An Examination of the Implementation of ICT Teaching Methodologies in the 5th and 6th Class Primary School Curriculum

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Declaration

I hereby declare that this is entirely my own work and that it has not been submitted for
the award of any degree at any other university.

Éilis Treacy
Abstract

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An Examination of the Implementation of ICT Teaching Methodologies in the 5th and 6th class Primary School Curriculum

(Under the direction of Maureen O’Brien)

The Primary School Curriculum (1999) is taught in all primary schools in Ireland. Using Information and Communication Technologies is recognised as a teaching methodology in the teacher guideline documents of the Primary School Curriculum. This case study on 20 schools in the environs of a large town in the west of Ireland, examined the implementation of ICT teaching methodologies in the primary school curriculum in 5th and 6th class. Pupil to computer ratio varied widely depending on single class settings and multi-class settings. Pupils’ use of computers ranged from everyday to rarely. Lack of infrastructure and class size was a major factor in the lack of integration of ICT methodologies in classroom teaching. Teachers surveyed and interviewed called for professional development in this area and a clear practical ICT curriculum for primary schools. Lack of time and support were further impediments to successful ICT integration. The abolition of the ICT advisory service added additional responsibility to the schools ICT post holders and principal. Recommendations drawn from this study include an interactive e-portal in conjunction with pedagogically appropriate ICT teaching resources, in-service days for ICT and a system to maintain existing ICT infrastructure in schools.
Acknowledgements

From the formative stages of this thesis, to the final draft, I owe an immense debt of gratitude to my supervisor, Maureen O’Brien. Her sound advice, careful guidance and encouragement were invaluable as I attempted this research.

I would also like to thank those who agreed to be interviewed, for, without your time and cooperation, this research would not have been possible.

For their efforts and assistance, a special thanks to all the teachers involved in this case study and particularly those who facilitated the field visits and the focus group.

To each of the above, I extend my deepest appreciation.
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<td>DEIS</td>
<td>Delivering Equality of Opportunity in Schools</td>
</tr>
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<td>DES</td>
<td>Department of Education and Science</td>
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<td>NCCA</td>
<td>National Council for Curriculum and Assessment</td>
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<td>NCTE</td>
<td>National Centre for Technology in Ireland</td>
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<td>NPADC</td>
<td>National Policy Advisory and Development Committee</td>
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<td>NQPT</td>
<td>Newly Qualified Primary Teacher</td>
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<td>NQT</td>
<td>Newly Qualified Teacher</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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For my family and friends who offered me unconditional love and support throughout the course of this thesis.
Chapter 1 – Introduction

1.1 Background
The Primary School Curriculum (1999) is taught in all primary schools in Ireland. The document was prepared by the National Council for Curriculum and Assessment and was launched in 1999 to replace Curaclam na Bunscoile (1971). The curriculum aims to develop the full potential of every child while recognising the uniqueness of each child.

The curriculum is set out in 23 documents, consisting of: A Primary Curriculum introduction, 11 curriculum statements and 11 teacher guidelines. Each curriculum statement contains the rationale, aims, objectives, structured content and assessment approaches for each of the 4 class levels (infants, first and second, third and fourth and fifth and sixth). The teacher guidelines are designed to provide resource material to support teaching and learning. Each teacher received a copy of the full set of documents.

The Teacher Guidelines “explore a wide range of approaches and methodologies that develop the new emphases and give expression to new thinking on teaching and learning” (NCCA 1999, p.66). Using Information and Communication Technologies is recognised as a teaching methodology in these teacher guideline documents. All 11 subjects except for drama include a sub heading Using Information and Communication Technologies in their Teacher Guidelines.

This thesis aims to research the implementation and integration of these ICT methodologies into the primary school curriculum. The study will focus on 5th and 6th mainstream class teachers in a representational sample group.

1.2 Research Problem
Mainstream primary school class teachers consult the Teacher Guidelines of the Primary School Curriculum for guidance and direction in their teaching. The first in a series of ICT in education initiatives was launched a year before the introduction of the 1999 curriculum.

Irish schools have invested in technology. Teachers have become very computer literate through attending courses and developing their own personal interests in ICT. However
Ireland is below the European average in teacher access, competence and motivation to use the internet in classroom situations. The average student to computer ratio in Ireland is 50% above the OECD country average (O’Flaherty & Shiel 2006).

1.3 Rationale
While much research has been published on ICT in education, research in Irish ICT in education is scarce. O’Grady (2007) published a paper entitled Information Communication Technology and Newly Qualified Primary Teachers Ireland: School and classroom experience which gave an insight into the teacher qualified in the Curriculum of 1999 who had completed the Mary Immaculate College laptop programme. Mulkeen published numerous papers many evaluating various government initiatives in ICT in education. While Mulkeen’s research is wide ranging, this research seeks to examine the implementation of ICT teaching methodologies from the mainstream class teacher’s perspective. This investigation aims to complement the previous research, and enhance current knowledge regarding the implementation of ICT teaching methodologies in the mainstream classroom.

Although based on a geographically and numerically small sample, the findings of such an investigation may be useful in many contexts, including identifying issues which can be addressed locally; highlighting ICT professional development requirements; and informing local and national policy regarding provision of ICT for mainstream senior classes.

1.4 Aims
This investigation examines the implementation of ICT teaching methodologies in the 5th and 6th class among a sample of 20 schools within a 30 mile radius of a large town. It attempts to:

- Examine the ICT teaching methodologies advocated by the Primary School Curriculum
- Explore teachers’ implementation of these methodologies
- Highlight the factors affecting the implementation of these methodologies and the barriers which may impede effective ICT use
- Make comparisons with other countries and policies adopted with regard to ICT integration in classroom teaching.
1.5 Research Approach
A qualitative case study was the approach selected to undertake the study. A combination of quantitative and qualitative research methods were blended to form a single case study. Quantitative methods included an online questionnaire and written questionnaire and an examination of documentary evidence of regional educational context. The qualitative research methods included field visits, interviews of two principals, two ICT post holders, a former ICT adviser and a focus group of a sample of mainstream 5th and 6th class teachers.

1.6 Scope and (De)Limitations
The scope of this research was confined to 5th and 6th class mainstream primary teachers in 20 schools in a 30 km radius of a major town in the west of Ireland. While this sample could be considered as reflecting a mix of urban and rural schools it cannot be claimed to be representative of all schools in Ireland. Thus the researcher recognises that this study cannot be generalised to all teachers of 5th and 6th class in Irish primary schools, however it is hoped that the findings will enable readers to compare and relate to their own experience.

1.7 Structure of Thesis
This thesis encompasses six chapters, with this first chapter providing a basic introduction to the study. It conveys the background, research problem, rationale, research approach and scope of the investigation.

An extensive review of literature specific to the topic under investigation is contained in Chapter 2. Literature is reviewed under 4 distinct headings which in succession: explore the History of ICT policy in Irish primary schools, examine the teaching methodologies recommended by the 1999 Irish Primary Curriculum, identify the factors affecting ICT use among teachers and analyze the incentives and encouragement to teachers to use ICT.

Chapter 3 outlines the rationale behind the selection of a qualitative case study methodology to support this investigation. The choice of research instruments is explained with reference to the development of the study, and the ethical factors taken
into consideration. Some limitations of the methodology are also outlined.

The findings of this research are presented in Chapter 4. These include an outline of the context of the study, a description of the sample schools, and excerpts from the 'raw data', incorporating interviews, focus groups, questionnaires and photographs from field visits. These findings are interpreted, assessed and discussed with reference to the literature in Chapter 5.

Chapter 6 concludes the thesis with a brief review of the investigation, general conclusions drawn from the findings and some suggestions for future research.
2 Chapter 2 – Review of Literature

2.1 Introduction

This chapter identifies four main areas requiring review in respect of the research question which forms the basis of this thesis:

- History of ICT policy in Irish primary schools.
- The teaching methodologies recommended by the 1999 Irish Primary Curriculum.
- Factors affecting ICT use among teachers
- Incentives and Encouragement to teachers to use ICT

The first section will examine the policies and guidelines published by the Government of Ireland (through the NCTE) in relation to ICT in primary schools since 1998, along with the teaching methodologies advised by the Primary School Curriculum (1999) in each subject.

The next section will identify the approaches, methods and policies pertaining to teaching and learning with ICT adopted by other countries.

The third section will explore Irish teachers’ perceptions of the use of ICT in education. It will begin by focusing on the internal factors affecting teachers’ use of ICT and progress to the external factors.

The literature review will conclude by exploring other countries approaches to professional development, mentoring programs, laptop schemes and online learning environments to incentivise and encourage teachers’ to use of ICT in their teaching.

2.2 ICT in Irish Primary Education

2.2.1 Physical Infrastructure

In 1996 the International Data Corporation (IDC) ranked Ireland in the third division, at position 23, in terms of its state of preparedness for the Information Age. The US was ranked first, followed by Sweden, Denmark and Finland. Other countries such as New Zealand (9), Singapore (16), and Israel (19) were also ranked above Ireland.

In 1998 with the Action Programme for the New Millennium, the Government committed itself “To achieve computer literacy throughout the schools system”
(Department of the Taoiseach 1998). In pursuit of this aim, three successive initiatives on information technology in education were undertaken: IT2000, Blueprint for the Future, and Investing Effectively in Information and Communications Technology in Schools.

2.2.1.1 IT 2000

Schools IT2000 was launched in 1997 (NPADC for Information Communication Technology 1997), implemented in 1998 (Mulkeen 2004), and reviewed in 2001 (NPADC 2001a). *The Impact of Schools IT2000* findings on the establishment of the National Centre for Technology in Education (NCTE) and the direct grants to schools to fund ICT infrastructure were mainly positive. Many support mechanisms were now established, all schools had access to the internet and use of ICT and software by teachers and principals had increased dramatically (NPADC 2001a, p.3). The impact of IT2000 was found to be more pronounced in the Primary Schools than Secondary schools with a larger increase and higher percentage of primary teachers and principals using ICT in school than secondary teachers and principals (NPADC 2001a, p.8). While IT2000 had invested in resources and training, *The Impact of IT2000* recommended further training, funds and equipment as essential factors for ICT integration into schools and teaching (NPADC 2001, p.11).

2.2.1.2 The Blueprint for the future of ICT in Irish Education

*The Blueprint for the future of ICT in Irish Education: Three Year Strategic Plan 2001-2003* (NPADC 2001b) took the recommendations of *The Impact of IT2000* and invested €107.92m in ICT in primary and secondary schools (NPADC 2001b, p.2). It allocated the funds to equipment, special needs students, support services, teacher training, development of school ICT plans, a scheme of innovative ICT projects, collaboration with other European countries and partnership with the social partners, industry and the broader community (NPADC 2001b, p.5). Education Centers were to play a “pivotal role in supporting the delivery of the Action Plan at local level. Centre based ICT Advisors [will] deliver back-up planning and advice services and provide training programmes for teachers in accordance with their identified needs” (NPADC 2001b, p.10).
The NCTE 2005 *Census on ICT Infrastructure in Schools* (O'Flaherty & Shiel 2006) gave a snapshot of the impact of *The Blueprint for the future of ICT in Irish Education* in schools in May/June 2005. Many findings were positive: the pupil-computer ratio had decreased, the proportions of schools with networked computers and or internet access had increased, three-quarters of schools had a designated ICT co-ordinating teacher, 79% of schools had an ICT school plan, 32% of primary schools reported facilitating ICT professional development for staff, 80% of primary schools reported having purchased subject-specific content on CD Rom/DVD. Some areas were still lacking; 30% of computers in schools were over 6 years old, one third of ICT expenditure after grants was on technical support, there was a need for online materials specific to the Irish primary school curriculum, participation in online projects was poor (18%) among primary schools possibly due to the fact that some schools had poor or no internet connectivity (O'Flaherty & Shiel 2006).

2.2.1.3 National Broadband Programme for Schools 2004

The *National Broadband Programme for Schools* was launched in spring 2004 (Department of Communications, Marine and Natural Resources 2004, p. 2). This was to facilitate more online learning and interaction between schools. It was proposed to commence broadband rollout in the autumn of 2004 and to have every school provided with a high speed broadband connection by 2005 (Department of Communications, Marine and Natural Resources 2004, p.4).

2.2.1.4 Investing Effectively in Information and Communications Technology in Schools 2008-2013

In February 2007, 4 years after *The Blueprint for the Future of ICT in Irish Education*, the then Minister for Education and Science Mary Hanafin T.D. appointed a Strategy Group to advise on the priorities for ICT in Schools. The group was chaired by Mr Jerome Morrissy, Director of the NCTE and comprised individuals with a range of complementary experiences and expertise in education, industry and the public service. In their executive summary the group were critical of the lack of direction or funding since *The Blueprint for the future of ICT in Irish Education*:

Firstly, teachers have demonstrated their willingness to incorporate ICT in their teaching by their high participation rates in ICT professional development programmes and, secondly, integration of ICT in learning and teaching has taken place in schools, albeit limited to a level commensurate with the level of ICT investment. However, the general conclusion of these studies is that, while all schools are equipped with some computers and have limited internet access, a lack of sufficient and sustained investment over recent years has resulted in inadequate
and ageing ICT equipment in schools, no provision for technical support and inadequate levels of broadband internet.

(ICT Strategy Group 2008a, p.1)

The group identified five key investment goals to integrate ICT into teaching in schools:

A. The provision of an appropriate ICT infrastructural configuration and technical services in each school
B. The support of leadership, ingenuity, creativity and vision for ICT integration in schools
C. Meeting teachers’ ICT professional development needs to support the development of school-wide ICT capacity
D. The provision of on-demand access to curriculum-relevant digital content and tools
E. The provision of robust and adequate levels of broadband internet to all schools.

(ICT Strategy Group 2008a, p.11)

Since the 10th of July 2008, when the report Investing Effectively in Information and Communications Technology in Schools 2008-2013 was published, there have only been two press releases from the Department of Education and Science regarding ICT in education. On the 11th of November 2006,

Under the Government's dormant accounts fund, which takes long-unclaimed money out of financial institutions and invests it in disadvantaged communities, €1 million is being made available to schools in the most disadvantaged areas for equipment such as computers and other communications hardware and software.”

(DES 2008a)

On the 5th of January 2009, €2.2m was allocated to 72 primary schools around the country.

Minister O’Keeffe said the 72 primary schools in which major construction work was completed in 2008 will each get EUR5,000 per classroom to buy computer hardware, software and digital equipment.

(DES 2009)

At the launch of the report Investing Effectively in Information and Communications Technology in Schools 2008-2013 the Minister for Education reiterated “The Government’s commitment to integrating ICT in teaching and learning is set out in the Programme for Government and the need for investment in this area is recognised in the National Development Plan where provision is made for investing €252m over the period to 2013” (DES 2008b). €3.2m of this €252m has been allocated so far, time will tell if it will have the impact the strategy group envisaged.
2.3 ICT methodologies in the Primary School Curriculum

2.3.1 Introduction

The integration of ICT in learning and teaching helps to create environments which enable all students to become confident and self-directed learners. When used well, ICT enriches learning and enhances teaching. It is a powerful motivational tool for students and it increases the scope and opportunities for learners with special educational needs.

(ICT Strategy Group 2008, p.18)

In tandem with the focus on ICT infrastructure, the Primary School Curriculum was revised and published in 1999. It sought to integrate this new infrastructure into the delivery of this revised curriculum. The curriculum was presented to primary school teachers in the form of 23 books; a curriculum book for each of the eleven curriculum subjects, with accompanying Teacher Guideline books and a book of general introduction. For many primary school teachers, it has become their central source of reference in classroom planning.

In the *Primary School Curriculum* (1999), all eleven subjects excluding Drama, have a subsection under “Teaching methodologies” called “Information and Communication Methodologies”. The author will summarise the recommendations of the ten Teacher Guideline books below.

2.3.2 Recommendations of Irish Curriculum Teacher Guidelines

“Computers and other items of information and communication technologies enrich the teaching and learning of language considerably”(NCCA 1999, p.91). The English teacher guidelines devote two pages to Information and Communication methodologies. The main methodologies it advises are:

- Reading on screen instructions to develop literacy
- Use of computer programs for various aspects of literacy, also books on CD Rom format
- Reference books on CD Rom
- Word processing programs for process writing
- Concept keyboards
- Using e-mail and internet to communicate student work with other schools

(NCCA 1999a, p.91-2)

The Gaeilge teacher guidelines recognised the importance of ICT in education: “Tá sé ríthábhachtach go mbeidh múinteoirí bunscoile agus páistí ar aon in ann úsáid a bhaint as na deiseanna uile atá ar fáil trí theicneolaíocht an eolais agus na cumarsáide”(NCCA 1999b, p.171). Over two pages, the most common forms of ICT use advised by the Gaeilge Teacher Guidelines are:
• Games for maths, events and interactive stories
• Programs to help the writing process, drafting, redrafting and editing
• Use of pictures and graphics to add to story writing
• Email and internet as a form of communication with other schools trí Ghaeilge
• Use of the internet for reference and for services available through Irish
• Use of internet for project work
• Irish lessons in the “virtual” classroom, interaction with other teachers and learners through the virtual classroom

(NCCA 1999b, p.171)

The Mathematics Teacher guidelines section on “Using Technology” covers four pages. However calculators have been included under “Technology” and take in nearly two pages, this leaves two pages for Information and Communication Technologies. “Like the calculator, the computer is a tool that can be used by children and teachers but is not a substitute for good teaching” (NCCA 1999c, p.61).

Suggested methodologies are:

• Drill and practice programs
• Adventure programs solving specific mathematical problems
• Databases
• LOGO
• Use of internet to access information for above mentioned exercises

(NCCA 1999c, p.61)

Using Information and communication technologies takes one page in the History Teacher Guidelines. “Information and communication technologies (ICTs) can be a greatly enriching resource in the teaching and learning of history” (NCCA 1999d, p.114). It suggests:

• data-handling programs
• a number of simulation-style programs/History games
• word-processing and drawing programs to communicate findings
• CD-ROMs for History
• using the internet to access a wide range of sources
• using email and internet to link with other schools to share research

(NCCA 1999d, p.114)

“Information and communication technologies can be a greatly enriching resource in the teaching and learning of geography”(NCCA 1999e, p.155). Two pages are devoted to it and suggested methodologies include:
• data-handling programs
• 2-D and 3-D mapping games
• word-processing and drawing programs
• CD-ROMs for reference purposes
• Atlases on CD-ROM
• Digital weather-recording instruments (it was noted that such instruments would probably be beyond the resources of a Primary School but could be in use in post-primary schools and recommended the sharing of such data)
• using the internet for reference
• Using internet and email to link with other schools and agencies to share work and findings.

(NCCA 1999e, p.155-6)

“Information and communication technologies can be a greatly enriching resource in the teaching and learning of science”(NCCA 1999f, p.140). Methodologies suggested over two pages are:

• Data-handling programs
• Many interactive programs, with virtual experiments
• Word-processing and drawing programs to communicate results
• The internet to access a wide range of sources.
• The internet and email to communicate with other schools and share findings.
• CD-ROMs based on science.
• Sensors attached to the computer that detect and measure temperature, light, sound, position, humidity or pressure

(NCCA 1999f, p.140-1)

“Information and communication technologies can be used to broaden and enhance children's experience and understanding of art. Computer art is an exciting addition to the art media available to them. It offers supportive experience to working directly with materials and tools and an additional means of expression, communication and design” (NCCA 1999, p.130). The Art Teacher Guidelines suggest these methodologies over two pages:

• Painting and drawing programs.
• Computer activities may be designed by the teacher to teach specific aspects of the visual arts programme. Objectives must be clear, and he/she must be able to appraise the activity with reference to them. Activities could include experimenting with
  o the ways in which colours affect each other
  o shape
  o layout
  o organising space
  o suggesting the third dimension
  o elementary perspective.
• A page make-up ('desktop publishing') program to extend graphic work.
• CD-ROM’s of their art
• Using the internet to access resources
“The use of information and communication technologies can be highly motivating in the classroom. Multimedia materials in particular are an enormous asset to the study of music. With only a multimedia computer and a pair of headphones, children working individually, in pairs or in small groups can listen to music, explore and learn about music, practise skills, research topics and share ideas with others outside the classroom” (NCCA 1999h, p.122). Information and Communication Technologies take two pages in the Music Teacher Guidelines and suggest the following methodologies.

