UNIVERSITY of LIMERICK
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Observing the Use of RLOs in the English Post-primary Classroom.

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A dissertation submitted to the Department of Education and Professional Studies, College of Education and Health Sciences, University of Limerick for the degree of Doctor of Philosophy

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Submitted to the University of Limerick 2011
Declaration

I declare that the work presented in this thesis is to the best of my knowledge and belief original and my own work, except as otherwise acknowledged in the text. The material has not been submitted, either in whole or part, for a degree at this or any other university.

Ann Marcus-Quinn

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Dr Oliver McGarr (Supervisor)

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Date ____________________________
Abstract

Despite the attempts to integrate ICT across the curriculum of all post-primary education systems in the developed world there remains low levels of use. One of the major reasons for this low level of use is the availability of curriculum relevant software. In recent years the availability of high quality authoring tools has provided opportunities for the low-cost development of highly reusable curricular relevant materials. The increasing use of educational repositories can now facilitate the wide-scale distribution of these resources. This has the potential to radically reconceptualise use of ICT across the curriculum in Irish schools, particularly in the Humanities area, an area that has not traditionally incorporated ICT.

The research aimed to develop curricular specific courseware for the teaching of poetry at Junior Certificate level in Irish post-primary schools. It aimed to capture the collaborative design and development process used in the development of the courseware and describe and evaluate the implementation of the resource by teachers in different educational contexts.

The research employed a case study approach as it was seen as the most suitable methodological approach to capture the richness of the design and implementation of the resource. The resource was developed in collaboration with six practicing teachers and implemented in three different schools in very different classroom settings. Through the use of semi-structured teachers interviews, student questionnaires and classroom observations the research methodology employed aimed to capture the richness of the experience from the participants’ perspective.

The research found that despite the low levels of ICT use in schools the participating teachers were enthusiastic users of the resource. While it was evident that the students had limited experience of using ICT in schools they nonetheless enjoyed the experience and appeared to benefit from use of the resource. The research also found that the resource was highly reusable and was interpreted and used by teachers in different ways to best suit their needs and the needs of their students.

The findings of this research suggest that the framework used in the collaborative development of the resource has enhanced the reusable nature of the object and that future resources should employ a similar collaborative approach. The research also suggests that the reusability of the resource is dependent of the curricular and pedagogical coherence of the learning object. The research raises a number of issues for the development of such tailor-made solutions and highlights opportunities for future developers.
Acknowledgements

Firstly, I would like to thank Dr. Oliver McGarr, my supervisor, for his invaluable advice, guidance and expertise over the course of this study. I would also like to thank my external examiners Professor Tom Boyle and Professor Muiris O’Laoire.

Dr. Bob Strunz for his ongoing support, advice and encouragement.
Barbara Geraghty and Yvonne Cleary for working with me and acting as mentors and friends.

I also wish to thank my NDLR colleagues who have given great support and advice and my colleagues at the CTL in UL.

The teachers and students involved in this study; without their enthusiasm and innovative approach to teaching and learning this study would not have been possible.

Finally, to my family:
My parents, Jim and Margaret, my brother Colman, my husband Ian and our little lady Hannah.
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<tbody>
<tr>
<td>BECTA</td>
<td>British Educational Communications and Technology Agency</td>
</tr>
<tr>
<td>DES</td>
<td>Department of Education and Science</td>
</tr>
<tr>
<td>GLO</td>
<td>Generative Learning Object</td>
</tr>
<tr>
<td>IBEC</td>
<td>Irish Business and Employer Confederation</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>IWB</td>
<td>Interactive White Board</td>
</tr>
<tr>
<td>MIT</td>
<td>Massachusetts Institute of Technology</td>
</tr>
<tr>
<td>NCTE</td>
<td>National Centre for Technology in Education</td>
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<tr>
<td>NDLR</td>
<td>National Digital Learning Repository</td>
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| RLO          | Reusable Learning Object  
  “small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts.” (Wiley, 2000) |
| UL           | University of Limerick |
| VLE          | Virtual Learning Environment |
Chapter 1

Introduction

Background and context
The interest in ICT in education has seen a steady increase in the levels of ICT resources in Irish post-primary schools in recent years (Shiel & O’Flaherty, 2006). However, while resources have increased, the use of the technology has remained generally confined to a narrow range of vocational subjects. These subjects, including Business Studies and Technology, having had an ICT element since the late 1980s, dominate ICT use. The challenge ahead is to explore ways in which ICT can be used across the wider curriculum. Over a decade ago the Irish government introduced a national initiative to integrate ICT across the curriculum (Schools IT2000) yet despite the considerable investment, its use within traditional core subjects such as English and Mathematics has been limited (DES, 2008). There are several reasons for this limited use and most of the reasons identified appear to mirror international trends. Factors such as the limited availability of suitable content, appropriateness of courseware and its curricular coherence are among the reasons cited in numerous evaluations of ICT use in recent years (Ertmer, 1999; Ringstaff and Kelley, 2002; Back, Jung and Kim, 2008).

In general, there appears to be a lack of understanding in schools as to what role ICT should play in traditional classes (McGarr & O’Brien, 2007; Mulkeen, 2002; O' Doherty, Gleeson, Moody, Johnston, Kiely, & McGarr, 2000). The report on the impact of the national ICT in education initiative (Schools IT 2000) highlighted that ICT use was particularly low in Humanities. Across all schools in Europe a higher
A proportion of teachers of Humanities tended never to use the Internet for teaching compared to teachers of other subjects (Shiel & O’Flaherty, 2006). Selwyn (2000) asserts that;

“When the existing (subject) culture is pupil-centred, the introduction of ICT into subject teaching is likely to be seen as less problematic, whereas in subjects with a more teacher-centre culture ICT might be seen as a threat to traditional classroom processes of teaching and learning” (Selwyn, 2000, p 42).

Recognising the teacher centred nature, in Ireland, the focus of curricular initiatives in English in recent years has focused on the integration of pedagogies with a strong focus on pupil participation (Callan, 1997). While it is not known as of yet the impact of these curricular changes, regardless of the pedagogies employed there may be a reluctance by teachers to integrate ICT into their teaching if perceived as a threat to their existing pedagogical approaches.

However, the technological advancements that have been made in both society and education will inevitably influence the pupils’ experience. There is a general shift in pedagogy towards more independence in learning combined with the technology to facilitate such learning. Language learners in particular can benefit enormously from the advancements given the range of authentic materials available to the learner. If ICT is integrated into the classroom in a meaningful manner it can significantly improve student learning by increasing motivation, providing authentic learning resources, providing a more visually stimulating experience, facilitating communities of practice using various communication (Petter, Reich, and Scheuermann, 2005) tools and facilitating more autonomous learning (Robyler and Doering, ).
The challenge for the Humanities subjects:

This research study chose the English classroom as the learning environment to conduct the research study as student beliefs and discussion are at the very core of the subject. English at post-primary level seeks to develop competent thinkers capable of dealing with the consequences of living in a modern globalised world.

"The liberal arts teach people how to think deeply and reflectively about the good life, the good society, and the very idea of the 'good'. The liberal arts do their work by acquainting students with at least some of the history of how humans have thought about such things, thereby giving them a richer and more complex language in which to speak and with which to think. The liberal arts do their work by encouraging students to think of lifelong learning as an integral part of a good life... (by) ...reminding us by way of a plenitude of human counterexamples that any one of us may be wrong or only partially right... But the values of the liberal arts can't be transmitted simply by opening the great books and reciting key passages. Classroom discussion and debate is an indispensable part of our pedagogy, not only because it gives students a chance to try out ideas and gut reactions on each other in a relatively safe space but also because it serves as a form of deliberation in which each of us participates according to his or her abilities and desires”.

(Bérubé, 2006, p 295)

The use of ICT in Humanities holds enormous potential. Not only can the integrated use of technology within these subject areas enhance the pupils’ learning experiences, the proliferation of technology in society requires new skills and literacies. In this context the use of the technology across the curriculum is vital if pupils are to develop these essential critical literacy skills. While critical literacy skills can be addressed across a broad range of subject areas, this is particularly important in the core subject of English where media studies has been a significant component of the syllabus for several years. Through the use of appropriately designed digital content the subject can provide the opportunity to develop the critical media skills (Younie, 2001) while also addressing core areas of the wider English syllabus.
ICT needs to be congruent with cultural practices. If ICT is to be accepted as a fully integrated component of a subject it must be relevant to existing course content and congruent with teachers’ beliefs and values. Teachers should consider it as adding “value” to the subject and not as something that requires more effort from both teacher and student with little reward. ICT initiatives seen by practicing teachers as initiatives that take valuable time/resources from existing course work will be adopted in a superficial manner and will have little impact over long-term practice (Goodwyn, 2000).

Although English as a subject tends to have a culture that is book dominated it does lend itself to a variety of teaching strategies of a more student centred and participatory nature. Multimedia is hardly new. The interactive language classroom (Rivers, 1987) emphasises the use of authentic materials and engaging students in purposeful activity using available technology. Teachers have often invited students to listen carefully to the lyrics of songs and have asked them to interpret the lyrics as they would the lines of a poem. Teachers have also brought students to screenings of films or plays on the curriculum. However, for many ICT is a new form of expression that is yet to be exploited. In addition, the explosion of internet use, and students’ exposure to this medium, adds another dimension to the traditional media studies lesson.

Recognising the shortage of curriculum specific materials that could promote greater levels of ICT integration within the Irish post-primary system, this study aims to develop RLOs for use within Junior Certificate English and explore the breadth of their application within a post-primary context. The use of interactive multimedia
presentations of poetry, as the primary vehicle, also provides an opportunity for the study to explore students’ development of critical literacy and explore the reality of students’ levels of ICT literacy.

Based on the premise that if students can be encouraged to critically appraise poems on a range of subjects the skills acquired may be transferable to other contexts, in particular their abilities to critically analyse web-based media. Through their reading and analysis of poetry students can develop functional literacy skills, as Bleiman (2001) notes, “poetry is (also) an under-rated area for developing pupils’ knowledge about language and extending their ability to use it more effectively” (p.6). The study of poetry in this way may also increase student motivation, enhance creativity, highlight the relevance of the study of poetry and perhaps develop a life-long interest and appreciation of poetry.

The research aims to address a key area of how ICT can be used in the traditional Humanities subjects. The RLOs used in this study provided a vehicle through which digital literacy skills could be developed. This research looks beyond the teaching of basic computer skills and looks at how computer use could be integrated into the curriculum (Kirkpatrick and Cuban, 1998). This research project focused primarily on the application of RLOs in different contexts at post-primary level but also offered an opportunity to examine students’ levels of ICT literacy. The third aspect of this research examined whether use of such resources could develop critical media literacy – although this was not the main focus of the study.
Research Questions:

There were three primary research questions driving this study. Outlined below are the three key questions and the key objectives used to pursue them.

1. Design: What is the most effective way of designing RLOs for the post-primary context?
   a. In particular the study aimed to collaborate with post-primary teachers in the design of curriculum specific RLOs to enhance teaching and learning.
   b. To evaluate the effectiveness of this development strategy.

2. Implementation: How do teachers use RLOs in the classroom?
   a. To examine how is ICT currently being used
   b. To determine what are the current levels of use of ICT in schools and in what way does this impact on the uptake and use of RLOs.
   c. To explore teachers’ use of RLOs in different contexts and examine the different pedagogical uses.
   d. To examine the educational benefits of the use of RLOs in the classroom.

3. Evaluation: What role can RLOs play in promoting greater levels of ICT integration across the curriculum, particularly at the Humanities level?
   a. To explore the development of a framework for the future development/use of RLOs.
   b. To highlight the issues effecting greater levels of ICT integration.

In order to answer these questions, several research methods were employed to aid collection and analysis. These methods are described in detail in the Methodology chapter.
Research Study and Limitations:

This research study was conducted at post-primary level. The participating schools were all post-primary schools in the Midwest region. The classroom observations were carried out during the academic year 2008/2009. This study used various methodologies which are outlined in detail in the Methodology chapter. This number of participating schools in this study is small. However, even though this is a small sample, and arguably is not necessarily representative, very typical schools were used. This study aimed to explore issue in-depth rather than to seek generalisations. Since this study has been carried out new technologies such as rapid authoring tools have become more available and we now live in a more challenging economic climate. However, the research remains relevant as the elements of instructional design and the organisation of schools remain the same.

This study was largely concerned with students in first and second year of their post-primary education. These students had not yet been divided groups based on what level exam they would take at Junior Certificate (higher or ordinary level English). Initially it was intended to only use this type of mixed ability group. However, due to difficulty in recruiting participants two small groups of eight students in a learner support class were also included. Consequently, this study reports on the use of an RLO in three very distinct settings with different outcomes and expectations by teachers and students.

The learning object was designed to be used by an individual student working on their own on their own PC; engaging in a personal learning experience. However, the
schools involved in the study could not accommodate this. In many cases there were a number of students sharing computers.

**Background of the researcher**
When undertaking any research study the researcher must be aware that their unique background and experience will have some bearing on how a piece of research is formulated and conducted. Therefore it is necessary to briefly describe the background and experiences that have influenced this research study. After completing an undergraduate BA in German with Media and Communication Studies I undertook an MA in Technical Communication. Technical Communication includes the area of Instructional Design. This course gave me great insight into the possibilities for delivering materials for distance education and into the kind of RLOs that could be created using available authoring tools such as Flash and Dreamweaver. After my MA I worked as a technical writer creating online help and support documentation for customer relationship management software. I then worked as a teaching assistant in Technical Communication at the University of Limerick and this included working with distance students delivering course material online.

Since 2006 I have worked with the National Digital Learning Repository and have developed RLOs with faculty at the University of Limerick (UL). These RLOs have varied from objects to help Physiotherapy students grasp the stages of gait analysis to the steps involved in summary writing for Technical Communication students. One RLO that I developed with the Japanese section was awarded a European Language Label in 2007 and has been used successfully to help students learn Hiragana for the past four years at UL. The use of RLOs, particularly for distance education course material, is a growing area. RLOs have the potential to be used to greatly enhance the teaching and learning experience of today’s learners at all levels.
As I had seen RLOs used to great effect at third level education my motivation was to develop an RLO for use at second level. As a child I remember a favourite poem "The Owl and The Pussycat" being aired on television. The nonsense poem was written in 1867 is still popular with children today. It has been animated several times over the years including the 1952 version which is the version that inspired this research study RLO. While the material for the project changed significantly from the initial concept the primary focus has remained the same; that is to observe the potential for RLOs in the classroom.

My background is not in Education Studies and as such prior to this study I had not been in a classroom in over ten years. I had a very different, somewhat idealised, notion of the classroom of today. The reality for teachers was quite different to what I had expected. Working directly with the teachers to develop the RLO was the same process that I engage in when working with faculty at the University. This previous collaborative work experience greatly helped in the design and development of an RLO that is curriculum specific and meets the teachers’ needs.

**Structure of the remainder of the thesis:**

Chapter two, the literature review presents a review of the literature which helped to guide and focus the study. Chapter three discusses the context of ICT use in Irish post-primary schools and provides an overview of the use of technology in post-primary schools in Ireland; particular attention is paid to the typical barriers which prevent the uptake of ICT at post-primary. Chapter four, the methodology describes the specific qualitative methods employed by the researcher to conduct this study. Chapter five presents the research findings from each of the three schools. Each
school’s experience is documented separately. Chapter six the discussions and conclusions chapter discusses the research findings and looks at the main issues which emerged over the course of the study.
Chapter 2

Literature Review

Introduction
This chapter presents a review of the literature which helped to guide the study and focus the methodology and design. Much of the available literature is positive about ICT use. However, while there is a considerable amount of literature available describing the use of ICT at third level and in particular the use of Learning Objects in this setting (Hodgins, 2002; Polsani, 2003; Nito et al 2006; Evans, 2002; Boyle, 2005, Campbell, 2005; Linsey and Tompsett, 2007) there is significantly less available reporting on ICT use at post-primary level. Much of what is available is incomplete or inconsistent as much of the evidence is drawn from small-scale case studies and there is a paucity of larger research projects/case studies from which generalisations may be extrapolated (Kiridis, Drossos and Tsakiridou, 2006). In general, successful use of ICT in the classroom is mainly experienced where tasks have clear educational aims and perceived as relevant by learners (Riding, 1996; Tearle et al, 1998; Lord, 1998; McFarlane, 2001; Boyle, 2003; Geraghty and Marcus-Quinn, 2009)

Common to the literature is the conclusion that ICT is not a silver bullet (Means, Olson and Singh 1995) and while it does bring its own challenges to the classroom it has enormous potential (Kim and Freemyer, 2011; Shapiro and Hughes, 1996; Small, 1997, Brett, 2008). However, the implementation of ICT in the classroom must be pedagogically driven and follow a clear educational vision and structured policy (Mooij and Smeets, 2001, Robertson, 2002, Selwyn, 2006). Technology for technology’s sake is not enough. Unfortunately a lot of current ICT use may be
described as a solution in search of a problem (Oppenheimer, 2003). Incorporating ICT use into the classroom makes real demands in terms of time and money on a school and therefore the tangible qualitative benefits must be clear from the outset. Where resources are limited it is even more important that there be hard evidence of a return on investment (Williams et al, 2000; Milis and Mercken, 2004; Remenyi Bannister and Money, 2007; Carcary, 2009).

This literature review is divided into six sections. Section one, the ICT drive, looks at what is driving the ICT agenda internationally. Some global examples are provided to illustrate that there is acknowledgment among key policy makers that the integration of ICT is essential to schools. However, despite this acceptance the provision of ICT remains problematic. The need for a clear ICT policy is highlighted if any real change is to occur.

Section two, why invest in ICT, highlights that while there are three rationales for implementing ICT into the post-primary sector Economic, Educational and Vocational it is the business community and business leaders that are calling for the ICT to be exploited to a greater degree that it is at present. It appears that the overriding rationale is based on economic competitiveness of nation states. Therefore, it would seem that it is the economic agenda that dominates the drive for ICT integration into the Education system. This section looks at the expectations of ICT at post-primary level from an international perspective.

Section three, international agencies, discusses the role that international agencies, such as BECTA in the UK, have played over the last few years. In May 2010 the UK
Government announced a package of public sector savings which included the closure of BECTA. Given that such organisations have received considerable investment over the past decade to promote the use of ICT within post-primary education it is important to look at the role that they have played in shaping the type and level of uptake of ICT within the education system.

Section four, new literacies, focuses on the emergence of new literacies; particularly on the area of digital literacy. The expectations for today’s post-primary student are high. Students are expected to critically engage with new media. Therefore, it is imperative to address and explore the literature surrounding these new literacies.

Section five, blended learning, looks at the growing popularity of blended learning solutions. Given that the term blended learning is often abused it is important to provide a spectrum of what is a realistic expectation for the present school system.

Section six, reusable learning objects, explores the growing area of RLOs and the future role that they may play within the education sector. This section presents an overview of digital learning objects and discusses the role that they are expected to play in the changing post-primary classroom. This section will also provide a rationale for choosing poetry as the vehicle for this research study.
Investing in ICT. What appears to be driving the interest in ICT in schools? Sections one and two explore what is driving the ICT agenda internationally.

How is the international community meeting this challenge? Section three looks at some examples of organisations which have received considerable investment over the past decade to promote the use of ICT within post-primary education.

ICT is changing how teaching and learning takes place in schools and it is also changing what needs to be taught in schools. Section four examines the new and evolving literacies to emerge from the growth of ICT in society.

Integrating ICT into teaching and learning? Section five explores blended learning and examines the ways in which ICT can be embedded into practice.

Reusable Learning Objects; section six defines RLOs and explores the possibility of using RLOs to assist in the integration of ICT in teaching and learning.

Fig 1 Thematic Structure of Literature Review
Section One: The ICT Drive

In order to look at the international drive to integrate ICT into post-primary there are a number of issues to address. These include:

- Who is driving the initiatives for ICT integration?
- Why this agenda is being promoted.
- How does this agenda manifest itself in national policy and initiatives?

Looking at many of the international initiatives it would seem that ICT is seen as a “quick fix” to address skills such as problem solving and digital literacy.

The European Commission DG Education and Culture produced a report in 2004 on Innovative Learning Environments in School Education. The findings of this report highlight that the integration of ICT has been identified by key stakeholders as a priority:

“there is a strong public involvement in promoting the integration of ICT in learning in the school environment. This means that even where the integration of ICT in schools is not yet underway, it is a major goal which is jointly recognised as representing a priority need among both central and local government politicians, school administrators, school management, teachers, parents and pupils”

(European Commission, 2004, p 13)

The European report also states that there is a “general awareness in all member states that ICT potentially has an important part to play in promoting social inclusion and equal opportunities” p245. There is a global recognition at government level that there is a need for new literacies and many governments around the world are looking to reform their educational systems to prepare students for the 21st century. Often, these reforms incorporate ICT and attempt to connect education change with economic growth and social development. Leading international figures are calling for educational reform to educate and equip students with the essential skills for a modern world (e.g. Obama, 2009). ICT is seen as a means to provide students with
these skills. However, the development of ICT in schools is progressing irregularly across and within schools and technologies (Trinidad, 2005). ICT has become in many instances just another term which has been added to a long list of competencies and skills expected of teachers and students. Rarely is a best-practice clear example provided. This is seen as problematic by many in the Irish context as many training programmes tend to be broad and technically focussed. Phase 1 and 2 of the IT2000 initiative are a good example of this. Many schools achieve, with difficulty, the government targets set in terms of numbers of computers and connectivity. Others are pioneering, attempting to exploit the benefits that ICT can offer (Scrimshaw, 2004). Technology has become embedded in the everyday practices of many schools using a range of technologies to support teaching and learning.

It seems that the implementation of ICT into schools has been quite haphazard; ICT has been allowed to play a central role in some schools while remaining at the periphery of others (Simpson, Payne and Condie, 2005). There have been some calls for the standardisation and regularisation of ICT within the Education sector. President Obama in his first major speech on education, delivered before the U.S. Hispanic Chamber of Commerce on March 10, 2009 declared:

“I'm calling on our nation's governors and state education chiefs to develop standards and assessments that don't simply measure whether students can fill in a bubble on a test, but whether they possess 21st century skills like problem-solving and critical thinking and entrepreneurship and creativity”.
(Obama, 2009)

It would seem that key stakeholders have identified the skills necessary for students to hold in the twenty-first century but what about those already in the teaching profession responsible for educating these young minds? The National Council for
Chapter 2: Literature Review

Accreditation of Teacher Education (NCATE) document *Technology and the New Professional Teacher* (1997) states that:

> “in addition to technology skills, teachers need an attitude that is fearless in the use of technology, encourages them to take risks, and inspires them to be lifelong learners”

(NCATE, 1997, p 245).

Roblyer and Doering (2006) also cite the role of the teacher key to the success or failure of ICT in schools:

> “We need teachers who understand the role technology plays in society and in education, who are prepared to take advantage of its power, and who recognize its limitation. In an increasingly technological society, we need more teachers who are both technology savvy and child centred”.

(Roblyer and Doering, 2006, p 248)

If the role of the teacher is seen as imperative to the process of developing ICT and digital literacy skills in the next generation we should look at what steps are being taken to ensure that teachers receive the support that they need to carry out this vital role. This drive is evident in a number of countries. In Australia the government department of education, employment and workplace relations (DEEWR) has financed The Digital Education Revolution initiative. This $2 billion initiative recognises the need for sustainable and meaningful change to teaching and learning in Australian schools in order to prepare students for further education and training and for living and working in a digital world. A total of $1.9 billion over five years has been allocated to the National Secondary School Computer Fund (NSSCF). Distance education is the only option for many and the NSSCF project recognises that Australian students need greater access to, and more sophisticated use of, ICT. They need the best hardware, high-speed broadband connections, quality digital content and well-trained teachers to integrate technology into teaching and learning.
In December 2008 the Dutch Minister of Education announced the Wikiwijs project, an open, internet-based platform, where teachers can find, download, (further) develop and share educational resources. The project is based on open source software, open content and open standards. Wikiwijs is inspired by the idea of wikis: collaborative developing of content. Educational resources are developed by teachers, for teachers. Teachers can freely use anything they find in the Wikiwijs database in their classrooms. Wikiwijs is available to all levels of the Dutch educational system: primary, post-primary and third level. This project, while it is still only in its infancy, clearly shows the commitment of the Dutch government to implementing a clearly defined and realistic approach to incorporating ICT into the post-primary classroom. The project also highlights the commitment of the government to supporting the development of suitable resources for teachers and students. This project also draws attention to the technologies that can facilitate such development work. In the past rapid authoring tools and dissemination systems were unavailable to previous ICT initiatives. Now software such as Articulate or Raptivity allows for rapid development of RLOs by non technical experts. Initially only Maths and Dutch will be catered for but more subjects will be added when the platform is completed. Wikiwijs is scheduled to be fully operational at the start of the school year 2010/2011.

