Enniscorthy Vocational College, Enniscorthy, Co Wicklow
Roll Number: 71630K

Inbound Current: 20.12 M  Average: 7.88 M  Maximum: 39.29 M
Outbound Current: 246.23 k  Average: 320.78 k  Maximum: 7.95 M

School Name: St Oliver’s Community College, Drogheda, co Louth
Roll Number: 71761C

Inbound Current: 9.26 M  Average: 7.56 M  Maximum: 96.80 M
Outbound Current: 1.53 M  Average: 1.25 M  Maximum: 7.60 M
School Name: O Fiaich College, Dundalk, Co Louth
Roll Number: 71770D

School Name: Colaiste Chiarain, Croom, Co Limerick
Roll Number: 71840V

School Name: St Peter’s College, Dunboyne, Co Meath
Roll Number: 71950F
School Name: Dunshaughlin Community College, Co Meath
Roll Number: 71960I

School Name: Beech Hill College, Monaghan
Roll Number: 72210Q

School Name: St Declan’s Community College, Kilmacthomas, Co Waterford
Roll Number: 72230W
School Name: St Paul’s Community College, Browne’s Rd, Co Waterford
Roll Number: 72241E

School Name: Davitt College, Castlebar, Co Mayo
Roll Number: 76060U

School Name: Castleknock Community College, Castleknock, Dublin 15
Roll Number: 76062B
School Name: Castleroy College, Newtown, Co Limerick
Roll Number: 76073G

School Name: Colaiste Phobail Cholmcille, Doirí Beaga, Co. Donegal
Roll Number: 76079S

School Name: Cavan Institute, Main St, Cavan
Roll Number: 76087R
School Name: Mount Temple Comprehensive School, Malahide Rd, Dublin 3
Roll Number: 81002K

School Name: Crescent College Comprehensive, Dooradoyle, Co Limerick
Roll Number: 81014R

School Name: Trinity Comprehensive, Ballymun Rd, Dublin 9
Roll Number: 81017A
School Name: Coolmine Community College, Clonsilla, Dublin 15
Roll Number: 91315O

School Name: Malahide Community College, Co Dublin
Roll Number: 91325R

School Name: St Mark’s Community College, Tallaght, Dublin 24
Roll Number: 91325R
School Name: St Aidan’s Community College, Tallaght, Dublin 24
Roll Number: 91338D

School Name: Hartstown Community School, Clonsilla, Dublin 15
Roll Number: 91339F

School Name: Pobalscoil Rosmini, Drumcondra, Dublin 9
Roll Number: 91344V
School Name: Carrigaline community College, Carrigaline, Co Cork
Roll Number: 91388S

School Name: Carndonagh Community School, Lifford, Co Donegal
Roll Number: 91406R

School Name: Pobalscoil Choich Chreaannfhasha, Leitir Ceannainn, Co. Dhún na nGall
Roll Number: 91408V
School Name: St Caimin’s Community School, Shannon, Co Clare
Roll Number: 914471

School Name: Gorey Community School, Co Wexford
Roll Number: 91492N

School Name: St Louis Community School, Kiltimagh, Co Mayo
Roll Number: 91494R
School Name: Community School, Carrick on Shannon, Leitrim
Roll Number: 91496V

School Name: Cashel Community School, Cashel, Co Tipperary
Roll Number: 91497A

School Name: Gort Community College, Gort, Co Galway
Roll Number: 91498C
School Name: Loreto community College, Milford, Co Donegal
Roll Number: 91500J

School Name: Moate Community College, Moate, Co Westmeath
Roll Number: 91501L

School Name: St Colmcille’s Community School, Knocklyon, Dublin 16; Roll Number: 91510M

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