- CD-ROMs for music
- Other packages allow the teacher to create form charts and add text messages to accompany any available CD. With this software, the teacher can design a visual aid to any listening lesson. Since the teacher writes the messages, the script can be designed for any age or class level, and the lessons can be tailored to a teacher's specific need.
- Synchronised text messages are especially useful.
- Projection systems
- The internet as a source of reference
- Use of internet and email to link with other schools
- Midi compatible keyboards
- Notation Software

Drama which is the third Arts subject does not have ICT listed or mentioned as a teaching methodology.

“Information and communication technologies can be used to supplement and research specific areas within the physical education curriculum as children complete units of work” (NCCA 1999i, p.101). One page is devoted to it. Suggested methodologies include:

- The internet to research sport and history of different sports.
- CD Rom Encyclopaedias on sport
- The use of databases

The Social Personal and Health Education Teacher Guidelines include one page under teaching methodologies for The media and information and communication methodologies. As part of SPHE there is more of a focus on safe internet use and awareness of the influence of the media.
Children live in an information society, and it is essential that they are given opportunities in SPHE to:

- access and retrieve information
- explore some techniques used in the media and the various technologies for communication available to them
- learn to make decisions and become more discerning in their use of the technology and the media
- develop self-confidence in using a wide range of technology
- enhance their relationship skills as they discover new ways of communicating and explore and learn together.

- Use CD-ROMs for reference in SPHE.
- Use word-processing programs and publishing programs to redraft and edit work
- View television and listen to radio programs
- Use the internet for research

(NCCA 1999j, p.96)

2.4 Factors Affecting Teachers Use of ICT in Primary Schools

2.4.1 Introduction

As shown above, teachers are increasingly expected to make effective use of ICT in their teaching and learning (Cloke and Sharif 2001; OECD 2001). However it is well documented in the literature that traditionally, schools have not made effective use of technology (Cuban 2001; Scrimshaw 2004).

Rogers (2000) states, that understanding where teachers are in terms of their level of ICT adoption is a necessary step in understanding the barriers that prevent and the factors that influence adoption as each step requires different support and assistance.


External factors encompass the availability and accessibility of the necessary hardware and software, the presence of technical personnel, institutional support and a staff development program that includes opportunities for skill acquisition and maintenance.

Internal barriers come in the form of teacher attitudes or perceptions about technology in addition to the person’s existing competencies in using these forms of technology.

(Newhouse et al. 2002, p.39)

2.4.2 External Factors

2.4.2.1 Infrastructure

Lack of ICT equipment is one of the most often cited school-level barriers to ICT use in schools (Pelgrum 2001; Cox et al.1999; Jedeskog 2007; Fabry and Higgs 1997).
Manternach-Wigans et al. (1999) observed that teachers were very frustrated by this lack of access to ICT resources and teachers said it was one of the main reasons why they did not integrate ICT more into their teaching and learning.

Using up-to-date hardware and software resources is a key feature to diffusion of technology (Gulbahar 2007). Hardware, software and network infrastructure must be available to integrate ICT in education (Afshari et al. 2009, p.85). Richardson (2000) reported that many teachers integrated technology into their teaching when they saw the potential of on-line lessons and the possibility of creating shared, net-based teaching materials. “Therefore, hardware, software and network infrastructure must be available to integrate ICT in education” (Afshari et al. 2009, p.85).

The most recent figure for average student to computer ratio in Ireland was nine students per computer compared to an OECD country average of six to one in 2005 (O’Faherty and Shiel 2006).

Cuban et al. (2001) argue that infrastructure is more than a question of ‘availability’; it is also about access, location and organisation of resources.

Thus, Albirini’s (2006) findings substantiated this globally felt barrier that computer access has often been one of the most important obstacles to technology adoption and integration worldwide (Pelgrum 2001). On the other hand, Mumtaz (2000) stated that many scholars proposed that the lack of funds to obtain the necessary hardware and software is one of the reasons teachers do not use technology in their classes. Also, a report on teachers’ use of technology by the National Centre for Education Statistics (Cronen and Smerdon, 2000) indicates a correlation between availability of computers and computer use. In general, teachers who had computers in their classes were more likely to use them in instruction than teachers who did not; more than 50% of teachers who had computers in their schools used them for research and activities related to lesson preparation. A total of 78% of teachers surveyed cited limited access to computers as a barrier to effectively using computers in their classes. Of this total, 38% thought “not enough computers” was a “great barrier” to using technology in their classes. Therefore, efficient and effective use of technology depends on the availability of hardware and software and the equity of access to resources by teachers, students and administrative staff.
2.4.2.2 Support

Mulkeen (2004) found lack of technical support and maintenance as “the single item most frequently identified as an issue in all types of Irish schools” (Mulkeen 2004, p.23). The unreliability of hardware, expensive repairs and maintenance, coupled with a lack of technical support have made teachers wary of using ICT in everyday teaching (Dawes 2001).

Meijer et al. (2003) stress the availability of appropriate support structures for implementation of ICT as being of equal importance to many teachers as having the appropriate hardware and software to use. They report confusion over uncoordinated sources of support, information and advice as a significant factor hindering Irish teachers’ use of ICT in Special Needs education.

Under Schools IT2000 all full-time Education Centres recruited an ICT advisor during 1999 (NPADC 2001a, p.12). By 2001, The Impact of Schools IT2000 (2001a) noted that over two thirds of education centres had an ICT adviser and the Education Centres that did not have an ICT adviser were in the process of recruiting. In a speech launching Teachnet Ireland in 2001, the Taoiseach praised the work of ICT advisers: “I know too that there is excellent work being done by ICT advisors who are located around Ireland and liaise closely with the NCTE” (Department of the Taoiseach 2001). He reiterated the government’s stance on ICT in education: “The project is in keeping with the Government’s policy of encouraging the use of information and communications technologies in our schools” (Department of the Taoiseach 2001). The Blueprint for the future of ICT in Irish Education: Three Year Strategic Plan 2001-2003 (NPADC 2001b) echoed the Taoiseach’s sentiments by declaring Education Centres were to play a “pivotal role in supporting the delivery of the Action Plan at local level. Centre based ICT Advisors [will] deliver back-up planning and advice services and provide training programmes for teachers in accordance with their identified needs” (NPADC 2001, p.10).

One of the five key investment goals by the 2008 ICT strategy group was “Meeting teachers’ ICT professional development needs to support the development of school-wide ICT capacity” (ICT Strategy Group 2008). However this was seen as the role of the
ICT co-ordinating teacher and the principal of the school. The ICT post holder and principal were to be provided with a copy of *Planning and Implementing e-Learning in your School*, developed by the NCTE which has yet to be published and distributed. The existing ICT advisers learned of the abolition of their posts on a news programme on RTE on the 20th of June 2008. Most of the existing ICT advisers were teachers on secondment from their teaching duties. On the 20th of June the Department of Education sent letters informing the Education Centres that it was not prepared to renew secondment arrangements for the 14 teachers seconded as ICT advisers. The three other ICT advisers who were on a non-secondment contract basis were “under consideration” (Dáil Éireann 2008).

2.4.2.3 Time

11% of Irish teachers cited a lack of time as a major obstacle to ICT use (Mulkeen 2001), mirroring the findings of Chiero(1997) and Dawson(2000). In a Swedish study conducted by Jedeskog (2007) teachers were concerned about the lack of time to deal with all that is demanded of them. One teacher described learning how to handle and use the computer as a pedagogical tool; “It takes more time than expected. It is like turning a transatlantic liner around, a very slow process” (Jedeskog 2007 p.3).

Other researchers found ICT implementation to be a step by step process. Fullan (2001) cited three stages to ICT implementation. First, knowledge about the innovations’s existence and then making a decision whether or not to adopt it. Second, the implementation and finally, to consider continuing. The time taken to complete this process depended on the individual teacher.

2.4.2.3 Leadership & Planning

Technology leadership is becoming more important an issue in successful ICT implementation. School leaders play increasing role in leading change, providing vision and objectives, as well as professional development initiatives in using ICT to bring about pedagogical changes. (Yee, 2000; Yuen, Law & Wong 2003; James, 2005) (Chung 2007)

Chung (2007) believed that there have been inadequate leadership development and support in recent years. “School heads neglected the extra stress on teachers brought about by ICT adoption (EMB, 2005)”(Chung 2007). He found that quite often a small group of teachers led by middle management was in charge of all ICT related duties.
According to him much time was spent on the infrastructure rather than curriculum integration.

Some school heads even think that investing in high-end facilities or expensive hardware/software shows their schools are technologically advanced. Actually they may be “putting lipstick on a bulldog” (Moss Kanter, 2001), as ICT only brings cosmetic change to schools without really transforming learning and teaching.

(Chung 2007)

For ICT implementation to take place much staff development and support are required. The school head must possess the strategy and knowledge in leading change (Chung 2007). Different approaches have been put forward; Kotter (1996, p.21) suggested “The eight-stage process of creating major change” in a top-down manner. Fullan (1993), believed that "What is required is a ...two-way relationship of pressure, support and continuous negotiation. It amounts to simultaneous top-down bottom-up influence" (Fullan 1993, p.38). His framework for leadership stressed moral purpose, understanding change, relationship building and knowledge sharing. The systems approach focuses on the interrelatedness of all parts of the school organisation (Chung 2007).

A ‘top down’ approach of applying pressure without support can simply generate alienation and withdrawal, with superficial change occurring at best. On the other hand, support without pressure can lead to attempts at change that fail to tackle difficult core improvement issues. By using the opportunity of external change as a stimulus, and by taking advantage of external support and the evidence of good practice and research, schools can scrutinise and adapt external programmes to enhance the learning outcomes of their students.

(Harris and Hopkins 1997)

Cuban (1988) categorized efforts to improve schooling as first-order or second-order change. First-order change seeks to improve the effectiveness of schools "without disturbing the basic organizational features, without altering the way that students and adults perform their roles" (Cuban 1988). Second-order change aims to alter the fundamental relationships of a school, creating new goals, re-organising structures and creating new cultures. Fullan (1991) argues that we need to address more second-order changes if we are to improve education. These changes need to affect the practices, culture and structure of schools by restructuring roles and re-organising responsibilities, including those of students and parents.
2.4.2.4 Professional Development

One of the best investments a government can make to improve student learning is to invest in teacher professional development. Any policy put into place to infuse ICT into schools that does not have a strong teacher professional development and support strategy will only lead to disappointing results. (Owston 2006)

Teacher expertise has been identified by many researchers as a major factor influencing student achievement. Owston (2006, p.1) states that “teacher expertise is one of the most influential factors in determining student achievement and that professional development is the best option to develop needed expertise.” He claimed that teacher expertise surpasses other socio-economic factors which may affect a student’s learning and that “teacher expertise is the largest single factor affecting student achievement scores” (Owston 2006, p.1). According to Weets (1997); “Preparing teachers is perceived as the main critical success factor in deploying ICT in education” (Kirschner and Selinger 2003, p.3)

In a survey of American teacher training institutions by the Milken Exchange on Educational Technology (1999) findings revealed that at most institutions between 25 and 50% of faculty members in the school of education integrated information technology in their teaching and only 25-50% of students frequently and systematically use ICT in their practice teaching (Kirschner and Selinger 2003, p.3). Kirschner and Selinger (2003) found that while schools were increasingly expected to integrate technology and provide increased access to students and teachers, the majority of teacher training students are “graduating in an information age without proper guidance on how to use technology in the classroom” (Kirschner and Selinger 2003, p.7).

Four years later O’Grady had similar findings in his paper Information Communication Technology and Newly Qualified Primary Teachers Ireland: School and classroom experience. The aim of his paper was to explore “How newly qualified primary teachers (NQPT), competent and confident users of technology, integrate ICT into their teaching during their initial teaching career” (O’Grady 2007, p.6). He found that contradictory to their recommendations; the inspectorate did not always support the NQPTs in relation to the use of ICT during their probationary year and specifically during the diploma visits (O’Grady 2007, p.17). The NQPTs had taken ICT as an elective college and had participated in a laptop scheme since starting college. They agreed that both the elective and laptop scheme “prepared them adequately for
integrating ICT but suggested that more need to be done in the areas of classroom management and teaching practice. They needed more classroom experience of ICT while in College and supportive supervisors during teaching practice” (O'Grady 2007, p.16).

2.4.3 Internal Factors

2.4.3.1 Demographics

Teachers’ characteristics (e.g. individual’s educational level, age, gender, educational experience, experience with the computer for educational purposes and financial position) can influence the adoption of an innovation (Rogers 1995; Schiller 2000). The report by the National Center for Education Statistics (2000) indicated that teachers with fewer years of experience were more likely to use computers in their classes than teachers with more years of experience (Afshari et al 2009, p.80). The same report indicated that younger teachers score higher on their perception of ICT, and have translated their positive perception into higher degree of ICT use in education (Bee Theng and Chia Hua 2008).

Albirini (2006), however, found that age was not a significant factor in relation to teachers’ attitudes towards ICT. In a study exploring the extent of ICT adoption among secondary school teachers in Malaysia, analysis found that the elderly respondents (aged over 45 years) made more frequent use of ICT in schools. The main reason could be, senior teachers having vast teaching experience, sound classroom management skills and good knowledge of the curriculum, can easily digitize their materials with ICTs, hence more flexibly apply ICTs in classroom instruction. This also suggests that they feel comfortable with ICT and see its value in education, and have tried to enrich their lesson and make teaching lively with texts, sounds and images. The result is in agreement with Novak and Knowles (1991) who found that younger beginning teachers struggling to survive and settle into their new role as teachers do not emphasize the usage of computer as they view computers as ‘extra’, and not as a tool to enhance teaching.

(Bee Theng and Chia Hua 2008)

In terms of competency, Bee Theng and Chia Hua (2008) found that young teachers aged below 35 recorded a higher mean of competency than older groups. The result is consistant with a report by the U.S. National Center for Education Statistics (2000) which revealed that new teachers, having grown up with computers, have greater computer skills to enhance their teaching and instructional practices (Bee Theng and Chia Hua 2008, p.29).
Technology is and has been a masculine domain. (Butler 2000; Henwood 2000; Schumacher & Morahan-Martin 2001, Young 2000). “Computer software, (Butler 2000) language about computers (Campbell 2000) and computer professionals (Young 2000) have all been viewed as masculine, regardless of actual facts” (Lucas 2003). Jackson, Ervin, Gardner and Schmitt (2001) indicated that female users, compared with males, are more inclined to hold negative reactions to computers. Females usually also have more negative attitudes towards computers (Durndell and Thompson 1997) and greater computer anxiety (McIlroy et al. 2001). Lucas (2003) went further to find that “This negative view and the masculinisation of and gendered attitudes toward technology have lead men and women to use technology differently” (Lucas 2003). Research has shown that males use the internet primarily for the gathering of information (Gefen and Straub 1997), while women use the internet primarily for communication (Jackson et al. 2001). A study conducted by Spotts, Bowman & Mertz (1997) found that male faculty staff in a university self-rated some of their computer knowledge and expertise higher than did women in the same faculty. However there was no difference in the frequency of use between the two genders (Lucas 2003).

2.4.3.2 Personality
Some teachers have had negative experiences with ICT where frequent technical problems with hardware or software or both have caused them to abandon ICT in their teaching and learning (Snoeyink and Ertmer 2001). They fear loss of control in the student-centred classroom and feel inadequate because their students do not suffer the same levels of technophobia (Cox et al. 1999). Scrimshaw (2004) was concerned that teachers do not, necessarily, have the skills to overcome this lack of confidence. Teachers perceive ICT as threatening the ‘orderly pattern’ of their classrooms and therefore, not a desirable tool in their classrooms (Cox et al. 1999).

Afshari et al. found the teacher’s own learning style a factor in ICT integration and therefore, personal characteristics of teachers are an important influence on how easily they take up an innovation. Rogers (1995) found that innovators are divided into five categories, depending on the stage at which they take up an innovation and identifies a tendency for there to be distinctive differences in the personality characteristics of earlier and later adopters (Rogers 1995). He surmised that early adopters differ from later adopters in tending to show greater empathy, less dogmatism, a greater ability to deal with abstractions, greater rationality, a more favourable attitude towards change, a
better ability to cope with uncertainty and risk, a more favourable attitude toward science, less fatalism and higher aspirations (Afshari et al. 2009). Later adopters are described as more realistic, steadier in their judgements, having a concrete grip on problems, disliking fads, less willing to take unnecessary chances, preferring to be guided by experience and having a more realistic appreciation of possibilities than earlier adopters (Afshari et al. 2009).

2.4.3.3 Proficiency

It was found that Irish Primary teachers demonstrated limited competence in ICT prior to the introduction of IT2000, a quarter having ‘no computer skill’ (Mulkeen 2004, p.18) and only 20% actually using computers in school (NPADC 2001a, p.2). From 1998 onwards, “IT2000 provided training using a cascade model. Short courses were developed, typically of 20 hours duration, and interested teachers were trained to be trainers” (Mulkeen 2001, p.2). Teachers were not paid to go on courses, but volunteered to attend in the evenings and during holidays, “83% of (primary school) teachers did a course, compared with 65% of post primary teachers.” “By 2000 90% of primary teachers and 73% of post primary teachers were reported to have some computer skills” (Mulkeen 2001, p.2). Yet when questioned “primary teachers rated themselves as having a lower level of competence in this regard (competence in the use of ICT) than did post-primary teachers” (NPADC 2001a, p.10). Again during the school years 2005/2006, the Irish Inspectorate found that “Only 30% of primary teachers and 25% of post-primary teachers rated their ability as either “intermediate” or “advanced” with regard to using teaching and learning methods that are facilitated by ICT” (Inspectorate 2008, p.xviii).

Most fundamental to sustaining an innovation is teacher support, for without this, the innovation simply cannot occur. The model posits that when teachers see that students are supportive of the innovation and that it benefits their learning, they tend to invest more time and effort into ensuring its success. As they invest more into the innovation, teachers find that they need to learn more about the pedagogical approach they are using (e.g., project based learning) and the technology itself. ...... The salient point is that ongoing teacher learning or professional development is essential for classroom innovation to succeed and for students to benefit from ICT.

(Owston 2006, p.3)

Primary school teachers showed their support for ICT integration by attending courses in large numbers; however, attendance at courses did not mean automatic ICT integration or teacher confidence. If, as according to Mulkeen, “Since 1998, over 85,000 course places have been provided for teachers. This exceeds the number of
teachers, suggesting that many returned for second and third courses.” (Mulkeen 2004, p.20), the problem must not be with participation, it must be with content.

2.4.3.4 Pedagogical Compatibility

According to Becker (2000), computers serve as a “valuable and well-functioning instructional tool” in schools and classrooms in which teachers:

a) have convenient access,

b) are adequately prepared,

c) have some freedom in the curriculum, and

d) hold personal beliefs aligned with a constructivist pedagogy.  

(Ertmer et al. 2006, p.3)

Ertmer et al (2001) found that the most common variable among technology using teachers was the belief that technology provided a valuable tool for achieving their visions of teaching and learning. Thus a technology based innovation is more likely to be successfully implemented when the technology under consideration fits both the content to be taught and the teaching style of the teacher (Zhao et al. 2002 cited in Cox et al. 1999).

Asking someone who has become a successful professional teacher to adopt new ways of teaching is to ask that person to return to a subordinate, insecure, learning role. The support and incentives need to be good for educators to want to change!

(Newhouse et al. 2002, p.43)

If teachers perceive no need to change their professional practice, they are unlikely to adopt the use of ICT (Cox et al. 1999). Warschauer (2003) describes this as having the hardware, the software, but not the ‘humanware’.