In addition to this project, the ministry of Education has also commissioned the Open University Nederland and Kennisnet to develop a programme plan to ensure the success of the Wikiwijs project comprising five components:

- Access (An adequate technical infrastructure)
- Content (Sufficient supply of educational resources)
• Communities (Enthusiastic teachers experiencing sufficient possibilities to connect to one another)
• Proficiency (Proficient users who possess the knowledge and skill to deal with developing, arranging and/or using open, digital educational resources)

The ICT Impact Report “A review of studies of ICT impact on schools in Europe” claims that in Europe the use of ICT in education and training has been a priority in most Western European countries during the last decade, but progress has been uneven. There are considerable differences within and between countries, and between schools within countries. A small percentage of schools in some countries have embedded ICT into the curriculum, and demonstrate high levels of effective and appropriate ICT use to support and transform teaching and learning across a wide range of subject areas. Most schools in most countries, however, are in the early phase of ICT adoption, characterised by patchy uncoordinated provision and use, some enhancement of the learning process, some development of e-learning, but no profound improvements in learning and teaching. The report acknowledges that incorporating ICT into the classroom is a costly endeavour. Given the cost involved the question is then raised as to level of ICT use where adoption has been successful.

The European Commision DG Education and Culture (2004) report on Innovative Learning Environments in School Education found that across Europe ICT is being used predominantly in the following areas:
• School management, for example scheduling
• To enable students to have a more active participation in their own learning process
• To allow classroom activities to be reorganised to promote more collaborative learning among students

• In some cases ICT being used for simulations and other experimental uses.

ICT is often accompanied by claims that it could solve all problems in schools. The European report urges that there must be realistic expectations in terms of what can be achieved. Writing about evidence-based management Pfeffer and Sutton (2006) address the dangerous half truths and flawed beliefs that when unchallenged in business often spell disaster for companies. Schools can learn from this.

“We focus on these half truths because leaders who understand why each belief is flawed, and who think hard about the evidence for and against each, can develop more effective and sophisticated approaches to running their organisations”.

(Pfeffer and Sutton, 2006, p26)

In Europe there has been much activity in the area of ICT in schools at all levels and sectors of education. Numerous reports have been commissioned on ICT provision and access and more specifically on the importance of digital literacy to today’s students. In Ireland, while we have not seen this same level of implementation of ICT into our primary and post-primary schools Eamon Stack, Chief Inspector of the Department of Education and Science, Dublin in his introduction to the ICT in the Schools Inspectorate Evaluation Studies report 2008 states that:

“ICT has brought profound changes to almost all aspects of our lives in recent years. ICT has transformed activities in every area of our daily lives; work, communication, medicine, travel, and even how we spend our leisure time”.

(DES, 2008, p 13)

Stack (2008) sees the development of ICT and its applications to areas such as the integration of media, continuing at an even faster rate. In a relatively short period of time, ICT skills have become as fundamental to living a full life as being able to read, write and use a computer.
**Summary**
These global examples illustrate that there is recognition among policy makers that ICT is important to schools. However, while the need for these new literacies is undisputed the implementation of ICT in to the everyday classroom is a slow process. If ICT is to be integrated into our schools in any kind of meaningful manner a strong policy is required. Some countries as we have seen from the above examples have a clear policy in place while others have not yet identified how they will begin the process of change. Even when there is a national policy in place how will it be possible to examine if schools are using ICT to develop the key skills identified as necessary by the policy makers? The next section will explore three of the competing agendas that will more than likely be responsible for initiating a national policy regarding ICT in our post-primary schools.

**Section Two: Why invest in ICT?**

**Introduction**

It is an accepted fact that to function in today’s world modern citizens must know how to interact with technology. Given that all young people in the developed world must engage with some formal education school would seem to be the appropriate place to develop crucial ICT competencies (Tondeur, 2007). However, if school is to be the agreed location for then careful consideration must be given to the body that will set the ICT policy. As each group will have its own vested interest.

**The economic agenda:**
Reading the literature one may be forgiven for thinking that we live in a world where the successful implementation of an ICT strategy in schools is the gateway to enlightenment. We must therefore look at the literature with a cautious eye. How much is hype and what actually works at the chalkface? The literature endorses the
value of investing in ICT in education. Sahlberg (2006) in his article *Education reform for raising economic competitiveness* discusses the advantages of producing IT literate students equipped for the modern world. Sahlberg focuses on educational reform and states that both primary and secondary education significantly contributes to economic development and growth. Governments need to recognise people as human capital and increase the investment in knowledge, skills and health in order to provide future returns to the economy through increases in productivity. Furthermore, better quality education “increases average earnings and productivity and reduces the likelihood of social problems that, in turn, are harmful for economic development” (Sahlberg, 2006 p260). Within education, ICT is seen as a way to promote educational change, improve the skills of learners, and prepare them for the global economy and the information society (Haddad & Draxler, 2002; Kozma, 2005).

Sahlberg states that it is assumed that to increase economic competitiveness, citizens must acquire knowledge, skills and attitudes necessary for civic success and the knowledge-based economy. His article argues that what schools are expected to do in order to promote economic competitiveness often contradicts commonly accepted global education reform thinking. Experience in many countries indicates that increased standardisation of teaching and learning, for example, may be counterproductive to the expectations of enhanced economic competitiveness. The conclusion is that rather than competition between education systems, schools and students, what is needed is networking, deeper co-operation and open sharing of ideas at all levels if the role of education in economic competitiveness is to be strengthened. The key features of education reform policies that are compatible with
competitiveness are those that encourage flexibility in education systems, creativity in schools and risk-taking without fear on the part of individuals.

Kozma (2005) writes that while economic factors are frequently used to defend investment in ICT there has not always been a strong national ICT policy in place. This is particularly true of Ireland and will be discussed in chapter three.

“economic rationale is frequently used to justify ICT investments, and the investments in educational ICT have been substantial, national plans have often lacked explicit causal connections between these investments and the desired economic and social impact stated in national goals”.

(Kozma, 2003, p 120)

This is a crucial area in the organisation of educational policy. There needs to be a sound pedagogic model in place. Technology for technology’s sake is not a sound educational policy and is often a significant reason for the failure of ICT within education (Kim and Freemyer, 2011).

ICT-based innovation can and does occur in classrooms without there being a close linkage to national policy (Jones, 2003; Kozma, 2003). However, without clarifying the association between ICT-based education reform and the required social and economic outcomes and including these outcomes into policies, it is less probable that classroom innovation will contribute to national economic and social success. Kozma believes that the connection between educational investment and their economic and social returns is a concern for all countries but the relationship is most crucial in developing countries, where the resources are extremely stretched. According to Kozma the factors that drive productivity-based economic growth are “capital deepening, higher-quality labor, and knowledge creation”.
These factors can serve as the basis for three complementary, somewhat overlapping approaches to education reform that can contribute to economic and social development by: Increasing the technological uptake and basic literacy skills—or the knowledge-acquisition approach

- Increasing the ability of the workforce to use knowledge to add value to economic output by applying it to solve complex, real-world problems—or the knowledge-deepening approach

- Increasing the capability of the workforce to innovate and produce new knowledge and by increasing the capability of citizens to benefit from this new knowledge—or the knowledge-creation approach.

Each approach has different implications for educational policy, teacher professional development, classroom pedagogy, curriculum, assessment, ICT use, and school organization and administration. While these approaches and their implications are not empirically derived, they provide policy makers with a conceptual tool that allows them to think about reform in ways that connect with economic and social development goals and provide a “knowledge ladder” by which policy makers can play progressively higher forms of productivity-based educational change. The drive by the economic sector to include ICT in the education system is concentrated on the notion that the successful implementation of ICT will benefit the country as whole. Providing students with the skills they need to perform to the best of their ability in the modern world is seen as necessary to the greater good of an economy. Producing a competent, skilled workforce to entice companies and foreign trade is the drive behind this push for ICT. This is further discussed in relation to Ireland in chapter three.
The Educational drive
From the literature it is clear that schools, teachers and parents do recognise the importance of ICT. The ever increasing dependence on technology (Roblyer and Doering, 2006) means that many countries are reforming their education systems to provide their citizens with knowledge and skills that enable them to engage actively in democratic societies and dynamic knowledge-based economies (OECD, 2000; Riley, 2004). The fundamental requirement for this is that everyone has sufficient knowledge and skills in literacy, numeracy and ICT. Students and teachers have moved on, largely, and now less persuasion is needed in illustrating the importance of educating students to be ICT literate. Maybe the education system is not as far along the ICT journey as many would wish but it is moving away from needing to be heavily persuaded.

“Both students and teachers must see the value in using technology for learning. Both students and teachers must expect to succeed using technology in general but especially as a tool for meeting learning goals. Finally, both students and teachers must see the costs of using technology for learning as acceptable.”

(Abrami, 2001, cited in Reynolds, Treharne and Tripp, p 165)

Rather than shifting emphasis on to standardised knowledge of content and mastery of routine skills, many of the advanced education systems are focusing on flexibility, creativity and problem solving through modern methods of teaching, such as co-operative learning, and using multilateral clusters, community networks and ICT in teaching.

The literature has many voices calling for reform of the education system. One such voice is Sir Ken Robinson (2006). Robinson argues that the current education system was designed conceived and structured for a different age and follows a production
line approach to education. The system currently in place was conceived in the intellectual culture of the enlightenment and in the economic circumstances of the industrial revolution. The current system is essentially focuses on conformity and standardisation. In order to reform the current system all stakeholders in the education system need to think differently about human capacity not just the policy makers. It is crucial to examine the culture of our institutions and the habitats that they occupy. The old conception of academic and non academic, abstract and vocational theoretical and practical need to be re-examined. As a community we need to recognise that most great learning happens in groups. Collaboration is the therefore one of the keys to growth. Robinson argues that “If we atomise individuals and separate them and judge them separately we form a disjunction between them and their natural learning environment”.

At the 2006 Technology Entertainment Design conference (TED), an annual multidisciplinary conference to promote and share ideas Robinson discussed the current education system and the role that creativity now plays in the system. He posed the question; “Do schools kill creativity?” Robinson claims that creativity is as important in education as literacy and should be treated with the same status. Schools need to not “educate people out of their creative capacity”. Robinson argues that the education system is predicated on the idea of academic ability. This can be seen in the hierarchy of subjects in schools: Maths is seen as worthwhile whereas Art is not as worthwhile. It would seem from the present system’s priorities that the purpose of education is to produce university professors. However, the modern world requires that education must be diverse. Robinson claims that the interaction of different disciplinary ideas produces great creativity and innovation. Among educational
Theorists it is recognised that there is a need to rethink the fundamental principles in which we educate our children. The system needs to be broadened and the “whole being” must be educated if we are to meet the needs of the modern world.

The drive by the education sector to include ICT in the education system is predicated on the notion that ICT will equip students with the skills they need to perform to the best of their academic ability in the modern world. This drive is problematic in that ICT is seen by many policy makers as a quick fix solution for the many problems in the current system (Chacko, 2005). ICT tends to manifest itself in this area as the provision of more and more hardware to schools without the other necessary supports in place to ensure success. Schools rarely have sufficient resources or support staff to meet their technology needs. What is needed is a national policy that will enable schools to meet these demands. Guidelines are not good enough as they are seen as fluid and can be ignored.

The vocational drive
Subjects and activities are also justified on the basis that they can prepare students for different vocations or different types of employment. Across the literature there is a recognition that the 21st Century demands that citizens acquire a competency in the following skills:

- Technological and media literacy: students must be able to use applications to manage, analyze, integrate, evaluate and create information in a variety of forms
- Effective communication: students should be able to use multimedia communication in a variety of contexts
- Critical thinking: students should be able to use the information available to them to make difficult choices
• Problem solving: students should be able to use real life situations to make decisions and solve problems.

• Collaboration: students should be able to demonstrate teamwork and leadership.

(Kozma, 2008, Tondeur et al, 2007, Tearle, 2003, Kirschner and Selinger, 2003, Robinson, 2006). The vocational drive by the sector to include ICT in the education system is predicated on the notion that ICT will equip students with the skills they need to perform to the best of their ability in the modern world.

Summary
As this section has highlighted, the drive to integrate ICT can be driven from different perspectives and perceived needs (e.g. economic, educational and vocational). Such is their influence; these differing perspectives can determine the nature of ICT use in the classroom and highlights that the education system needs to be aware of the underlying drives and their subsequent effect on ICT usage. Regardless of the rationale for its integration, all developed counties have implemented similar strategies to embed ICT across their education systems; the following section will take the UK as a case study and examine some of the strategies that BECTA had put in place. These are organised under the following headings: BECTA’s impact of ICT in post-primary schools report, technology for the classroom, Test Bed project, SCHOLAR project,

Section Three: BECTA an example of an International Agency

Introduction
The result of these drives to introduce more ICT into the education system is that a number of agencies have been put in place to establish ICT strategy and implementation. Internationally, irrespective of a country’s economic standing, there is no shortage of arguments to for the perceived need for students to have access to
ICT during their education. However, it necessary to look at what level of ICT is actually in place. In recent years there have been significant investment and numerous surveys carried out to collect data on the extent to which schools are integrating ICT into teaching and learning. The post-primary education system in the UK is structurally quite similar to that of Ireland. Therefore looking at the UK experience of ICT in schools under the direction of BECTA is a worthwhile endeavour if Ireland is to profit from the lessons learned. BECTA was the UK agency that supported the four regional UK education departments in their strategic ICT developments with the purpose of applying the power of ICT to support learning. In order to achieve their objective, BECTA’s primary aim was to work to deliver the following strategic aims:

- Improve learning and teaching through the effective and embedded use of ICT
- Increase the number of educational institutions making effective, innovative and sustainable use of ICT
- Improve the availability and use of high quality educational content.
- Develop a coherent, sustainable and dependable ICT infrastructure for education

**BECTA’s ICT in post-primary schools report**
The impact of ICT in post-primary schools report commissioned by BECTA, the UK government's lead agency for ICT in education revealed that there has been a “steady increase in the number of computers and other technologies over time, with most schools achieving the baseline targets for computer-to-pupil ratios”. The report also states that there is a “considerable variation within and across schools with regard to regular access to reliable technologies and broadband connectivity” (p.3). The report
found that where the use of ICT is most effective in enhancing the learning experience, teachers have been able to integrate a number of technologies such as laptops, interactive whiteboards and the internet. This blend of hardware, software and connectivity enables teachers to develop innovative approaches to teaching and learning. A crucial factor in the efficient and successful use of ICT is the existence of a school-level ICT strategy outlining the expectations and sustainability of ICT use.

The report also found that while innovation often begins within subject department, it requires a whole-school commitment if it is to become embedded in the daily lives of students, providing continuity and consistency across the years. While individual champions of technology and ICT can guide the way, guidance and considered planning is crucial to sustain the widespread implementation of technology in schools. Many of the UK commissioned reports have found that teachers’ confidence and skills levels have improved significantly in the last few years. This has been attributed to the provision of more relevant and appropriate staff development opportunities. Programmes tend to be more focussed. The result of this is that many teachers are able to identify the kind of training appropriate to their needs whether it is supporting their teaching and learning strategies, student assessment or administration:

“We have found a common void in professional development for faculty-training needed to gain the requisite computer skills to integrate technology into the curriculum effectively. Too often success occurs in pockets within the institution, where individually motivated faculty embrace advances' in technology, mastering-on their own time-the skills needed to merge the digital world with academia”.

**Test Bed project**

One of BECTA’s larger projects The ICT Test Bed Project was a 4-year study which investigated how the sustained and embedded use of ICT in learning spaces can improve learner outcomes, classroom practice and institutional development. The study examined the impact of computers on learning attainment in 22 primary schools, 5 secondary schools and 3 Further Education (FE) colleges. The research implied that few teachers make full use of computers in classrooms, despite a £1 billion commitment from the government to increase the use of IT in schools. Of those teachers studied, many fear that computers can interfere with book based learning, particularly in creative subjects and humanities.

At the start of the Test Bed project in 2002, primary schools were performing less well than matched competitor schools on a range of key performance measures. They were also underperforming compared to the national average. While collectively the Test Bed and comparator schools have shown improvements between 2002 and 2006, the rate of improvement for Test Bed schools was higher than for the comparator schools; indeed, the Test Bed schools outperformed the comparators in 2006 (Figure 1). Of critical significance is the fact that the Test Bed schools are now at or above the national average (78 per cent).

Some of the key findings of the Test Bed study are as follows:

- As technology was embedded, the schools’ national test outcomes improved beyond expectations.
- The impact of ICT on attainment levels was greater for primary schools than for secondary schools.
• Effective use of presentation technologies led to greater interaction between teachers and learners.

• Effective use of ICT personalised learning by enabling greater learner choice within the curriculum, improved assessment for learning and more learner-directed teaching.

• Technology facilitated more effective assessment for learning by making it easier for learners to be more involved in target-setting and for teachers to give individualised feedback.

• The use of electronic registration improved attendance levels in some schools by three to four per cent, while behaviour management systems were perceived to have a positive impact on both behaviour and attendance, prerequisites for effective learning.

**SCHOLAR project**

Another of BECTA’s successful projects is the SCHOLAR project. This project comprises a set of online e-learning resources developed to support five A-level subjects: biology, chemistry, physics, maths and computer science. During the 2004/05 academic year the Learning and Skills Council (LSC) funded a trial of SCHOLAR in 56 schools and colleges in England. The research investigates whether there was any relationship between student attainment and student use of the e-learning resources during that academic year. The study showed that there was a clear correlation between high use of e-learning and attainment. An interesting finding in this research was the positive impact e-learning had on learners with learning difficulties and on student’s who were quiet and under-confident. Analysis revealed that there was a positive correlation between the number of e-learning pages accessed by a student and the difference between their AS and A2 grade. The more pages of e-
learning accessed by a student, the more likely they were to improve a grade between AS and A2. The majority of students did better than expected in their exams.

With the demise of BECTA there is no clear direction from Government regarding ICT policy at post-primary level in the UK. The next couple of years may see many schools having little or no progression in implementing an innovative strategy for ICT direction. When the closure of BECTA was announced many teachers contributed to http://www.bbc.co.uk/blogs/thereporters/rorycellanjones/ the BBC News blog that looks at technology in Education. Many were sorry to see BECTA finish while many more questions the role that BECTA had ever played.

Compared to Ireland the UK has a much larger budget to invest in ICT in education. This literature review has looked to the UK’s experience as it is crucial to learn from this before looking at how things can be changed in Irish schools. Brown (2005) summarises this succinctly as he stresses the importance of the teacher in this process:

“There are complex forces behind the drive to reform schools through ICT and rather than be lured by the political and economic spin of new computer technology the teaching profession needs to create a culture of activism and reconceptualism”

(Brown, 2005, p 82).

**Technology for the classroom**

The range of technologies available for use in the classroom has increased rapidly as the infrastructure in schools has developed. Interactive whiteboards (IWBs) have been the focus of a considerable number of studies, large and small, in no small part due to government endorsement and support for them (Smith, Higgins, Wall and Miller, 2005). They are relatively common in schools compared with other technologies and the reports from studies of their impact draw similar conclusions. The outcomes are almost universally positive, particularly where they are used in conjunction with other
technologies and there are clear pedagogical reasons for their use (Beauchamp, 2004; Moss et al, 2007; Merchant, 2009). However, it is important to note that there is a significant minority present in the literature which is cautious towards their widespread adoption in schools (Schmid, 2008; Wall, Higgins and Smith, 2005). In spite of this small level of dissent it is generally held that display and presentational software, including animations and simulations, combined with IWBs, help pupils to develop an understanding of abstract concepts through concrete examples and graphical images of, for example, microscopic processes. Mobile technologies are growing in availability and, given their attractiveness to pupils, are gradually being introduced to support various educational initiatives, usually with a focus on communication. They have been shown to be effective in supporting learning for disaffected and hard to reach pupils (Betcher, 2009). Mobile technologies are being developed for use in projects aimed at improving access to ICT for those pupils without a computer in the home. Educational software developers are beginning to capitalise on students’ enthusiasm for online gaming, potentially benefiting the development of a range of skills including decision making, information processing and working in teams (Rauterberg, 2004). Whole-school approaches to implementing ICT supported education have often been more successful in primaries than in secondary schools (BECTA, 2005). This is an area that would benefit from focused study, to determine what factors are critical in realising the aims of a whole school e-strategy.

Technologies with a visual dimension – digital video, photography, video conferencing – engage pupils and provide a stimulus for collaborative working and discussion and, where the pupils are in control of the technology, give them a sense of
ownership and autonomy of the learning process (Geraghty and Marcus-Quinn, 2009). Such technologies appear to be especially effective when used with groups of pupils with special or additional needs (Hayes, 2007). Learning platforms and virtual learning environments, are often used as repositories or communication technologies, although there is evidence that they are, for many schools, becoming central to a whole range of activities, linking various technologies and applications. They can make a significant contribution towards personalising the learning and teaching experience, for both pupils and teachers (Cleary and Marcus-Quinn, 2008). They have been shown to support discussion and collaborative activity as well as multi- and cross disciplinary work.

The needs of targeted groups of pupils, those with special needs, the disaffected and the children of travellers, are being addressed through various initiatives involving a range of technologies. Compared to the school population as a whole, the numbers in each group are relatively small and, as a result, much of the evidence of the impact of ICT use comes from small-scale studies. The very nature of the problems faced by the pupils involved means that the initiatives tend to be relatively intensive in terms of individual support. As a result, while the evidence may point to gains for the pupils involved, issues of scale and sustainability arise (BECTA, 2008). There is a growing body of evidence on the positive impact that ICT can have on the learning of pupils with special educational needs, whether through adaptive or assistive technologies specially designed to support pupils with specific disabilities or through the use of mainstream technologies such as digital video and photography.
While there is evidence that the new technologies are increasingly becoming integrated into the learning experiences of pupils and that learning is being enhanced by the new technologies, growth has been limited by the need to provide fast connectivity to online communities, online repositories of resources and virtual learning environments (VLE) or learning platforms. The little systematic evidence that exists indicates that good resources can have an impact on motivation and attainment. Once established, e-learning can offer flexible, personalised learning and bridge the gap between home and school learning (Cleary and Marcus-Quinn, 2008).

There is a concern, however, that there is not yet a good understanding of how teachers can support pupils and make the most of e-learning packages. Apart from the issues surrounding teacher supports to e-learning there are a number of other problematic areas which need to be addressed. Zhang et al see these as:

“Other important issues in e-learning must also be taken into consideration. Issues of trust, authorization, confidentiality, and individual responsibility must be resolved. Owners of intellectual property should be properly compensated. Security on the Internet is a growing challenge, primarily due to the open access by the public to this universal network. In addition, since multimedia materials are heavily used in e-learning systems, a high-bandwidth network is a basic requirement for efficient content access”


A persistent theme in the literature is the extent to which ICT can make the learning experience more personalised, more targeted at the needs of the individual learner. Combinations of technology and applications give greater choice in relation to what, when and where to study, selecting according to interests, learning styles and preferences and need. Such systems can give the pupil more autonomy and independence with regard to learning and a range of sources of information to draw on. This can be unsettling for some teachers and may well change the dynamics of the pupil–teacher relationship. There is little in the literature on the potential impact on
relationships in the classroom as schools develop e-capability and use ICT to support the learning process more widely.

**Summary**
This section has highlighted most developed counties have implemented similar strategies to integrate ICT. Among them they include a clear vision for their use, pathfinder projects to explore innovative technologies and broader implementation and training programmes. Ireland does not yet have a clearly defined policy for the integration of ICT into post-primary schools. Compared to other developed countries Ireland will have a much smaller budget at its disposal to draw up and implement an effective ICT strategy for schools. It is therefore crucial that Ireland’s policy be influenced by the work that has been undertaken internationally if the available funding is to be spent in an effective manner. The documented successes and failures of agencies such as BECTA should influence whatever policy is put in place.

The emergence of RLOs provides an additional dimension to this implementation which as, of yet, has not been utilised effectively. This issue will be examined in future sections of the review. Regardless of whether one believes ICT should take a central role in the education experience in schools there is widespread recognition that the use of ICT in society is creating new forms of literacies that students should be prepared for. The following section will focus on literacies and why they are important for today’s students and teachers alike.

**Section Four: New Literacies**

**Introduction**
This section focuses on the emergence of new literacies; particularly on the area of digital literacy. Many students maintain blogs, create podcasts, upload videos to sites such as YouTube and FaceBook and have a presence on social networking sites like
Twitter. It is therefore imperative that they be educated in aspects of new literacies so that they can partake in this type of online activity in an informed and educated manner.

**What is information literacy?**

There are many forms of literacy and in order to define any of these new literacies we first need to explore the ideas behind information literacy. In 1989, the American Library Association devised a six-stage model for information literacy. This model has influenced much of the literature in the area. This model regarded information literacy as consisting of six stages to process information handling. These are:

1. recognizing a need for information
2. identifying what information is needed
3. finding the information
4. evaluating the information
5. organizing the information
6. using the information

These six stages still form the basis for much work in the area of information literacy. Eisenberg and Johnson (1996) see information literacy as comprising six components: location and access, use of information, synthesis, and evaluation. Another model is the “seven pillars” model, developed by SCONUL (Society of College, National, and University Libraries) in the UK (SCONUL, 2006), which identifies the following seven aspects:

1. recognize information need
2. distinguish ways of addressing gap
3. construct strategies for locating
Bawden (2001) considers that information literacy is more than computer literacy. Soft skills such as evaluation of information and recognition of information need are included. Indeed, one could argue that they are more critical than simply locating material. Bawden in his review of the existing work on information literacy states that the six stage model has continued to dominate the literature. In the 1990s, although an alternative perspective emerged it never challenged the popularity of the “six stages” style of model. This viewpoint saw information literacy less as a series of competences to be mastered and more as “a set of general knowledge and attitudes to be possessed by an information literate person. Notable is the set of seven key characteristics presented by Bruce (1994, 1997), such that the information literate person is one who:

1. engages in independent self-directed learning
2. uses information processes
3. uses a variety of information technologies and systems
4. has internalized values that promote information use
5. has a sound knowledge of the world of information
6. approaches information critically
7. has a personal information style

Bawden goes on to discuss the work of Shapiro and Hughes (1996), who envisaged a concept of, and curriculum for, a kind of computer literacy comprising seven components:
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1. tool literacy—competence in using hardware and software tools
2. resource literacy—understanding forms of, and access to, information resources
3. social-structural literacy—understanding the production and social significance of information
4. research literacy—using IT tools for research and scholarship
5. publishing literacy—ability to communicate and publish information
6. emerging technologies literacy—understanding of new developments in IT
7. critical literacy—ability to evaluate the benefits of new technologies

Digital literacy

Digital literacy is seen as an important skill and a basic right in the twenty-first century and many ICT initiatives focus on this. There are a number of definitions available it is crucial to ask “what is digital literacy and what does it encompass? Digital literacy is a specific aim of the DigEuLit project. The DigEuLit project was planned as a response to a call for actions on “digital literacy” in the context of the eLearning Programme of the European Commission. The European Commissioner for Education and Culture states that,

“The modernisation of Europe’s education and training systems is our goal, and through our proposed eLearning programme we believe we can help create a society of life-long learning and education for all”

(European Commission, 2003, p 1).

One of the four key components of the project is the promotion of “digital literacy”: “The ability to use ICT and the Internet becomes a new form of literacy – “digital literacy”. Digital literacy is fast becoming a prerequisite for creativity, innovation and entrepreneurship and without it citizens can neither participate fully in society nor acquire the skills and knowledge necessary to live in the 21st century”. The primary aim of DigEuLit is to develop a European Framework for Digital Literacy (EFDL):
“a definition, generic structure, and set of tools which will enable educators, trainers and learners to share an understanding of what constitutes digital literacy and how it can be mapped into European educational practice”.
(Martin, 2005, p 1)

If we are to now look at the area of digital literacy it is crucial to look at the work of Gilster (1997) who is attributed with coining the phrase “digital literacy”. In an interview with Pool, Gilster defines Digital literacy as:

“the ability to understand information and—more important—to evaluate and integrate information in multiple formats that the computer can deliver. Being able to evaluate and interpret information is critical. When I talk to teachers and librarians, I emphasize that you can’t understand information you find on the Internet without evaluating its sources and placing it in context”. Gilster speaks largely about how people process the information that the find using the computer—specifically the internet”.
(Gilster in Pool, 1997, p 6)

Gilster sees the information provided by the Internet as different for several reasons. The information gathered is not all text. Multimedia computers enable students and teachers to download video, audio, and photos.

“The manner of how students find this information is different from the way they check out a book, buy a magazine, or sit down to read. A multimedia computer with an Internet connection enables people to truly construct information from around the world. The information is multidimensional and interactive. If a student finds a picture that they like, they can do more than view it. They can save it to a file on their own computer, use it in a hypertext creation of their own (being careful of copyrights, of course), print it out, or send it to a friend by e-mail. Or even discuss it on another newsgroup, talk about it on a chat group”.
(Gilster in Pool, 1997, p 7)

Gilster sees the most important aspect of digital literacy as knowing how to find those resources. He decries the deceptively simple approach that many adapt when performing an Internet search. "Type in a keyword and presto! A software "spider" scurries through thousands of files looking for it. But getting 30,000 hits after a search
is not going to help you find important information. Teachers and students need to
learn sophisticated search techniques--so they get only 50 hits or fewer per search”.

In 1997 when asked to comment on the future for technology in schools Gilster stated:

“in the near term—the next five years—I see a bit of a backlash against
technology. A lot of people are upset about the state our schools are in. They say, "You
know, we've spent X many millions on computers. Where are the results?"
It's dismaying to find that so many of the positive studies tend to come from
technology companies and people who have a vested interest in technology. It's
very hard to come up with the really impartial studies that show a huge increase
in student learning. Even Steve Jobs of Apple said computers are great in
education—as long as you remember that they alone won't solve the problem. A
backlash might be productive because it will make us reexamine how we use
technology in the classroom. Ideally, technology sets up wonderful possibilities
for multimedia projects. The beauty of new technology, within 10 years, is that
we're going to have very broad bandwidths and thus much faster connections. A
school's best teachers can become available to anybody on the Net. In Internet-
based instruction, you can attend class at 3 a.m. if you want to—whether it's a high
school or a college class. You can communicate with class members and the
teacher through e-mail, chat lines, and electronic forums. Video conferencing will
enhance the "live" aspects of virtual instruction. What the Net's going to give us is
the ability to turn our educational facilities loose—to distribute education. That's
provocative because it points to lifelong learning. Now that doesn't mean we'll do
away with classrooms—or teachers. But it does mean reenfranchising a whole
class of people in the work force who would like to learn more”.

(Gilster in Pool, 1997, p 6)

Given that these comments were made in 1997 they show remarkable understanding
of how technology tends to be used in schools. This quote could have been made
today. Eshet Alkalai following on from Gilster’s work concludes that digital literacy
is not about merely using the technology but it is about how the technology is used a
special type of thinking is required:

“digital literacy involves more than the mere ability to use software or operate
a digital device; it includes a large variety of complex cognitive, motor,
sociological, and emotional skills, which users need in order to function
effectively in digital environments. The tasks required in this context include,
for example ‘reading’ instructions from graphical displays in user interfaces;
using digital reproduction to create new meaningful materials from existing
ones; constructing knowledge from a non linear, hyper textual navigation;
evaluating the quality and validity from information; and have a mature and
realistic understanding of the ‘rules’ that prevail in the cyberspace”.

(Alkalai, 2004, p 93)
Eshet proposes a conceptual framework for digital literacy, which includes photo-visual literacy; reproduction literacy; branching literacy and socio-emotional literacy. Roblyer and Doering’s work also looks at the pervasiveness of technology into the lives of young people today. “Today’s young people engage with technology everyday in almost every aspect of their lives. Integrating technology and education taps into their comfort zone” (Roblyer and Doering, p 14). Laverick (2009) discusses the importance of preparing teachers who are ready to capitalize on children’s eCulture by integrating this concept into formal learning experiences. Children already have some level of digital literacy. Laverick (2009) identifies the benefits of including “children’s eCulture” in school curricula. “Children’s eCulture” is the culture of children as it relates to electronics and technology. Integrating children’s eCulture into formal learning experiences allows teachers to promote multiple literacies in their students. Laverick’s work looks at the existing literature to (a) describe the recreational uses of technology by children; (b) link these applications to school curricula; (c) familiarize educators with children’s eCulture as a means for promoting multiple literacies across the curriculum; and (d) discuss the need to integrate children’s eCulture in teacher education programs.

In recent years there has also been much discussion surrounding the notion of “digital natives” and more specifically digital natives being taught by “digital immigrants”. However this is not really an accurate representation of the skillset held by today’s youth commonly referred to as Generation Y. This generation of students may have an eCulture but it needs to be trained. Students may feel that because they have been interacting with digital technologies all of their lives that they are more technologically literate that those teaching them. This may be further reinforced by
teachers appearing to be apprehensive about using the available technologies (Lankshear and Knobel, 2006). Teachers have a duty not to perpetuate this myth. Teachers are trained and have the information literacy needed to help students exploit all that this digital world has to offer. Such training is necessary if it is the technology that is to be exploited and not the students.

Palfrey and Gasser (2008) in their work on the digital natives’ project at the Berkman Center for Internet and Society examine how young people today use the internet and other available technologies to learn and to communicate. Digital Natives is an interdisciplinary collaboration of the Berkman Centre for Internet & Society at Harvard University and the Research Centre for Information Law at the University of St. Gallen. The aim of the project is to understand and support young people as they grow up in a digital age. Within the project, a variety of methods is used to investigate a range of themes pertaining to young people and their use of technologies. Palfrey and Gasser acknowledge that the very term digital native is problematic and state that it is important that the term digital native is not applied across the board to an entire generation but rather it should be applied to segments of the population. Students need to learn the essential skills of processing the information that they receive. It is important that students are able to evaluate and reflect on what they find online.

Palfrey and Gasser also explore some of the myths surrounding how young people use new technologies. One of the questions that they address is “Does it make sense to talk about a distinctive global culture of young people?” Palfrey and Gasser’s work on focuses on students who have only known life in a digital age. One of the main
Chapter 2: Literature Review

myths that pervades is that Digital Natives are wasting time online. They may be engaging in more social activities while online but the skills that they are learning are important. They are also replacing the friend that may have helped with homework with technology. Students can go online, find information that challenges the text and then network with others, compare notes and even e-mail the experts.

Another study carried out by Luckin et al (2009) reports on survey and focus group data relating to the activities and perceptions of learning with Web 2.0 technologies of students aged between 11 and 16 years in 27 UK secondary schools. The study confirms that these learners had high levels of access to Web 2.0 technologies and that Web 2.0 activities were prolific. However, patterns of use were complex. The types of activity evidenced by the study suggest that learners can be categorised into four main groups:

1. Researchers mainly in terms of reading with little evidence of critical enquiry or analytical awareness;
2. Collaborators mainly with respect to file sharing, gaming and communicating;
3. Producers: mainly in terms of sharing experience through social networking sites
4. Publishers: mainly in terms of sharing experience through social networking sites.

What is most interesting from this study is that most participants expressed an interest in using online technologies to support familiar school activities, such as presentations or for communication. However, learners “seemed cautious about other values associated with Web 2.0 tools, such as the shared construction of knowledge in a public format”. The study revealed that few learners were familiar with the complete offering of Web 2.0 activities and only a small number were engaging in more
sophisticated activities, such as producing and publishing self-created content for wider consumption. There was little evidence of groundbreaking activities and only a few emergent signs of the higher order thinking skills. The paper concludes that these higher order thinking skills need to be encouraged and supported in any attempt to use Web 2.0 for learning in formal education.

Looking at the body of literature we cannot claim that just because students are young and are accessing the available technologies that they have the necessary skills to use what is available in the best possible way (Clark et al 2009, Kennedy et al, 2008). It is clear that learners are motivated to use Web 2.0 technologies and there is evidence to suggest that teachers have a leading role to play in assisting learners to make better use of these available technologies to support learning (Saloman and Perkins, 1996). However, the current cultures of schools can prevent teachers from playing this role effectively (Callan, 1997; McGarr, 2009). In the classroom of 2010 while Gilster’s vision isn’t quite a reality just yet there is definitely an awareness among educators that today’s world expects students to have the necessary digital literacy skills to function in a modern society. Schools will need to address this imbalance of skill.

**Why is a broad understanding of Digital literacy important?**

The review has found that many students have patchy levels of information literacy (Gannon-Leary, 2009; Rainey, 2006, Selwyn, 2009; Prensky, 2001). This can be dangerous as they risk being manipulated by the information that they access. It is therefore crucial that teachers play a leading role in exploring the connection between work and schooling in the areas of technology and literacy education. Eshet (2004) in his work stresses that students need to be able to make educated judgements based on
what they find online. Eshet provides a conceptual framework for the concept of
digital literacy. This framework comprises five types of literacy:

1. photovisual literacy
2. reproduction literacy
3. information literacy
4. branching literacy
5. socio-emotional literacy.

This work, based on an extensive review of the literature and observations, indicates
that these five types of digital literacy include most of the cognitive skills employed
when exploring a digital environment.

In Eshet’s study three groups of participants: 10 high-school students, 10 university
students and 10 adults over age 30 were given assignments designed to test their
ability to solve problems and perform tasks, each of which required a different type of
digital literacy. Eshet’s work on digital literacy goes beyond the more restrictive
definitions offered for digital literacy to provide a conceptual framework (photovisual
literacy, reproduction literacy, information literacy, branching literacy and socio-
emotional literacy) that could contribute significantly to our understanding of how
learners work in digital environments.

In the UK BECTA has also commissioned a number of reports on digital literacy.
Digital literacy is seen as a combination of: functional technology skills, critical
thinking, collaboration skills and social awareness. It is sometimes called web
literacy, information literacy, internet literacy or media literacy. The term ‘digital
literacy’ relates to:
- the functional skills of knowing about and using digital technology effectively
- the ability to analyse and evaluate digital information
- knowing how to act sensibly, safely and appropriately online
- understanding how, when, why and with whom to use technology.

**Importance of new literacies**

The 2009 Digital Britain report states that technology provides opportunities to participate in new kinds of learning, social, community and work activities. As functioning members of a modern society we need to be digitally literate to make the most of these opportunities. The 2009 report highlights that while many young people are able to use the technology, they may not be aware of how they are using it or indeed how it is using them. The report states:

> “This is particularly apparent in relation to ‘higher level’ critical thinking skills, e.g. awareness of commercial strategies or bias in the media. Supporting young people to make informed decisions about how and why they participate digitally is an important response to the commercialisation of childhood, to the need for e-safety and to children’s increasing use of technology”.

(BECTA, 2009, p 4)

Digital literacy is important for society. Digital literacy can affect equality of access to information and services, employment, social inclusion and further learning opportunities. In turn, this can affect wider business productivity. Indeed developing digital literacy is a key aim of the Government’s Digital Britain strategy, as outlined in the 2009 Digital Britain report. The literature states that we need to take on board the omnipresence of technology in the world of today’s student. Students need a guide to help them to become digitally literate. However, we must be cognisant that for all the positives that technology brings there are also negatives: Technology can be disruptive. However, Boyle (2008) asserts that “This disruption encourages us to rethink, to re-evaluate how we do things. The revolution in ICT stimulates us to
confront our ideas about learning, pedagogy and education”. This disruption encourages us to rethink, to re-evaluate how we do things. The revolution in ICT stimulates us to confront our ideas about learning, pedagogy and education”.

P180 “need for much greater emphasis on pedagogical quality as opposed to technical quality, in adherence to standards”. Robyler and Doering (2006) echo this message:

“If we begin with more realistic expectations in mind, we have more potential for success and impact on teaching and learning. Planning must always begin with this question: What specific needs do my students and I have that (any given) resources can help meet?”

(Roblyer and Doering, 2006 p 11)

Common to National Curricula is a description of learners’ right to use ICT to support their learning across the curriculum. However, students are still not being given the skills that require to function in a modern digital world.

“Research shows that not all learners are equipped with the skills knowledge and understanding that will enable them to critically engage with technology and use it effectively. In the same way that traditional literacy is essential for all subjects, digital literacy needs to be incorporated into all teaching. Developing digital literacy is about addressing the changing nature of subject knowledge and acknowledging that young people will need different kinds of skills, knowledge and understanding in order to develop their subject expertise. Every teacher can offer a different perspective as to how technology can add value in their subject. Young people are more likely to stay safe online if they have the ability to make appropriate and informed decisions about their use of technology”

(BECTA, Digital Literacy, 2008, p 6)

BECTA’s numerous studies confirm that young people need to be educated so that they have the necessary literacy skills to find, validate, synthesise, communicate information. This generation will also need to be educated in how to collaborate with one another using new technologies. They will also have to be taught how to deal with any inappropriate material to which they may be exposed.

“The success of young people in engaging effectively with technology will impact on their learning, lifelong education, leisure and future working lives.”

(BECTA, Digital Literacy, 2008, p 8)
The Independent Review of the Primary Curriculum (Rose, 2008) argues that creating successful learners, confident individuals and responsible citizens depends on a sound education in literacy, numeracy and ICT. This recognises the increasing digitisation of the world, which “will require digital literacy of all children for their full participation in society” (Rose, J. 2009, p 5). Reforms to the secondary curriculum are based on a rationale that in order to be successful in the future, young people need the skills and competences to manage their own learning and lifelong development in a changing world (Robinson, 2006; Luckin, 2009). Students who cannot process information and are not digitally literate are significantly disadvantaged, in terms of educational achievement and employment when they leave school.

**Summary of New Literacies**

This section has looked at the different types of literacies that today’s modern world expects of its citizens. The lack of common understanding of what literacy is for students in the IT age needs to be addressed before any solutions can be offered. This research study promotes digital literacy and highlights the fact that today’s students are confronted with aspects of new media on a daily basis. In learning to critically appraise the multimedia poem the skills acquired can be used elsewhere online and in students’ day to day lives. The next section explores the concept of blended learning and how a blended learning approach may be the solution to the successful implementation of ICT in schools. A definition of blended learning for the context of this study is also provided.

**Section Five: Blended Learning**

**Introduction**

This section of the literature review looks at the area of blended learning. Often blended learning is offered as the quick fix to introduce an ICT element to the
traditional classroom (Oliver and Trigwell, 2005). Individual instances of blended learning are as ICT rich or poor as the classroom they are delivered in. It is therefore important to look at what blended learning could achieve.

**Defining Blended Learning**

Blended learning is a term used quite frequently to describe the way ICT should be embedded in teaching and learning. Like many terms used relating to ICT and education it is a very loose concept and open to differing interpretations. Before exploring blended learning an unpacking of what it constitutes may help maintain a clearer focus on the research. Petty (2009) highlights that the computer-based instructional drive of the 1980s had limited success, this was in part due to the isolated nature of the learning experience. Blended learning uses the potential of ICT while maintaining the benefits of the traditional learning environment where the social engagement and social construction of knowledge occurs.

![Continuum of Blended Learning](image)

**Fig 2. Continuum of Blended Learning (Jones, 2009)**

Jones (2009) offers a model illustrating a continuum for blended learning. The continuum categorises the provision of simple documents such as PowerPoint presentations as at the periphery of blended learning with complete module delivery present at the core of successful blended learning. Given the wide range of possible definitions such a continuum is helpful. Blended learning, in the context of this study,
is the exploitation of available technology and existing classroom practice to achieve the best possible teaching and learning environment.

**When to use blended learning?**

Much of the available literature reports that blended learning is the preference for generation Y (Dziuban, Moskal and Hartman, 2005; Howe and Strauss, 2000; Levin and Arafeh, 2002; Howe, 2003). Mixing the best of various learning environment it is possible to appeal to more learning styles and therefore reach more students (Oblinger, 2003; Mellow; Woo, 2007). If a satisfactory level of digital literacy is to be achieved by our young people a blended approach may provide the means to achieve this level. We have already discussed the central role of the teacher in the process earlier in the chapter we will now discuss the opportunities that blended learning may provide in helping students to achieve a satisfactory level of digital literacy.

Identifying the learning objectives is the first stage in planning a blended learning environment. Clearly identifying the needs of the users (both teachers and students) is necessary. Boyle (2005) states that the pedagogical objectives should be at the centre of the process and that the organisational support and constraints should act as secondary shaping influences.

“Blended learning can provide a controlled and productive approach to educational process re-engineering. To transform a course completely, especially one with a high number of learners, is risky. There is a need to carry the teachers or tutors. A blend of familiar components together with new (often ICT-based) components will be more acceptable to them. Over time, as the new components become accepted, it should be possible to extend the blend in more novel and radical directions. Thorough evaluation is required to guide this development process. A significant challenge remains in mapping standard conceptual structures that, through more precise representation of structures and relationships, will aid this development process”.

(Boyle, 2005, p 221).
The concept of blended learning is widely interpreted and depends largely on what it is expected to achieve (Driscoll, 2002). For many teachers blended learning is no more than introducing some ICT-based element to the classroom while for others blended learning is a full course delivered in online environment. “At the base of these descriptions is usually a mixture of ICT-based and traditional teaching” (Boyle, 2005, p 221).

Boyle sees the required features of a suitable methodology as those that:

1. Provide the right balance of creativity and structure;

2. Be flexible, and support iterative development;

3. Encourage and support collaborative, team-based working;

4. Involve tutors closely to ensure:
   • accuracy and quality of the products;
   • acceptability of the products;
   • delivery and appropriate evaluation

5. Be robust in the face of development noise: where the developers may be working ‘part-time’ with several other demands on their time;

6. Deliver results: to get the project accepted there should be a promise of clear, observable or measurable results.

Before embracing a blended approach the high level questions that need to be asked:

- What do you want to achieve?
- How can blended learning achieve this?
- How are you going to get resources to achieve this goal?
- How will you know that the project has succeeded?
Chapter 2: Literature Review

Boyle stresses the importance of planning when it comes to designing ICT material for the classroom. As ICT can be quite costly to produce it is imperative that the outcomes are clear from the planning process.

“The design/development team needs to have an appropriate mixture of roles, and in academic settings, clarity about the commitment of people working part-time on the project. There should be a clear plan for tackling the design and development tasks. The plan involves breaking the overall problems into sub-tasks and allocating these to groups and individuals within the group. There needs to be regular group meetings to discuss the progress against targets. Good design requires a creative, motivated group. The operation of the group, therefore, must be robust and flexible in order to keep the momentum going. Compromises may well be required within the group to achieve the aim of an overall integrated blended learning environment. It is useful to have a clear ‘design and development’ phase. However, analysis and design functions do not have to be realised sequentially as non-overlapping phases” (Boyle, 2005, p 226).

Once it has been established what is to be achieved by using ICT in the classroom the next step is to look at what happens in the real classroom setting? In addition to digital literacy expectation students need to learn how to evaluate and reflect on classroom activity regardless of how it is taught. Reynolds et al (2003) in their paper, “ICT—the hopes and the reality” examine the reasons contributing to the excessive optimism that often surrounds the use of ICT to enhance levels of pupil achievement. ICT remains a controversial issue for many teachers. Attitudes to whether, how and why it should be used for teaching and learning are very varied. While Reynolds’ study is largely concerned with the teaching of maths the findings are of interest to any teacher contemplating introducing an ICT element into their classroom. Reynolds et al cite a study by Ellis where the suggested uses for ICT in the teaching of English and literacy are explored. The study offered students the opportunity to improve their basic literacy skills:

“A group of her students who were having difficulty with spelling, punctuation or sentence construction were given the opportunity to use one of these
programs, and their scores on these areas improved dramatically, according to the tests provided by the software manufacturer. However, their “apparent gains in accuracy on the standardised tests were not carried over to the students’ own writing.”

(Reynolds, 2003, p 155)

What can be taken from this experience in Reynolds’ opinion is that in order to realise the potential of blended learning it is the educational principles and not the technology that must lead:

“ICT tools are useful for the purpose of the practise, but that teachers need to find better ways of helping pupils to integrate the use of their improved skills into other writing activities. Once again we return to the concept that ICT has to enhance existing patterns of learning, building upon good practices in a way that extend them beyond what conventional means would have allowed”.