In an American case study of a small number of primary teachers (Ertmer et al. 1999) the researchers identified three levels of computer use, varying in their relationship to the existing curricula. These involved using ICT as:

- a supplement to the curriculum (e.g., during free time or as a reward for completing other assignments)
- a reinforcement or enrichment of the current curriculum
- a facilitator for an emerging curriculum.

In a paper entitled: The Impact of Teacher Skills on the Integration of ICT in Irish Schools. Mulkeen found that there was a connection between training and ICT integration. The three factors that appeared to be related to the level of ICT integration were:

- Teachers in the school having done a higher degree in ICT in education.
- School having participated in a pilot project (even if not related to ICT)
The school principal's use of email.  

(Mulkeen 2001, p.3)

He concluded that “future training will need to focus on building a pedagogical vision for ICT, aimed at both teachers and principals (Mulkeen 2001, p.3).

An example of a similar situation was in the Silicon Valley, California. In 2000 and 2001 Cuban carried out an in-depth study on the use of technology in classrooms in the schools in Silicon Valley. He chose to carry out his research in Silicon Valley as that area is known to be the leading high-tech hub of the USA. However in schools based in the home of the electronics industry he found that

.....over half of elementary and middle school teachers continue to be nonusers of computers for classroom instruction, about 1 in 3 are occasional users, and about 1 in 10 uses the technologies daily.  

(Cuban 2001, p.72)

In his study, he found that when computers were used, drill-and-practice software, maths games and simulations were the most common tasks.

In the end, both supporters and critics of school technology (including researchers) have claimed that powerful software and hardware often get used in limited ways to simply maintain rather than transform prevailing instructional practices.

(Cuban 2001, p.73)

Irish teachers were found to be using similar applications with their students. Primary school teachers used curriculum content software more than their post-primary colleagues.

The categories of curriculum software most commonly used by primary teachers were age-appropriate word processors, reference software, problem-solving and educational games.

(NPADC 2001, p.8)

Later in the schools years of 2005/2006, the inspectorate found that

Where ICT is used in primary classrooms it predominates in core curricular areas, such as English and Mathematics, and in Social, Environmental and Scientific Education (SESE).

(Inspectorate 2008, p.xix)

The evaluation also found that many 5th class students, on their 7th year of primary school, who would have commenced their primary schooling in 1998:

...do not have the competence to complete basic tasks on the computer.... more than 30% reported that they were not able to print a document or to go on the internet by themselves. Almost half (47%) reported not being able to create a document by themselves. The majority did not know how to create a presentation (72%), use a spreadsheet (86%), or send an attachment with an e-mail message (88%). Competence in the use of ICT is limited for the most part to basic ICT skills, centred on the use of word-processing.”

(Inspectorate 2008, p.xix)

The inspectorate in their report ICT in Schools Inspectorate Evaluation Studies (2008) reported evidence of the use of ICT to facilitate teaching and learning in 59% of classrooms visited. However, the inspectors only observed ICT actually being used in
22% of the lessons observed (Inspectorate 2008, p.xviii). They recommended in their key recommendations that:

- Schools and teachers should regularly review the use of ICT in their work. In particular, they should strive to ensure greater integration of ICT within teaching and learning activities in classrooms and other settings.
- Teachers should exploit the potential of ICT to develop as wide a range of students’ skills as possible, including the higher-order skills of problem-solving, synthesis, analysis, and evaluation.
- Schools should exploit the benefits to be had from ICT in their assessment procedures and also in their administrative practices.

(Inspectorate 2008, p.xxii)

2.5 Incentives and Encouragement to Teachers to use ICT

2.5.1 Introduction

Up to now the focus of ICT in Irish schools has, to a large extent, been concerned with the provision of technology and resources. While this will remain an important enabling aspect of the initiative, we will only begin to make real and meaningful progress when the main focus shifts from the technology to its use by the learner.

(ICT Strategy Group 2008, p.18)

In the above diagram, Ireland ranks 11th in Europe in teacher access, competence and motivation to use the internet in classroom situations. In this sub chapter the author will
examine what other countries and educational institutions have done to combat this
teacher under-confidence and competence in using computer technologies in the
classroom and where the future of classroom learning lies with ICT.

2.5.2 Professional Development
Given that the research literature on integration of technology in education only started
attracting widespread attention in the 1980s, the literature on professional development
to accompany such initiatives is understandably modest (Lawless and Pellegrino 2007).
Barton and Haydn (2007) researched an actual professional development program for
ICT integration. They trialled an approach which allocated time for teachers to reflect
on their own practice in using ICT. In doing so, Haydn and Barton (2007) sought to
examine “whether a bottom-up approach based on enabling teachers to develop their
own interests in the ICT might be more productive”. Teachers were given time to work
on their own or with others on problems that were directly related to their current
practice. Resulting use of ICT differed between departments but teachers appreciated
the programme structure because it “gave them time to construct knowledge of a new
pedagogy which included ICTs” (Afamazaga-Wright 2008). Haydn and Barton (2007)
recommended this model for all ICT teacher professional development programs as it
did not appear to have had any negative feedback from staff (Afamazaga-Wright 2008).
A successful program of professional development for the integration of ICT therefore
should include action research (Haydn & Barton, 2007; Jamissen & Phelps, 2006) as
well as mentoring (Jamissen and Phelps, 2006; Dixon and Swan, 2006; Levin and
Wadmany, 2006).
Baylor and Ritchie (2002) found that professional development made a difference to
teacher morale and therefore teacher willingness to embrace innovation in their
classroom practice (Afamazaga-Wright 2008). Furthermore they recommended that
professional development initiatives gear towards the needs of teachers, and include
exemplars and continuing assistance to support teacher development. Lumpe and
Chambers (2001) added that providers of professional development should take note of
teacher beliefs in all areas of teaching and learning, in order to plan for effective
professional development.
The UK launched its National Grid For Learning in 1997 and the Prime Minister
pledged that “by the year 2002 all 32,000 schools in Britain would have multimedia
computers and internet connections, and that all teachers would receive training to
ensure that they were competent and confident to teach using ICT” (Dawes 1999, p.236). The Stevenson Committee noted that teachers are ‘crucially important’ to ICT innovation (Dawes 1999, p.236). Professional development for teachers in the UK started with the “needs and interests of the learner” (BECTA 1998, p.55). Online support networks were set up to provide communication, information sharing and peer tutoring (Dawes 1999, p.249).

While the Netherlands has no specific e-learning policy (Baak 2003), teachers appear to use ICT for teaching purposes more hours weekly than teachers from any other country ...showing, in parallel, more confidence regarding their skills. E-learning is integrated into more general educational policies and has been in use since the early 1990’s, suggesting familiarity with technologies (Kikis-Papadakis 2003).

According to Mallik (2008), adoption of emerging pedagogy is linked to staff development. He cites countries where there are ‘benchmarks’ or ‘ICT driving licenses’, which list ICT competencies for teachers (Mallik 2008).

Cyprus, Germany, Singapore and New Zealand have special arrangements for the professional development needs of principals in ICT (Mallik 2008). In countries such as UK the presence of ICT in schools has evolved into the provision for a computer-related personnel structure in the school system for technical support and coordination (Mallik 2008; Becta 2008).

Mallik also found that “In systems where ICT across the curriculum has recently started, and the ICT infrastructure in schools are relatively low, as in some Eastern European countries, the focus is more on technical skills” (Mallik 2008). He noted that in the US, “preparing teachers” means helping them construct their own understanding of how to teach with, not just operate, technology (Mallik 2008).

2.5.3 Mentoring

“Mentor teachers are an important link in the process for developing 21st century teachers” (Grove 2008, p.3). Kay (2006) found that their beliefs and actions had a direct impact on what student teachers do and learn while on their field experience. Mentors bridge the gap between pedagogy and “real world” classroom experience (Kay 2006). Doering, et al. (2003) described mentors for student teachers as the “crucial cog” in preparation for use of technology in teaching. According to Bullock (2004) the mentor’s skill level, ability to model technology-integrated lessons and support for and
during student teacher lessons with ICT are salient factors that can enable or disable a student teacher’s use of technology (Bullock 2004). Doering et al. found that students who were placed with non-ICT using mentors were hindered or unmotivated in their use of technology in the classroom. Russell et al. (2003) believed mentors to be vital to student teacher training as they noted that most student teachers had not experienced learning content area subjects with these new and emerging ICT tools during their childhood education so they have not traditionally learned processes or approaches for learning how to learn with ICT (Russell et al. 2003). In addition, their models of teaching drawn from personal experiences would not entail scenarios of how to use ICT in the instructional process (Russell et al. 2003).

Ertmer et al. (1999) in identifying 3 levels of computer use, recommended that training provision be systematically differentiated to meet the needs of teachers at each of these three levels (Scrimshaw 2004, p.16). Ertmer et al. (1999) recommended mentoring and demonstrations by peers to show how ICT could help teach existing and expanded content. The chance to observe and talk with teachers who had already solved similar problems to theirs would be helpful. So too would seeing evidence of meaningful outcomes being achieved (Scrimshaw 2004, p.16).

McDermot & Murray (2000) found that the key to successful mentoring was time and trust. Both teachers must feel comfortable asking questions of each other, no matter how basic these seemed and as they became more skilled they discovered more ways of integrating technology into the curriculum (Scrimshaw 2004, p.16).

2.5.4 Laptops

The New Zealand Ministry of Education began a laptops for teachers scheme in 2002. It commenced with the Laptops for Secondary Teachers and following its success it was extended to primary school teachers also. Since 2003 the Laptops for Teachers scheme (TELA) has provided permanent teachers in schools that opted for the scheme to have access to a laptop or 3 years with the option for the school to renew the rental for another 3 years. New Zealand’s Ministry of Education has deemed the laptop scheme a success. Teachers confidence and expertise with ICT improved.

Nearly all teachers reported they were comfortable with word processing and most were comfortable using email and searching the Internet. By 2006, using graphics, locating information in a database, downloading digital photos, and using presentation software were tasks that between half and three quarters of teachers felt comfortable with.
The laptops facilitated collaboration between colleagues and by 2006 approximately three quarters of teachers used their laptops to email colleagues.

There was a substantial increase in teacher use of laptops for accessing the Internet for professional readings over the course of the three years (2004-69%: 2005-80%: 2006-91%), and for collaboration in developing units and lesson materials (2004-58%: 2005-70%: 2006-82%).

The teachers found the portability of the laptop affording them more flexibility of time and place of work. Many administrative tasks became less onerous and by 2006 two-thirds of teachers used their laptops for taking notes at meetings (Cowie et al. 2005). The laptop was used more for lesson planning; connection to the school network and was found to facilitate an overhead projector more quickly than the classroom PC. By the end of 2006 almost two thirds of teachers made use of the laptop for classroom practice. The initiative was so successful that the report recommended: “that school leaders encourage all their teachers to participate in the TELA scheme as a means to promote whole school focus on and development of ICT use” (Cowie et al. 2005).

In Spring 2002 the English Department for Education and Skills launched The Laptops for Teachers initiative (LfT). In the first two years of the initiative the Government provided £120 million, allocated directly to Local Education Authorities (LEAs) for the purchase of laptops (Cunningham et al. 2004).

In an evaluation following implementation of this scheme 55% of respondents said they were using a wider range of sources to prepare lessons. One of the most frequently cited benefits of having a laptop was that it provided respondents with access to a greater range of resources than ever before and respondents felt they were more discerning at finding websites and resources since having the laptop. Respondents widely reported becoming more confident and competent in their use ICT use. The proportion of respondents who reported themselves to be confident users of ICT increased from 65 per cent before they received laptops to 74 per cent after they received their laptops. Teachers commented that personal access to a laptop had an extensive impact on their planning and preparation of resources to be used in lessons. The respondents’ use of email rose from 48% before the laptop scheme to 67% after the introduction of the
scheme. Respondents liked the flexibility the laptop offered; they could do administration work or lesson planning from home (Cunningham et al. 2004).

2.5.5 Online Learning Environments

In 2004 the Northern Ireland *emPowering Schools Strategy* envisioned, “That all young people should be learning with, through and about the use of digital and online technologies” (Topping 2004). It launched an online learning environment, *Learning NI* to facilitate enhanced experiences for the learner. It sought to “enhance and individualise the learner’s educational experience, helping them to enjoy learning, improve their performance and raise standards” (Education Technology Strategy Management Group 2004, p.1). According to the Technology Strategy Management Group:

Research shows that when ICT use is integrated across the whole of the school curriculum then standards of attainment can improve. Inspection evidence shows that when the curricular integration of ICT is limited, and there is over emphasis on uninspired teaching of ICT skills, then the breadth, balance and variety of the pupils’ experience of ICT suffers. A better balance needs to be struck in school development and lesson plans.

(Education Technology Strategy Management Group 2004, p.1)

A major emphasis was placed on personalising learning and teaching and improving arrangements for assessment, record-keeping and reporting. Online tests and personal profiles for all students we to be adopted under this new strategy. E-learning: connecting with other students through an online network, to share ideas and resources, would overcome the limitations to curriculum provision in small schools.

Listed as one of the main aims of the Northern Irish Technology Strategy was: to “help the learner to develop the skills needed to be economically active in the global knowledge economy”

To promote lifelong learning the Group sought to “blur the boundary between learning in and out of school, extending the partnership between the school, parents and the community” (Education Technology Strategy Management Group 2004, p.11). It recognised that this would “weaken the familiar certainties of traditional roles, creating new dynamics to which everyone will take time to adjust” (Education Technology Strategy Management Group 2004, p.11).

With regards to staff, it was believed that the schools agenda should address the development of:

Professional ICT competence for all staff (which includes classroom and learning assistants, those who work in libraries, and technicians, who should all be able to support teachers with
ICT) and the application of those skills to enhance and support teaching and learning in the classroom

(Education Technology Strategy Management Group 2003a, p.1)

It also encouraged the use of Learning NI as a “unique opportunity to establish online communities of practice, through which the educational challenges facing the school service today can be addressed” (Education Technology Strategy Management Group 2003a, p.17)

In 2002 Scotland embarked on an extensive study on the state of its schools education system. The National Debate on Education recognised some highly valued features of its schools systems, namely flexibility, breadth and balance of the curriculum, the quality of teaching and the comprehensive principle (Learning and Teaching Scotland 2009).

In response to the National Debate, a Curriculum Review Group was set up which led to the publication in 2004 of A Curriculum for Excellence.

The purpose of the programme is to improve the learning, attainment and achievement of children and young people in Scotland. It is also about ensuring that pupils achieve on a broad front, not just in terms of examinations. It is important to ensure that children and young people are acquiring the full range of skills and abilities relevant to growing, living and working in the contemporary world. Curriculum for Excellence aims to ensure that they will enjoy greater choice and opportunity to help realise their individual talents.

(Learning and Teaching Scotland 2009)

Launched in 2007, Glow claims to be the world’s first national intranet for education. Managed by LTS and delivered by a private company, Glow was designed to work alongside the National Curriculum for Excellence. Through Glow Scottish educators have access to resources which actively promote creative learning and teaching. It is a nationwide project, with each local authority working with the Glow team. Since the rollout of the live service in 2007, 16 out of the 32 Scottish local authorities are now live with Glow and numbers are rapidly continuing to rise (Learning and Teaching Scotland, 2008).

2.5 Chapter Summary

Irish ICT policy implementation commenced with IT2000 in 1998, this was followed by The Blueprint for the future of ICT in Irish Education: Three Year Strategic Plan 2001-2003. In 2007, the Minister for Education launched the report: Investing Effectively in
A primary teacher’s central sources of reference are the 1999 Primary School Curriculum books and Teacher Guidelines. The Teacher Guidelines place a large emphasis on the use of CD-ROMs and internet for reference, communicating findings of projects with other schools, using subject based CD-ROMs, use of word processing software, databases and drawing programs. Some methodologies were noted to be very subject specific and time consuming on the teacher. Many methodologies were not suitable for situations of one computer per classroom.

While the majority of primary school teachers in Ireland have attended at least one computer course, it has been found that teachers’ confidence in the use of ICT is still low. In a study in Silicon Valley, teachers’ use of ICT was found to be similar to Irish teachers use of ICT. Training and ongoing training are central to ICT implementation in schools. In the school years of 2005/2006 the inspectorate found ICT use in schools to be limited and advised more use. However the inspectorate on their visits to the NQT’s was found not to be supportive of the use of ICT in the classroom.

Other countries have tackled teacher competence in ICT in a variety of ways. New Zealand and England have funded laptops for teachers’ scheme, where teachers are provided with their own laptop to take up and use for lesson planning and deliverance. Northern Ireland is aspiring to the set up of a full virtual learning environment by the provision of personal email accounts and profiles for all students. Scotland has reinforced their new Curriculum for Excellence by Glow, which claims to the world’s first national intranet for education. It has a full time Glow team which works with each local authority.
Chapter 3  Methodology

3.1 Overview
This chapter outlines the procedure involved in examining the implementation of the ICT Teaching Methodologies in the Primary School Curriculum in 5th and 6th class. Section one details the research questions. The rationale for selection of the methodology employed is discussed in the next section along with details of the participants and the setting. Section three concentrates on the selection and implementation of appropriate research tools. The final section gives consideration to issues of validity and reliability and also addresses the limitations of the research methodology.

3.2 Research Questions
Following an analysis of the research aims, the following set of research questions was identified:

Have the ICT Teaching Methodologies in the Primary School Curriculum been implemented?

What factors promoted the implementation of the ICT Teaching Methodologies in the Primary School Curriculum?

What factors impeded the implementation of the ICT Teaching Methodologies?

To address these questions and to support this investigation a research instrument which was deemed to be appropriate was selected.

3.3 Research Methodology
A qualitative case study, defined by Nunan (1992) as “an intensive, holistic description and analysis of a single entity, phenomenon, or social unit”, was the approach chosen to undertake the study. A combination of quantitative and qualitative research methods were blended to form a single case study. Creswell & Plano (2006) believed that “A researcher who uses mixed methods research is using a research design with philosophical assumptions as well as methods of inquiry”.

The case study methodology was deemed an appropriate approach as it is “The single instance is of a bounded system” (Cohen et al. 2000, p.181). Yin (1984) defined the
case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin 1984, p.23).

3.3.1 The Setting
This research was carried out in 20 primary schools within a 30 kilometre radius of a major town in the west of Ireland. The schools ranged from 2 teacher rural schools to 22 teacher urban schools. All schools were co-educational.

3.3.2 The Participants
The sample of teachers involved in the study comprised of teachers of senior classes. For the purpose of this research, the author defined it as the teachers of 5th and 6th classes or the teacher of senior classes in a two or 3 teacher school. There were 24 teachers in total in this group. 12 members of the sample participated in the survey, and 4 were also interviewed in a focus group.

3.3.3 Other Contributors
A sample of 2 school ICT post holders and 2 principal teachers were also interviewed. The director of the local education centre was interviewed as they had previously held the job of ICT advisor.

3.4 Research Instruments
During this research data was collected from a number of sources:

- Questionnaire online
- Questionnaire written
- Focus Group
- Field visit
- Examination of documentary evidence
- Interview of teachers, education centre directors and principals

3.4.1 Questionnaire
The questionnaire is a widely used and useful instrument for collecting survey information, providing structured, often numerical data, being able to be administered without the presence of the researcher, and often being comparatively straightforward to analyze (Wilson and McLean, 1994).
3.4.1.1 Creating the Questionnaire
Cohen *et al.* (2000) recommends to operationalize the questionnaire by clarifying its general purpose. The second phase involves the identification and itemizing of subsidiary topics and the third phase involves formulating specific information requirements relating to each of these issues (Cohen *et al.* 2000, p.246).