(Reynolds, 2003, p 155)

A similar study carried out by the University of Newcastle suggested several ways in which ICT can improve teaching and learning in English (Moseley and Higgins, 1999). ICT was found to have supported learning by helping to “increase the intensity of pupils’ learning” for example by using multimedia to create a teaching resource about apostrophes for other pupils to use. It also had the effect of “increasing pupils’ focus on story-writing” in the experiment where pupils planned a story by creating pictures to accompany it with a drawing package. Teachers used ICT “to support reading, spelling and redrafting as well as to enhance reading comprehension.” It also “supported pupils’ literacy skills by presenting words and text visually and aurally”.

This study involved a series of experiments with teaching with ICT, and the evaluations of its success and future potential by the different teachers varied a great deal. Most felt that ICT had been a good tool to use in the situations they used it, but some mentioned that they had initially found “the demands of individualised work [by pupils on the computer] were considerable”. However, most said they intended to use the system again, with alterations to improve the way the lesson ran. Some teachers
were extremely enthusiastic about the ideas provided by the experiment; others acknowledged that ICT had not been “a ‘Damascus experience’, at least not in its present state of development.” While at the level of teacher perceptions this research is persuasive, the evidential base of measuring improvements in pupil performance is simply not there.

**Summary of Blended Learning**
There are as many critics of blended learning as there are advocates. As more educational institutes embrace VLEs there is an expectation on faculty and teachers to develop blended learning solutions. However, the process of integration will continue to be problematic until there is an acknowledgement that creating blended learning materials is a process that requires much planning and commitment and is not simply a matter of converting static documents (such as MS Word) to into PowerPoint presentations. The next section will examine the growing presence of RLOs and the role that they can play in the ever changing classroom.

**Section Six: Reusable Learning Objects**

**Introduction**
This section explores the role that RLOs could play in the uptake of ICT. Over the past 8 to 10 years web-based learning tools have been evaluated and received positively by higher education students (Haywood et al, 2004, Hong, 2002, Lundgren and Nantz, 2003). However, little research has been done examining teachers in middle and secondary school environments. The purpose of the current study was to analyse teacher perceptions of the use of learning objects secondary school classrooms. Overall, most teachers rated learning objects as easy-to-use and engaging for students. They also reported that learning objects promoted successful learning.
Defining RLOs
There are many definitions of digital learning objects. An early definition by Wiley (2000) states that digital learning objects are “small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts.” In a later paper, Caws, Friesen and Beaudoin (2006) cite Harman and Koohang’s (2005) definition for learning objects used in education: “learning objects are digital resources of any kind that can be similarly combined, shared and repurposed in different educational contexts.” While Wiley favours the internet as the mode of delivery for digital learning objects, this is rather restrictive. For the purpose of this chapter, we define digital learning objects as any object which enhances learning (a photo, an MP3, a map etc.), that can be shared in digital form and delivered in various ways (Virtual Learning Environment, online repository, CD, mobile phone, MP3 player).

Of course, the concept of RLOs is as old as education itself: in particular, teachers have been using multimedia – various kinds of authentic materials — in the classroom for as long as they have been available. These materials, however, could not be shared and could only be accessed in the classroom, greatly reducing the possibility of autonomous use by learners. In addition, every teacher who wanted to use such materials had to build their own portfolio of resources.

In recent years, there has been a large increase in the number of third level courses delivered online. Courses are either delivered completely online or using a blended approach whereby students may receive some coursework online but they may have to attend a limited number of workshops or lectures on campus. This change in delivery has necessitated a change in the type of course materials that learners are
given. Many lecturers facing the challenge of developing materials for online
delivery have had to evaluate their own teaching materials and in some cases have
either had to redesign or develop teaching resources that match this new cohort’s
learning expectations and needs. Digital resources are being developed increasingly
to meet these needs (Mohan, Greer and McCalla, 2003).

Kim and Shih (2004) are also among the many practitioners at third level who believe
that one of the greatest challenges for distance learning in the creation of high quality
course materials (lecture notes, references, tests, etc). They stress the importance of
sharing and reusing well-developed learning objects to “reduce the load on
instructors, and to make them available across a wide variety of platforms” (p 27).
International best practice indicates that the successful development of high-quality
learning objects is collaborative, that there are sufficient resources available in terms
of expertise and money and that the objects can easily be shared.

In October 2002 the Massachusetts Institute of Technology (MIT) began an initiative
to make available online without any subscription fee all of the educational materials
from its undergraduate and postgraduate courses. These materials, including learning
objects, but also lecture content of all lectures, are available to anyone. The project is
jointly funded by the William and Flora Hewlett Foundation, the Andrew W. Mellon
Foundation, and MIT. In terms of its sheer size, comprehensiveness, level of
coordination as well as its free global access, this project is now taken as an example
of best practice for the development and sharing of high quality learning objects.
James Taylor from the University of Southern Queensland Australia, located in an area with a long history of distance education and consequently an international leader in off-campus education, asserts that the growth in the field of instructional design and technology has led to a marked increase in collaboration. He advocates “…a multi-disciplinary team approach, wherein a wide range of specialist expertise is applied to the generation of training programs” (Taylor: 1998, 9). Taylor states that the necessary level of expertise for the development of technical teaching and learning systems is usually beyond the skill set of individual teachers and appears to demand the deployment of an expert teaching team, with a wide range of specialist skills. These include specialists in instructional design, systems design, electronic information systems, database design, graphic design, student administration, electronic publishing and project management working alongside subject matter experts. Taylor continues to advocate this structured collaborative method of design and development of content in preference to what he terms “random acts of innovation”. These random acts of innovation are the result of many individual lecturers spending time and money developing similar learning objects. If they shared their resources, perhaps in a repository, they could see where gaps needed to be filled rather than constantly reinventing the wheel.

Closer to home, the 81 Centres for Excellence in Teaching and Learning in the UK and Northern Ireland were funded from 2005 by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL) in Northern Ireland. These centres develop high quality learning objects and make them available online to the wider teaching community. Similarly, the Joint Information Systems Committee (JISC) is “funded by the UK HE and FE funding bodies to provide world-class leadership in the innovative use of ICT to support
education and research.” Both of these initiatives have access to enviable levels of expertise and money resulting in rapidly-produced high quality learning objects. JISC also funds JORUM, the UK’s digital learning repository which was officially launched in 2006. A national digital learning repository like this is both more economical and more efficient than the alternative which is each institution funding, hosting and populating its own repository.

Ireland’s National Digital Learning Repository (NDLR) is a Higher Education Authority-funded initiative, in which the seven Irish universities and fourteen Institutes of Technology are involved. Despite having a much lower level of funding than in the UK, the NDLR has proven successful in terms of cross-institutional collaboration and the development of learning objects. This may be because the HE community in Ireland is small enough to make collaboration easier. In addition to storing the learning resources, the project also provides infrastructure to support subject or discipline based communities of practice in higher education. The development of these communities of practice is unique to the NDLR. The spirit of collaboration generated by many of these communities of practice facilitates the development of learning objects with very limited resources. The Department of Education are exploring the possibility of establishing a similar repository type service for the post-primary sector. This is discussed in the following chapter.

For higher education professionals wishing to develop digital learning objects issues remain, however. One fundamental and long-running controversy is the doubt whether technology used in education results in a significant statistical difference in learning outcomes or not. This is neatly summarised in Conger (2005, 3). She also makes the point that many media comparison studies (MCS) that examine the
question of significant difference are methodologically flawed and lack a theoretical basis. Conger concludes citing Sener (2004): “Rather than continuing to perform MCS, then, we should move towards developing teaching pedagogies that make best use of current technologies.” Oblinger and Hawkins (2006, p 14) go so far as to query the usefulness of the question itself: “we need to ask: ‘Difference in what?’” and then go on to summarise their vision of learning as follows: “Learning occurs as a result of motivation, opportunities, an active process, interaction with others, and the ability to transfer learning to a real-world situation.” The remainder of their article demonstrates that technology has a positive role in education when it is used to bring about beneficial change as a means to a clear pedagogical end and that use of technology is social: “Being with others is now multimodal involving face-to-face and online communication, often simultaneously (Oblinger and Hawkins: 2006, 15). They conclude that it is crucial to exploit to the full the range of opportunities afforded by technology in education.

To make optimum use of digital learning objects, therefore, they need to have clear, achievable learning outcomes that are relevant to the skill they are trying to learn. While learning objects produced using word processing or presentation software have their place, their sustained use to produce learning objects does not exploit to their fullest extent the possibilities offered by technology in education.

While much of the literature encourages the development of digital learning objects, a number of issues remain which impede instructors from deciding to develop them. These include the following: concern about cost, lack of time, access to expertise and
anxiety about the perceived quality of shared learning objects (Boyle, 2003). Concerns about copyright also hamper sharing.

Instructional designers have a range of design and development models to choose from. There are hundreds of models to design and develop training materials, but nearly all are variants of the basic ADDIE model (Kruse, 2009). The five phases of this model are:

- Analysis,
- Design
- Development,
- Implementation
- Evaluation

The ADDIE model provides a simple but systematic approach to the design and development process. There are alternative systematic models in circulation outlining the most successful plan for the design and development process of a learning object. However, as Kruse (2009) comments, a systematic approach with distinct steps allows for more efficient use of time and resources. The stages recommended by the London Metropolitan University (Cook, 2006) are as follows:

1. Concept
2. Specification
3. Peer review 1
4. Development
5. Peer review 2
6. Student Peer review
7. Revision
8. Delivery
9. Packaging and metadata
10. Deposited
Having limited resources can lead to more focussed planning; resulting in a more successful learning object. Learning outcomes must be clarified at the very beginning of the process, ensuring that the object leads to the intended outcomes. While possibly time-consuming, this step is crucial. Another way of reducing costs is to identify existing resources that can easily be accessed, in-house recording and design facilities, at no additional cost, for instance. Developing effective digital learning objects takes time. However, establishing a clear idea of the learning outcomes will save time in the long run and successful reusable objects reduce teaching time far into the future. Collaboration also saves time because not everyone in the group will need to develop the same level of technical skill. One of the advantages of repositories and communities of practice is the opportunity for collaboration. The following account describes a successful collaboration between two disciplines – Technical Communication and Japanese – at the University of Limerick leading to the development of an effective digital learning object for language teaching. The development process, which is an adaptation of the ADDIE model, was as follows (see figure 3):

**Successful Collaborative Learning Object Development**

The process begins with an existing learning activity. The instructor decides to explore the option of digital delivery. He or she meets the instructional designer who has technical expertise. They conduct a needs analysis together. The instructor clarifies the learning outcomes required. Next, they make a rough draft of a storyboard (this can be as simple as a basic diagram of what you intend). After that, they both search for existing material that might meet these needs. If this material already exists, no further work may be needed. If there is no usable material in
existence already, they develop a couple of possible prototypes together and the instructor selects the most appropriate one. These prototypes are not complete learning objects: they give an idea of what the eventual learning object will look like. Once the most appropriate prototype has been selected, it is developed as a full learning object. The team next carry out initial usability testing. On the basis of the findings from this testing, they implement required changes. They then carry out usability testing again with a different group, implement any additional changes and finally make the learning object available for use by learners.

The specific development model chosen is not as important as having a design and development process in place. Awareness of the stages in the process applicable to your project is essential. However, our experience shows that storyboarding and usability are the two areas that should not be omitted.

Learning Objects for post-primary students
Successful learning happens where students take a deeper approach to their class work (Prosser and Trigwell, 1999; Rust, 2002; Gibbs, 2004). Deep learning is where
students can relate material covered in the classroom to other areas of their life and can subsequently apply the new knowledge gained to their daily lives. Felder and Brent (2005, 2003, 2001) have published on student motivation and while their work focuses on the third level classroom their findings can be applied to those at second level. They outline three types of student that inhabit the classroom:

1. Highly motivated with an interest in the subject,
2. Those with a lack of aptitude,
3. Highly apathetic towards the subject but with the ability to succeed.

Felder and Brent suggest some attributes that can be included in course material to help combat low levels of student motivation. These include: clear relevance to familiar phenomena, explicit statements of the knowledge and skills that students will be expected to acquire and that assignments should provide practice in the skills specified in the objectives. Where learning objects are being used they must be of a high enough quality to engage with learners:

“To achieve large scale reform you cannot depend on people’s capacity to bring about substantial change in the short run so you need to propel the process with high quality teaching and training materials (print, video, electronic).”

(Fullan, 2007, p 92)

Much research has been carried out to discover the benefits of learning objects at third level (Finlay et al, 2008, Taylor, 2002; Hiddink, 2001; Cook, 2006) but relatively little exists to show the benefits of use at second level. Where there is research much focuses on the technical aspects and the feasibility of the funding to provide classrooms with the necessary equipment. This study provides a detailed description of the design, development and evaluation process of a learning object for secondary school students of English poetry.
Research by Kay and Knaack (2005) has found that students reported that the learning objects were beneficial, citing a motivating theme, interactivity, and visual qualities as the most important features. However, almost 60% of all students were critical about the learning object quality. Clarity of instructions, help functions and organisation/layout presented the most problems. As with some previous studies key steps that appeared to be beneficial in the development process included a collaborative team approach, understanding the learner, a focus on clear instruction and organisation, and using a comprehensive, theoretically supported evaluation metric to examine the quality and benefits of learning objects (Kay and Knaack, 2005). Parish (2004) summarises this nicely in saying:

“(the) learning object movement can foster effective learning by introducing active learning experiences, supporting student-centered learning environments, propagating new ideas about instruction, and increasing collaboration and sharing of resources, it (use of RLOs) can play a major role in improving education and training”

(Parish, 2004, p65)

Summary of RLOs
This section has served to define RLOs and to look at the process involved in collaboratively designing and developing successful RLOs. While the growing role that RLOs could play in the classroom has been discussed it is important to assert that it is not the motivation of this researcher to promote the use of RLOs in preference to traditional classroom activities. The use of technology in the classroom should always be driven by a pedagogy first technology second philosophy. The appropriate use of RLOs and traditional teaching can complement one another if the RLO is planned accordingly. In the following final section of this chapter we shall briefly conclude the findings of the literature review.
**Conclusion of review findings**

Sections one and two discussed the forces driving ICT initiatives in education. Such competing agendas (economic, educational and vocational) can lead to a high level of fragmentation of usage and rationale for usage. Within such a context it is likely to see pockets of good practice and pockets of poor practice. This is borne out in the subject inspection reports for post-primary schools. This highlights the value of curriculum specific courseware for post-primary schools.

Section three looked at how ICT is being embedded into education. The integration of ICT into the classroom can be complex and problematic process. There are multiple factors to be considered. However, it is clear that the teacher is central to the process. This study kept the teacher at the centre of the design, development and delivery of the RLO. This research study, having looked at the experience of an agency such as BECTA in the UK, provided a focus for teachers in how they could potentially embed more ICT into their teaching.

Section four looked at the need for new literacies and explored how the use of ICT could assist students in critically engaging with a wide range of opportunities afforded by new media in an educated and informed manner.

Section five highlighted the growing area of blended learning. Given the range of experiences encompassed by blended learning it is crucial that an agreed definition of blended learning be established if this type of solution is to be promoted as best practice in a typical Irish post-primary classroom.
The sixth and final section discussed the emergence of RLOs. Internationally, there has been a momentum gathering behind the use of RLOs. It will be interesting to observe how RLOs could be embedded into the Irish post-primary classroom given the following obstacles:

- The highly centralized nature of the education system in Ireland.
- The limited levels of ICT usage.
- The didactic and teacher-centered approaches to classroom management.
- The domination of state examinations.

Much of the literature acknowledges that new technologies afforded by Web 2.0 can enable the active, vibrant, relevant teaching of English (DES, 2008; Schetzer and Warschauer, 2000, Waycott and Kukulska, 2003). Technology need not replace traditional texts or undermine traditional skills. Technology can instead aid motivation, understanding, engagement, analysis and creativity (Rickard and Oblinger, 2003). Forms of communication have changed radically in the past few years. Teachers need to help students understand critique and produce the new media in which they are immersed. Students also need to experience a learning environment that reflects the media rich environment outside school (BECTA, 2007, 2008). As a profession, teachers cannot ignore ICT. Teachers need to acknowledge young people’s use of Web 2 technology and need to understand how to harness their creative potential in the classroom (Thornton and Houser, 2005).

Many teachers themselves recognise that there is a need to include digital literacies in the classroom (Cox, 2007). However, as long as this is voluntary and not supported it cannot be expected of teachers and therefore ICT presence in teaching and learning will not be equitable for all students (Lefoe, Olney and Herrington, 2008). The subject
inspection reports gave the most accurate picture of teaching as it is. If the level of ICT adoption in post-primary schools is to improve then teacher support is central to the process. While the comments made by Moore et al were made in reference to faculty teaching at higher level they are just as relevant to the post-primary sector.

“Faculty development for existing and future faculty is a pivotal investment for integrating technology in higher education; it can catalyse innovations in learning across generations.”

(Moore, Moore, & Fowler, 2005, p.11)

The body of evidence on the impact of ICT on intermediate outcomes, such as motivation, engagement with and independence in learning, is more persuasive. The benefits identified in the literature include increased collaboration, greater engagement and persistence, more on-task behaviour and better conceptual understanding (Passey and Rogers, 2004; McMahon and Posipil, 2005; Haughey and Muirhead, 2005). Understanding of the extent to which ICT can support creativity, including critical thinking skills and problem solving abilities, is developing, although some of the evidence appears contradictory. In the studies encountered, positive findings were associated with a range of technologies, particularly those with strong visual elements such as digital video, drama-oriented software and multimedia presentations (Foreman, 2004). Much of the evidence is drawn from small-scale case studies and there is a paucity of large-scale, methodologically rigorous research from which generalisations may be drawn (Kay and Knaack, 2005; 2007). In general, impact is most clearly observed where tasks have clear educational aims, are designed to maximise the potential of the ICT in use and are perceived as purposeful by pupils (Duval et al, 2003).

The review of the literature review served to answer aspects of the research questions posed in the study. The reports of successful case studies illustrated how ICT could
be used to enhance and augment the classroom. The review also helped to identify what typically impedes or promotes the use of ICT in the classroom.

The following chapter looks at the Irish context for ICT integration at post-primary level. This chapter explores ICT policy, provision and the English curriculum at Junior Certificate and focuses on how ICT can be used to enhance teaching and learning and develop digital literacy skills within an Irish context. This section also draws on subject inspection reports and other relevant publications by Department of Education and Science in order to discuss the current level of ICT use and barriers to use within the context of an Irish post-primary classroom.
Chapter 3

ICT in the post-primary classroom; the Irish context

Introduction

In order to understand the research it is essential to understand the national context in which this study took place. Therefore, this chapter will outline briefly:

- The structure of the Irish education system.
- The historical role of ICT in Irish post-primary schools.
- How the use of ICT has evolved to its current level.
- Recognition of the role that ICT can play in post-primary education.
- Initiatives to promote ICT at post-primary
- Issues associated with implementing ICT into school practice.
- Where the typical school is now.
- Recommendations of the Minister’s report: the reality.
- How English as a subject is taught at post-primary level.
- Why use ICT to enhance poetry?

The first section that will be discussed is the structure of the Irish education system.

Structure of the Irish education system

The Irish education system is divided into three levels: Primary (8 years), secondary (5 or 6 years) and higher education. Secondary school comprises junior cycle and senior cycle. The junior cycle is spread over three years with the state Junior Certificate examination sat in all subjects (usually 10 or 11) in early June of the third year. Transition year is optional in some schools and compulsory in others. Senior cycle is spread over two years with the state Leaving Certificate examination sat in
early June of the final year. The results of the Leaving Certificate examination determine for many students their choice of study at third level and ultimately their future career plans. Poor performance in this exam results in many students repeating this entire year in order to improve their future prospects.

The historical role of ICT in Irish post-primary schools

Introduction
Historically, Ireland has looked to other European countries where ICT is concerned. The IT2000 project was modelled on the Swedish IT initiative and took most of its ideas from similar projects on other EU countries. For example, scoilnet was largely based on skoolnet a Danish web portal providing ICT resources for teachers and students. Ireland’s strategy towards providing any kind of support for ICT in schools has traditionally been quite reactionary. There have been very few proactive initiatives put in place. Rather than forming a clear ICT strategy with the limited funds available Ireland has instead chosen to try to replicate best practice for ICT in schools from abroad but without the necessary financial investment.

How the use of ICT has evolved to its current level
The emphasis on rote learning has been a criticism of the Irish educational system for a number of years. As far back as 1991 an OECD report on Irish schools noted that terminal examinations dominated both the curriculum and the teaching practices within schools. Within this environment the teaching tended to be didactic in nature with an emphasis on wrote learning. Other studies by Callan (1997) and Mackey (1998) note a similar focus. Research into the relationship between ICT and school improvement, completed as part of an international OECD funded project concluded that:

“The dominance of the expository paradigm of teaching and learning, particularly at post-primary, represents a major barrier to the successful
integration of ICT into teaching and learning in the Irish situation. Unless this issue is addressed, it is unlikely that the meaningful integration of ICT into learning will occur and ICT use may be mainly confined to computer applications …”

(Gleeson, O’Grady, McGarr and Johnston, 2001, p 8)

The role of ICT in the classroom in Irish schools up until recently has offered little more than teaching students basic software applications such as Microsoft Office (McGarr and O’Brien, 2007). Many schools, although boasting a computer lab, do not have subject specific courseware particularly for Humanities subjects. In the main these subjects continue to be taught without technology. Without a directive from the department of Education and Science, how schools choose to incorporate technology into the classroom depends entirely on the individual school (Mulkeen, 2002). Teachers have recognised that classes of mixed ability students with a variety of learning styles require a variety of teaching strategies. Technology, in particular multimedia and ICT can enhance the student learning experience and may engage those lesser able students who may otherwise become unmotivated and disengaged.

The budget for ICT in Irish schools is also low relative to other countries and many initiatives are voluntary. In 1998, Tesco started a "computers for schools scheme" in Ireland, offering computers in return for schools getting vouchers from people who shopped at Tesco. The scheme continues to be quite successful and in 2009 schools and clubs across Ireland ordered more than three quarters of a million Euro worth of equipment. Other similar incentive schemes include Microsoft’s Authorised Refurbisher programme. Outside of schools directly fundraising for ICT equipment these types of sponsored schemes are one of the few ways for them to acquire the necessary equipment for ICT labs. The problem with this type of activity is that it
subjects students to heavy commercial marketing during school time and promotes underfunding of education (Molnar, 2007).

In Ireland the Department of Education (DES) has committed to developing Information and Communications Technology infrastructure in schools. The purpose of this commitment is to help teachers incorporate ICT into their skill sets and teaching practice and develop curriculum and learning resources that make use of ICT. In July 2008 the Department of Education published two reports on ICT in schools. *Investing Effectively in Information and Communications Technology in Schools* 2008-2013 is the report of the strategy group appointed to advise on priorities for investment in ICT in schools. *ICT in Schools* is an evaluation on the impact of ICT on teaching and learning which was carried out by the DES Inspectorate. One of the findings of the report was that the integrated use of ICT strengthens learning and increases the sense of relevance by making learning more reflective of students’ social and personal use of ICT. As stakeholders in the education system the union of secondary students were consulted when the report was being prepared.

Students recognise the role that ICT could play in the classroom. In its submission to the above report the Union of Secondary Students stated: “There should not be a dramatic transition between the use of technology at home and at school. We need to be stimulated and challenged in a modern learning environment” (NCTE, 2008, p 1)

The recommendations outlined in the report build on what has been achieved to date. The report recognises that supports need to be out in place for the successful implementation of ICT in the post-primary classroom:
“The enthusiasm for and commitment of our teachers to ICT integration is manifest – there is now a need to provide them with the appropriate ICT facilities and supports to facilitate greater ICT integration in learning and teaching. Our vision for ICT goes beyond what the National Development Plan (NDP) funding can deliver but, if implemented, we believe that it will lead us to the ultimate goal of transforming our schools into 21st century e-learning environments”.

(NCTE, 2008, p 1)

Publicly the stakeholders have been consulted, the value of ICT recognised and a commitment has been made to put supports for ICT in place. However, it is necessary to look at how this commitment actually manifests itself on the ground in schools for teachers and students.