Wilson and McLean (1994) suggest an alternative approach which is to identify the research problem, to clarify the relevant concepts or constructs, then to identify what kinds of measures (if appropriate) or empirical indicators there are of these (Cohen *et al.* 2000, p.246)

These two approaches can be united in their recognition of the need for the questionnaire to be:

- a) Clear on its purposes
- b) Clear on what needs to be included or covered in the questionnaire in order to meet the purposes
- c) Exhaustive in its coverage of the elements of inclusion
- d) Asking the most appropriate kinds of questions
- e) Eliciting the most appropriate kinds of data to answer the research purposes and sub-questions
- f) Asking for empirical data

(Cohen *et al.* 2000, p.247)

Cohen states that “the larger the size of the sample, the more structured, closed and numerical the questionnaire may have to be” (Cohen *et al.* 2000, p.247). A semi-structured questionnaire was used with the majority of questions closed because they “enable comparisons to be made across groups in the sample” (Cohen *et al.* 2000, p.247). While open ended questions “enable respondents to write a free response in their own terms”, an over-reliance on open ended questions can be more demanding of most respondents’ time and may discourage respondents from completing the survey (Cohen *et al.* 2000, p248&249). Answers from the open ended questions were used as stimulus for the focus group.

3.4.1.2 Piloting the Questionnaire
Oppenheim (1992, p.48) remarked, everything about the questionnaire should be piloted; nothing should be excluded, not even the type face or the quality of the paper. Cohen *et al.* (2000) recommends piloting the questionnaire, using a group of respondents who are drawn from the possible sample but will not receive the final, refined version. The questionnaire was piloted with 3 teachers of senior classes, who
work outside of the research catchment area in a 4 teacher school, a large town school and an 8 teacher school.

3.4.1.3 Administration
The administration of the questionnaires took place over a 4 week period. On the first week an email was sent to each participating schools email account, requesting participation and providing a link to the online questionnaire. The following week, the same text of the email was sent by post to all schools that had not completed the online questionnaire along with a hard copy of the questionnaire and a stamped addressed envelope for return. They were also reminded of the availability of the online questionnaire. “Of the four factors that Hoinville and Jowell discuss in connection with maximizing response levels, the follow-up letter has been shown to be the most productive” (Cohen et al. 2000, p.263). At the beginning of the 4th week, any school who had still not responded was posted another copy of the questionnaire, along with a stamped addressed envelope.

3.4.2 Focus Group
“Focus groups are a form of group interview...the reliance is on the interaction within the group who discuss a topic supplied by the researcher” (Cohen et al. 2000, p.288). Focus groups are found to be useful to triangulate with more traditional forms of interviewing, questionnaire, observation etc (Cohen et al. 2000, p.288). Morgan suggests between four and twelve people per group (Cohen et al. 2000, p.288). As sampling is a major key to the success of focus groups (Cohen et al. 2000, p.288): the focus group contained:

- A teacher of 5th class who was trained before the Curriculum of 1999 and works in a large semi urban school.
- A teacher of 5th class, two years probated, teaching in a large town school
- A teacher of 6th class in a large town school, 7 years probated
- A teacher of 5th and 6th classes in a three teacher school, trained before the Curriculum of 1999, also a teaching principal.

Two teachers were from the same school and had a working relationship, all teachers are known to each other from inter school activities but do not socialise outside of school functions. Research has found that “focus groups operate more successfully if they are composed of relative strangers rather than friends” (Cohen et al. 2000, p.288).
3.4.3 **Field Visits**

Lofland and Lofland (1984) found that field researchers rely most heavily on the use of field notes, which are running descriptions of settings, people, activities, and sounds. They included drawings or maps as field notes because they acknowledged the difficulty of writing extensive field notes during on observation. 4 schools were visited, with photographs and notes taken.

3.4.4 **Examination of Documentary Evidence**

Documents are an important source of information. Two types of data are classed by Wellington (2000) – primary and secondary. “Primary sources of data have been described as those items that are original to the problem under study” (Cohen *et al.* 2000, p.161). Questionnaires, interviews and focus groups are primary sources in this study. Secondary sources “are those that do not bear a direct physical relationship to the event being studied” (Cohen *et al.* 2000, p.161), in this study they include WSE reports and field visits. All documentation should be assessed for its relevance to the research. Scott (1990), in Wellington (2000) gives four criteria for assessing the quality of documentation:

- **Authenticity**: Is the evidence genuine and of unquestionable origin?
- **Credibility**: Is the evidence free from error and distortion?
- **Representativeness**: Is the evidence typical of its kind and, if not, is the extent of its untypicality known?
- **Meaning**: Is the evidence clear and comprehensible?

(Wellington 2000, p.114)

In order to portray the integration of ICT in the 5th/6th class primary curriculum in the sample schools, all documentation relating to the use of ICT in those primary schools were reviewed. The pre-existing sources included recent WSE reports from 3 of the schools and evidence of ICT usage on display in classrooms as noted in field visits. ICT school policies were also consulted.

3.4.5 **Interview of teachers, education centre director and principals**

The use of the interview in research marks a move away from seeing human subjects as simply manipulable and data as somehow external to individuals, and towards regarding knowledge as generated between humans, often through conversations (Kvale 1996 cited in Cohen *et al.* 2000, p.267).

The interview involves the gathering of data through direct verbal interaction between individuals. In this sense it differs from the questionnaire where the respondent is
required to record her responses to set questions (Cohen et al. 2000, p.269). The interview was based on the questions asked in the questionnaire. It gave the respondents an opportunity to elaborate more fully on the reasoning behind their answers.

The author used a Standardised open-ended interview. “The exact wording and sequence of questions are determined in advance. All interviewees are asked the same basic questions in the same order”. The merit of this technique includes increasing comparability of responses, reduces interviewer effects and bias and facilitates organization and analysis of the data (Cohen et al. 2000, p.271).

3.4.6 Analysis
According to Delamont (2002) “‘analysis’ of qualitative data is a process that continues throughout the research: it is not a separate, self-contained phase” (Delamont 2002, p.171). The quantitative data arising from the online and postal questionnaires were integrated into spreadsheets and graphs by the online software used (survey monkey.com). The qualitative data was coded in parallel with the data emerging from the interviews, focus groups and field visits.

3.4.7 Reliability and Validity
Triangulation may be defined as the use of two or more methods of data collection in the study of some aspect of human behaviour........Triangulation is a powerful way of demonstrating concurrent validity, particularly in qualitative research

(Campell and Fiske cited in Cohen et al. 2000, p.112)

The questionnaires gave an opportunity for class teachers to share their views in confidence and gave the author a detailed breakdown of teachers’ usage of ICT by curriculum subject. The focus group provided an opportunity to check the consistency of the responses of the questionnaires and probe some issues in more depth. The field visits gave visual evidence of data provided in the questionnaires and provided engagement with the field. The interviews with the ICT post holders, school principals and the former ICT adviser gave insight from a different angle. The WSE reports gave an outside view of some of the schools which took part in the study.
3.5 Limitations of the Methodology

The following were recognised as limiting factors to the investigation.

3.5.1. Sample

This case study was designed to reflect the situations of the wide spectrum of Irish primary schools: large urban, medium semi urban, small rural. However the limited population and restricted geographical location may not be fully representational.

“Sampling error is not necessarily the result of mistakes made in the sampling procedures. Rather, variations may occur due to the chance selection of different individuals” (Cohen et al. 2000, p.96). It is hoped that this sample would provide an insight into teachers use and perceptions of ICT in the primary school curriculum but the author does recognise that sampling error can occur.

3.5.2 Researcher Bias

The issue of researcher bias is an ongoing concern in a qualitative case study.

“Interviewers are human beings, not machines” (Bell et al. 1999, p.139). As the author worked as a 6th class teacher in one of the sample schools while this study was taking place, bias, even subconsciously, could easily occur. To combat this, research began with the questionnaire. Kitchenham and Pfleeger (2002, p.721) warn of constructing a survey to arrive at pre-conceived conclusions. Care was taken to keep the questions focused on the curriculum. All other questions were of factual nature. Every effort was made to provide “exhaustive, unbiased and mutually exclusive response categories (Kitchenham and Pfleeger 2002, p.721).

“Studies reported by Cannell and Kahn (1986), in which the interview was used, seemed to indicate that validity was a persistent problem (Cohen et al. 2000, p.121). According to Cohen (2002, p.121) the most practical way of achieving greater validity is to minimize the amount of bias as much as possible.

To safeguard against the authors bias and preconceived notions, questions and stimuli for the focus group and interviews were constructed using data and issues arising from the questionnaires. It is impossible to eliminate this potential bias but it is hoped that acknowledgement of it has led to greater awareness on the part of the researcher (Bell 1999).
3.5.3 **Participant Bias**
As the author was a participant in the study and had prior knowledge of some of the participants involved in the study, “response effects” (Borg (1981) cited in Bell (1999)), potential was high. “Response effects” occur when participants consciously or subconsciously give untrue or exaggerated responses, to please the interviewer or to reflect well on themselves and their teaching. To address this, questionnaires were piloted, leading questions were eliminated, all data was triangulated and findings from the surveys were used for further enquiry in the focus group and interviews.

3.6 **Summary**
This chapter outlined the research methodology used to conduct this study. It identified the research instruments as online questionnaire, written questionnaire, focus group, field visit, examination of documentary evidence and interviews. It outlined the procedures involved for each. The setting, participants and other contributors to the case study were described. Reliability and validity of data collected and methodologies used were discussed and the potential weaknesses of the study were also addressed.
Chapter 4 –Findings

4.1 Introduction
This chapter presents the findings which were uncovered in the study using the approaches outlined in the previous chapter. The findings, both quantitative and qualitative in nature, are organised into three sections.

The first section conveys a profile of the context of the research by profiling the schools involved. The second section profiles the teachers involved in the research. The third section contains mainly quantitative data regarding teachers’ use and understanding of ICT methodologies. The factors influencing teachers’ use of ICT methodologies is detailed in section four while the last section deals with the Incentives to use ICT in the classroom.

4.2 Schools
This study focused on 20 schools in and around a large county town in the west of Ireland. The town is well serviced with many local based shops and businesses. It has two hospitals, a general and psychiatric. A major motorway is in construction which will bypass the town, along with this a cinema, shopping centre and some British and international outlet stores will be built along the bypass. The town is within commuter distance of a city and another major county town and this will be facilitated further by the motorway. The region is traditionally agricultural and this is still very visible through the weekly marts and an annual horse fair in the town. The schools in the region reflect this urban/rural mix. While some schools in the study had up to 30 teachers, many of the schools were two teacher schools. All schools are co-educational. A brief profile of all the schools in this study and their involvement is detailed below.

4.2.1 School A
School A is a two teacher school in a small village. The school doesn’t have a website but does have an email address listed online. With no response to the initial email, a follow up letter was sent but unfortunately there was still no response.

4.2.2 School B
A rural school, with two mainstream teachers. It has no school website but does have a school email address. There was no response to the initial email but the survey was
completed on the hard copy posted out with the follow up letter. The school was visited on a field visit.

4.2.3 School C
A three teacher school in a rural area. The village is marked by a shop, pub and petrol pumps. The school has no email address and didn’t respond to the postal letter and hard copy of the survey.

4.2.3 School D
A two teacher school, located in a rural area close to a major road, and a short commuting distance to a large town. The school has an up to date website and email address and was the first school to respond to the email invitation to the survey. The female teaching principal teaches eight 3rd to 6th class pupils in one room.

4.2.4 School E
A 20 teacher school with 14 mainstream classes. It is located at the edge of the major town. It has grown from a rural two teacher school to a thriving 20 teacher urban school. It is the biggest school in the town in terms of pupils, with School G in the town centre and School K as the Gaelscoil alternative. The school has a website but the email address listed is not in use. As the author is a teacher in the school it was followed up by email to the proper email address and hard copies given to the 3 other teachers eligible for the survey. One teacher completed the survey online and two completed it on hard copy. The author completed the survey online.

The teachers who partook in this survey taught; 6th, 6th, 5th, and a 4th/5th split class. Two teachers had 30 children in their room and the two other teachers had 29. Teaching experience ranged from 3 years to 19 years. All teachers trained in an Irish teacher training college as full time B.ed’s.

The school has two ICT B-post holders. Every teacher has one computer in their classroom. An interactive whiteboard was installed in the school library during the school year. 10 laptops were also purchased which can be used in the school library or wheeled on the laptop trolley for use in other classrooms. Further IWB’s and laptops are to be purchased in the new school year.
4.2.5 School F
This school is located 8 miles from the major town. It is staffed by a teaching principal and two mainstream teachers. It has an email address but did not respond to the invitation to participate in the survey. There was also no response to the follow up letter. The school had a whole school evaluation 3 years ago.

4.2.6 School G
School G is a large 30 teacher town school with 13 mainstream classes. It is a DEIS school and has the relevant supports. It has a new and very current school website. At the time of survey distribution there was no email address displayed on the website. The school was sent a hard copy of the survey and this was returned promptly. The school website is now fully updated and an email address is provided on it. One of the three teachers of senior classes completed the survey. The teacher had 26 6th class pupils in her room with one computer. The school has an interactive whiteboard for use by all the teachers in a central location. The school also has a laptop trolley. The school envisages purchasing more IWB’s.

4.2.7 School H
This 3 teacher school is located in a rural area approximately 10 miles from the major town. The school doesn’t have a website or an available email address. There was no response to postal invitations to partake in the survey.

4.2.7 School I
A two teacher school in a rural area. The school has an email address but no website. There was no response to the email and no response to the postal follow up letter.

4.2.8 School J
A two teacher school with a current enrolment of 17. This school had an email address but no website. It was unresponsive to the initial email invitation and the follow up postal invitation.

4.2.9 School K
School K is a Gaelscoil on the edge of the town. It has 7 mainstream classes with a foireann of 10 teachers in total. The school has a website and a visible school email address. This was the only school to make contact using email. The principal contacted
the author via email to request a hard copy of the survey for the teacher of the senior classes.

4.2.10 School L
A four teacher school with no email address and an outdated online school blog. There was no response to postal invitations to partake in the survey.

4.2.11 School M
A three teacher school in a small village 10 miles from the town. The school doesn’t have an email address or website but returned the survey when posted out to the school. The teacher of the senior classes, also the school principal, partook in the focus group. The school recently had a whole school evaluation. This teaching principal had 15 5th and 6th class pupils in her room. Her pupils used the 3 computers in the classroom daily for research, word processing and subject specific internet sites and games.

4.2.12 School N
School N is a 3 teacher rural school. It underwent a whole school evaluation in 2006. The school has no website or email address but responded promptly to the postal invitation to partake in the survey. The teacher of 4th, 5th and 6th class completed the survey. She had 20 pupils in her class.

4.2.13 School O
This is a 4 teacher school that doesn’t have a website or a visible email address. However on receipt of a postal invitation the teacher used the link provided on the letter to complete the survey online. The male 5th and 6th class teacher had 21 pupils in his class and had a classroom assistant.

4.2.14 School P
This 6 teacher school with teaching principal is located in a large village on a major road. This semi-urban school has no website but it does have an email address. It did not respond to the initial email invitation but it did return a hard copy of the survey after it received the follow up letter. The school was also visited as a field visit.

4.2.15 School Q
This 8 teacher school has an email address but failed to respond to the initial email or the follow up letter.
4.2.16 School R
School R is a 5 teacher school with teaching principal. It has an outdated school blog and a visible email address. However there was no response to both the email invitation and the posted follow up letter.

4.2.17 School S
School S located on a major road has grown from a small two teacher school to a large 14 teacher school with 11 mainstream classes. It has its’ own website and visible email address. It also publishes all school news items on the website. The survey was completed on hard copy after the follow up letter was sent. The 5th class teacher teaches 29 pupils with no classroom assistant. This teacher also took part in the focus group.

4.2.18 School T
This school has 6 mainstream teachers and is quite a large school for the rural area it is situated in. The school was initially contacted through email and followed up by postal letter but there was no response.

4.3 Teachers Use of Recommended ICT Methodologies

4.3.1 English
Teachers used ICT in English depending on the facilities they had available to them. As the majority of the teachers had only one computer in their classroom they preferred to “Focus on the subject and the books.” (Focus Group)
None of the teachers in the focus group had ever encountered “Concept Keyboards”. The former ICT adviser had experience of them but had only helped schools to purchase one on very rare occasions. They were mostly used for children with special needs and entailed a significant amount of money being spent to equip one child.

Teachers frequently used drill and practice CD’s and websites for early finishers. Most of these sites and CD’s practiced and reinforced children’s spelling and comprehension. Teachers felt they would like to do more word processing but it was difficult with class size and lack of equipment.

The “Dissolving Boundaries Programme”, was the only example the former ICT adviser could give of schools using email and internet to communicate student work with other schools. One school in the catchment area of the Teachers Centre has been involved in this.

In the WSE report for School N, it was noted that ICT is used effectively in the teaching of English creative writing. “Some teachers incorporate the use of ICT to enhance
teaching and learning opportunities, particularly in the use of Microsoft Word and the internet. There is scope for development in the more regular use of ICT to mediate pupils’ learning in all classrooms. It is planned to increase the range of computer software to support classwork” (DES 2006, p.4). The involvement of the school in Write a Book Project organised by their local education centre was commended by the inspectors report.

4.3.2 Gaeilge
Teachers in the Focus group rated Gaeilge as the “least interactive” subject on the curriculum. One teacher used “Gaelspell” regularly to correct her Irish spelling and grammar when designing worksheets and classroom signs. Another teacher used PowerPoint frequently to present lessons. They stressed the need for Irish designed sites as most of the educational sites they used were from the UK and USA.

While some resources were available on scoilnet and other Irish sites such as www.seomraranga.com, they were mostly classroom signs and printable worksheets.
4.3.3 Mathematics

Figure 4.5 Gaeilge

Figure 4.6 Maths
None of the focus group had ever encountered LOGO. One of the principals interviewed, had used LOGO in the 1980’s on the first computer that came to the school.

The four teachers of the focus group agreed it was more important to “*stick to the book*” in the senior classes, as there was so much to cover. 5th class in particular had a large quantity of new material that had the teacher hard-pressed to complete in the year. As in English, Maths drill and practice programs were used a lot for early finishers.

One teacher who has 3 computers in her room took part in World Maths Day, where the children competed against other children in other countries. She found that very worthwhile as the children were very engaged as their opponents were real.

All teachers expressed a desire to use computers more in Maths but time and facilities were holding them back. However the WSE report of School N noted that “Limited opportunities are provided for using information and communication technologies (ICT) to develop mathematical skills.” It suggested that “the potential of using ICT to develop pupils’ understanding in Mathematics, particularly for pupils experiencing learning difficulties, should be explored” (DES 2006, p.10).
4.3.4 History

Teachers used the internet for sourcing lessons and information to supplement history lessons. The teachers in the focus group did not use the computer in any other way for history. Inspectors noted that in School N; “Broadband, the internet and ICT are effectively used to access relevant material and support pupils’ understanding of historical concepts” (DES 2006, p.11).

4.3.5 Geography

The teachers in the focus group rarely used the computer for Geography, the only use was for research on the internet. One teacher used an interactive map quiz program that her school had purchased. She used that mostly for early finishers or as a reward.
4.3.6 Science

Figure 4.8 Geography

Figure 4.9 Science
One teacher in the focus group recalled receiving a sensor to monitor electricity. It was part of the green schools initiative and while attached to the computer, the sensor gave reading of the electricity usage in the room. Some of the other teachers had used interesting sites explaining experiments or with videos of natural phenomena. The former ICT adviser listed some sites he had used with teachers www.hermanshomepage.com and www.brainpop.com as being very useful. He had never used sensors to gauge temperature or pressure etc with primary or secondary school.

4.3.7 Visual Arts

Teachers in the focus group had used publications that included CD ROMs to do Art Appreciation. They never did any interactive computer activities with the children in Art as they felt they had “enough to do” with the real concrete art lessons without trying to emulate it on a computer.
4.3.8 Music

One teacher recognised the Notation Software as software she used in college when studying music to degree level. The program they used was Sibelius. She did not see the need to use such software at primary school level (Focus Group). The former ICT adviser recognised the notation software as software they now use at leaving cert level.
4.3.9 Physical Education

The focus group did not see any need for P.E. to be integrated with ICT. Like Art they felt that to do a proper P.E. lesson was enough without “trying to spend time on a computer”. They used computers occasionally in their lesson preparation.
4.3.10 Social, Personal and Health Education

Teachers in the focus group would have informally discussed issues of bullying, peer pressure, identity and self-confidence in relation to use of the internet. In one school this was also addressed in the 6th class’s RSE talk. One teacher also used programs from www.webwise.ie to explore these issues.

4.4 Factors Affecting Use of ICT Teaching Methodologies

4.4.1 External Factors

4.5.1.1 Infrastructure
While the teachers in the focus group were quite competent in ICT and used the computer regularly at home, they admitted that the computer often was often “never turned on” and left unused in the back of the room. One teacher had a set time table so that children could leave their desk and use the computer for their assigned slot for 30 minutes each week.
One respondent to the survey had an interactive whiteboard in their classroom. One third of teachers surveyed had use of a laptop provided by the school. Half the teachers had one computer in their classroom for the whole class. Two teachers had two computers and four teachers had three computers for use in their classroom.

On closer examination, the classrooms with three computers had 30, 15, 11, and 8 children in their rooms. The teachers with two computers in their classroom had 20 pupils in 4th to 6th class and 16 pupils in 5th & 6th classes. This gives an average pupil to computer ratio of 9:1. The teachers with one computer in their class had between 21 and 30 pupils in their classroom with the average being 26.33 pupils per class and thus a pupil to computer ratio of 26.3:1. The lowest actual pupil:computer ratio found was 2.6:1, the highest was 30:1. The lowest pupil to computer ratio was in a multi-class of 3rd to 6th, the second lowest was also in a multi-class of 3rd-6th class. The highest ratio was in a single class of 5th and the second highest ratio was also a single class of 5th.

One of the schools visited on a field visit was the school with the second lowest pupil to computer ratio. The senior classroom had classes 3rd to 6th, with 11 pupils in total in the room.
The female teacher with over 30 years teaching experience had rarely used computers in her studies during initial teacher training as a fulltime B.ed in Ireland. She attended “many” ICT courses during her teaching career and is now “very comfortable” using technology. In her classroom there were 3 computers for the pupils to use.
The class also had access to a fourth computer in the office adjoining the classroom when the visiting learning support teacher was not using the office. Each child in the room had access to a computer on a daily basis.

Most of the pupils’ time on the computers was spent using subject specific internet sites and games, researching the internet for projects and classroom work, using word processing programs to type up work and preparing presentations for the rest of the class. This work was evident on the walls of the classroom.
The teachers’ ongoing use of computers in her teaching and classroom management were also evident in her classroom displays and signs.

One of School F’s five recommendations on their WSE report was that “The staff should seek to increase the use of the school’s upgraded ICT resources to support teaching and learning across all areas of the curriculum” (DES 2007a). In School N, the WSE report noted that “The use of ICT in presenting teaching and learning plans is very effective in some classes” (DES 2006, p.6). It advised: “The potential of using co-operative group work and ICT should be explored further as effective approaches and methodologies in stimulating the development of pupils’ higher order thinking and scientific skills” (2006, p.12).

All schools surveyed had a policy of having at least one computer in every classroom. One third of teachers worked in a school which had a computer room or laptop trolley.
Two schools had an interactive whiteboard available for use for all the teachers of the school.

The former ICT adviser explained that policy and recommendations changed down through the years from having two computers in every classroom to having a central computer room to the present recommendations which are four computers in the classroom, a printer and a digital projector. He felt that this present recommendation of four computers in the classroom gave the pupils more of a chance to use the technology. He wondered at the value of using up one computer to facilitate an interactive whiteboard and pointed out that there is only one major study in Europe investigating the educational benefits of IWB’s. (Interview 1)

One of the school principals described the history of ICT infrastructure in his school. “It didn’t start with Department of Education started grants, it started with a promotion run by Apple in the 1980’s, where you had to collect tokens.” (Interview 4) The only application on the computer was LOGO and this computer was housed in the senior classroom. With the advent of IT2000 the school aimed to provide a computer to every room in the school. An IT grant, continued “for a while” but now is part of the “minor works” scheme. He finds the “latest group” (NCTE service desk) more supportive and structured on how best to spend money on ICT (Interview 4).
The ICT post holders interviewed teach in a large school and they cited lack of finance as their biggest problem. They saw no new money coming in for fixing and support. Last year they ran out of ink cartridges months before the end of the school year and only a limited number could be purchased after that out of school funds. They have found the grants to be insufficient to cover the cost of maintaining ICT in the school and have relied heavily on the generosity of the school Board of Management (Interview 3).

4.5.1.2 Support
Teachers in the focus group had used the ICT advisory service down through the years. The teaching principal had found the ICT adviser to be invaluable when it came to sourcing and buying equipment. She said she felt “lost” now with nobody to consult for advice or technical support (Interview 2). The other principal interviewed had always found the adviser helpful when buying equipment (Interview 4). The ICT post holders interviewed felt very alone without their ICT adviser, they regularly rang him for advice on fixing computers, buying equipment and maintenance issues such as anti-virus software (Interview 3).

The former ICT adviser had found that the support he provided had changed over the term of his role. When he first took up the job he had lots of calls to help schools start up ICT in the school. There had been a gap between his employment and the last ICT adviser finishing. Essentially in his own words he was “playing catch up.” He has noticed a decrease in teachers looking for ICT training and he believes this is due to society’s acceptance of technology in general (Interview 1). The principal of the large school noted this also. ICT training was not listed as a priority for in-school development planning by the staff. He believed that teachers attend courses themselves that they are interested in or want to improve on (Interview 4).

The former ICT adviser spent much of his time when he began his job setting up email address for schools and helping the technical side. He has found that while many town schools are flourishing with ICT suites, wireless broadband etc, there are many rural schools who have yet to get broadband or can only get broadband through satellite which often isn’t very reliable. Much of his later work as an ICT adviser involved visiting schools, piloting IT projects and setting up courses to facilitate the needs of the teachers (Interview 1).
4.5.1.3 Time

Teachers in the focus group believed time to be one of the major obstacles in ICT integration. The focus group discussed the time involved in correcting copies, sourcing material for lessons, preparation for sacraments, matches, quizzes and other extracurricular activities. They felt they were always short of time and did not have the free time to find new software or learn new skills in ICT. They found advice from colleagues to be the most helpful because “at least then you know it worked well” (Focus Group). One teacher surveyed did not see herself using technology more in the next five years because of “Lack of time.” (Questionnaire)

One of the recommendations of the focus group was in-service days for ICT so teachers would have time to explore new software and technology and learn how to put it into practice.

A female 5th and 6th class teacher visited on a field visit cited “time” as her main obstacle to ICT integration in her classroom. She had 23 5th and 6th class pupils with one computer.

She used ICT constantly in her studies as she trained online as a postgraduate. She uses ICT for lesson preparation but not for lesson delivery. This is visible through the signs for classroom management and posters designed and printed by the teacher using the computer.
Outdated equipment and lack of technical support was an obstacle to ICT integration in her class. She had other pieces of hardware in the room but lacked the time and expertise to get full use out of them.

She saw the class size as another impediment to full ICT integration. Despite this, there were many typed and printed student projects on display and the children in her class used the computer “daily”, to use subject specific CD ROMs, to research the internet, to use word processing programs, to prepare presentations and to use subject specific internet sites and games.
She didn’t see herself using ICT more over the next 5 years unless “facilities improve and class sizes decrease”. The benefits of ICT for her were “Increased information available.” (Questionnaire)

4.5.1.4 Leadership and Planning
The school environment in which the teachers worked was found to have a bearing on their use of ICT in their teaching. The school management was one of the factors which influenced the adaptation of ICT methodologies from the primary school curriculum.

58% of the schools had teaching principals and one third of the respondents to the survey were teaching principals. One of the focus group members was also a teaching principal. The role of the principal and Board of Management were recognised as crucial. Teachers in the focus group explained that while most of their present computers were bought on grants since IT2000, IT equipment which was purchased in the current year and future years are only possible through the fundraising of the Board of Management and the Parents Council. Some schools in the focus group have made IT equipment a priority and are focusing all fundraising efforts on the purchase of IWB’s and computers. In the WSE report of School L, the school board “has identified the promotion of a greater use of information and communication technologies (ICT) in
teaching and learning as a priority for the future” (DES 2007b, p.5). All 3 schools which underwent WSE inspection had ICT policies as part of their school planning. The former ICT adviser found that in his experience ICT integration and innovation in any school came about because of one person. This person was either the principal or a teacher supported by the principal. With the mentoring, advice and example of that teacher or principal, ICT integrates through the school. Unfortunately, the former ICT adviser found, that someone like that usually moved on to another job quite quickly (Interview 1). While they may have set up websites or file sharing or networks in the school, the expertise leaves with them. This collaborates with school websites and email addresses found by the author when researching the sample schools. Many hadn’t been updated for years as the teacher who set it up had possibly left the school and the other teachers hadn’t the knowledge or possibly the passwords to update the site.

Teachers in the focus group said they “just do not know what to do when it came to ICT.” The teaching principal cited the courier delivery of four books for each of the teachers in her school from the NCTE. She could not recall the name of the books, but gave it as an example of a waste of money. She or her staff never read the books which were about how to use ICT in education.

She felt that it would have been more beneficial to provide the software recommended by those books and have CD’s provided which automatically install the software when entered into a computer. The other teachers in the focus group concurred with this “If we just knew what we needed to have done with the children in the year, we could work towards that.” They found that with 11 subjects to teach on the curriculum, researching and finding software suitable, installing and showing the children how to use it, took up more time than they had. For the teachers in the focus group the amount of ICT covered or used in the year with the class depended on the individual teacher. The focus was on covering the curriculum.

The former ICT adviser had on a few occasions drawn up school ICT policies. In those cases he met with the principal and teachers and made a list of all the ICT skills the children should leave primary school with. They then divided up the skills between the different class levels. This happened only in a few schools and depended on the initiative and foresight of the principal teacher (Interview 1).
He concurred with the teachers of the focus group and took it one step further. He believed there should be a central site for all Irish IT resources, that teachers could log on, enter their name and class level and receive the software applicable to that class.

4.5.1.6 Professional Development
Two thirds of respondents to the survey had a module of ICT as part of their teacher training. One quarter of respondents never used computers while studying to be teachers.

4.14 Use of computers by participants while studying to be primary teachers.
While half the respondents to the above question answered “rarely” or “never”, half of the respondents to the survey had attended some type of ICT course provided by the teacher centre. The amount of courses attended varied from 2 to over 10 (Questionnaire).

One teacher who had attended many courses had attended college over 30 years ago; she “never” used ICT as part of her studies or teaching practice. She has completed 6 courses in ICT during her teaching career. Both she and the children in her class use the computer daily. This is facilitated by 3 pc’s and a laptop in the classroom. Children use subject specific CD ROMs, the internet for research and educational games, word processing and design presentations for the class. She sees the children as “very technologically minded”. She regards ICT as a: “Good way to get children interested, Valuable source of info (and) convenient, relevant to life in 21st century” (Questionnaire).
Only 2 of the 12 respondents to the survey had a post graduate qualification in ICT. The ECDL (European, Computer Driving Licence) and H.dip in Software Design and Development. One of the ICT post holders had organised courses for the staff of her school based on the needs of the staff. Attendance at the time was quite high (Interview 3).

4.4.2 Internal Factors

4.5.2.1 Demographics
The sample of teachers in this research comprised of the full population of 5\textsuperscript{th} and 6\textsuperscript{th} class teachers in the area. This consisted of 24 teachers in 20 schools. 12 teachers completed the survey leaving a response rating of 50\%. Four out of the 12 teachers opted to respond to the survey online.

4.5.2.1.1 Classes Taught
The majority of rural schools with teaching principals can be seen by the predominance of multi-class teachers in Figure 4.1.

Class sizes for the 12 teachers ranged from 8 children in one room in a multiclass setting to 30 children in a single class setting. The average number of children in the classroom for teachers in this area was 21.5. One third of the teachers reported having a classroom assistant and the majority of teachers had a teaching principal in their schools (58.3\%).
4.5.2.1.2 Gender, Age and Teaching Experience

The majority of the respondents were female (83.3%). Figure 4.2 illustrates the age range of the teachers.

Figure 4.2 Age Distribution of Participants

Figure 4.3 shows the years of teaching experience of the respondents. 75% of respondents trained in an Irish Training college as a full time B.ed., 2 respondents trained in the UK as post graduates and one respondent trained online as a postgraduate. Therefore figure 4.3 would not mirror figure 4.4 as the teachers who trained as post graduates would have had a more delayed entry to teaching.

Figure 4.3 Years Teaching Experience

4.5.2.2 Personality.

The teachers in the focus group felt they were quite comfortable with technology and in the course of discussions jotted down websites and programs others mentioned when
discussing the focus questions. They used computers after school in planning schoolwork and networking in their personal lives. However they cited incidents of having something prepared for the class using the computer and it letting them down or the computer freezing. They said they would like to have the time to do more but it took so much effort to prepare and ensure that the equipment worked on the day that they did lessons using ICT rarely.

One older teacher spoke about how her son often came in after school hours with her to help maintain the computers and believed that without his help at the start she would never had mastered ICT in the classroom. She believed herself to be “lucky” to have such support at home as otherwise she would have been lost (Focus Group).

The former ICT adviser believed Irish teachers in particular were very reluctant to share resources and every teacher essentially “reinvented the wheel” daily instead of sharing lesson plans and resources (Interview 1).

4.5.2.3 Profiency

All respondents had a computer at home. 4 had both a personal computer and a laptop at their disposal at home. All respondents to the survey had a personal email account.
Figure 4.15  What would best describe your internet and email usage?

A majority of respondents use the internet daily, 4 respondents cite “almost daily” and one respondent used the internet only monthly (Questionnaire). The former ICT adviser felt that teacher competence in ICT had improved as teachers were using the internet more and more in their everyday lives (Interview 1).

4.5.2.4 Pedagogical Compatibility

Teachers in the focus group admitted to not using the computer as a teaching tool. They generally used it as a reward for early finishers, or something they made use of when they “have enough time”. Phrases such as concept keyboards and data handling programs, which are mentioned on many occasions throughout the ICT teaching methodologies, were alien to the teachers of the focus group. At the beginning of the focus group session, one teacher told the author, “I’m taking part because I want to get ideas of how to use the computer in class. I find that I never turn it on. I never know what to do with it.” The teachers believed that there was some great software out there to use but most would not integrate into the teaching of classes with 30 children. They noted websites from the UK (www.bbc.co.uk, www.sparklebox.co.uk) and America (www.funforthebrain.com, www.kindarart.com). They found them to be excellent but could not fully rely on them as they were based on a different curriculum (Focus Group).

The older teachers in the focus group, spoke about the adjustments undertaken by them with the new curriculum of 1999. They felt the workload was heavy enough without having to try and use a computer as well. All teachers of the focus group questioned the inclusion of ICT with PE and Art as they felt it would be much more beneficial to
children to do PE and Art with the proper concrete resources rather than “waste time inside on a computer” (Focus Group).

4.5 Incentives to use ICT

4.5.1 Professional Development

![Figure 4.16 Use of Computers During Initial Teacher Training](image)

Use of computers in college and teacher training was quite low. 50% of respondents cited “never” or “rarely” when questioned on this. A third of respondents reported no ICT module in their teacher training course. Half the respondents had attended some type of ICT training course for teachers as an evening or summer course. Of those who attended these courses the amount of courses attended per person ranged from 2 to more than 10. 2 of the respondents had higher diplomas in the area of ICT; Software Design and Development and Digital Media Development for Education. One respondent had completed the ECDL. None of the respondents had a master’s degree (Questionnaire).

The focus group listed lack of training as one of the factors that hinder ICT integration. The teacher who had completed the ECDL was one of the focus group participants. While it had given her confidence and computer skills, it was not training for the primary school teacher. The teachers believed that if in-service days were provided for staffs solely on ICT integration, they would be well received (Focus Group).

The former ICT adviser found that uptake on training and courses in ICT to be quite high and sometimes unpredictable. He cited an example of facilitating a course on “Clicker 5” It was hailed as the new, best, most comprehensive English ICT package available. He set up the course, i.e. provided the room, employed the tutor, and
advertised the course. Two people turned up. He set up another course the term after, hoping that uptake would increase as more people were aware of the software. 3 teachers attended. He opted to do the course one last time and again advertised the course, set up venue etc. Only 2 teachers arrived the first night of the course. He decided to give up on it, there didn’t seem to be any interest. However, he ran into a problem in the new terms schedule of courses and had one slot free. Also the tutor for Clicker was available. He ran the clicker course again but knew the chances of the course being a non-runner due to attendance was highly likely. 65 teachers turned up the first night of that course. He had to divide the class into 3 and employ two more tutors. He has never found an explanation for the attendance that night. There was no demonstration of Clicker 5 in any school prior to the last course; there were no free copies of software distributed or any incentive or attention focused on the software to raise awareness of it (Interview 1).

Primary teachers’ uptake of courses offered by the teachers centre is higher than secondary school teachers for a few reasons. Primary school teachers avail of summer courses offered by the teacher centres because on completion of a course they are awarded Extra Personal Vacation Days. The former ICT adviser also explained that courses offered to primary teachers are more generic. The ICT skills learnt can be transferred to any class level and most subjects. Courses run for secondary school teachers are subject specific, for example a course on the software used in engineering will only interest the teachers of engineering. Every secondary school has on average 2 engineering teachers. For the course to run, all the engineering teachers in the area would need to attend. The course would only need to run once in the teacher centre. Courses for primary schools can run all year as the catchment is every teacher in every primary school in the area (Interview 1).

4.5.2 Mentoring
As mentioned previously, the former ICT adviser found that most innovation happened in schools because of the drive of one person, sometimes the principal, sometimes a teacher. None of the teachers surveyed were B-post holders for ICT. The former ICT adviser believed the job of the post holder for ICT in the school to be quite immense. He worried about the effects of the report “Investing Effectively in Information and Communications Technology in Schools. 2008-2013” and the onus it was laying on the post holder and the principal. When working as the ICT adviser, he was very busy,
particularly when schools were purchasing equipment. With the onset of Interactive Whiteboards and other new IT equipment, the teaching post holder and the principal will have no adviser to consult.

He also gave an example of schools that have been innovative and penalised for it. Some schools were lucky to have individual members of staff who saw the value of networking the school computers and or setting up broadband. Those schools benefited to great expense which in most cases was fundraised for by the teachers, pupils and parents. When the Schools Broadband Scheme was introduced, those schools assumed they would qualify for the grant too and be reimbursed. That was not so, and only schools who weren’t networked and weren’t on broadband qualified for the grant. In effect, those schools who sought to be innovative, were penalised. “Why should anyone bother, when that’s the way you’re rewarded” he concluded (Interview 1).

4.5.3 Online Learning Environments

The majority of respondents got their lesson ideas for ICT from colleagues. Scoilnet was used by over half the respondents (Questionnaire). In the focus group the teachers found that it was very hard to access good resources, particularly on Irish material i.e. local history, Irish history, Gaeilge, geography of Ireland. They found scoilnet to be very un-interactive.
“It’s full of worksheets and printables’, nothing for the children to use.” The former ICT adviser agreed with this and had his own idea of an Irish central digital portal as mentioned previously.

4.6 Summary

20 schools were contacted to partake in the research questionnaire, 10 schools responded and 12 teachers completed the questionnaire. 3 schools were visited on field visits, 2 principals were interviewed, 2 post holders and one former ICT adviser. A focus group was also held. All participants were very co-operative and accommodating to the research. Research findings will be discussed in the following chapter.

5 Chapter 5 – Discussions

5.1 Introduction

The implications of the findings of Chapter 4 will be discussed in relation to each other and in light of the literature review of Chapter 2.

This chapter will first discuss ICT in Primary Schools, its history, initiatives implemented and its influence in schools. The second part of this chapter will explore ICT Methodologies, recommended by the Irish Primary school curriculum and the methodologies in use in the Irish classroom. Factors affecting Teachers Use of ICT external and internal will be discussed in the third section and the chapter will conclude with Incentives to use ICT.
5.2 ICT in Primary Schools

The research uncovered a considerable volume of ICT use among senior primary school teachers. *The Impact of Schools IT2000* found that use of ICT had increased more dramatically in primary than secondary schools. This was reflected in the experience of the former ICT adviser, who explained that because the secondary school teachers taught subject specific classes, courses for the primary school teachers were more readily attended because skills taught were transferrable across many class levels and subjects.