One of the most recent EU reports; *Benchmarking Access and Use of ICT in European Schools (2006)* has shown that 82% of Irish classroom teachers had used computers in class in the 12 months prior to the survey date. However, Ireland falls below the EU25 average in terms of use in ‘25-50% of lessons’ (8% vs. 20.2%) and in ‘more than 50% of lessons’ (7.5% vs. 16.5%). Clearly, although our teachers are using digital technologies in their lessons, the frequency in which they do so means that we sit at the lower end of the scale. In addition, 91% of Irish teachers acknowledge that there are significant learning benefits for pupils using computers in class and say that pupils are more motivated and attentive when computers and the internet figure as part of lessons. The study also confirms that Irish teachers have positive attitudes about the different applications for ICT in teaching. They achieve figures around the EU25 average on attitudes that ICT should be used by pupils to do exercises and practice (79%), letting pupils retrieve information in a self-directed manner (79%) and for collaborative and productive work by pupils (82%). However, Ireland ranks at the very bottom in Europe when it comes to teachers’ satisfaction.
with the ICT infrastructure: some 85% of Irish teachers wish there was better support and maintenance for ICT in our schools. Schools do not have access to a basic level of equipment and technical support to enable ICT integration to take place. The absence of multi-annual funding makes it difficult for schools to plan for ICT development. Teachers do not have access to sufficient digital content and digital content tools relevant to Irish school curricula.

\textit{Recognition of the role that ICT can play in post-primary education}

The Irish Business and Employers Confederation (IBEC) promotes the interests of business and employers in Ireland by working to foster the continuing development of a competitive environment that encourages sustainable growth and within which both enterprise and people can flourish. Shortly after the Junior Certificate results of 2008 were announced to over 56,000 students, Tony Donohoe, the Head of Education, Social & Innovation Policy at IBEC, stated that the Junior Certificate needed urgent reform;

\begin{quote}
\textit{“(The Junior Certificate) stifles creativity and a spirit of enquiry in the next generation. Society and business need an education system that produces individuals who are adaptable, can think for themselves and have an appetite to learn. The Junior Certificate, which is assessment and output focused, fails to produce these skills which are now critical for the knowledge economy”} (IBEC, 2008).
\end{quote}

These comments cannot be ignored and highlight the scale of the challenge that lies ahead. In recognising this challenge IBEC noted that; “the Junior Certificate curriculum fosters negative attitudes towards particular subjects and discourages many from continuing within the formal education system. Failure to radically reform the Junior Certificate is, therefore, a failure to recognise the huge potential that young students can achieve during their early years at second level (IBEC, 2008). IBEC
further noted that there was too much emphasis on rote learning with post-primary schools and advised that the Junior Certificate should be reformed to include preparation for life long learning, capacity building for learning, the promotion of self esteem and an emphasis on exploration, risk taking and entrepreneurship.

Productive and contributing adults cannot ignore the world around them. We live in an information-rich world must prepare students to live and work in this world. Learning to read and write is a basic literacy skill set. However, for today’s classroom, it is no longer enough. Reading a daily newspaper or magazine, even watching the news, is now an online task for many. Electronic literacy, the capacity to organize and make sense of information in addition to being able to read and write in the new medium, is required if students are to become informed citizens in a digital age (Schetzer and Warschauer, 2000). Today’s students are confronted with interactive television, radio, film, and the internet. A new type of literacy is required to read and engage with these new media. The media rich world of today sees students from an early age continuously bombarded with coded messages. Without the critical thinking skills required students could potentially fall prey to the commercial media. Multiple literacies are required to make sense of the world (Goodman 2003). “The products, music and styles being sold are effectively woven into the fabric of life so that they no longer can be identified as commercials. They are simply a part of everyday life” (Goodman, 2003, p 28). Students today need to be able to express themselves articulately if they are to become competent citizens of a media savvy world.
Expansive and strategic investment in ICT in education is an investment in all our futures and must now become a priority for Ireland. Ireland has experienced rapid social change and achieved enviable economic growth in the past decade but, to sustain these, it must prepare the next generation for the evolving knowledge society. Full participation in our knowledge society increasingly requires confidence and fluency in personal ICT usage. The very nature of learning is changing. Teaching must take account of the ICT-enabled styles and methods of learning that students have experienced outside the classroom. This is a major challenge but it is of great importance to the future of each individual student and to Irish society generally.

The following figure (fig 4) illustrates the recommendations of the minister’s strategy group:

![Fig 4 Recommendations of the minister’s strategy group](image)

In addition to the need for new literacies there is also a need for students to take responsibility for their own learning in today’s classroom. ICT can encourage autonomous learning. Kupetz and Ziegenmeyer (2006:66) identify the following characteristics of educational technology promoting autonomy it:

- Involves problem solving activities
- Encourages active learning
• Is motivating and relevant
• Is flexible
• Avoids embarrassment to students
• Involves a dialogue about learning
• Responds to individual differences

Hall, in a 2006 study carried out research looking at how emerging, novel computer technologies could be used to enhance interaction and learning. The project focuses on children’s interaction in museums. The research involved follow up visits to the schools. The work documents the design process and provides insights for participatory design of technology to enhance children’s experience with the technology in museums. Although the research focussed on primary school children the findings are still very relevant to the post-primary classroom. Design guidelines from the 2006 project were useful for informing the design of the learning object that this research is based on. One of the finding of Hall’s work is that sometimes it is necessary to look beyond the functionality of the technology to consider all stakeholders’ requirements. “It might be pedagogically and educationally important that children discuss and explore the technology, and the rationale for its design” (Hall and Bannon, 2006).

One of the aims of the report of the Minister’s strategy group, “Investing effectively in ICT in schools 2008-2013” is to ensure that there is an adequate supply of innovative, high quality and Irish curriculum-related digital teaching and learning resources available to teachers and students at all levels:

“The learning process is built on a cyclical process whereby content in its many different forms is exchanged between the learner and the teacher. All schools require access to relevant, engaging and educative digital content and content creation tools. The roll-out of broadband provides a greater
opportunity to deliver wide-ranging learning resources directly to teachers and students in all schools. Many of the submissions to the Strategy Group indicated that the lack of availability of relevant digital content is a concern for time-pressured teachers who want to integrate ICT but often find there is a limited supply available to them. Relevance to the Irish curriculum is the key yardstick. It is clear that a balance is required between providing offline digital content resources, online content and online content creation tools that allow teachers and students to create and share their own teaching and learning content. The use of online learning environments, VLEs and school websites provide opportunities to build and share content. As outlined in the NCTE’s Digital Content Strategy, the three most effective approaches used in establishing a content pool for schools are “procure, build and share”. The expertise of the teacher remains central to the development of digital content for Irish schools. Given the right supports and content creation tools, Irish teachers can contribute significantly to creating a first class content pool for the Irish curriculum”.


This new focus on curriculum specific material to enhance traditional lessons is particularly relevant for this research study. This recognition of the role that RLOs could play in bringing ICT into the classroom is a welcome step forward. The report provides much discussion about putting a world class repository of digital content in place. The recommendations from the report are as follows:

1. Scoilnet (www.scoilnet.ie), the portal for Irish education, must be expanded to provide a dynamic and comprehensive library of Irish curriculum-related tagged content to ensure easy access to online curriculum resources. In addition, Scoilnet should provide access to online content creation tools, learning platforms, particularly those which support and encourage online content collaboration and sharing among teachers and students, e.g., VLEs and other services.

2. Develop digital content resources relating to, and supporting, the Irish curriculum, e.g., French.ie. Gaeilge, in particular, should be given special attention. It is important that teachers can easily access useful digital content in sufficient amounts.
3. Purchase digital content centrally and distribute it to all schools (e.g., Ordnance Survey Ireland maps) through the schools broadband network. Provide schools with a bank of encyclopaedic and reference materials as a necessary all-round resource for schools. In 2009 the government made the online encyclopaedia Britannica available to all post-primary schools.

4. Facilitate the establishment of subject-specific online communities of practice, based on existing successful models. Online communities of practice increase teacher confidence and assist in building appropriate user-generated content for teaching and learning. Using VLEs and sharing content with other educational agencies and groups will boost the availability of relevant digital content in Ireland.

5. Develop strategic partnerships with those Irish public bodies and agencies that hold relevant cultural and historical content in order to transform this valuable indigenous content into useful learning resources. For example, the “Look at History” pilot project, which linked digital content in RTÉ’s archives with the Leaving Certificate history syllabus, has been a successful model of collaboration with purposeful content being made available for use in the classroom.

6. NCTE’s Software Central service should be developed as a support and advice centre for schools in relation to the use and purchase of software, digital content and digital tools.

7. Provide specific advice and support on software and digital content tools for special educational needs.

8. Promote the use of software/content tools in schools to encourage the local development and sharing of content by teachers and students. Advances in web
technology will provide more opportunities for easier content development over the next six years.

9. Explore and promote, where appropriate, the use of open source software and its applicability in teaching and learning.

10. Build on existing software licensing agreements by putting purchasing frameworks in place for school-appropriate software and provide grants to schools to purchase digital content and software suitable to their needs.

The above recommendations were made in 2008. Only one of these recommendations focuses on the provision of more hardware and equipment to schools. Yet in December 2009 the Minister for Education and Science confirmed that some 3,000 primary schools would receive €22 million in grants to buy laptops and digital projectors as part of the Government's plan for smart classrooms. A year later, on the 15 October, 2010 the Tánaiste announced €20.75m in grants for high-tech classrooms in post-primary schools. The press release posted on the department of Education’s website stated:

“698 post-primary schools across the country are to get some €21 million in grants for high-tech equipment over the coming days as part of the Government's strategy to make technology an integral part of the learning process, according to the Tánaiste and Minister for Education and Skills, Ms. Mary Coughlan, T.D. Post-primary schools throughout the country will each receive a base grant of €1,700 and a payment of €63.45 per capita, which will enable the schools to purchase equipment. DEIS schools will receive a higher basic grant of €2,550. "These new grants will enable post-primary schools throughout the country to equip their classrooms with appropriate technology, to enhance teaching and learning and to help meet the needs of the 'Smart Economy'. This is a strong signal that this Government is committed to equipping our classrooms with the latest technology." ... The National Centre for Technology in Education (NCTE) has advised schools of the appropriate equipment specification which should include a fixed digital projector and teaching computer....These grants demonstrate this Government’s commitment to providing the kind of high-tech hardware required to fulfil that objective."
While it is positive that more funding is being made available to post-primary schools the money is for equipment. There would seem to be no commitment here to the badly needed support that is crucial if the equipment is to be used in the classroom. The recommendations from the minister’s 2008 report are thorough and would seem to address the barriers to the uptake of ICT. Nevertheless, how can these recommendations be properly implemented without a full commitment to all issues, not just hardware provision. It is clear that it will take more than equipment to implement a proper ICT strategy for post-primary schools. Continuing professional development is should be prioritised and made available at the same time as the equipment is installed in schools. Without the skills to use the equipment the investment is a poor choice.

**Initiatives to promote ICT at post-primary**

**Teachnet**

Teachers are aware of the new demands expected of them and one organisation, TeachNet Ireland, funds innovative Irish teachers throughout Ireland to publish curriculum units that demonstrate the integration of ICT into classroom teaching in a meaningful and practical way. TeachNet Ireland is an initiative of St Patrick’s College Drumcondra, run in association with the Teachers Network New York. TeachNet Ireland is predominantly funded by the Citi Foundation, with additional funding from the Microsoft Ireland and The Ireland Funds.

The project’s major components include:

- Identifying teachers and other educators to serve as trainers/facilitators;
- Conducting training workshops for teachers in all subject areas;
• Awarding grants to teachers to disseminate innovative student-focused curriculum projects;

• Developing an online database of the innovative projects to share with a national and international audience of teachers and students;

• Publishing print catalogues of the innovative classroom projects to encourage other teachers to adapt these projects;

• Creating an on-line and off-line professional community of teachers who are integrating technology into the school curriculum.

Teachers are trained on how to best disseminate technology integration into classroom teaching and to create interactive curricula for publication on the www.teachnet.ie and www.teachnet.org websites. These resources enable teachers and students throughout Ireland (and internationally). TeachNet Ireland publishes fifty programs annually and one of the primary aims is to stimulate content development by Irish teachers.

Among business leaders there is much interest in how ICT can be incorporated into classrooms to foster critical thinking and digital literacy. Dr. Chris Horn of Irish computer company Iona Technologies gave an interview to the Irish Independent in April 2009. In this interview he addressed a number of interesting proposals for teachers. Horn believes that Irish teachers should use collaborative websites, such as Wikipedia, to work collectively to share knowledge by creating collaborative documents. This notion that teachers should both produce and share content is one that is central to the Dutch government’s educational philosophy. Teachers themselves seem to agree with this. A Blog published on TeachNet’s site agrees strongly with Horn. However, it is suggested that teachers will require help and support to publish materials on the Web, whether it is on a Wiki or as a podcast. This
help may involve professional development and teachers may also require technical support. Nevertheless, these challenges can be overcome, these tools have enormous potential for teacher professional groups as they give them a platform to collaborate and publish. Students will need to develop the skills necessary to navigate through these vast amounts of information so that they can find relevant content and process this content in a critical manner.

**What Department supports are in place?**

The Department of Education has put a number of measures in place to promote the use of ICT in schools. Computers in Education and Schools IT2000 are among many of the initiatives that have been rolled out over the last decade or so. This section explores the supports that are currently in place.

**The National Centre for Technology in Education**

The National Centre for Technology in Education (NCTE) is an agency of the Department of Education and Science established in 1998. The centre has a wide remit in the area of ICT and education. Its main tasks are managing the implementation of the Government's ICT in Schools Programme, the development of ICT policy proposals and providing policy advice to the Department of Education and Science (DES).

The ICT in Schools Programme builds on Schools IT2000. Under this major national initiative the Irish government invested over €50 million between 1998 and 2001, building an ICT infrastructure and facilitating the integration of ICT into teaching and learning in Irish schools. The National Centre for Technology in Education (NCTE)
managed the implementation of Schools IT2000. This role has now evolved and the core work areas of the NCTE today include:

- Providing information and advice to other educational agencies on ICT in education.
- Managing funding for schools to develop their technological infrastructure and purchase ICT equipment and software. The DES provides the funding in most cases.
- Designing and implementing a series of in-career ICT training programmes for teachers.
- Developing and maintaining ScoilNet - an online educational portal.
- Piloting models of technology integration and support through the Schools Integration Project (SIP).
- Providing support in educational ICT to teachers of students with special needs.
- Researching ICT in education and developing and evaluating educational software.

It is important to note that the NCTE is not embedded in the existing architecture of the Department of Education and Science. This agency is separate to the department and therefore the activities that it supports are separate to the fundamental activities of schools. As far as ICT is concerned there is very little that is required of schools. It is difficult to see how any kind of increase in ICT use can be expected without requiring schools to use some ICT in classes.
The Technology Integration Initiative (TII)

The Technology Integration Initiative (TII) promotes and supports the integration of best practice in schools’ ICT infrastructure to facilitate the effective use of ICT throughout the school.

The Schools Broadband Programme

The Schools Broadband Programme aims to provide all primary and post-primary schools in Ireland with broadband access and other services. That is, controlled internet access, secure email, IT security services etc. The NCTE administers this programme including providing advice and support on all aspects of the programme to schools. In the Supplementary Budget 2009 €7 million was provided by the Department of Communications, Energy and Natural Resources for a pilot project to equip post-primary schools with 100mbs broadband.

School networking

School networking is an ICT infrastructure strategy supporting the networking of computers in schools. Networking will facilitate broadband being distributed throughout the school.

ICT in schools census

The NCTE carries out nationwide ICT censuses of schools under the Technology Integration Initiative. These are comprehensive censuses of the levels and usage of ICT in schools. These census reports are available on the NCTE website.
Schools Integration Project

The Schools Integration Project (SIP) was set up in 1998 and aims to examine and explore a range of teaching/learning matters specifically from an ICT integration perspective. Eighty pilot projects were established in a number of "lead" schools working in partnership with education centres, businesses, industry, third-level institutions and the community.

Scoilnet

The Scoilnet programme is responsible for the promotion and use of the Internet in education under the Government's ICT in Schools Programme. At the core of this initiative is the development of the Scoilnet website. Scoilnet is the Department of Education and Science's official portal for Irish education. It contains links and resources that support teachers, students, parents and school managers. Content on the site is developed and updated by a team of curriculum experts. The Scoilnet programme also supports the development of other specific education websites, individual school websites and the use of the Internet for education.

Special education and ICT

NCTE carries a range of specialised information on Special Educational Needs (SEN) and ICT as well as advice and resources for teachers and others working in the area of ICT and special needs.

Summary

This section has described the supports and infrastructure that are currently in place for teachers to introduce some elements of ICT into their teaching. However, despite the many initiatives that been put in place by the department of education uptake of
ICT among teachers is still relatively low. The next section will look at some of the issues that prevent teachers from integrating ICT into their classroom.

**Issues associated with implementing ICT into school practice?**

One of the findings of the minister’s strategy group is that Ireland is in a better situation where teachers’ skill bases are concerned, but there are issues to be addressed. The group found that Ireland’s teachers are aware of the relevance of ICT in children’s lives – primarily because they themselves use technology to such an extent in their personal lives and recognise its increasingly central role in society. Equally, teachers recognise the role of ICT in learning and teaching and many thousands of teachers have attended professional development courses in a voluntary capacity as part of the Department’s programmes for ICT in schools previously mentioned. Others, at their own expense, have availed of taught programmes and courses where they live within reach of universities and colleges. But this approach is not sustainable in the longer term and will not ensure that all teachers receive the training and support necessary to more effectively and consistently embed technologies in their practice.

As outlined in the previous section there are supports in place. If there is such a wealth of agencies offering support to help schools plan and implement an ICT policy then why is there so little uptake of ICT at post-primary in Ireland? For many teachers in Irish schools there is no obligation to include any element of ICT in their teaching. For the teachers who do try to incorporate some ICT component into the class there are a number of barriers to overcome. Many teachers themselves recognise that there is a need to include digital literacies in the classroom. However, as long as this is voluntary and not supported it cannot be expected of teachers and
Therefore will not be equitable for students. Roblyer and Doering (2006, p. 62) identify nine essential conditions for effective technology integration. These nine conditions are similar to the nine recommendations set out by BECTA in 1998 and are as relevant to an Irish context as they are to the American.

They are:

- Appropriate Teaching and Assessment Approaches
- Engaged Communities
- A shared vision for technology integration
- Empowered leaders
- Standards and curriculum support
- Required policies
- Access to hardware, software and other resources for sustainable integration
- Skilled personnel and opportunities for professional development technical assistance.

These same nine conditions are also apparent in the Minister’s strategy report. One of the main conclusions of the report on ICT use in Irish post-primary schools 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. If we are to successfully meet the challenge of providing our school-going children with the skills and capabilities they require for the future, we need to invest now in the process of transforming schools into e-learning environments. The following key investment goals must be met as necessary steps towards achieving this:
• The provision of an appropriate ICT infrastructural configuration and technical services in each school.

• The support of leadership, ingenuity, creativity and vision for ICT integration in schools.

• Meeting teachers’ ICT professional development needs to support the development of school-wide ICT capacity.

• The provision of on-demand access to curriculum-relevant digital content and tools.

• The provision of robust and adequate levels of broadband internet to all schools.

Schools require new ICT equipment, adequate broadband, technical support services and pedagogical guidance. There is an immediate need to provide new equipment and technical support. The Strategy Group recommends that this requirement be met by investment in these areas in the first three years of the National Development Plan period.

“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, real and meaningful progress will only be made when the main focus shifts from the technology to its use by the learner. Appropriately integrated into what teachers do, ICT facilitates exploration, creativity and interdisciplinary work. Teachers must be provided with the necessary reasons, skills and technology toolkits to enable them to embed ICT in learning and teaching. Formal education plays a central role in preparing people for social, personal and economic participation in society. Our growing knowledge economy requires an ICT-literate, creative and entrepreneurial workforce which confidently uses ICT for invention, problem-solving and knowledge creation. ICT enlivens learning in science, engineering and technology subjects which, in turn, can contribute to increased participation in these disciplines at third level. Creativity is, of course, an educational objective which should be valued for itself. Its nurture and expression can be facilitated in new ways through the incorporation of ICT”.

(ICT Strategy Group Report, 2008 p 1)
While NDP investment will enable schools to update their existing ICT equipment and facilities and will provide ICT services and supports, it is insufficient of itself to provide the desirable level of ICT which will be required by schools. It could be argued that this investment was an attempt to catch up with European pupil computer ratios rather than a real commitment to change. Achieving a desirable level of ICT usage in all schools depends on a number of critical and interconnected factors:

- Teacher education and professional development to leverage the benefits of new learning technologies
- The ready availability of appropriate digital content and content tools
- Sufficient computers and supporting ICT equipment in schools
- Adequate and robust broadband provision
- Technical support and maintenance of a high standard
- Structures to implement and support the investment
- Support for effect-focussed, leading-edge ICT research.
- Continuing professional development
- Software and digital content for learning and teaching
- ICT equipment – additional and replacement
- Schools broadband and services
- Technical support and maintenance
- Implementation structures and supports
- Innovative practice and research

One of the above initiatives that has been identified as necessary to developing a desirable level of ICT use in schools is: The ready availability of appropriate digital
content and content tools. This initiative is key to this research study which looks at the use of RLOs in the English classroom.

**Where the typical school is now**
The website for the National Centre for Technology and Education hosts a number of case studies of schools that have successfully implemented an ICT strategy for their school. One case that is typical of many schools is that of Newtown College. The school provides an account of their experience of ICT use. The school’s account of their experiences in, “Where we were” in terms of ICT is a good example of “where many schools are” and the main points of this account are as follows:

- The school had broadband internet access throughout the school, via a wireless network in the old building and via a cable network in the new building.
- Maintenance was carried out on an ad-hoc basis, with no maintenance contract in place. A company was engaged to deal with serious problems on a case-by-case basis.
- There was a mixture of new and old ICT equipment, which included desktops, laptops, printers, scanners, cameras and data projectors.
- All of the software installed in the computer room was licensed but a full audit of the software in use in the school needed to be carried out.
- There was a computer room in the new building, and about a third of the classrooms had a single desktop machine connected to the school’s network, and there were three computers in the library.
- Every room in the new building had access to the school network and was fitted with data projectors and computers.
• A room adjacent to the library had been designated a Special Needs Resource Centre and it had its own ICT equipment and appropriate software and digital resources.

• Most teachers received some ICT professional development, though some of this occurred several years ago. This had been delivered through a combination of NCTE CPD courses, subject association meetings, informal help from colleagues and an outreach initiative with a local multinational pharmaceutical company.

• All teachers indicated that they were able to ‘use computers’ to access the internet and email, perform basic word processing and input student results at the end of each term.

• Some teachers were using ICT as a teaching and learning tool regularly; many were using ICT as a teaching resource infrequently; and a few did not use ICT as either a teaching or learning resource.

• Some teachers had the use of school-owned laptop computers and other teachers use their own laptops.

• Three teachers had been involved in projects which used ICT to communicate with schools in other countries.

• There were timetabling difficulties in accessing the computer room as Transition Year, LCA, LCVP, Technical Graphics and careers classes booked the room for most of the school week.

• The school had a website, which was regularly updated, but it did not contain specific teaching and learning materials.

• The school sent out an electronic newsletter once a term to parents and other subscribers.
Most of the staff recognised the benefits of using ICT in teaching and learning. The use of ICT in Geography and Science received positive comment in the subject inspection reports as part of the recent Whole School Evaluation.

Likewise the targets set in the elearning plan for Newtown College are also very typical of many of today’s schools. The priorities were set as follows:

- That students would experience e-Learning activities regularly.
- That the school website would contain content developed by teachers and students and be used as a communicative tool.
- That the school would create and use its own digital content.
- That the school would work towards providing all learning areas with access to a range of ICT equipment, including mobile devices, over the next 5 years.

Many of the case studies available on the NCTE website describe a staged approach to adopting ICT as advocated by Tearle (2003):

“by focusing on one or two departments at a time, it has been possible to attend to their specific needs and address difficulties as they arise; hence improving the likelihood of success and positive response from those involved”

(Tearle 2003, p 576).

Many schools are aware of what they need to do and put in place for an effective ICT policy. However, without the necessary supports in place for staff to use the basic equipment there can be no major increase in the uptake of ICT at post-primary level.

**Recommendations of the Minister’s report: the reality**

The account provided by Newtown College illustrates that the recommendations set out by the Minister’s strategy group are all valid and that schools would welcome the
opportunity to act on the recommendations. However, making recommendations is a world apart from putting a structure in place to enable schools to effectively implement any of the recommendations. If any of the recommendations are to be implemented there are a number of issues, apart from the provision of equipment, which will need to be addressed:

1. **Budget**: cuts to staff budgets directly affect “extra curricular activity”. ICT is still seen by many teachers as an “added extra” and not something that makes up a basic lesson.