*The Blueprint for the future of ICT in Irish Education: Three Year Strategic Plan 2001-2003* (NPADC 2001b, p.10) believed that Education Centers were to play a “pivotal role in supporting the delivery of the Action Plan at local level. Centre based ICT Advisors [will] deliver back-up planning and advice services and provide training programmes for teachers in accordance with their identified needs.” Teachers in the focus groups spoke about the invaluable help and support the ICT adviser had provided to their schools. The teaching principal had consulted the ICT adviser on all school ICT purchases. Teachers in the focus group had been involved in ICT curriculum projects which the ICT adviser had set up in the teachers centre. Each of the teachers of the focus group could recall the ICT adviser visiting their school at some stage either as technical support or facilitating a project. The former ICT adviser spoke of a full workload. Because technology is ever changing, there was always something new to do. He spoke of how when he first took the job he was mostly involved in setting up email address’ and teaching basic computer maintenance, this has moved onto IWB’s, podcasting and video conferencing. He believed schools hadn’t noticed the full effect of a lack of support services because since the ICT advisers were abolished, no funding had since been released to the majority of school for ICT. Schools are at a standstill as they have no funds to purchase equipment and have to fundraise to maintain equipment (Interview 1).

The *National Broadband Programme for Schools 2004* was successful to a degree, with most schools reporting positive experiences. One teacher had her class involved in World Maths Day and children were able to compete with children around the world. This reflects the findings of BECTA (2005, p.3) who found that broadband connectivity allows technology to become embedded throughout a school and leads to significant
efficiency gains and changes in the work practices of staff and pupils. Unfortunately
the unreliability of satellite connection caused some complaints from members of the
focus group and was a major source of concern to the former ICT adviser (Interview 1).
More seriously, innovative schools who had sourced connections at their own expense
were penalised. The former ICT adviser had assisted those “innovative” schools at the
time and was surprised to find the schools could not claim back the grant after it was
introduced. He believed this act suppressed future innovation in primary schools.

The report *Investing Effectively in Information and Communications Technology in
Schools 2008-2013* was critical of the lack of direction or funding since *The Blueprint
for the future of ICT in Irish Education*, the results of the report have been hugely
disappointing. While their general conclusion stated that “while all schools are
equipped with some computers and have limited internet access, a lack of sufficient and
sustained investment over recent years has resulted in inadequate and ageing ICT
equipment in schools, no provision for technical support and inadequate levels of
broadband internet” (ICT Strategy Group 2008, p.1), little has been done since the
report to remedy this. The former ICT adviser cited rural schools with little or no
broadband connection a major concern in 2009 (Interview 1). The ICT post holders
interviewed acknowledged the grants received for hardware but spoke about the lack of
funding for general maintenance of the equipment. They cited small technical issues—
printers, ink cartridges, updating anti-virus software as consuming all of their time and
most of their ICT budget (Interview 3).

5.3 ICT Methodologies
The 2008 ICT Strategy Group referring to a Wold Bank Report, said that the advanced
education systems were focusing on “flexibility, creativity and problem solving through
Examples included ICT integration and community networks. The most advocated
teaching methodology in the Primary school curriculum for ICT were subject specific
CD ROM’s. According to the survey they were the most used by participants.
However members of the focus group pointed out that while they were good for drill
and practice, it was usually the “early finishers” who were allowed onto the computer
to use those CD’s. As only one child or two at most could use the computer at a time, it
was rare that the whole class got the benefit of the CD ROM. Many of the CD ROM’s
that members of the focus group used were “drill and practice” and thus not inspiring
much “flexibility, creativity and problem solving.” Teachers in the focus group spoke about how they often didn’t turn on the computer if they had a busy day as it took too much time to “set up” one child on a CD ROM while up to 29 children waited to be taught (Focus Group).

The report states that “teachers, who are catalysts of learning in the knowledge society, must be provided with incentives and encouraged to make their workplace and classrooms creative learning organisations where openness to new ideas and approaches can flourish”. (ICT Strategy Group 2008, p.18)

Data handling programs were advised to be used in five of the subjects yet many of the respondents did not know what data handling programs were (Questionnaire). Members of the focus group confessed to never having used them. When looking at the ICT teaching methodologies in relation to Art and P.E. with the focus group, they questioned the value of putting a child on a computer to use the methodologies advised instead of participating in a good Art or P.E. lesson. The reiterated the need to cover a large curriculum in 5th and 6th class and the pressure they were under, without “having to put on a computer as well. ”

Use of ICT in Gaeilge was very low in the survey, with “never” being the response most common for all Irish ICT methodologies. Surprisingly there are no ICT methodologies for Drama in the Curriculum Guidelines, yet teachers in the focus group have used the internet and ICT to facilitate drama lessons.

Scoilnet is the education portal of the Department of Education and Science (DES) in Ireland. It aims to promotes the “integration of ICT in teaching and learning” (NCTE 2009). 58% of respondents cited Scoilnet as a resource for ICT integration in the classroom. However on closer examination, 91% of respondents took advice from other colleagues and two-thirds of respondents got ideas from courses attended. Only 7 out of the 12 respondents to the survey used Scoilnet and those who used scoilnet also used Google, articles from Intouch, advice from colleagues, recommendations from courses attended and the Curriculum teacher guidelines (Questionnaire). Members of the focus group were not able to give any example of an interactive lesson they found worthwhile on Scoilnet. The found it hard to use as the resources were not listed in any particular order. Also many of the links were to American or UK educational sites and more were to book companies (Focus Group). The former ICT adviser found it to be very “disappointing” and instead gave examples of other countries education portals and advised the author to use those in her teaching (Interview 1).
5.4 Factors Affecting Teachers Use of ICT

5.4.1 External Factors

5.4.1.1 Infrastructure

70% of respondents to the survey felt they would use ICT more if or when their school purchased more computers, a computer suite or IWBs (Questionnaire). This reflects the findings of Pelgrum (1997) who reported the lack of ICT equipment as one of the most often cited school-level barriers to ICT use in schools. The frustration felt by the teachers in the focus group echoes Maternach-Wigans et al. (1999) observations that lack of access to ICT resources was one of the main reasons why they did not integrate ICT more into their teaching and learning.

The absence of up-to-date hardware and software, suitable for Irish primary schools was noted by the teachers in the focus group and the former ICT adviser. Grants were released with each initiative (Mulkeen 2004) yet there was very little direction given as to how to spend them. A principal interviewed, believes there is more guidance from the NCTE on how to spend grants (Interview 4) but the post holders found that there is very little money to maintain the existing hardware in the school (Interview 3).

The student to computer ratio in this study varied widely from the average Irish ratio of nine students to one computer (O’Flaherty and Shiel 2006). The lowest pupil computer ratio was found to be 2.6:1 and the highest 30:1. The teachers with the three lowest pupil computer ratios had 3 or more classes in their room and less than 15 children. The 3 highest pupil computer ratios had one class in the room and 29 to 30 children. The teachers with the 3 lowest ratios were teaching principals. The three highest were teachers in one of the largest schools in the study (Questionnaire).

Cuban et al. (2001) argued that infrastructure is more than a question of ‘availability’; it is also about access, location and organisation of resources. Thus from the findings of the survey and the focus group, children in most of the small schools, in multi-class settings have much more access to ICT than the children in the large single class setting. For example, the teaching principal with 3 computers in her classroom was able to facilitate her students taking part in World Maths Day as there were 5 children to a computer and they could take turns throughout the day. The same could not be done with 30 children and one computer. This echoes a report on teacher’s use of technology
by the National Centre for Education Statistics (Cronen and Smerdon 2000) which indicated a correlation between availability of computers and computer use.

3.4.1.2 Support
While Mulkeen (2004) found lack of technical support and maintenance to be the single item most frequently identified as an issue in all types of Irish schools, this did not rate as highly with the teachers in the focus group. The former ICT adviser noted that his job changed from being very technical in the early years to more project based in later years (Interview 1). Teachers in the focus group also praised the children in the senior classes for being very “tech savvy” and often fixed computers for them whenever there was a problem.

However the teachers did identify with Dawes (2001) when he spoke of the unreliability of hardware making teachers wary of using ICT in everyday teaching. Each member of the focus group was able to recount a story where they had a lesson prepared and the computer wouldn’t work or the printer stopped working. They concluded that “you can never rely on technology.” (Focus Group).

Meijer et al. (2003) reported confusion over uncoordinated sources of support, information and advice as a significant factor hindering Irish teachers’ use of ICT in Special Needs education. The teachers of the focus group echoed this when they wondered if it would be possible to have a set curriculum for ICT, if they could know what to cover in ICT skills each year.

In the focus group the teaching principal in particular mourned the loss of the ICT advisory service. In her experience the advisory service had lived up to its aims to “deliver back-up planning and advice services and provide training programmes for teachers in accordance with their identified needs” (NPADC 2001b, p.10). She gave the example of her own school of 3 teachers and did not see how anyone of her staff would have the time to take on extra ICT duties in the absence of an ICT adviser (Focus Group).

3.4.1.3 Time
Teachers in the focus group considered time to be one of the major obstacles in ICT integration, mirroring the findings of Chiero (1997) and Dawson (2000) and Mulkeen (2001). Jedeskog (2007) described the difficulties teachers had in having enough time
to learn how to handle and use the computer as a pedagogical tool. The teachers involved in the focus group suggested inservice days for ICT so teachers would have time to explore software and technology.

This relates to Fullan’s three stages to ICT Implementation; First, knowledge about the innovations’s existence and then making a decision whether or not to adopt it. Second, the implementation and finally, to consider continuing. From the focus group, the surveys and the interviews, teachers in this study seem to be between the second stage and the third stage.

A factor which facilitated the second stage was when teachers got advice from colleagues because they knew it worked and didn’t have to waste time on trial and error. An example of such is the teacher who trained online and was very technologically literate but because of her class size and workload, didn’t have time to integrate ICT fully into her classroom teaching (Field Visit).

3.4.1.4 Leadership and Planning
Chung (2007) belief that “School heads neglected the extra stress on teachers brought about by ICT adoption” would not correlate with this study as one third of the participants were teaching principals. However his belief that School leaders play an increasing role in leading change was echoed by the former ICT adviser when he explained that innovative schools were lead by a principal or a teacher supported by the principal, who was interested in ICT in education (Interview 1).

The “putting lipstick on a bulldog” (Kanter 2001 cited in Chung 2007) approach does hold true when the teachers of the focus groups described the various initiatives and books delivered to the school which nobody read. A severe lack of training and direction from the Department of Education was noted (Focus Group). While 75% of respondents to the survey cited more infrastructure as a means to integrate ICT into their teaching in the next five years, interestingly a quarter of respondents believed the future purchase of IWB’s in their school would enable them to fully integrate technology into their teaching (Questionnaire). The former ICT adviser claimed that there was only one full study to date on the value of IWB’s.

Fullan (1993) top down approach had been implemented in some of the schools the ICT advisor worked with. However as a large number of small schools were involved in this
study, and many of the respondents were teaching principals, lack of time and an already large workload have impeded a more widespread adoption of such an approach (Interview 1).

Cuban (1988) first order change and second-order change approach might work better in the smaller school. Until now most of the ICT duties in some schools have been left in the hands of the post holder and or the principal. Teachers in the focus group called for direct assistance from the department in the form of practical help, rather than theoretical help already sent out in the various books published after each ICT initiative. The former ICT advisers’ suggestion of a central online resource bank would facilitate both Cuban’s theory of change and Fullan’s top down approach.

3.4.1.5 Professional Development

Owston (2006) and Weets (1997) found that preparing teachers was the “main critical success factor in deploying ICT in education.” (Kirschner and Selinger 2003, p.3) Only two thirds of respondents to the survey had a module of ICT as part of their teacher training. One quarter of respondents never used computers while studying to be teachers. Half of respondents rarely or never used computers when studying to be teachers (Questionnaire).

This was also found in American teacher training institutions by the Milken Exchange on Educational Technology (1999). At most institutions between 25 and 50% of faculty members in the school of education integrated information technology in their teaching and only 25-50% of students frequently and systematically used ICT in their practice teaching (Kirschner and Selinger 2003, p.3).

Only half of the respondents of the survey attended ICT courses in the teacher centres. Some of the respondents who didn’t attend courses in the teacher centres also never used ICT in their studies to be teachers. This follows O’Grady’s study (2007) which found that newly qualified teachers needed more classroom practice in ICT in college to facilitate teaching with ICT when qualified.

3.4.2 Internal Factors

3.4.2.1 Demographics

Much research has investigated the effect of age and gender on ICT classroom usage. Rogers (1995) and Schiller (2000) found that teachers’ characteristics can influence the adoption of an innovation. The report by the National Center for Education Statistics
(2000) indicated that teachers with fewer years of experience were more likely to use computers in their classes than teachers with more years of experience (Afshari et al. 2009, p.80). Conflictingly Albirini (2006) found age not to be a factor and furthermore an Asian study by Bee Theng and Chia Hua (2008) found respondents aged over 45 years made more frequent use of ICT in schools. The findings from this research concur with Albirini and Bee Theng’s findings. 41.6% of respondents were over 25 years teaching. Three quarters of these respondents used ICT daily in their teaching and the children in their class used ICT “daily”. All these older respondents taught more than one class and the largest class size was 20. Each of these respondents were teaching principals (Questionnaire).

Bee Theng and Chia Hua (2008) found that young teachers aged below 35 recorded a higher mean of competency than older groups. This was also consistent with a report by the U.S. National Center for Education Statistics (2000) which revealed that new teachers, having grown up with computers, have greater computer skills to enhance their teaching and instructional practices (Bee Theng, and Chia Hua 2008,p.29). The average class size for younger teachers was 26.5. The majority of new teachers (66%) taught in a large school with a non-teaching principal. All young teachers used ICT in lesson preparation but only 33% used ICT daily in the classroom and 50% used computers weekly in the classroom and a further 16.7% of respondents had their students on the computer “seldom”(Questionnaire).

Researchers’ belief that “Technology is, and has been, a masculine domain” (Butler, 2000; Henwood, 2000; Schumacher & Morahan-Martin, 2001, Young, 2000), does not agree with the findings of this research. The majority of respondents were female (83.3%). Childrens use of ICT in a male teachers classroom was noted to be considerably less and listed as “weekly” or “seldom”(Questionnaire). These findings do not correlate with Jackson, Gardner and Schmitt (2001) who indicated that female users, compared with males, are more inclined to hold negative reactions to computers

3.4.2.4 Personality.
In contrast to Snoeyink and Ertmer (2001), Cox et al. (1999) and Scrimshaw (2004), the teachers in this study had a largely positive attitude to ICT. All respondents saw the benefits of ICT in teaching and 83.3% of respondents to the survey saw themselves using ICT more in the next 5 years. While Scrimshaw (2004) was concerned that
teachers do not, necessarily, have the skills to overcome “this lack of confidence”, all teachers had a computer at home, all teachers had a personal email account and 92.7% of teachers used a computer daily or almost daily. The older teachers who had not received a module of ICT in college had all attended computer courses in the local teacher centre (Questionnaire).

Afshari et al. (2009) found later adopters of ICT in education to be more realistic, steadier in their judgements, disliking fads and preferring to be guided by experience and having a more realistic appreciation of possibilities than early adopters. This was seen in the teaching principals who with many years experience used software recommended by colleagues and spoke of the learning benefits of some of the websites used (Questionnaire). The teacher who had her class participate in World Maths Day online found it reinforced skills taught in the classroom and gave the children a sense of accomplishment (Focus Group).

3.2.4.5 Profiency

It was found that Irish Primary teachers prior to IT2000 demonstrated limited competence in ICT, a quarter having ‘no computer skill’ (Mulkeen 2004, p.18). “By 2000 90% of primary teachers and 73% of post primary teachers were reported to have some computer skills” (Mulkeen 2001, p.2). During the school years 2005/2006, the Irish Inspectorate found that “Only 30% of primary teachers and 25% of post-primary teachers rated their ability as either “intermediate” or “advanced” with regard to using teaching and learning methods that are facilitated by ICT” (Inspectorate 2008, p.xviii).

The respondents to this study all had a computer at home and a personal email account. Daily usage of the internet was the most common (58.3%) (Questionnaire) and the former ICT adviser believed teacher competence in ICT had improved as most used it in their daily lives (Interview 1).

Initial set up and new technologies still seem to be the most problematic. One older teacher, also a teaching principal, relied on her son to help set up new software and technologies for her (Focus Group). The former ICT adviser had always been consulted on new technologies introduced to schools (Interview 1).
2.5.1.1 Pedagogical Compatibility

Ertmer et al (2001) found that the most common variable among technology using teachers was the belief that technology provided a valuable tool for achieving their visions of teaching and learning. Teachers in the focus group and in the questionnaire all believed in the potential of using new technology with children. However all teachers surveyed and in the focus group found it difficult to integrate technology into teaching.

Zhao, Cox and Newhouse found that a technology based innovation is more likely to be successfully implemented when the technology fits the content to be taught and the teaching style of the teacher. Teachers spoke of having large classes and one computer and the difficulty in catering for all needs. Cox et al (1999) found that “if teachers perceive no need to change their professional practice, they are unlikely to adopt the use of ICT”. Warschauer (2003) described this as having the hardware, the software, but not the ‘humanware’.

The findings of the questionnaire and focus group correlated with Ertmer et al (1999). In an American case study of a small number of primary teachers the researchers identified three levels of computer use. Using ICT as:

• a supplement to the curriculum (e.g., during free time or as a reward for completing other assignments)

• a reinforcement or enrichment of the current curriculum

• a facilitator for an emerging curriculum.

Teachers in this study largely used the first two levels of computer use. They used drill and practice programs as a supplement to the curriculum or as a reinforcement or enrichment of the current curriculum. None of the focus group used ICT regularly for lesson delivery, however all the focus group used ICT for lesson preparation.

The focus group echoed Mulkeen’s sentiments in 2001 when he stated that “future training will need to focus on building a pedagogical vision for ICT, aimed at both teachers and principals (Mulkeen 2001, p.3).
5.5  Incentives to use ICT

5.5.1 Professional Development
The “bottom-up” approach of Haydn and Barton (2007) would be a welcome professional development programme for the teachers in this study. Teachers in the focus group spoke of needing time to explore the technology and to discuss with colleagues the benefits. They trialled an approach which allocated time for teachers to reflect on their own practice in using ICT. Haydn and Barton (2007) found that teachers appreciated the programme structure because it “gave them time to construct knowledge of a new pedagogy which included ICTs” (A famazaga-Wright 2008).

Jamissen and Phelps (2006) believed also in the value of mentoring, and this was further supported by the questionnaire when 91.7% of respondents cited “colleagues” as the main source of ideas for ICT integration.

Baylor and Ritchie (2002) found that professional development made a difference to teacher morale and therefore teacher willingness to embrace innovation in their classroom practice (A famazaga-Wright 2008) and that professional development initiatives should gear towards the needs of teachers, and include exemplars and continuing assistance to support teacher development. Teachers in the focus group spoke of being “lost” with all they were expected to do and the impracticality of the large publications sent out by the NCTE after the launch of various initiatives. They found short pieces in the INTO Intouch magazine to be more beneficial as they felt they were pitched at their level and took their classroom situation into account. This concurs with Lumpe and Chambers (2001) who found that providers of professional development should take note of teacher beliefs in all areas of teaching and learning, in order to plan for effective professional development.

5.5.2 Mentoring
As mentioned previously, the former ICT adviser found that most innovation happened in schools because of the drive of one person, sometimes the principal, sometimes a teacher. None of the teachers surveyed were B-post holders for ICT. The former ICT adviser believed the job of the post holder for ICT in the school to be quite immense.
He worried about the effects of the report “Investing Effectively in Information and Communications Technology in Schools. 2008-2013” and the onus it was laying on the post holder and the principal. When working as the ICT adviser, he was very busy, particularly when schools were purchasing equipment. With the onset of Interactive
Whiteboards and other new IT equipment, the teaching post holder and the principal will have no adviser to consult.