2. **Equipment**: In cases where schools do not have the necessary equipment to include an ICT component into the lesson the economic climate suggested that there would be no new equipment provided for ICT. However, the Tanaiste’s announcement in October 2010 committed to €21 million in grants for equipment.

3. **Sustainability**: Without a school policy in place implementing any level of ICT into lesson is impossible. Teachers should be able to take ownership and implement an ICT strategy into their teaching.

4. **Teacher Training**: Without the appropriate professional development teachers cannot be expected to implement any kind of ICT strategy.

5. **Time constraints**: A forty minute class is a very short period to get a class to settle and login and access online resources.
6. **Confusion:** Some parents are concerned about the level of learning when computers are introduced. A class held in the PC lab is often perceived as a treat and not a regular feature of the curriculum. Parents, as stakeholders, need to be involved in policy making.

7. **The Curriculum:** The evaluation needs to take ICT into account. We live in a digital world this should be reflected in the assessment procedures.

**Summary**
This section has highlighted some of the issues that prevent teachers from adopting ICT into their teaching practice. It has also described where the typical school, with an active approach to implementing a strategy for ICT, is now. This section has also drawn attention to the recommendations that have emerged from the Minister’s strategy report on ICT in schools while also listing the issues that will need to be addressed if the recommendations are to be put into practice in schools. This research study suggests making curriculum specific RLOs freely available to teachers may help to speed up the process of ICT integration in schools. However, teachers will need support during the initial stages of such a process. Teachers would also need to be included in the design and development process of such RLOs for the initiative to be successful.
**English in schools**

**Introduction**

As this study aims to integrate RLOs into the post-primary classroom it is important to provide some context in terms of the teaching of English in schools. This section will outline what is expected of students sitting the Junior Certificate English examination. It will also look at what supports are currently in place for teachers of English. The available subject inspection reports for English will also be discussed.

**Junior Certificate**

The primary aim of the Junior Certificate English curriculum is to build on what has been taught at primary level. The Junior Certificate curriculum for English is varied and expects that all students will develop their language and literacy skills.

> “The essential aim of teaching English at Junior Cycle is to reinforce and continue the work of the primary school in nurturing the intellectual, imaginative and emotional growth of each student by developing his/her personal proficiency in the arts and skills of language. This personal proficiency involves three dynamically interrelated elements: personal literacy, social literacy and cultural literacy”.

(DES, 2010, p 1)

There is no set teaching methodology for Junior certificate English. Instead the DES provides teachers with a set of guidelines from which they can choose the best approach that they find suits their students’ needs.

> “These guidelines are not prescriptive. Each individual teacher is free to choose his or her preferred teaching methodology for the achievement of the specified objectives and desired outcomes of each new syllabus. These guidelines offer some suggestions which may be of further help to teachers. Particular attention is paid to areas of knowledge, understanding, skills, concepts and attitudes which the new syllabus highlights more than heretofore each syllabus should be taught with conscious reference to the overall aims of the Junior Certificate programme... Numerous opportunities exist for cross-curriculum linkages: these should be exploited through collective teacher planning and through individual teacher initiative; These references would include books, videos, teaching-packs, computer software and other such
However, the Junior Certificate English curriculum requires that students sitting both the higher and ordinary level examination will be examined on the following:

- Reading
- Writing
- Functional Writing
- Media Studies
- Drama (Unseen and studied)
- Poetry
- Fiction

The higher level exam is set over two exam papers which are both taken on the same day; one in the morning and one in the afternoon. The ordinary level exam is one paper.

**Support services for teachers of English**

“Sustained, content-focused professional development is key to helping teachers gain practical knowledge of specific curricular activities and develop an understanding of what classroom instruction with the materials should look like”

(Penuel et al, 2009, p659)

The availability of a professional support service for teachers is recognised as a significant asset for teachers. New teachers can avail of advice/mentoring from more experienced members of the profession in addition to a range of other services. In the UK the National Association for the Teaching of English (NATE) provides support, training and policy for teachers of English. The remit of this agency includes:
Chapter 3: ICT in the Post-primary Classroom: The Irish Context

| Practice Classroom-based case studies and other practical explorations | Resources for interactive whiteboards Useful ICT-based resources for GCSE Professional development |
| Learning Platform Project: Exploring how far learning platforms enhance teaching and learning |
| Resources Teaching materials including: Start here: an ICT primer for secondary English teachers bbc Schools bitesize project and other learning objects online |
| Home Learning for English websites for students and those working with them, primarily for Key Stage 3 |
| Policy Guidance and discussion on the role of ICT in English teaching and learning including NATE's Position Paper on ICT and English and an influential document on the Entitlement to ICT in secondary English. |
| Making hard topics in English easier with ICT NATE's innovative collection of case studies |

Table 1 Remit of NATE

The National Association for Teachers of English is run on a voluntary basis through elected executive and council committees. Members are affiliated to a network of regional branches. The administrative base is in Sheffield where there are offices, a meeting room, publications warehouse and a dispatch centre. The association has a range of committees and working parties which address current concerns, disseminate knowledge and ideas, promote the work of the association and seek to represent the views of the association to national bodies, local authorities, the DCSF, OFSTED, QCA, examination boards, etc. The UK’s National Association for the Teaching of English works to:

- Promote standards of excellence in the teaching of English from Early Years to University
- Promote innovative and original ideas that have practical classroom outcomes
- Support teachers' own professional development through:
  - access to current research
  - publications
national and regional conferences

- Provide an informed national voice on matters concerning the teaching of English and its related subjects
- Encourage sharing and collaboration between teachers and learners of English and its related subjects

In contrast to the UK what was there for Irish teachers of English is now gone. The Teaching English Support Service existed from 2001 until 2003. This service succeeded the Leaving Certificate English Training Support Service (1998-2001), established to help teachers with the introduction of the new Leaving Certificate English Syllabus, which was examined for the first time in 2001. The current support site began life as the website of the Teaching English Support Service (2001-2003). In June 2003, much to the disappointment of the service and the many teachers it served, the Teaching English Support Service ceased to operate and responsibility for the continuing support of English fell to a re-structured Second Level Support Service. The new arrangements, which came into effect in September 2003, offered a reduced range of service. The Minister’s strategy group may make recommendations for this to be reinstated but without any real tangible support these recommendations will remain just recommendations.

**ICT use in the English classroom**

**Subject Inspection reports:**

Subject inspection reports present findings based on observations of practice in schools and classrooms. The purpose of these reports is to make a positive contribution to the teaching and learning of English, and they are therefore intended to
be of particular relevance to teachers of English and to school managements. The aims are fourfold:

- to inform and encourage professional dialogue
- to assist schools and subject departments in the process of self-review
- to suggest areas for improvement
- to share exemplars of good practice.

These reports are a good measure of what is actually taking place in schools as they are evidence-based and are informed by a variety of activities:

- meetings with the principal or deputy principal (or both)
- meetings with the teachers of English
- meetings with learning-support and language-support teachers feedback to individual teachers and to the subject department
- observation of teaching and learning
- interaction with students
- review of students’ work
- review of relevant school and subject documents
- review of relevant data from the State Examinations Commission.

Inspectors found that in the majority of schools there were only four first-year English lessons a week and in some schools there were only three lessons a week.

Traditionally, English has been regarded as a “resource-light” subject, which can be taught anywhere. Given syllabus changes and the introduction of new programmes, this is no longer a tenable view, if indeed it ever was.

There are certain basic requirements for all rooms in which English is taught:
• a good-sized board with a high-quality writing surface
• students’ seating sufficiently flexible to facilitate pair and group work
• display spaces for students’ work and for relevant illustrative material.

Yet the subject inspection reports state that these basic needs are not met in all schools.

“A number of the classrooms visited fell below even this basic level of provision; yet the classroom in which English is taught should be a resource in itself, an environment rich in print and also conducive to the study of the spoken word and visual texts. Therefore, the schools that exemplified best practice were those where, in the English classrooms,

• books, including dictionaries, were on display and in use
• audio equipment (cassette or CD player) was available and used appropriately
• a television of adequate screen size, with video or DVD player, was available and used appropriately”.

(DES, 2008 p10)

“The availability of information and communications technology (ICT) in schools has had a discernible impact on how teachers research and prepare lessons and materials. Worksheets, templates and resource notes are increasingly produced on computer, aiding legibility and ease of use. Teachers are also increasingly using the internet for their own research and for material to download for class use. Guiding students to useful web sites and instructing them in the appropriate use of material obtained on the internet should now be seen as part of the teacher’s role. In particular, issues of plagiarism and the proper acknowledgement of sources should be dealt with in the school’s policy on acceptable internet use”.

(DES, 2008 p12)

**Exemplars of good practice**
The report has a number of descriptions of good practice selected from the seventy-five individual school reports on which the overall subject inspection report is based.

“The English department has engaged with ICT as a useful tool in the teaching of English. English teachers have built up a significant bank of web-based resources on the staffroom computer. Student work done using word processing packages was also in evidence”.

(DES, 2008, p18)

“The school is currently involved in a project concerning the development of software to be used to enhance teaching and learning in a range of subjects. A number of English lesson programmes have recently been created as part of this project”.

(DES, 2008, p18)
“Similar to the leaving certificate syllabus the Junior Certificate English and Communications programme combines prescribed activities and assignments with opportunities for teachers’ and students’ choice of texts and materials. Good programme planning in this area was characterised by

- a structure that emphasised the building of skills, thus increasing students’ confidence and self esteem
- a range of suitably challenging materials, including substantial creative texts in a variety of genres
- a choice of materials and methods designed to connect with and enrich the students’ own experience”.

(DES, 2008, p23)

**Problematic areas**

The reports call attention to a number of problems associated with the teaching of English at post-primary. These include some students not getting enough exposure to a wide variety of literature including poetry.

“With specific reference to the junior cycle, the texts chosen in all genres were frequently from a very small and predictable pool. In a significant minority of schools, students read only one novel over the three years of the course, and had a very limited exposure to poetry.

English textbooks of the anthology or compendium type were widely used. These should not be seen as forming the plan for English in the junior cycle, nor should they be the only resource available for the teaching of poetry and language skills in particular. The availability of audiotapes as an adjunct to the reading of novels and especially of plays was noted, and commended as good planning of resources, in a number of schools”.

(DES, 2006, p 24)

The lack of audio visual material has also been identified as a problem. Where material is available it should be used a part of the lesson. Where inspectors observed such material being used they commented that it was of great benefit to students.

“The use of audiotapes and CDs was less widespread than it should be, given the wealth of resources available in these formats. Some very good practice was observed in relation to novels on tape, with students reading along silently, and it is recommended that this practice be used where appropriate, either to assist students’ understanding or to draw their attention to key moments. Poetry and songs on tape were also used effectively. Audio resources are especially applicable to drama; where used, they clearly added to students’ engagement with and understanding of the play. Audiotapes are particularly recommended for the teaching of Shakespearean drama, where the complexities of the language may mean that students find the reading of
parts too daunting. Audiotapes also provide an excellent resource for teasing out issues of characterisation and interpretation”.

(DES, 2008, p 30)

The inspectors also identified the teaching of the basic mechanics of language as problematic in some schools and suggested that ICT be used to combat this:

“The second concern arose where language skills, in particular grammar and syntax, were treated as a separate issue in textbooks. In practice this led to the teaching of language skills in isolation, whereas they should be grounded in the texts the students are reading. The practice of taking English classes to the computer room was observed in a few schools but is much less widespread than is desirable. The process of drafting and editing which is essential to the development of students’ writing skills can be carried out in an efficient and engaging way on word processor. Work on sentence structure, paragraphing and layout can be done particularly effectively, and the grammar, spelling and word-counting tools, carefully used, aid the development of proofreading skills”.

(DES, 2008, p33)

**Teaching Strategies**

The inspectors of English observed the use of a wide range of teaching strategies at the schools visited. The following extracts commenting on the teaching strategies employed by teachers are taken from their official reports. A common theme to emerge from these reports was the success of teaching strategies that involved the students to actively participating in the lesson.

“The effectiveness of these strategies varied, sometimes because of the nature of the student cohort and sometimes because of the level of preparation by the teacher. However, the most effective strategies were those that demanded the active participation of students, whether as engaged listeners, responsive readers, or purposeful writers. The dominance of teacher talk, whether providing information and opinion or questioning students, was a strikingly consistent finding in inspections of English. As a teaching style this relies heavily on the ability of students to be an audience—literally a group of listeners. Where students could process the spoken word in an active and engaged way, and were confident enough to express their own sometimes dissenting views, this method worked well. However, even in these circumstances some variety in teaching methods is desirable. It must be said that too often the unvarying use of this teaching style led to passivity and disengagement on the part of students. Another common phenomenon observed was where the question sought a response to more complex issues, for example the mood or tone of a poem, but students were not given enough time to respond thoughtfully. Where this occurred, the work of expanding the
response was actually done by the teacher, not the students. At its best, however, questioning was flexible and dynamic, in that it was appropriately applied to many different purposes and contributed greatly to lively and productive teaching and learning. Questioning was used particularly effectively to help students see links between new material and prior learning and to push them towards more precise thinking and expression”.

(DES, 2008 p 8)

The reports also record that many teachers described their classes as mixed ability yet the teaching strategy did not accommodate the different levels of ability of the students. This would suggest that there is a need for teaching resources that could be used by both weaker and stronger students to the extent that their ability would allow.

“While many teachers commented to the inspectors on the wide range of ability in most class groups, there was little evidence of differentiation in the teaching methods observed. The most common practice was that teachers organised class work so that more able students could work independently, leaving the teacher free to give assistance where required. Rarely was the teacher’s interaction with the class differentiated so as to ensure that all students had an opportunity to answer a question or to make a contribution at a level that was appropriate for them. However, some very good practice was observed where worksheets or other structured assignments began at a very manageable level and continued to more complex tasks, with useful prompts or writing frames to enable all students to develop their responses. It is recommended that English departments take an active approach to continuing professional development in the area of differentiation”.

(DES, 2008 p33)

The report also addresses the basic functional literacy skills and suggests that ICT could be exploited to motivate and encourage students to finish their work to a high standard.

“Accuracy in language and register will not be achieved without planning, drafting, rewriting, and editing. As these are actual stages in the real-life writing and publishing process, they should be directed towards a similar end in the school setting to encourage students to take the necessary pains to attain a worthy finished product. In a number of schools, selected samples of students’ finished work were published in the form of classroom displays, corridor or library display for an open day or parents’ night, a space on the school web site, or a newsletter or magazine. This very good practice should be a feature in all schools. The use of ICT to teach editing skills was observed to be effective but not widespread, and its greater use for this purpose is recommended”.

(DES, 2008 p 35)
Chief Examiners' Reports

In addition to the subject inspection reports the chief examiners' reports provide a review of the performance of candidates in the examinations and detailed analysis of the standards of answering. The reports are published in a selected number of subjects and programmes each year. The examiners report from 2003 and 2006 reported the following findings regarding the poetry section (see table 2). The reports for subsequent years have not been made available as of yet (2010). These reports provide stakeholders and policy makers with the opportunity to see where the system is failing. If the problems are noted then something can be done to address them.
Table 2: Extract from examiners’ reports

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<td>This Section (poetry) was a popular choice with the majority of candidates opting for it. Questions: A, B, C and D were well answered by all candidates, the majority scoring between 38 and 40 for these four questions. Question E required the candidate to give 4 points about a poem they had studied. The majority of candidates could name the poem and tell the story of it. A large number of candidates then ignored the last 2 parts to this question; ‘Do you think it was a good poem? Give a reason for your answer.’ The most frequently selected poem was “Mid-Term Break” by Seamus Heaney.</td>
</tr>
<tr>
<td>The most common causes of low performance in the poetry section are as follows:</td>
</tr>
<tr>
<td>1. Using a novel or a play to answer question E. This meant that the candidates were marked out of 10 rather than 20.</td>
</tr>
<tr>
<td>2. Not being able to name the poem.</td>
</tr>
<tr>
<td>3. A small number of candidates used the poem from the paper.</td>
</tr>
<tr>
<td>4. Ignoring the last two parts of Section E, thus losing 10 marks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>English Section 4: Poetry 2006</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Examiners reported that this was a very popular section in 2006, unlike previous years where candidates tended to avoid the poetry section. Candidates engaged well with the poem presented to them and were able to articulate interesting opinions on both the mother and the poet, as required in Part D. For Part E, where candidates were asked to write about a studied poem, the most popular choice, as in previous years, was <em>Mid-Term Break</em> by Seamus Heaney. This part was well answered, with candidates producing detailed commentary and some writing out the whole poem. The most common causes of low performance in the poetry section are as follows:</td>
</tr>
<tr>
<td>1. Part C: not answering the whole question</td>
</tr>
<tr>
<td>2. Part D: some candidates wrote about a studied poem</td>
</tr>
<tr>
<td>3. Part E: writing about the poem printed on the paper.</td>
</tr>
</tbody>
</table>
A common theme that runs throughout the available reports is that while ICT is not the answer to all problems, where curriculum specific material is available, it could be used to a greater degree in classes:

“While the integration of ICT into the Junior Certificate English course will not automatically cause learning to take place it can enhance the learning that is taking place. It is recognised by the inspectors that ‘instances of good practice in teaching poetry included using AV material’”  

(DES, 2008, p 42)

**Summary**

This section has given some context for the teaching of English in schools. It has also provided some accounts from the subject inspection reports published by the department of Education on the teaching of English. ICT is highlighted in these reports as an area which could be exploited to a greater degree than it currently is.

The next section will focus on how poetry is currently taught for the Junior Certificate and will also provide the rationale for why poetry was chosen as the vehicle for this research study.

**Why use ICT to enhance poetry?**

“Pupils notice more about the language of poetry because it’s not ordinary and everyday and therefore taken for granted. Understanding what makes poetry poetry helps in understanding what makes prose prose”

(Bleiman, 2001, p 6).

The Junior Certificate English and Communication course aims to develop students’ aesthetic appreciation of English literature while also equipping them to meet the literacy demands of everyday life. The course aims to encourage students to express themselves creatively. Both poetry and prose facilitate such expression through lively discussion. However, as poems are usually quite short and tend to have one central theme, the text can gain students’ attention more readily than that of a piece of prose.

“Tests have shown that a sharp interactive image can improve recall of word pairs by
300% compared with simple rote learning” (Rose, 1991, p 5). In addition to this, poems actively invite students to interpret them in their own individual way. There is arguably no “incorrect” reading of a poem. This makes poetry an attractive option for expression for teenage students anxious not to “lose face” in front of their peer group.

A poem can also have a lasting influence on a student. My own first memory of poetry brought to life was Halas and Bachelor’s 1952 adaptation of Edward Lear’s children’s poem “The Owl and the Pussycat”. Written in 1871 Edward Lear's "nonsense" poem plays on the sound of words and works very well as an animation.

In this research study other poems have been given a similar “lease of life” by developing them as multimedia presentations. Bleiman (2001) states that, “It’s worth remembering that a poem can be used to teach many of the same … language objectives (as prose) but may have a more lasting, memorable and pleasurable impact”. Goodwyn (2000) also asserts the importance of employing aspects of visual communication when teaching English. Goodwyn maintains that:

“It is not that we are leaving words behind and are turning to the visual; simply that the visual is coming up alongside the verbal again in communication. … The verbal is no longer the only mode we have to deal with as English and language teachers”.

(Goodwyn, 2000, p 26)

Poetry lends itself to multimedia adaptation quite easily. It complements other art forms. Visual art such as; painting, sculpture and photography, are long-associated with poetry. Poetry naturally creates pictures in the mind’s eye. Many popular songs are viewed as “good poems”. Meaningful lyrics set to music have the same artistic merit as poems. One of the sections of the LCA English and Communication exam for 2004 required students to look at the lyrics of “The Voyage” recorded by Christy
Moore. Students had to answer a number of questions based on their interpretation of the lyrics. This particular type of literature is not elitist and would engage with the students. Many students would have come across this song before and were probably already consciously familiar with the lyrics and subconsciously aware of/familiar with its central theme.

If students can be encouraged to enjoy the experience of critically appreciating poetry they will then be able to apply this skill to other areas of their life: interpreting real-life situations. The UK’s National Association for the teaching of English believes that the appropriate use of ICT in the classroom can benefit students and improve their experience of poetry in the classroom. Chris Warren in his introduction to “Poetry and ICT” lists some of the benefits of learning English literature, specifically poetry, through ICT as: ICT adds fluidity to words, encouraging a spirit of risk-free experimentation – words can be moved around, they can be changed, they can be deleted and added to in powerfully efficient ways that were impossible before. The physical arrangement of words on the page can be experimented with painlessly on a computer. ICT allows poems to be broken down and rebuilt so that new ways of reading the text can be explored. Laverick in her 2009 article Connecting Children’s eCulture to Curriculum: Implications for Educators cites a case study where poetry was used as a vehicle to harness students’ interest in technology to develop other skills “ third and fourth grade students in two schools collaborated to create podcasts of poems that they wrote and illustrated (Dlott, 2007). When children write for an audience and view their writing as purposeful, it motivates them to continue writing. “In contrast to pencil-and-paper writing activities, students enthusiastically reworked their ideas to help their virtual partners grasp the ideas they wanted to communicate”
Roblyer and Doering (2006) also see the benefit of using ICT and internet activities where students cannot see the relevance of concepts to their lives (history, social studies).

The experience of ICT use in Irish classrooms is similar to that of the UK. The specific learning outcomes for the GCSE in Media studies are that students should develop enquiry, critical thinking and decision-making skills through consideration of issues that are important, real and relevant to learners and to the world in which they live. Students should also develop their appreciation and critical understanding of the media and its role in their daily lives. GCSE subject criteria for media studies develop their practical skills through opportunities for personal engagement and creativity understand how to use the key media concepts to analyse media products and their various contexts. The learning outcomes for students in the Junior Certificate cycle are more general and are listed below. Students will be able to:

- use punctuation correctly
- complete a range of vocabulary enlargement exercises
- use a dictionary
- read a short story or novel or poem and comment on the writers purpose, viewpoint and style
- show some understanding for key concepts such as: genre, setting, theme, character, tone and register
- compose a short text which expresses a personal experience or viewpoint.

Most students’ experience of poetry in the classroom will have been text-based. Often the lesson centres on the teacher reading through the poem line by line.
interpreting phrases. Generally the teacher will deconstruct the poem line by line, revealing more subtle meanings while also providing some additional historical or biographical information on the poet to give a context for the poem. There may also be a discussion including some of the more confident class members where opinions about the poem could be shared. It is possible in this type of classroom environment for weaker or less enthusiastic/motivated students to have an extremely passive learning experience: making few notes and not paying very much attention.

The below illustration is a typical (if somewhat neater) representation of what a student is left with at the end of a “typical” text-based poetry class. It is these scribbled notes that student answers are primarily based on. How much detail a student can assign to a poem in this type of class depends on a number of contributing factors; including how quickly they can note dictated comments to the size of their handwriting.

Fig 5: Annotations for "Strange Fruit" by Seamus Heaney
This courseware affords students the opportunity of discovering the poem for themselves. When students take responsibility for their own learning they become more focused. Self directed learning can facilitate a more active learning experience and would also enable (and encourage) students to “recreate” the lesson for themselves at a later date. The multimedia lessons could also be undertaken in pairs to facilitate group-work activity and discussion in a blended learning environment with the teacher acting as a facilitator. Students could also print off screen shots from the lesson for reference and revision.

Bleiman (2001), Cox (1989) and Weaver (1996) assert that poetry can be used as a creative means of focusing on the aspects of English language that some students perceive as tedious or monotonous. Poems that are short can be a particularly effective means of illustrating the mechanics of language. Spelling, vocabulary, and grammar can be analysed and reflected on through the close examination of a poem. Students often perceive these skills as boring and difficult, yet they are essential skills for the world of work. These functional literacy essentials can be taught through multimedia poetry lessons;

“Pupils notice more about the language of poetry because it’s not ordinary and everyday and therefore taken for granted. Understanding what makes poetry poetry helps in understanding what makes prose prose”

(Bleiman, 2001, p 5).

As part of this research study to explore how multimedia and digital learning objects can be integrated into the traditional lesson a multimedia rich resource for teaching poetry at post-primary level was developed. The poetry course was selected as it provided the opportunity to explore broad themes within the syllabus. It also enabled the development of research skills, critical thinking and analytical skills which are required in dealing with ambiguous meaning and the multiple perspectives and
interpretations of material. The developed courseware aimed to:

• Present material in a more motivational and engaging manner

• Challenge the course participants to explore poetry at a deeper level.

• Provide the information and sources to enable this exploration to take place

• Erode the perceived divisions between subjects

• Enable the courseware to be easily accessible, contributing self directed and autonomous learning

Summary
This chapter has afforded a context for the research study and has outlined the structure of the Irish education system. It is only by looking at the role that ICT has played in Irish post-primary schools up until now that will make it possible to envisage a future for ICT at post-primary level. It is crucial to understand how ICT has evolved to its current level in schools if progress is to be made. Schools, teachers, parents and students all recognise the role that ICT could play in post-primary education and many are interested in getting involved in the initiatives to promote ICT at post-primary level. However, the issues associated with implementing ICT into school practice need to be addressed if the full recommendations of the Minister’s report are to become a reality for the typical school. This chapter has illustrated how poetry could be used as the vehicle to initiate some level of ICT into a traditional classroom. The following chapter presents the methodology for the research study.
Chapter 4

Methodology

In conducting this research study, one of the primary aims was to understand how learning objects could be used to engage students and enhance their learning experience. This research intends to examine how students could use technology to critically engage with an online resource and construct a personal learning experience which could then be applied to other areas of their daily lives where they are required to engage with online resources. This study will also explore how one RLO could be used across multiple settings. In order to do this a study was planned which would follow the fundamental components of case study research. This study drew on both quantitative and qualitative data collection methods such as observations, online surveys, and focus group interviews, online discussion fora and LMS event logs. This chapter reviews the primary research questions for this study. Following this the setting and technology used is described. Next the design and development of the learning object that was the focus of this research is described in detail. Finally, the data analysis procedures for examining the data are presented. The outcomes of this study are described in the results chapter.

“No one type of research is closer to 'enlightenment' than any other, but that certain kinds of research are better able to answer certain kinds of research questions” (Malin, 2003 p22). Fitting the correct research methodology to any given research study is crucial. For this research study it was imperative that there be a blend of both qualitative and quantitative methods used with the emphasis being placed on the qualitative. Such a blend of approaches would ensure that no opportunity to collect
data would be missed and captured the subjective meaning and experiences of the participants. Most importantly there should be a chain of evidence which allows the reader of the case study to ‘follow the derivation of the evidence from initial research questions to ultimate case study conclusions’ and vice versa” (Yin, 1994, p 98).

Before undertaking any of the fieldwork the advantages and disadvantages of each approach were given great consideration. Gerring (2001), one voice among many, argues that a purely descriptive study that takes no methodological position cannot be further explored and is therefore of little use to researchers. The research methods used for data collection and analysis are imperative to any educational study. To assess the work in any meaningful manner the researcher must decide on the most relevant methods of conducting the research and on the most appropriate method(s) of analysing the research data (Gerring, 2004). Any piece of social or educational research is informed by some basic underlying assumptions and employs certain procedures. It is vital therefore to know what these are in order to carry out research and to assess it in any meaningful way the products of such research (Hitchcock and Hughes, 1989:8). Gerring (2001) states that:

“…rather than approaching the social sciences as quasi-science or quasi-humanities, let us entertain the hypothesis that these disciplines strive for somewhat different objectives and utilize rather different methodological tools, than their cousins on the hard facts and soft ends of the academic spectrum. Perhaps that is we have held a false set of expectations about what social science is. The social scientist must justify how they obtained findings – questions of method, narrowly construed, but also why those findings are important and why they are true- questions of methodology broadly construed”.

(Gerring, 2001, p14)

**Phases of the Research**

Many theorists including Gerring (2001) advise that the work be divided into three interdependent tasks: concept formation, proposition formation and research design.
Phase 1: Reconnaissance

Phase 2: Implementation

Phase 3: Evaluation

Figure 6 is a visual representation of the research activity.

**Phase 1: Reconnaissance**

At this stage of the research the researcher informally interviewed teachers of Leaving Certificate Applied (LCA) English and Communications, read a number of LCA reports and spoke with other stakeholders in LCA curriculum (including lecturers from Department of Education and Professional Studies as they had been involved with curriculum design). At this point the researcher also attempted to choose poetry and terms that would best match this group of student needs. A few months into this stage the researcher realised that working with LCA students would prove problematic for this research as except for motivation it would be difficult to provide any evidence based material proving the effect of multimedia poetry. It was decided that the research project would now focus on Junior Certificate English course (poetry). The researcher informally interviewed teachers from a number of schools and identified six poems that could be used. In addition to discussing the text the researcher also spoke with the teachers regarding their classroom plan. How did they currently teach a poem? What did they focus on? What outcomes were they looking to achieve? In order to see successful examples of technology enhanced environments the researcher also visited the Yeats multimedia exhibition in the National Library in Dublin and also visited the Victoria & Albert Museum in London. Having looked at some successful and innovative projects the researchers started the design process. After this the researcher accessed a number of department reports
detailing Junior Certificate syllabus and what is expected of Junior Certificate students.

**Phase 2: Implementation**

The researcher created a template and continued to design the poems. In order to gain valuable feedback this stage of the work was presented at an international conference, CAL 2007. This presentation outlined the design process of developing a learning object. Once the preliminary design of the six poems was finished supplementary material from BBC schools website was included as it was deemed very relevant and curriculum specific. The design work continued throughout the year. Once the resource was considered ready for dissemination the researcher tried unsuccessfully to make contact with schools to carry out usability testing. In June 2008 a group was identified a group for usability testing. The results of the work at this point were presented at Edtech 2008. In June 2008 usability testing was undertaken with "Whizzkids" a group of 12-14 year olds. The researcher observed the students working and took notes. This group also filled out an online survey. Based on their comments the design of some of the graphics and how much text on each screen was altered. At this point video was also included in a new format.

Over the summer 2008 the researcher also made contact with the principal at St. Mary’s to organise a pilot study. In September a pilot study was carried out. The researcher held an informal group discussion prior to the pilot study. Each week students accessed a different poem and teacher moved around the room the researcher observed and took notes. In December 2008 the work thus far was presented at EDUCA online, Berlin.
Phase 3: Evaluation

This evaluation stage involved speaking with the teachers after they had participated in the research study. The feedback was largely positive.
Phase 1: Reconnaissance/ concept formation.

Phase 2: Implementation/ proposition formation and research design.

Phase 3: Evaluation and analysis.

Fig 6 Representation of research activity
Courseware Development

One of the aims of this research (see page 6) was to determine a coherent framework for the authoring of RLOs. As part of the present study to explore how multimedia and digital learning objects can be used to foster critical thinking, a multimedia rich resource for teaching poetry at post-primary level was developed. The poetry course was selected as it provided the opportunity to explore broad themes within the syllabus. It also enabled the development of research skills, critical thinking and analytical skills, which are required in dealing with ambiguous meaning and the multiple perspectives and interpretations of material. The developed courseware aimed to:

- Present material in a more motivational and engaging manner
- Challenge the course participants to explore poetry at a deeper level by providing them with additional resources to assist them in interpreting the poem’s meaning.
- Provide the information and sources to enable this exploration to take place
- Erode the perceived divisions between subjects
- Enable the courseware to be easily accessible, contributing self directed and autonomous learning

Of course not all learners take to this type of learning immediately. In this new classroom teachers also have to explore new methods of teaching. Teachers can “induce learners to adopt different learning styles” (Mishan, 2004).

All instructional design theorists agree that it is important to keep the learner at the heart of the project when developing software. Merrill provides a set of instructional design hints to engage learners, these will be central to this research:
• The knowledge provided builds on learner's existing knowledge

• Learner gets a chance to demonstrate new knowledge

• The learner applies new knowledge

• The new knowledge is integrated into the learner's world.

Richard Mayer’s seven principles of multimedia learning (2001) were also be central to the development of the multimedia lessons:

Multimedia Principle: Students learn better from words and pictures than from pictures alone.

1. Spatial Contiguity Principle: Students learn better when corresponding words and pictures are presented near rather than far from each other.

2. Temporal Contiguity Principle: Students learn better when corresponding words and pictures are presented simultaneously rather than consecutively.

3. Coherence Principle: Students learn better when extraneous words, pictures and sounds are excluded rather than included.

4. Modality Principle: Students learn better from animation and narration than from animation and on-screen text.

5. Redundancy Principle: Students learn better from animation and narration than from animation, narration, and on-screen text.

Awareness of best design practice means that the student needs are at the centre of each stage of the design process.
Description of the Learning Object

This digital resource can be accessed on the CD that accompanies this research thesis. The learning object comprised seven individual lessons: six poems taken from the Junior Certificate syllabus and one lesson focusing on poetry terms (see figure 2).

![Fig 7: The Poetry Corner welcome screen](image)

Needs Analysis

This digital resource was developed in collaboration with English teachers at post-primary level. Teachers in the greater catchment area of the University of Limerick were invited to participate in the research study. Six teachers expressed an interest in the study and contributed to the development of the courseware. A number of the participating teachers had begun to explore alternative pedagogical approaches to the teaching of poetry but none had explored the potential of ICT. The teachers that participated in the needs analysis for this courseware described how they normally approached a poem with their class. Based on this we created a wish list for the
multimedia lesson. Biographical information on the poet, plenty of images, a background for the social context of the poem were all deemed to be appropriate content. Having a specific, even if rather limited, objective with measurable outcomes ensures that courseware design was not compromised by the availability of extra features. Deciding on specific learning objectives guarded against the inclusion of bells and whistles for their own sake.

**Authoring Tool**

A number of considerations were taken into account when choosing the authoring tool to develop the courseware. The main factors were: accessibility, ease of use and quality of visuals. Other technological concerns included browser compatibility and bandwidth speed. It was also eventually decided to place the learning object on a CD to enable learners to access the material from any PC without having to access the internet. This courseware provides learners with individual access to multimedia poems and provides additional features, principally biographical information on each of the poets in addition to either a sound file or a short piece of film where the poem is read aloud. Learners are initially presented with a title screen with a basic introduction to the poet. Navigating through the poem enables learners to proceed at their own pace and in a non-linear format where they can access biographical details, the socio-historical backdrop of the poem, embedded multimedia and other interactive features to engage the user. The inclusion of these elements aims to enable learners to discover literature in a more novel and innovative manner.

Flash, developed by Macromedia, is a powerful authoring tool that allows the development of e-learning material that can include text, graphics, sound, animation and interactive buttons. Flash also features a scripting language called ActionScript
which allows further interactive features. Files that are created in Flash are called “movies” and have a .fla file extension which means that these files can be edited. The published Flash files can be published as .swf files. These are the compressed and final files that are read by the Flash Player. This allows users without the Flash software package on their computers to play the files.

Within the Flash environment it is relatively easy to animate and the designer has total control over the animation (size, colour, speed). This finished courseware is highly interactive. On every screen users are expected to partake in the learning experience: there is little opportunity for passive learning. The use of simulation in Flash enables learners to gain a deeper insight into the poem engaging with them in the cultural context in which the students live Goodman (2003). Flash facilitates audio and video integration without displaying popup player windows. Many web-based e-Learning programs available on the web are slow to download and feature popup windows. Another advantage of having the program on a CD is that the security settings of individual computers won’t block any aspect of the courseware.

Flash facilitates both vector and bitmap animations. Unlike bitmaps, vector graphics when scaled up retain their quality and will not appear “grainy”. Vectors also have a much smaller file size than bitmaps. In addition to this the compression technology within Flash makes file sizes small and therefore the .swf files can be downloaded quickly. Flash player is also available to download (free of charge) and therefore anyone can download the player to their own PC and view the files.
Navigation

Navigation is crucial to any e-Learning environment. Users do not want to be trapped or lost at any point during their learning experience. It is therefore vital to include, at the very least, 'next' and 'previous' buttons for navigation. The courseware allows learners to replay animations and to listen to audio as often as is needed: it hands control over to learners, as they can access any poem at any time. Clark and Mayer (2003) suggest giving learners control, but not too much control. Learners will want control but may not know the best ways to improve their learning. Therefore, instead of letting learners skip over a lesson without taking any kind of quiz, navigation controls should direct the learners to go through some quiz or practice before they can skip to the next lesson. “The Poetry Corner” courseware allows users to reflect on different aspects of the poem before moving on.

Graphics

Placement of graphics: Irrelevant graphics/sounds/video should not be included on any web page (Nielsen, 2000) and the e-learning environment is no different. A clean template was essential to the design process. How all six poems would be displayed complete with multimedia content needed to be carefully planned. Any excess elements could have been criticised as “chartjunk” (Tufte, 1983) whereas presenting too little content to this digital generation risked losing their attention. Ultimately we decided to present all six poems on a menu just “one click away” at any time. Unnecessary and distracting content can clutter the screen and makes it difficult for learners to focus on the task in hand. Usability testing revealed that although the screen was uncluttered with just the necessary elements displayed, students requested that more songs be included.
Pedagogical agents

There has been much research in the area of pedagogical agents. Online or pedagogical agents are characters that pop up on the screen to help guide learners, or give them feedback (Clark and Mayer, 2003). Clark and Mayer’s research shows that while they can help learning, animated characters are just as effective as a real person, but that a real voice (for audio) is more effective than a computer generated voice. However, further research is needed. During our usability testing, it seemed that a “virtual guide” would not be necessary. The courseware, where possible, includes the voice of the poet reading their poem aloud. The group used for usability testing commented that they liked this feature and “thought it was cool to hear the real voice”. Clark and Mayer (2003) note that instructions should always be clear and concise. The tone of instructions is crucial and when issuing instructions a conversational style is more effective than formal style. Below is an example of formal and informal instructions: for instance, a formal instruction would normally read as follows: “This program demonstrates how to read and appreciate a poem. The aim is to learn how to …. Examples are provided throughout the program.” Conversational instructions, however, would read as follows: “When you have finished these lessons you should be able to…. The tone of the courseware tries to engage with the learner by mimicking the tone that a teacher may use in the classroom. It is also very important to set out the aims and objectives of the courseware so that they are clear and easy to understand. “The Poetry Corner” uses a conversational tone to describe the aims and objectives of the courseware, and this tone appealed to our usability group. The typeface for the instructions was another significant screen element that needed to be carefully considered. Shriver (1996) advocates using a san serif style for online/screen delivery. The font used in the
courseware is comic sans. The usability groups remarked that they “thought that the instructions were easy to read”.

Recognition

One of the biggest failings with e-Learning courseware is that some testing allows users to “learn” the sequence of answers. This means that many learners do not properly understand why an answer is correct. Having already taken the test they have merely learned off the order of answers and so they are not really processing information. However, this courseware is based on recognition. Therefore the content lends itself to this method of testing and all recognition is beneficial to learners.

Usability Testing and Courseware Evaluation

Another vital step is quality assurance through usability testing. This may seem superfluous, but it is the only method of ensuring that the object both meets the needs of learners and achieves its original purpose. Nielsen (2009), in his Usability 101, advocates that 10% of the overall budget be allocated to usability. This results in a more successful object.

Nielsen (2000) repeatedly stresses that usability testing is a necessary stage of the development process. If there is no testing of courseware before it is made available to learners, there is a much higher chance of critical and negative feedback. Formative evaluation rather than terminal evaluation is very worthwhile as it facilitates improvement before the end product reaches the end user. In order to evaluate the courseware produced it was decided to conduct a small scale evaluation. The evaluation was part of an ongoing development of the courseware. The evaluation involved a small-scale usability study with a group of 24 students. The students were between 12 and 14 years of age and attended a range of different post-
primary schools in the locality. The students were participating in a technology summer camp and were typical of the target group that the courseware was being developed for. As the camp is designed to maximise exposure to the world of multimedia technology this group of students were ideal to carry out usability testing. They felt that their role as “usability testers” was important so they were quite happy to participate. The participants used the courseware for a period of 40 minutes. During that time their use of the courseware was observed. An open observation approach was adopted as the courseware was in its early stage of development and the evaluation at this point was exploratory in nature. Following use of the courseware all students were invited to completed an online questionnaire comprising ten questions. Evaluating the courseware during the development process in this manner allowed users to give their comments and provide constructive criticism. The observation data aimed to validate the issues emerging from the questionnaire data by comparing comments and opinions with their actual use of the courseware. This usability testing, implemented at this stage of the development process, allows sufficient time to incorporate valid suggestions and eliminate possible problems before the next stage of the development process.

Usability testing followed a task-based approach. This type of usability testing focuses on how typical users perform key tasks. The group were given the CD and were asked to perform a key task: to explore the six available poems. The group were given no instruction, but encouraged to use the instructions on the CD and interact with the material in whatever way felt appropriate to them. The usability testing highlighted that the students were very open to using multimedia resources in the classroom. In response to the question: “Have you ever used any digital learning
objects in the classroom?” there was a mixed response. A total of 10 had used some form of what they perceived as a “digital learning object” while 14 had not. When asked what type of digital resources they had used there was a variety of objects mentioned: film, computers, electronic whiteboards and computers, data projectors, video cameras, Edu-click were all mentioned as examples of technology in the classroom that they had used.

The purpose of the usability study was to present the learning object prototype to a group of representative users who would use the finished object. Data from this group was gathered using ten questions and primarily examined the perceived student benefit of using the learning object compared to the traditional classroom lesson. The coding scheme for the usability group was based on that used by Kay and Knaack (2005).

**Table 4: Coding Scheme for Assessing Learning Object Benefits for Usability Group**

<table>
<thead>
<tr>
<th>Question</th>
<th>Criteria</th>
<th>Sample Student Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>What class/year are you in at school</td>
<td>When the learning object was introduced in the curriculum</td>
<td>“I'm finished 2nd year and I will be in 3rd year coming up” “4th year”</td>
</tr>
<tr>
<td>Do you like English as a subject</td>
<td>Refers to personal success/difficulties in subject areas</td>
<td>58.3% No 41.7%</td>
</tr>
<tr>
<td>Do you like poetry?</td>
<td>Refers to interactive nature of the Process</td>
<td>41.7% No 58.3% Yes</td>
</tr>
<tr>
<td>Have you ever used any digital learning objects in the classroom? Response</td>
<td>Refers to previous experience of technology enhanced learning</td>
<td>“electronic whiteboard and edu click for tests” “computers, data projectors” “i said no”</td>
</tr>
<tr>
<td>Did you like using today's multimedia poetry resource?</td>
<td>Refers to liking to work with computers</td>
<td>“No, very difficult for me” “Yes, it was interesting and good information about the author.” “Not really, do something other then poetry”</td>
</tr>
<tr>
<td>What did you like in particular?</td>
<td>Refers to process being fun, interesting, motivating</td>
<td>“Letter for little bit. Difficult for Some subjects’ “how they go about showing the poem with background information” “not having to read books”</td>
</tr>
</tbody>
</table>
Chapter 4: Methodology

| Is there anything that you didn't like? | Refers to some aspect of the learning process | “Some of the older language in Shakespeare's sonnet”  
“i was disappointed when mid term won't play”  
“some of the poems lacked info about the themes”  
“the lack of other subjects” |
| If you were designing something like this resource what would you include more of or less of? | Refers to the clarity of the program and/or the quality of instruction | “More subjects to study”  
“less questions”  
“more about the images that are occurring in it”  
“more subject that we would actually need help in” |
| Compare to other method | Compared to other teaching method / strategy | “All the information on the author.”  
“the audio” |
| No reason given | | “dunno”  
“?” |

**Outcomes of the usability testing**

The initial reaction to the courseware was very positive. When they were asked if they liked English as a subject 14 said yes 10 said no. When they were asked if they liked poetry 10 said yes 14 said no. In spite of the high number claiming to dislike poetry the courseware appeared to be highly motivating. Observations made noted the enthusiasm of the group in all but two students that appeared to have negative attitudes towards the study of English in general and poetry in particular. The multimedia nature of the courseware appeared to be the most appealing aspect of the courseware. Students used all embedded features including the background biographical information, the embedded video, audio and the historical context provided on each poem. It was noted in the observations that the older students, that had sat the Junior Certificate examination two weeks previously, appeared to be very interested in the core text of the poems. The younger students, on the other hand, were more interested in the supporting features, particularly the audiovisual features that provided background and context to the poem. This suggests that the contextual information was both helpful and engaging. Students worked in pairs for the purposes of the usability testing. This enabled interaction and discussion among the students and facilitated a ‘think aloud’ method of evaluation. The group (with the exception of two boys) were completely absorbed in what they were doing throughout the session.
Chapter 4: Methodology

Data collected as part of the questionnaire supported the observations. Responses from the students indicated that they enjoyed the experience and using the courseware. Apart from some minor technical problems caused the hardware used the students reported no problems in navigating the courseware and using the various features embedded in the courseware. When asked to provide recommendations for further development and modifications they suggested adding more information about the themes of the poems in advance of the poem. This suggestion may be a result of current classroom practices where teachers often outline the theme of the poem before addressing its content. This approach suggests quite a didactic approach is used by teachers in addressing poetry where the students are ‘told’ about the theme of the poem in advance rather than exploring its content and examining possible themes themselves. Other suggestions for improvement included greater levels of interactively, such as more mouse over features across all poems and the possible inclusion of interactive games. Two of the twenty four students felt that fewer questions should be included. On student, who particularly disliked English and questioned the relevance of teaching poetry mentioned that the courseware had the potential in other subjects but not in English.

All of the participants liked the inclusion of the authentic voice of the poet where it was available and they would like this to available for all poems if possible. The younger boys especially liked the short video clip relating to the battle of the Somme. The older girls liked the “mouse over” feature where they could hover the mouse over particular lines of the poem and they would be provided with additional information and vocabulary specifically relating to that line of text. In general the group would like to have more songs and video integrated into each of the poetry lessons.

Courseware Evaluation

The data collected from the usability group informed the design of the questionnaire devised for the groups used in the full research study. The categories and coding scheme for these questionnaires was based on that used by Kay and Knaack in their 2005 study.
### Table 5: Categories for Assessing Learning Object Benefits

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization / Layout</td>
<td>Refers to the location or overall layout of items on the screen.</td>
</tr>
<tr>
<td>Learner Control over Interface</td>
<td>Refers the control of the user over specific features of the learning object including pace of learning.</td>
</tr>
<tr>
<td>Animation</td>
<td>Refers specifically to animation features of the program.</td>
</tr>
<tr>
<td>Graphics</td>
<td>Refers to graphics (non-animated of the program), colours, and size of text.</td>
</tr>
<tr>
<td>Audio</td>
<td>Refers to audio features</td>
</tr>
<tr>
<td>Clear Instructions</td>
<td>Refers to clarity of instructions before feedback or help is given to the user.</td>
</tr>
<tr>
<td>Help Features</td>
<td>Refers to help features of the program.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>Refers to general interactive nature of the program.</td>
</tr>
<tr>
<td>Incorrect Content / Errors</td>
<td>Refers to incorrect content.</td>
</tr>
<tr>
<td>Difficulty / Challenge Levels</td>
<td>Was the program challenging?</td>
</tr>
<tr>
<td>Useful / Informative</td>
<td>Refers to how useful or informative the learning object was.</td>
</tr>
</tbody>
</table>

The data collected helped to answer the research questions. In the next chapter, I present and discuss the findings from the various data sources for each of the research questions.
The lack of curriculum relevant ICT materials is a common concern raised by teachers considering using ICT in their lessons. This issue is exacerbated in Ireland due to its relatively small population. This often makes it unfeasible to commercially produce curricular relevant learning material of a high standard. Within this context tailor made curricular resources developed in collaboration with practicing teachers using “easy to use” authoring tools may sound like the impossible. However, as this small scale research has highlighted, the availability of easy to use authoring tools that produce courseware of a professional quality has enormous potential for innovation in Irish schools. The potential for collaboration and sharing of these resources makes the development of these small scale resources attractive if seen as part of a larger community of courseware developers. There is a growing online community of centres and institutions with material freely available for use both in the classroom and at home. BBC Schools has commissioned a number of digital learning objects that present traditional material in a manner that appeals to a digital generation. In Ireland a number of online educational courseware portals are facilitating the sharing of this technology. Information is presented in attractive visual layout, comprising short pieces of text, often accompanied by spoken readings, thereby removing the often tedious task of decoding written texts. Sharing resources produced in this manner can overcome the problems of bandwidth which often inhibits use in schools.

It is also worth noting that many departments within third level institutions are now developing digital learning objects which they can then upload to a central repository where these learning objects may be shared with colleagues at other institutions and may be reused or redeveloped. Some international secondary schools have also recognised the potential of collaboratively developed material and have developed
similar repositories to share learning resources among staff and students. Such digital resources may also be incorporated into teaching materials distributed to distance learners. Irish post-primary schools should consider similar strategies.