He also gave an example of schools that have been innovative and penalised for it. Some schools were lucky to have individual members of staff who saw the value of networking the school computers and or setting up broadband. Those schools benefited to great expense which in most cases was fundraised for by the teachers, pupils and parents. When the Schools Broadband Scheme was introduced, those schools assumed they would qualify for the grant too and be reimbursed. That was not so, and only schools who weren’t networked and weren’t on broadband qualified for the grant. In effect, those schools who sought to be innovative, were penalised. “Why should anyone bother, when that’s the way you’re rewarded” he concluded (Interview 1).

5.5.3 Online Learning Environments
In 2004 the Northern Ireland emPowering Schools found that “when ICT use is integrated across the whole of the school curriculum then standards of attainment can improve.” (Education Technology Strategy Management Group 2004, p.1) It developed Learning NI as a “unique opportunity to establish online communities of practice.” (Education Technology Strategy Management Group 2003, p.17)

In tandem with its new National Curriculum for Excellence, Scotland launched Glow in 2007 as the world’s first national intranet for education. Through Glow Scottish educators have access to resources which actively promote creative learning and teaching (Learning and Teaching Scotland 2009)

Scoilnet, launched in 1998 claims to be the Irish “education portal” of the Department of Education and Science. However, when questioned, the majority of respondents got their lesson ideas for ICT from colleagues. More respondents used search engines such as google, than scoilnet. Teachers in the focus group found scoilnet to be very “un-interactive”.

5.6 Conclusion
The ICT advisory service was found to have been widely used and most missed by the teachers in the research findings. Lack of time and training impede teachers filling this void. Many of the teaching methodologies recommended in the primary school curriculum are unknown to the teachers or are not practical to implement in the average
classroom. The Scoilnet website, while used as a resource by some was not seen as an invaluable resource. Lack of infrastructure was the biggest impediment to ICT integration in the classroom. Lack of technical support was no longer as big an issue as when Mulkeen (2004) cited it; however the ICT post holders in the large school did find this a major concern. Time and lack of proper pedagogical training has lead to schools investing in good equipment that is rarely used. Women were found to be more frequent users of ICT in the classroom, however this might not be fully representational as primary school teaching is a female dominated profession. Age did not hinder ICT integration, and research suggests that some of the older teachers were more comfortable integrating ICT into their teaching.

6 Chapter 6 – Conclusion

6.1 Introduction

This research sought to examine the implementation of ICT Teaching Methodologies in the Primary School Curriculum of 5th and 6th class. This final chapter will initially review the investigation. Conclusions will then be drawn based on the findings yielded in Chapter 4 and the implications discussed in Chapter 5. This chapter will conclude with recommendations relevant to the situation under study, and suggestions for further research.

6.2 Review of Investigation

This investigation of the implementation of ICT Teaching Methodologies in the Primary School Curriculum of 5th and 6th class was intended to examine mainstream class teachers understanding and use of the ICT Teaching Methodologies laid out in the Teacher Guidelines of the Primary School Curriculum 1999.

On approaching this research project four areas of interest were identified:

- The introduction and growth of ICT in primary school
- The ICT Methodologies advocated by the Primary School Curriculum
- Factors Affecting Teachers Use of ICT
- Incentives and Encouragements to use ICT in the classroom

The relevant literature was reviewed in relation to the four interest areas above.
A Qualitative Case Study approach was selected as the research methodology as it was intended to afford an in-depth insight into the situation under study.

Following analysis of the findings in light of the literature, the investigation’s outcomes are outlined in the conclusions that follow.

6.3 Research Outcomes
Outcomes can be drawn from the three initial research questions:

- Have the ICT Teaching Methodologies in the Primary School Curriculum been implemented?
- What factors promoted the implementation of the ICT Teaching Methodologies in the Primary School Curriculum?
- What factors impeded the implementation of the ICT Teaching Methodologies?

6.3.1 Implementation of ICT Teaching Methodologies in the Primary School Curriculum
Some of the suggested ICT teaching methodologies have been implemented. Use of Subject Specific CD-roms were advocated in most subject guidelines and found to be the most commonly used ICT application in classrooms in this case study. However, due to the discrepancy of equipment distribution, while some pupils used these CDs on a regular basis, others used them rarely or only as ‘early finisher’ activities.

Many teachers used word processing for their own lesson preparation and classroom displays. Some classes with lower pupil computer ratio did word processing as part of English and SESE. Teachers of larger classes cited “time” and “large class size” as reasons for not using ICT methodologies at all in their teaching. Many of the methodologies recommended were not understood or known by the teachers surveyed, namely; LOGO, data bases and music notation software. Some methodologies were considered impractical for certain subjects such as P.E. or Art.

6.3.2 Factors which promoted the implementation of ICT
The biggest factor in the implementation of ICT methodologies was the teachers’ own interest in ICT. Teachers were found to attend night classes in the education centre in their own time and prepare work using ICT in their own time. Teachers were found to be willing to learn from each other and were very receptive to peer suggestion.
Leadership in the school was also a major factor, leading to more investment in ICT in the school and encouragement of innovative practices.

Small class size led to increased ICT integration in this case study. Students in rural schools in a multi-class setting received more hands on computer time per week than students of large urban schools in single classes. Senior classrooms in rural schools with over two classes also had more computers per classroom, which contributed to this increased use of technology by the students.

6.3.3 Factors which impeded the implementation of ICT
Many factors impeded the implementation of ICT methodologies. Lack of funding and direction from the governing bodies was cited by principals and post holders. Sporadic grants and the inclusion of the ICT grant in the minor works scheme has left little for the maintenance of existing equipment. The pressure of having to use technology in an already vast curriculum without proper training or formal ICT policy was cited by teachers surveyed. The abolition of the ICT advisory service was believed to be a retrograde step by many interviewed and surveyed, contributing to teachers feelings of isolation in trying to implement ICT teaching methodologies in the classroom.

6.4 Recommendations
This study has identified a number of issues in implementing ICT teaching methodologies in the Primary School Curriculum. In order to implement and integrate ICT as a tool for learning in the senior classes in primary school, the following recommendations are proposed:

6.4.1 Pedagogically appropriate ICT methodologies
Further research should be undertaken to identify pedagogically appropriate ICT methodologies for the Irish Primary School classroom, taking into consideration the average Irish class size. A minimum of 4 computers and one printer per classroom was recommended by the former ICT adviser. Findings from this research showed greater use of ICT in classrooms with three or more computers.

6.4.2 Formal ICT policy
A framework of skills to be completed by children before they leave primary school would give direction and guidance to class teachers. Teachers suggested the provision
of the software needed on CD to each school or through an online learning environment which the school could download to the school computers each year.

6.4.3 Virtual Learning Environment
Teachers in this study sought advice from colleagues more frequently than other facilities for help and ideas in ICT integration. Neighbouring countries Scotland and Northern Ireland have utilised online portals to great effect. An interactive blog or e-portal such as the type suggested by the former ICT adviser would facilitate sharing of resources, ideas, peer tutoring and mentoring. It could also work with the previous recommendation and have resources and software available for Irish primary teachers to download and use in their classrooms.

6.4.4 Equipment maintenance
The issues surrounding the maintenance of school ICT equipment should be investigated and practical solutions identified. Due to lack of knowledge and time on the part of principals and school post holders, money is regularly spent on maintaining hardware. This necessitates a teacher or principal bringing equipment to a professional after school hours or calling a professional to the school and paying call out charges. With the numbers of schools clustered together and the amount of equipment in each school, would it be more viable to employ a full time computer maintenance technician who could service an area the size of this case study?

6.5 Conclusion
This case study on 20 schools in the environs of a large town in the west of Ireland, examined the implementation of ICT teaching methodologies in the primary school curriculum in 5th and 6th class. As a result, the findings may not be able to be generalised to all primary schools in Ireland. However the results of this investigation provide some insight into mainstream class teachers strengths and difficulties in implementing and using this modern teaching method.

It is clear from this research that to implement ICT teaching methodologies in every school, clear and structured direction and supports are needed. Innovation and initiative should be encouraged and acknowledged. Scoilnet should be replaced or upgraded to become an interactive, engaging and useful e-portal in line with those provided by other countries Departments of Education. It is hoped with the implementation of
recommendations mentioned above that ICT teaching methodologies would become established, standard tools of the learning process in primary schools.
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# Appendix A

ICT teaching methodologies in the Primary School Curriculum: Teachers

## 1. Introduction

Thank you for taking the time to complete this questionnaire. No names of teachers, schools or children will be used in the publication of this research.

* 1. Please indicate which class level you teach:
   - [ ] 5th class
   - [ ] 6th class
   - [ ] 5th & 6th classes
   - [ ] 4th, 5th & 6th classes
   - [ ] 3rd-5th classes
   - [ ] Other (please specify)

* 2. How many children do you have in your classroom?

* 3. Do you have a classroom assistant/special needs assistant working in your room for any period of the school day
   - [ ] Yes
   - [ ] No

* 4. Does your school have a “teaching” principal?
   - [ ] Yes
   - [ ] No

* 5. How many mainstream classes/teachers does your school have?

---

100
2. Personal Details

10 questions to give a picture of your qualifications and training in ICT.

* 6. Please tick:
   - Male
   - Female

* 7. Please tick your age range:
   - 20-29 years
   - 30-39 years
   - 40-49 years
   - 50-59 years
   - 60-65 years

* 8. Please tick the number of years you are teaching:
   - 0-4 years
   - 5-9 years
   - 10-14 years
   - 15-19 years
   - 20-24 years
   - 25-29 years
   - 30-34 years
   - 35-39 years
   - 40-44 years
   - 45 years or more
ICT teaching methodologies in the Primary School Curriculum: Teachers

9. Where did you train?
   - in an Irish Teacher Training College as a full-time B.ed
   - in an Irish Teacher Training College as a full time Post Grad
   - in the UK as a full time Post Grad
   - in another country as a full time undergraduate
   - online, as a postgraduate student
   - Other (please specify)

10. While training to be a primary school teacher, how often did you use computers in your studies and teaching practice?
   - Constantly
   - Often
   - Sometimes
   - Rarely
   - Never

11. Was there a module of ICT in education as part of your teacher training course?
   - Yes
   - No

12. Have you ever attended an IT course either as an evening course or a summer course? (For this question, all forms of digital technology are included under IT i.e. digital camera, IWB etc)
   - Yes
   - No

13. If yes, how many courses have you attended in ICT?

ICT teaching methodologies in the Primary School Curriculum: Teachers

14. Have you completed any Graduate Diploma in the area of ICT?
   - Yes
   - No
   - Name of Qualification

15. Have you a Masters Degree?
   - Yes
   - No
   - Name of Masters
### 3. ICT Methodologies in the Primary School Curriculum

Below are the Teaching Methodologies for ICT suggested by the primary school curriculum. They are grouped by subject and can be found in each of the Curriculum Guideline books. Read each methodology carefully and tick which statement applies to your use of these teaching methodologies in the classroom: Always, Sometimes, Rarely, Never, What is this?

Answer each one in relation to the subject it is grouped under.

* 16. English

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<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
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### ICT teaching methodologies in the Primary School Curriculum: Teachers

#### 4.

**17. Gaeilge**

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#### 5.

**18. Mathematics**

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<td></td>
<td></td>
</tr>
<tr>
<td>Use of internet to access information for above mentioned exercises</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ICT teaching methodologies in the Primary School Curriculum: Teachers

### 6.

**19. History**

I use .....  

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data-handling programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a number of simulation-style programs/History games</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word-processing and drawing programs to communicate findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD-ROMs for History</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the Internet to access a wide range of sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using email and Internet to link with other schools to share research</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 7.

**20. Geography**

I use .....  

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data-handling programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-D and 3-D mapping games</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word-processing and drawing programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD-ROMs for reference purposes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlases on CD-ROM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital weather-recording instruments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the Internet for reference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using Internet and email to link with other schools and agencies to share work and findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ICT teaching methodologies in the Primary School Curriculum: Teachers

#### 8.

* 21. Science

<table>
<thead>
<tr>
<th>I use ......</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What Is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data-handling programs</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Many interactive programs, with virtual experiments</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Word-processing and drawing programs to communicate results</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The internet to access a wide range of sources.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The internet and email to communicate with other schools and share findings.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CD-ROMs based on science.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sensors attached to the computer that detect and measure temperature, light, sound, position, humidity or pressure</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

#### 9.

* 22. Visual Arts

<table>
<thead>
<tr>
<th>I use ......</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What Is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painting and drawing programs.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Computer activities designed by the teacher to teach specific aspects of the visual arts programme.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>A page make-up ('desktop publishing') program to extend graphic work.</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CD-ROM's of art</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Using the internet to access resources</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
**ICT teaching methodologies in the Primary School Curriculum: Teachers**

**10.**

**23. Music**

<table>
<thead>
<tr>
<th>I use .....</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-ROMs for music</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Packages which allow the teacher to create form charts and add text messages to accompany any available CD. With this software, the teacher can design a visual aid to any listening lesson.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Synchronised text messages</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Projection systems</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The Internet as a source of reference</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Use of Internet and email to link with other schools</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Midi compatible keyboards</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Notation Software</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**11.**

**24. Physical Education**

<table>
<thead>
<tr>
<th>I use .....</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Internet to research sport and history of different sports.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>CD Rom Encyclopaedias on sport</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The use of databases</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
### ICT teaching methodologies in the Primary School Curriculum: Teachers

**25. Social, Personal and Health Education**

I use ......

<table>
<thead>
<tr>
<th>Access and retrieve information</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What Is this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore some techniques used in the media and the various technologies for communication available to them</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learn to make decisions and become more discerning in their use of the technology and the media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop self-confidence in using a wide range of technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance their relationship skills as they discover new ways of communicating and explore and learn together</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use CD-ROMs for reference in SPHE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use word-processing programs and publishing programs to redraft and edit work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>View television and listen to radio programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use the Internet for research</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ICT teaching methodologies in the Primary School Curriculum: Teachers

#### 13. ICT usage

**26. Do you have a personal computer and/or laptop at home?**
- [ ] PC
- [ ] Laptop
- [ ] None

**27. Do you have a personal email account?**
- [ ] Yes
- [ ] No

**28. Which would best describe your internet and email usage?**
- [ ] Daily
- [ ] Almost daily
- [ ] Weekly
- [ ] Fortnightly
- [ ] Monthly
- [ ] Seldom
- [ ] Never

**29. Do you use the computer and the internet for lesson preparation?**
- [ ] Yes
- [ ] No

**30. Do you use the computer and internet for lesson delivery?**
- [ ] Yes
- [ ] No

**31. Do you have an Interactive Whiteboard in your classroom?**
- [ ] Yes
- [ ] No
**ICT teaching methodologies in the Primary School Curriculum: Teachers**

* 32. Does your school provide you with a laptop for use in your teaching?
  - [ ] Yes
  - [ ] No

* 33. Please type in the amount of each type of equipment in your classroom.
  - [ ] Laptop
  - [ ] Interactive White Board
  - [ ] P.C.
  - [ ] Digital Camera
  - [ ] Projector

* 34. Does your school have a computer room or a laptop trolley?
  - [ ] Yes
  - [ ] No

* 35. The children in my classroom use the computer:
  - [ ] Daily
  - [ ] Weekly
  - [ ] Fortnightly
  - [ ] Seldom
  - [ ] Never
14. ICT in the Classroom

* 36. Tick the statements which apply.
   Children in my class use the classroom computer to:
   - [ ] Use subject based CD ROMs
   - [ ] Research the internet for projects and classroom work
   - [ ] Use word processing programs to type up work
   - [ ] Prepare presentations for the rest of the class
   - [ ] Use subject specific internet sites and games
   - [ ] Other (please specify)

* 37. Are you the ICT post holder in the school?
   - [ ] Yes
   - [ ] No

* 38. Do you know the name of the Irish Government agency established to provide advice, support and information on the use of information and communications technology (ICT) in education?
   - [ ] Yes
   - [ ] No

   If "Yes", type in the 4 initials of that government agency.

* 39. Did you have an ICT advisor attached to your local education centre?
   - [ ] Yes
   - [ ] No
   - [ ] I don't know

* 40. Have you ever requested help or had the ICT adviser out to your school?
   - [ ] Yes
   - [ ] No
**ICT teaching methodologies in the Primary School Curriculum: Teachers**

* 41. Can you see yourself using ICT more in your teaching in the next 5 years?
   - [ ] Yes
   - [ ] No

   Give reasons why.

* 42. Do you see benefits in using ICT in teaching?
   - [ ] Yes
   - [ ] No

   Give reasons why

* 43. Where do you get your lesson ideas for ICT integration?
   - [ ] From Curriculum Teacher Guidelines
   - [ ] Scollnet
   - [ ] Using search engine e.g. google
   - [ ] Recommended sites from publications such as in Touch
   - [ ] Recommendations from Colleagues
   - [ ] Recommendations from courses attended

   Other (please specify)

* 44. Final question for office use only. The following information will not be published or distributed in any form.

   Name
   School
   Roll No.
Appendix B

Summary of results from questionnaire (completed online or written)

## ICT teaching methodologies in the Primary School Curriculum: Teachers use and understanding

1. Please indicate which class level you teach:

<table>
<thead>
<tr>
<th>Class Level</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th class</td>
<td>25.0%</td>
<td>3</td>
</tr>
<tr>
<td>6th class</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>6th &amp; 7th classes</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>4th, 5th &amp; 6th classes</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>3rd-6th classes</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

*answered question: 12  skipped question: 0*

2. How many children do you have in your classroom?

*answered question: 12  skipped question: 0*

3. Do you have a classroom assistant/special needs assistant working in your room for any period of the school day

<table>
<thead>
<tr>
<th>Response</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>66.7%</td>
<td>8</td>
</tr>
</tbody>
</table>

*answered question: 12  skipped question: 0*
4. Does your school have a "teaching" principal?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>41.7%</td>
<td>5</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

6. How many mainstream classes/teachers does your school have?

<table>
<thead>
<tr>
<th></th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

6. Please tick:

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Female</td>
<td>83.3%</td>
<td>10</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

7. Please tick your age range:

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29 years</td>
<td>41.7%</td>
<td>6</td>
</tr>
<tr>
<td>30-39 years</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>40-49 years</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>50-59 years</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>60-65 years</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0
8. Please tick the number of years you are teaching:

<table>
<thead>
<tr>
<th>Years</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 years</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>5-9 years</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>10-14 years</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>15-19 years</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>20-24 years</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>25-29 years</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>30-34 years</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>35-39 years</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>40-44 years</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>45 years or more</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question: 12  
skipped question: 0

9. Where did you train?

<table>
<thead>
<tr>
<th>Training Method</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an Irish Teacher Training College as a full-time B.Ed</td>
<td>66.7%</td>
<td>8</td>
</tr>
<tr>
<td>In an Irish Teacher Training College as a full time Post Grad</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>In the UK as a full time Post Grad</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>In another country as a full time undergraduate</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>online, as a postgraduate student</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>8.3%</td>
<td>1</td>
</tr>
</tbody>
</table>

answered question: 12  
skipped question: 0
10. While training to be a primary school teacher, how often did you use computers in your studies and teaching practice?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constantly</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Often</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>26.0%</td>
<td>5</td>
</tr>
<tr>
<td>Never</td>
<td>26.0%</td>
<td>3</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

11. Was there a module of ICT in your education as part of your teacher training course?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>66.7%</td>
<td>8</td>
</tr>
<tr>
<td>No</td>
<td>33.3%</td>
<td>4</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

12. Have you ever attended an IT course either as an evening course or a summer course? (For this question, all forms of digital technology are included under IT i.e. digital camera, IWB etc)

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>50.0%</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>50.0%</td>
<td>6</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

13. If yes, how many courses have you attended in ICT?

<table>
<thead>
<tr>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

answered question 6
skipped question 0
14. Have you completed any Graduate Diploma in the area of ICT?

<table>
<thead>
<tr>
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<tr>
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16. Have you a Masters Degree?

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<tr>
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16. English I use......

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<tr>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
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<tbody>
<tr>
<td>Reading on screen instructions to develop literacy</td>
<td>16.7% (2)</td>
<td>41.7% (6)</td>
<td>26.0% (3)</td>
<td>16.7% (2)</td>
<td>0.0% (0)</td>
<td>2.42</td>
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<tr>
<td>Use of computer programs &amp; CD ROMs for literacy</td>
<td>25.0% (3)</td>
<td>33.3% (4)</td>
<td>26.0% (3)</td>
<td>16.7% (2)</td>
<td>0.0% (0)</td>
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<tr>
<td>Reference books on CD Rom</td>
<td>25.0% (3)</td>
<td>16.7% (2)</td>
<td>26.0% (3)</td>
<td>83.3% (4)</td>
<td>0.0% (0)</td>
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<tr>
<td>Word processing programs for process writing</td>
<td>60.0% (8)</td>
<td>33.3% (4)</td>
<td>8.3% (1)</td>
<td>8.3% (1)</td>
<td>0.0% (0)</td>
<td>1.75</td>
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<tr>
<td>Concept keyboards</td>
<td>0.0% (0)</td>
<td>8.3% (1)</td>
<td>16.7% (2)</td>
<td>60.0% (6)</td>
<td>26.0% (3)</td>
<td>3.92</td>
</tr>
<tr>
<td>Using e-mail and Internet to communicate student work with other schools</td>
<td>8.3% (1)</td>
<td>33.3% (4)</td>
<td>16.7% (2)</td>
<td>41.7% (6)</td>
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Answered question | 12 |
| Skipped question | 0 |
### 17. Gaeilge I use......

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<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
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<td>Games for maths, events and</td>
<td>16.7%</td>
<td>33.3%</td>
<td>8.3%</td>
<td>41.7%</td>
<td>0.0% (0)</td>
<td>2.76</td>
<td>12</td>
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<td>interactive stories</td>
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<td>(4)</td>
<td>(1)</td>
<td>(6)</td>
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<tr>
<td>Programs to help the writing</td>
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<td>16.7%</td>
<td>41.7%</td>
<td>41.7%</td>
<td>0.0% (0)</td>
<td>3.26</td>
<td>12</td>
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<tr>
<td>process, drafting, redrafting</td>
<td>(0)</td>
<td>(2)</td>
<td>(6)</td>
<td>(6)</td>
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<td></td>
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<tr>
<td>and editing</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Use of pictures and graphics</td>
<td>16.7%</td>
<td>16.7%</td>
<td>25.0%</td>
<td>41.7%</td>
<td>0.0% (0)</td>
<td>2.92</td>
<td>12</td>
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<tr>
<td>to add to story writing</td>
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<td>(2)</td>
<td>(3)</td>
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<td>90.9%</td>
<td>0.0% (0)</td>
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<td>11</td>
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<td>of communication with other</td>
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<td>(0)</td>
<td>(10)</td>
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<td>schools Gaeilge</td>
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<td>16.7%</td>
<td>16.7%</td>
<td>41.7%</td>
<td>0.0% (0)</td>
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<td>reference and for services</td>
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<td>(2)</td>
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<td>(6)</td>
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<td>available through Irish</td>
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<tr>
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<td>work</td>
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<td>(4)</td>
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<td>Irish lessons in the “virtual”</td>
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<td>classroom, interaction with</td>
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<td>(0)</td>
<td>(1)</td>
<td>(11)</td>
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<td>other teachers and learners</td>
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**answered question** 12

**skipped question** 0

### 18. Mathematics I use......

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<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
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<td>16.7%</td>
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<td>(2)</td>
<td>(3)</td>
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<td>Adventure programs solving</td>
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<td>8.3%</td>
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<td>(0)</td>
<td>(10)</td>
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<tr>
<td>Use of internet to access</td>
<td>16.7%</td>
<td>33.3%</td>
<td>8.3%</td>
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**answered question** 12

**skipped question** 0
### 19. History I use

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<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
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<tr>
<td>data-handling programs</td>
<td>0.0% (0)</td>
<td>9.1% (1)</td>
<td>9.1% (1)</td>
<td>63.6% (7)</td>
<td>18.2% (2)</td>
<td>3.91</td>
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<td>a number of simulation-style programs/History games</td>
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<td>38.4% (4)</td>
<td>38.4% (4)</td>
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<td>word-processing and drawing programs to communicate findings</td>
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<td>41.7% (6)</td>
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<td>33.3% (4)</td>
<td>0.0% (0)</td>
<td>2.76</td>
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<tr>
<td>CD-ROMs for History</td>
<td>8.3% (1)</td>
<td>66.7% (8)</td>
<td>16.7% (2)</td>
<td>8.3% (1)</td>
<td>0.0% (0)</td>
<td>2.26</td>
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<tr>
<td>using the internet to access a wide range of sources</td>
<td>66.7% (8)</td>
<td>33.3% (4)</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>0.0% (0)</td>
<td>1.33</td>
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<tr>
<td>using email and Internet to link with other schools to share research</td>
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<td>16.7% (2)</td>
<td>16.7% (2)</td>
<td>66.7% (8)</td>
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**answered question 12**

**skipped question 0**

### 20. Geography I use

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<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
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<td>19.2% (2)</td>
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<td>18.2% (2)</td>
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<td>2-D and 3-D mapping games</td>
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<td>25.0% (3)</td>
<td>8.3% (1)</td>
<td>66.7% (8)</td>
<td>0.0% (0)</td>
<td>3.42</td>
<td>12</td>
</tr>
<tr>
<td>Word-processing and drawing programs</td>
<td>8.3% (1)</td>
<td>16.7% (2)</td>
<td>16.7% (2)</td>
<td>66.7% (7)</td>
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<tr>
<td>CD-ROMs for reference purposes</td>
<td>16.7% (2)</td>
<td>66.0% (8)</td>
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<td>25.0% (3)</td>
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<tr>
<td>Atlases on CD-ROM</td>
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<td>25.0% (3)</td>
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<td>41.7% (6)</td>
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<td>Digital weather-recording instruments</td>
<td>0.0% (0)</td>
<td>8.3% (1)</td>
<td>25.0% (2)</td>
<td>66.7% (8)</td>
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<tr>
<td>Using the Internet for reference</td>
<td>66.7% (7)</td>
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<td>0.0% (0)</td>
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<tr>
<td>Using Internet and email to link with other schools and agencies to share work and findings</td>
<td>8.3% (1)</td>
<td>16.7% (2)</td>
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<td>76.6% (8)</td>
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**answered question 12**

**skipped question 0**
### 21. Science I use.....

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<th>Rarely</th>
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<th>Rating Average</th>
<th>Response Count</th>
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<tr>
<td>Data-handling programs</td>
<td>0.0%</td>
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<td>41.7%</td>
<td>25.0%</td>
<td>16.7%</td>
<td>3.42</td>
<td>12</td>
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<tr>
<td>Many interactive programs</td>
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<td>60.0%</td>
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<td>41.7%</td>
<td>0.0%</td>
<td>2.92</td>
<td>12</td>
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<tr>
<td>Word-processing and drawing programs to communicate results</td>
<td>8.3%</td>
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<td>0.0%</td>
<td>2.67</td>
<td>12</td>
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<tr>
<td>The internet to access a wide range of sources.</td>
<td>60.0%</td>
<td>41.7%</td>
<td>0.0%</td>
<td>8.3%</td>
<td>0.0%</td>
<td>1.67</td>
<td>12</td>
</tr>
<tr>
<td>The internet and email to communicate with other schools and share findings.</td>
<td>8.3%</td>
<td>8.3%</td>
<td>25.0%</td>
<td>60.0%</td>
<td>8.3%</td>
<td>3.42</td>
<td>12</td>
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<tr>
<td>CD-ROMs based on science.</td>
<td>0.0%</td>
<td>68.7%</td>
<td>25.0%</td>
<td>8.3%</td>
<td>0.0%</td>
<td>2.42</td>
<td>12</td>
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<tr>
<td>Sensors attached to the computer that detect and measure temperature, light, sound, position, humidity or pressure</td>
<td>0.0%</td>
<td>16.7%</td>
<td>8.3%</td>
<td>68.7%</td>
<td>8.3%</td>
<td>3.67</td>
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**answered question** 12

**skipped question** 0

### 22. Visual Arts I use.....

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<th>What is this?</th>
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<th>Response Count</th>
</tr>
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<tr>
<td>Painting and drawing programs.</td>
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<td>33.3%</td>
<td>0.0%</td>
<td>68.3%</td>
<td>0.0%</td>
<td>3.08</td>
<td>12</td>
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<tr>
<td>Computer activities designed by the teacher to teach specific aspects of the visual arts programme.</td>
<td>0.0%</td>
<td>16.7%</td>
<td>8.3%</td>
<td>76.0%</td>
<td>0.0%</td>
<td>3.58</td>
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<td>A page make-up (&quot;desktop publishing&quot;) program to extend graphic work.</td>
<td>0.0%</td>
<td>16.7%</td>
<td>0.0%</td>
<td>76.0%</td>
<td>8.3%</td>
<td>3.75</td>
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</tr>
<tr>
<td>CD-ROM's of art</td>
<td>8.3%</td>
<td>41.7%</td>
<td>16.7%</td>
<td>33.3%</td>
<td>0.0%</td>
<td>2.75</td>
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<tr>
<td>Using the internet to access resources</td>
<td>41.7%</td>
<td>60.0%</td>
<td>0.0%</td>
<td>8.3%</td>
<td>0.0%</td>
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**answered question** 12

**skipped question** 0
### Music I use

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<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
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<td>CD-ROMs for music</td>
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<td>Rarely</td>
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<td>0.0% (0)</td>
<td>3.00</td>
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<tr>
<td>Packages which allow the teacher to create form charts and add text messages to accompany any available CD. With this software, the teacher can design a visual aid to any listening lesson.</td>
<td>0.0%</td>
<td>8.3%</td>
<td>Rarely</td>
<td>26.0%</td>
<td>60.0%</td>
<td>16.7% (2)</td>
<td>3.76</td>
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<td>Synchronised text messages</td>
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<td>0.0%</td>
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<td>25.0% (3)</td>
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<td>Projection systems</td>
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<tr>
<td>The internet as a source of reference</td>
<td>41.7%</td>
<td>41.7%</td>
<td>Rarely</td>
<td>16.7%</td>
<td>0.0%</td>
<td>0.0% (0)</td>
<td>1.75</td>
</tr>
</tbody>
</table>

### Physical Education I use

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>The internet to research sport and history of different sports.</td>
<td>16.7%</td>
<td>66.7%</td>
<td>Rarely</td>
<td>0.0%</td>
<td>16.7%</td>
<td>0.0% (0)</td>
<td>2.17</td>
</tr>
<tr>
<td>CD Rom Encyclopaedias on sport</td>
<td>9.1%</td>
<td>27.3%</td>
<td>Rarely</td>
<td>9.1%</td>
<td>64.6%</td>
<td>0.0% (0)</td>
<td>3.09</td>
</tr>
<tr>
<td>The use of databases</td>
<td>0.0%</td>
<td>Rarely</td>
<td>9.1%</td>
<td>0.0%</td>
<td>90.9%</td>
<td>0.0% (0)</td>
<td>3.82</td>
</tr>
</tbody>
</table>
26. Social, Personal and Health Education I use ......

<table>
<thead>
<tr>
<th>Activity</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>What is this?</th>
<th>Rating Average</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>access and retrieve information</td>
<td>8.3%</td>
<td>60.0%</td>
<td>8.3%</td>
<td>25.0%</td>
<td>(1) 8.3% (3)</td>
<td>2.76</td>
<td>12</td>
</tr>
<tr>
<td>explore some techniques used in the media and the various technologies</td>
<td>0.0%</td>
<td>60.0%</td>
<td>8.3%</td>
<td>41.7%</td>
<td>(2) 0.0% (5)</td>
<td>2.92</td>
<td>12</td>
</tr>
<tr>
<td>for communication available to them</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>learn to make decisions and become more discerning in their use of the</td>
<td>8.3%</td>
<td>16.7%</td>
<td>60.0%</td>
<td>8.3%</td>
<td>(1) 60.0% (6)</td>
<td>3.33</td>
<td>12</td>
</tr>
<tr>
<td>technology and the media</td>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>develop self-confidence in using a wide range of technology</td>
<td>8.3%</td>
<td>25.0%</td>
<td>60.0%</td>
<td>0.0%</td>
<td>(1) 0.0% (0)</td>
<td>3.08</td>
<td>12</td>
</tr>
<tr>
<td>enhance their relationship skills as they discover new ways of</td>
<td>16.7%</td>
<td>16.7%</td>
<td>60.0%</td>
<td>8.3%</td>
<td>(2) 60.0% (6)</td>
<td>3.17</td>
<td>12</td>
</tr>
<tr>
<td>communicating and explore and learn together.</td>
<td></td>
<td>(2)</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use CD-ROMs for reference in SPHE.</td>
<td>0.0%</td>
<td>16.7%</td>
<td>41.7%</td>
<td>0.0%</td>
<td>(2) 41.7% (6)</td>
<td>3.26</td>
<td>12</td>
</tr>
<tr>
<td>Use word-processing programs and publishing programs to redraft and</td>
<td>0.0%</td>
<td>33.3%</td>
<td>25.0%</td>
<td>41.7%</td>
<td>(2) 41.7% (6)</td>
<td>3.08</td>
<td>12</td>
</tr>
<tr>
<td>edit work</td>
<td></td>
<td>(4)</td>
<td>(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>View television and listen to radio programs</td>
<td>0.0%</td>
<td>60.0%</td>
<td>16.7%</td>
<td>33.3%</td>
<td>(2) 33.3% (4)</td>
<td>2.83</td>
<td>12</td>
</tr>
<tr>
<td>Use the Internet for research</td>
<td>8.3%</td>
<td>76.0%</td>
<td>16.7%</td>
<td>0.0%</td>
<td>(1) 0.0% (0)</td>
<td>2.08</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 12

skipped question 0

28. Do you have a personal computer and/or laptop at home?

<table>
<thead>
<tr>
<th>Device</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>50.0%</td>
<td>6</td>
</tr>
<tr>
<td>Laptop</td>
<td>88.8%</td>
<td>10</td>
</tr>
<tr>
<td>None</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 12

skipped question 0
27. Do you have a personal email account?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

28. Which would best describe your internet and email usage?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>Almost daily</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>Weekly</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Fortnightly</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Monthly</td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td>Seldom</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

29. Do you use the computer and the internet for lesson preparation?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>83.3%</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>16.7%</td>
<td>2</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

30. Do you use the computer and internet for lesson delivery?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>41.7%</td>
<td>5</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

123
### 31. Do you have an Interactive Whiteboard in your classroom?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>8.3%</td>
<td>1</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>91.7%</td>
<td>11</td>
</tr>
</tbody>
</table>

*answered question* 12  
*skipped question* 0

### 32. Does your school provide you with a laptop for use in your teaching?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>66.7%</td>
<td>8</td>
</tr>
</tbody>
</table>

*answered question* 12  
*skipped question* 0

### 33. Please type in the amount of each type of equipment in your classroom.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Response Average</th>
<th>Response Total</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop</td>
<td>0.33</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Interactive White Board</td>
<td>0.08</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>P.C.</td>
<td>1.83</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Digital Camera</td>
<td>0.75</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Projector</td>
<td>0.42</td>
<td>5</td>
<td>12</td>
</tr>
</tbody>
</table>

*answered question* 12  
*skipped question* 0

### 34. Does your school have a computer room or a laptop trolley?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>66.7%</td>
<td>8</td>
</tr>
</tbody>
</table>

*answered question* 12  
*skipped question* 0
36. The children in my classroom use the computer:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>60.0%</td>
<td>6</td>
</tr>
<tr>
<td>Weekly</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>Fortnightly</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Never</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question: 12
skipped question: 0

36. Tick the statements which apply. Children in my class use the classroom computer to:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use subject based CD ROMs</td>
<td>75.0%</td>
<td>9</td>
</tr>
<tr>
<td>Research the Internet for projects and classroom work</td>
<td>81.7%</td>
<td>11</td>
</tr>
<tr>
<td>Use word processing programs to type up work</td>
<td>83.3%</td>
<td>10</td>
</tr>
<tr>
<td>Prepare presentations for the rest of the class</td>
<td>50.0%</td>
<td>6</td>
</tr>
<tr>
<td>Use subject specific internet sites and games</td>
<td>83.3%</td>
<td>10</td>
</tr>
</tbody>
</table>

Other (please specify): 0

answered question: 12
skipped question: 0

37. Are you the ICT post holder in the school?

<table>
<thead>
<tr>
<th>Response</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>0.0%</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>100.0%</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question: 12
skipped question: 0
38. Do you know the name of the Irish Government agency established to provide advice, support and information on the use of information and communications technology (ICT) in education?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>33.3%</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>66.7%</td>
<td>8</td>
</tr>
</tbody>
</table>

If "Yes", type in the 4 initials of that government agency.

answered question 12
skipped question 0

39. Did you have an ICT advisor attached to your local education centre?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41.7%</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>I don't know</td>
<td>41.7%</td>
<td>6</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

40. Have you ever requested help or had the ICT advisor out to your school?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41.7%</td>
<td>5</td>
</tr>
<tr>
<td>No</td>
<td>58.3%</td>
<td>7</td>
</tr>
</tbody>
</table>

answered question 12
skipped question 0

41. Can you see yourself using ICT more in your teaching in the next 6 years?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>83.3%</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>16.7%</td>
<td>2</td>
</tr>
</tbody>
</table>

Give reasons why.

answered question 12
skipped question 0
42. Do you see benefits in using ICT in teaching?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Give reasons why 6 answered question 12 skipped question 0

43. Where do you get your lesson ideas for ICT integration?

<table>
<thead>
<tr>
<th>Source</th>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Curriculum Teacher Guidelines</td>
<td>50.0%</td>
<td>6</td>
</tr>
<tr>
<td>SDGnet</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>Using search engine e.g. google</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>Recommended sites from publications such as in Touch</td>
<td>58.3%</td>
<td>7</td>
</tr>
<tr>
<td>Recommendations from Colleagues</td>
<td>91.7%</td>
<td>11</td>
</tr>
<tr>
<td>Recommendations from courses attended</td>
<td>66.7%</td>
<td>8</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 12 skipped question 0

44. Final question for office use only. The following information will not be published or distributed in any form.

<table>
<thead>
<tr>
<th>Information</th>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>School</td>
<td>100.0%</td>
<td>12</td>
</tr>
<tr>
<td>Roll No.</td>
<td>100.0%</td>
<td>12</td>
</tr>
</tbody>
</table>

answered question 12 skipped question 0
Appendix C

Notes from Focus Group

English
Depends on facilities
One computer in class
Focus on subject
Concept keyboards? –never seen
Early finisher –spelling programs
Time-table Reading for literacy

Gaeilge
Gaelspell
Powerpoint for lessons with whole class using projector
The least interactive subject.

Maths
LOGO?
Stick to book- no time
World Maths Day competing with other schools

History
Internet

Geography
Internet

Science
Sensor for electricity

Art
Prim-ed book with CD for looking and responding
Computer activities-no-doing proper art instead
Desktop publishing?

Music
Sybelius notation software-used in college by one of the teachers
PE
Not applicable to ICT in classroom

SPHE
Wouldn’t ref curriculum book, not helpful
Better suggestions than recommended guidelines?
Powerpoint
Use Excel
As a subject, learning keyboard skills, need a certain goal to aim towards
Need to be shown “how to”, methodologies listed too vague
Provide grants
Provide the software
Factors that hinder ICT integration
Lack of time
Lack of facilities
3 computers in class in school M, 1 in each of the other schools
Need to help the children when on the computer
Need time to set up the equipment
ECDL is no training for primary teaching
Need inservice days for ICT
Factors that help or could help
Inservice days
Provide the software-practical
Céim ar aghaidh from the GAA, very useful
Interactive whiteboards