**School based research and case studies:**

A qualitative methodological approach typically refers to the methods used to learn at first hand about the environment under investigation and requires an active level of involvement and participation on the part of the researcher (Hitchcock & Hughes, 1995:12). However, the researcher has no control over the events as they unfold. The case study is particularly suited to research questions which require detailed understanding of a phenomenon. Yin advocates the use of multiple methods as part of a case study approach.

Bassey (1981) has written extensively on the usefulness of case studies: “an important criterion for judging the merit of a case study is the extent to which the details are sufficient and appropriate for a teacher working in a similar situation to relate his decision making to that described in the case study. The relatability of a case study is more important than its generalizability”. “If case studies are carried out systematically and critically, if they are aimed at the improvement of education, if they are relatable, and if by publication of the findings they extend the boundaries of existing knowledge, then they are valid forms of educational research (Bassey, 1981:85). A case study represents a research strategy and according to Yin (1981), “the distinguishing characteristic of the case study is that it attempts to examine (a) contemporary phenomenon in its real life context, especially when (b) the boundaries between phenomenon and context are not clearly evident. (Yin, 1981:59). There are different types of case study possible: exploratory, descriptive and explanatory.
Eisenhardt (1989) sees case study research as particularly useful opportunity for theory building “its independence from prior literature or past empirical observation, it is particularly well-suited to new research areas or research areas for which existing theory seems inadequate. This type of work is highly complementary to incremental theory building from normal science research. The former is useful in early stages of research on a topic or when a fresh perspective is needed, while the latter is useful in later stages of knowledge” (Eisenhardt 1989: 32).

Gerring (2004) suggests that to refer to a work as a case study might mean (a) that its method is qualitative, small-N (Yin 1994); (b) that the research is ethnographic, clinical, participant-observation, or otherwise “in the field” (Yin 1994); (c) that the research is characterised by process-tracing (George and Bennett 2004); (d) that the research investigates the properties of a single case (Campbell and Stanley 1963, 7; Eckstein [1975] 1992); or (e) that the research investigates a single phenomenon, instance, or example (the most common usage). Evidently, researchers have many things in mind when they talk about case study research. Case studies typically combine data collection methods such as archives, interviews, questionnaires, and observations. The evidence may be qualitative, quantitative or both.

The very nature of the case study strategy is that it provides an opportunity to observe an event occurring within a particular context and environment. While every care must be taken in choosing the best possible group and situation on which to base a case study research project the researcher must remain vigilant that they do not try to influence the participants or impose such conditions on the environment that they
affect the results of the experience. Cohen et al (2000) state that case studies undertaken for the purposes of social sciences and education based research cannot be controlled to a micro level: “We should not seek to create laboratory conditions when working with case studies in the social sciences and education (Cohen et al, 2000:212). Hartley echoes this approach:

“Notions of isolation and control of variables in order to establish causality may be appropriate for a laboratory, though whether in fact, a social situation ever could become the antiseptic, artificial world of the laboratory is both an empirical and moral question .... Further the ethical dilemmas of treating humans as manipulable, controllable and inanimate are considerable. We are looking at data collected over a period of time within its context”.

(Cohen et al, 2000 p 212)

For the purposes of this research study it was necessary to carry out a number of case studies where each group used the learning object in a different context. This was to investigate the reusable and repurposable nature of the learning object. Hitchcock and Hughes maintain that this type of multi site case study can also be advantageous:

“It is also possible to undertake multi site case study research or, alternatively, work in collaboration with colleagues in other schools”.

(Hitchcock & Hughes, 1989:327).

Once the researcher has decided upon a case study approach choosing the correct type of cases to examine is of the utmost importance:

“(The) Selection of cases is an important aspect of building theory from case studies. As in hypothesis-testing research, the concept of a population is crucial, because the population defines the set of entities from which the research Sample is to be drawn. Also, selection of an appropriate population controls extraneous variation and helps to define the limits for generalizing the findings”.

(Eisenhardt, 1989, p 12).

The researcher must always be mindful of what they are actually looking for:

“A hallmark of good theory is parsimony, but given the typically staggering volume of rich data, there is a temptation to build theory which tries to capture everything. The result can be theory which is very rich in detail, but lacks the simplicity of overall perspective. Theorists working from case data can lose their sense of proportion as they confront vivid, voluminous data. Since they lack quantitative gauges such as regression results or observations
across multiple studies, they may be unable to assess which are the most important relationships and which are simply idiosyncratic to a particular case”  

(Eisenhardt 1989: 30)

In the case of this research study this was overcome by remaining ever mindful of the research questions.

Access to a school classroom setting was essential for the purposes of this research study. This research study is therefore school-based. Hitchcock and Hughes (1989) have written about the value of such teacher-led collaborative research in schools

“School based teacher research, because it is done by teachers, albeit often in conjunction with so-called academics, can avoid this kind of hijacking and puts something back into the professional and pedagogical context”  

(Hitchcock and Hughes, 1989: 207).

Sachs (1998) also perceives the merit of collaborative research between schools and universities. Sachs sees collaborative research between school and university teacher researchers as helping to minimise the problems that can be associated with external university researchers investigating classroom activity. Evans, Lomax and Morgan (2000) argue that school-university research partnerships to carry out small-scale research case studies are an important contribution to an area that is lacking in educational research.

“Within this epistemological discourse, we would say that unless teacher action research reaches the public domain in a big way, and is recognised as worthy by influential educationalists, the battle will be lost”  

(Evans, Lomax and Morgan, 2000, p 407).

The battle here refers to the need to have this type of research recognised and championed. Evans, Lomax and Morgan state that it is important to place a small-scale action research study within the context of the existing research literature, to provide a clear account of what has occurred in the classroom and to outline the success criteria through evidence and examples of children learning something important. Much of the existing literature cites the need for more evidence-based practice (Hargreaves, 1996). One of the purposes of this research study was to provide
one such evidence-based case study. It must be borne in mind that this research is action research.

The nature of this research study suggested that the case study approach would best suit the research study. This led to the following questions:

• What are the research questions?
• How will the cases be selected?
• How many cases will be included in the study?
• How will the case studies be conducted?
• How will the data be analysed?

Similarly, the report that BECTA published in 2007 concluded that such small case studies measuring the impact that ICT can have are certainly worthwhile:

“The considerable investment that has gone into introducing ICT into schools – hardware, software, networking and staff development – will be deemed worthwhile if there is evidence that it has made an adequate impact on the performance levels and progress of pupils. In drawing conclusions from the available literature, it is necessary to acknowledge the extent and nature of the evidence available. While large-scale surveys provide data on provision, attitudes and preferences using samples sizes that are statistically credible, much of the evidence of impact on attainment and a range of intermediate outcomes such as motivation and engagement is derived from small scale case studies which are often snapshots of impact early in the life of the implementation of a new technology”

(BECTA, 2007, p 4).

While undertaking this type of research it is important to remain focussed. Once the case study is complete the researcher much progress the research study further? What is to happen to the findings so that others may benefit form the work? How are the findings to be disseminated so that a particular piece of work may take its place among the existing literature? Hitchcock and Hughes (1989) discuss the work of Atkinson and Delamont (1985) when assessing what is to become of the results of such small scale case studies:
“It might be possible to increase the generalization of a case study by comparing similar case studies from education and allied areas of professional work. It has been argued that if case studies are not explicitly developed into more general frameworks then they will be doomed to remain isolated one off affairs with no sense of cumulative knowledge or developing theoretical insight”

(Atkinson and Delamont, 1985, p 249).

Research Questions

There were three primary research questions driving this study.Outlined below are the three key questions and the key objectives used to pursue them.

4. Design: What is the most effective way of designing RLOs for the post-primary context?
   a. In particular the study aimed to collaborate with post-primary teachers in the design of curriculum specific RLOs to enhance teaching and learning.
   b. To evaluate the effectiveness of this development strategy.

5. Implementation: How do teachers use RLOs in the classroom?
   a. To examine how is ICT currently being used
   b. To determine what are the current levels of use of ICT in schools and in what way does this impact on the uptake and use of RLOs.
   c. To explore teachers’ use of RLOs in different contexts and examine the different pedagogical uses.
   d. To examine the educational benefits of the use of RLOs in the classroom.

6. Evaluation: What role can RLOs play in promoting greater levels of ICT integration across the curriculum, particularly at the Humanities level?
   a. To explore the development of a framework for the future development/use of RLOs.
   b. To highlight the issues effecting greater levels of ICT integration.


**Research methods**

- Informal interviews with teachers and students
- Questionnaires
- School visits and lesson observations
- Online Discussion in Sakai (Virtual Learning Environment)
- Feedback from students
- Feedback from Teachers

Quantitative and qualitative approaches were combined over the course of this study as these processes can highlight different issues which are of relevance to the topic under examination (Wallace, 1998). Both qualitative and quantitative data sources were used in this study to help answer the research questions. In the section on data collection sources and procedures I briefly describe the nature of each data source, when the data sources were collected, and any relevant participation information; the analysis procedures for each of these data sources are described in the data analysis methods section of this chapter. The data sources used in this study include the interviews, online student surveys, student focus group interviews, and interviews with the teachers.
**Context of the study: Schools and ICT**

This study was conducted over one academic year. The pilot group participated from (October-December). There were three post-primary schools involved. The schools varied in size and type, one being a 1047 student community college, the second a 400 student fee paying college and the third a 600 student previously comprised Convent of Mercy and Christian Brothers School until amalgamation into a co-educational school in 1985. The teachers involved in this research did not have a history of ICT use. The schools themselves all have ICT facilities as a result of recent state investment in ICT.

St. Mary’s is a co-educational school with a population of some 600 students. Improvement was predominantly seen in terms of recent infrastructural developments. As a result of a fire in 2006 the PC lab had to be refurbished. Consequently the PC lab was brand new at the time of this study. Computers are being used in technical/vocational subjects and the integration of ICT as a teaching and learning tool in other subject areas is at an early stage of development.

Annacotty College has some 1047 students. The school has used computers since its opening in 2000. The integration of ICT in different subject areas is now being attempted and is more advanced in some areas than others.

Cedar Hill is a girls’ secondary school with a population of 400 students. While the school did not have a history of ICT use, a substantial investment from the *Schools IT2000* initiative has enabled the school to start some developments in this area.
The RLO was used in three very different ways by each of the three schools. This is described in detail in the research findings.

Participants

Overall, there were 154 students and 13 teachers involved in this study. The following table shows the breakdown of the individual groups.

<table>
<thead>
<tr>
<th>Usability group</th>
<th>1st and 2nd year students</th>
<th>School 1</th>
<th>School 2</th>
<th>School 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Whizzkids”</td>
<td>24</td>
<td>58</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>Pilot group 2 classes</td>
<td>58</td>
<td>26</td>
<td>30</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 3: Breakdown of Participants

Data Collection Sources and Procedures

In this section of the chapter, the methods that were used in order to analyze each data source are presented. All of the data sources were analyzed according to specific methods in order to best answer the sub-questions that guided the data collection and analysis for this study in an effort to answer the main research question: How do students use the learning object within the context of the traditional classroom?

Interviews with Teachers

Many researchers claim that ideally, the number of interviews conducted depends on how much data is being generated in each succeeding interview. Gaskell (2000) believes that much can be gained by interviewing even a small number of subjects. The interview process stops when new interviews no longer reveal much new data. Those involved in this study consistently made much the same comments and observations, so it can be reasoned that were more interview sessions undertaken, little more information would have been revealed.
Mc Neil (1990) argues that it is possible to generalise results from the group that we have selected and apply them to the wider audience, provided that the group of people, or the situation that we are studying, is typical of the larger group as a whole. The participants of this research study were drawn from wide socio-economic group; the details of each group are provided in the Findings chapter. After reading the available reports pertaining to ICT use in Irish schools it was then necessary to speak to teachers to get an insight into the realities of incorporating ICT into the classroom. Interviews with the teachers contributed directly to the content, design and development of the learning object.

As discussed earlier working directly with teachers can form a successful research partnership:

“*The teachers’ excitement is also in seeing their students learn more effectively; it is in connecting their knowledge to the communities they teach in terms of content and relationships; it is in seeing their students being more successful; it is in learning about themselves so they understand their own values and the forces that drive them to reflect and reconstruct their knowledge*”.

(Evans, Lomax and Morgan 2000; 415).

**Student Focus Group Interviews**

For the purposes of this study it was decided to speak with the students in a focus group setting before they used the learning object. In order to gain a deeper understanding of the practicalities using the technology from a student perspective student groups were invited to share their thoughts and opinions about the learning object. Students were interviewed in focus groups, as opposed to individually, so that group members could contribute to each other's ideas and responses and therefore more useful information could be gathered (Morgan, 1997). However, it is important to be conscious of the subjective nature when interpreting this type of qualitative data.
Since the focus group is mainly a communication event it is imperative that the researcher must remember that there are many factors which can influence such interactions:

“one must reflect on the many factors which may negatively affect its overall success such as: low levels of trust, bias, deception, social desirability and face-politeness needs”

(Albrecht et al., 1993 p63).

Some of the questions in the focus group interview protocol were replicated in the online student questionnaires.

**Observation**

Observation is a key apparatus of the case study toolkit. Observation belongs to the ethnographic style of case study research using observation techniques to study a society or some aspect of a society, culture or group in depth. While the approach originally developed by anthropologists was intended to enable the researchers, as far as was possible, to share the same experiences as the subjects, to understand better why they acted in the way they did and 'to see things as those involved see things' (Denscombe 1998 p69) it is now a widely used strategy by many qualitative researchers. Malin (2003) believes that observers always precipitate some changes in participants' behaviour. Indeed, it would be impossible for a participant observer to enter a situation without affecting some aspects of behaviour. This strategy is employed by many researchers of small group case studies and for the purposes of this study observing students in the classroom, offered a rich source of qualitative data. While undertaking observation notes it is imperative that the researcher remain objective at all times. Malin (2003) in her research stresses that all participants must be adequately represented in the study; therefore the researcher must strive to be objective at all times:
“Students’ interests, as reflected in the research, may come into conflict with those of their teachers and how the researcher’s responsibilities to the profession may conflict with their responsibilities to certain members of the researched”

(Malin, 2003, p21).

Using software to aid in the analysis of the observation data may help to ensure a higher level of objectivity rather than depending on the researcher’s skills alone.

**Online Student Questionnaires**

This method of data collection is practical as it is cost effective, anonymous, can reach respondents in distant locations and is mainly written for specific purposes, based on a set of standardised questions. Researchers often choose this method of data collection because it permits a quick and effective means of collecting a large number of data from the participants (Dornyei, 2003, p 1). Online surveys were administered using survey monkey in order to measure student attitudes to English and specifically poetry as a subject, use of learning objects to aid schoolwork and computer use outside the classroom including games like the SIMs. Students were also asked about their use of other Web 2.0 technology, such as Bebo. While most filled out the questionnaire individually in one class I observed a number of students reading the computer screen beside them copying each other’s answers. This meant that their questionnaires had to be given out in hardcopy in subsequent weeks.

**Opportunistic elements of the case study**

The case study researcher is likely to be sensitive to opportunistic as well as planned data collection (Hartley, 2004). From the outset of this research project every effort was made to maintain an open-minded approach to the data collection and interpretation. Stake (1995) also recommends this approach:
“Most researchers find that they do their best work by being thoroughly prepared to concentrate on a few things yet ready for unanticipated happenings that reveal the nature of the case”

(Stake, 1995, p55).

By remaining flexible and allowing for some changes in direction new ideas could develop. Therefore when the opportunity presented itself to incorporate some usage of the University’s VLE into the study the project embraced it rather than saying it was outside of the original project scope.

As part of the research study a project site within Sakai was set up for the group of 30 students at Cedar Hill to join. As the school had not issued each student with an individual email/login the teacher set up one email address for the entire class to use. The teacher did not want his students using their personal email addresses for privacy reasons. The students were told that because of this their comments would have a level of anonymity that would not usually be the case with a VLE. Students were told that they could type their name at the end of their comments if they wished to reveal their identity. The majority signed their name and took ownership of their contributions. The student who was deemed to have contributed the most to the online discussion received an iPod as a prize. The event logs from the project site “Poetry Corner” were analysed and all of the log activity was included in the study and copied to a spreadsheet for analysis.

In one of the schools (Cedar Hill) students were given the option of designing their own multimedia poem. This was completely voluntary and was done in the students’ own time outside of the classroom. A total of 5 out of 30 emailed me a PowerPoint presentation on a poem of their choice. While this is a very small number this work was completely voluntary and of a high quality. They contacted the researcher
directly share that they had really enjoyed the experience of using the software in the classroom.

In St. Mary’s the teachers were involved in a project with NUI Maynooth: Teaching and Learning for the 21st Century. TL21 is a research project designed to enhance innovation and creativity in second-level schools in Ireland. The project aims to develop existing good practice in the classroom and promote fresh thinking in the teaching and learning process. The class involved with this project used the poetry learning object as their primary resource for this project and they built additional activities around it to achieve a highly blended learning experience.

Post use interviews with Teachers

The focus of these interviews was primarily on the student use and impact of the learning object developed. The feedback was largely positive from these interviews; only one teacher expressed concern about moving away from the more traditional poetry lesson.

Data Analysis

Once the data has been collected the researcher must be vigilant in managing the data. Selecting the most appropriate method of analysing the data is imperative to the success of the research study. The researcher must only read into the data what is there and not what they suppose to be there. Yin (1994) notes that a high quality case study is characterised by meticulous thinking, sufficient presentation of evidence to reach appropriate conclusions, and careful consideration of alternative explanations of the evidence. To guard against reaching premature closure Hartley (2005) suggests
that sufficient time be given to “careful description of the data and the development of categories in which to place behaviours or processes” (Hartley, 2005 p329).

As discussed, qualitative data is largely descriptive and the researcher’s raw material often comprises transcripts from interviews and observations. Much literature advocates the use of qualitative data analysis software to examine the data:

“It is possible to apply research methods to qualitative data in such a way that the dichotomy often claimed between quantitative and qualitative analysis is dissipated”

(Samkin and Schneider, 2008, p 207).

Researchers often use text analysis software to identify themes, create codes, and link multiple documents. A number of computer packages have been specifically designed for qualitative analysis. Software can help to manage, code, search and retrieve data. It can also help to identify emergent themes but it cannot provide a definitive result in your data. Examples of these programs include: QSR N6, EZ TEXT, AQUAD FIVE and ATLAS.

The researcher must remember that no matter what software package is chosen to store, manage and analyse the data the software is only as good as the researcher using it one must be willing to invest time and patience in learning how to exploit effectively this software, remaining aware at all times of a number of shortcomings (Hourigan, 2007). After considering the available software packages, it was decided to use the Weft software package as it was deemed most appropriate to this research project. Weft QDA is a GUI package for the analysis of unstructured textual data such as interviews and notes from observations. Weft is a freeware tool and in the spirit of freeware is available for use at no cost to the researcher. It is possible to import documents directly from a word processing package and code these documents easily on screen. Weft was suitable for this project as there was no need to work with rich
text (italicised, bold etc), the project was not working with audio or multilingual
documents nor was there any need for paid support. This tool crucially facilitated easy
data management and retrieval.

Weft is particularly effective in helping to categorise the emergent themes that arose
across the data; teacher interviews, student feedback and notes from the classroom
observations. This qualitative data analysis tool allowed for efficient management of
code-based inquiry and allowed the researcher to document the emerging trends.
Following a number of readings of each transcript a number of themes were
identified. The data was then coded according to these themes (see appendices 1-4).
In order to assess the validity of each of these themes the data was then reread.
The questionnaires and interviews were typed and inputted into Weft software for
further investigation and analysis by the researcher.

**Ethical Issues**

Regardless of the size of a study researchers are bound by a duty of care to the
participants of their study. “It is widely recognised that there is a need to safeguard
those who are the subject of research. Historically, ethical approval of research has
been seen as an issue for medical/clinical research. However, it is now recognised
that the responsibility extends beyond those previous boundaries and applies to all
research projects where humans are involved” (University of Limerick, 2006).

For this study the ethical concerns most relevant to qualitative, classroom-based
research on teaching were relevant. Prior to their agreeing to take part in the research
study all participants must be provided with a full understanding of what is involved.
The nature and aims of the research study were clearly explained to all participants in
preliminary meetings both before and after they agreed to participate (Kelly, 1989). Therefore, for this study “informed consent” was given by those involved.

For the purposes of this study it was necessary to gain approval from the University of Limerick research ethics committee. This committee considers the ethics of proposed research projects which will involve human subjects. It is the responsibility of the researcher to ensure that the projected research is ethical. As this research study involved the following: (a) direct experimentation on individuals, (b) surveys or questionnaires administered to individuals and (c) use of data derived from individual records where individuals might be identified. The necessary permission was acquired from the research ethics committee and from the schools involved before undertaking the research study.

**Limitations**

This study was largely concerned with students where the decision had not yet been made as to whether they would take a higher or ordinary level English exam in the Junior Certificate. However, due to difficulty in recruiting participants two small groups of eight students in a learner support class were also included. The rationale for including the support group was to explore how the learning objects could be used by a “less capable”* group. This group were therefore included to illustrate the diversity of the learning object and their participation was worthwhile. Consequently, this study reports on the use of an RLO in three very distinct settings with different outcomes and expectations by teachers and students.

* The teacher of these groups described them as weak and less capable than the average class.
The learning object has been designed to be used by one student on their own PC engaging in a personal learning experience. However, schools generally do not have the necessary number of functioning machines to accommodate this. In many cases there were a large number of students sharing computers. This was either due to a shortage of computers in the lab or because a number of machines had issues for example, the CD drive didn’t work or the machine was very slow.

For this study the researcher had no control over the time of day that the class could be observed using the learning object. Some classes were observed in the morning (9am class) and some in the first period after lunch (1pm). The mood of the class was very different at these times. The class were more focused in the morning and tended to be less settled in the afternoon. This may have had an impact on how they engaged with the learning object.

As it was extremely difficult to gain access to schools it was therefore difficult to maintain a level of uniformity in terms of data collection across all three sites. However, a rich quality of data was collected due to the teachers involved in the study. This increased the ecological validity of the study.

**Conclusion**
The availability of high quality courseware development tools facilitates relatively low cost development of highly reusable curricular relevant materials. This has the potential to radically reconceptualise the use of ICT across the curriculum in Irish schools, particularly in the Humanities area, an area that has not traditionally incorporated ICT. In this study the technology was used to address a very specific issue which would not traditionally be addressed in ‘off the shelf’ commercial
courseware products. Tailor made solutions, such as the one addressed in this study, puts the teacher back in the centre of the design and development of learning resources enabling more effective and responsive educational solutions, which can be modified to address different levels of abilities and different learning situations. There are of course challenges and opportunities created with this type of ICT use in English particularly in relation to the nature of pupil learning, the transferability of the skills acquired and their level of engagement with the developed product. The implications of this type of use of the technology on the informal and formal educational experiences of the learners requires further research.
Chapter 5

Research Findings

Context of the study: Schools and ICT
This study was conducted over one academic year. The pilot group participated from October-December while the main study took place from March-May. There were three post-primary schools involved. The schools varied in size and type, one being a 1047 student community college, the second a 400 student fee paying college and the third a 500 student previously comprised Convent of Mercy and Christian Brothers School until amalgamation into a co-educational school in 1985. The teachers involved in this research did not have a history of ICT use. The schools themselves all have ICT facilities as a result of recent state investment in ICT.

During 2008 and 2009 Ireland was in the midst of a global recession. A moratorium was put in place on the recruitment and promotion of the civil service, local authorities, non-commercial state bodies, the Garda Síochána and the Permanent Defence Forces. The ceiling on Teacher and Special Needs Assistant numbers was fixed at the overall collective number of such posts actually in place in schools. However, there was some recruitment of teachers in September 2008 for any vacancies arising or new posts approved by the Minister for Education and Science.

The Association of Secondary Teachers Ireland (ASTI) and the Teachers’ Union of Ireland (TUI) directed teachers not to cover unfilled management posts of teachers who resigned or were on maternity leave. State examination co-ordination,
disciplinary and pastoral care and even school closures were among the possible
effects expected if an escalation of action by second-level teacher unions took place.

School management bodies expressed concern about how schools would operate. The
Joint Managerial Body (JMB), which represents some 400 voluntary secondary
schools, were concerned that some schools would “struggle to function” if the issue
were not resolved. Michael Moriarty, general secretary of the Irish Vocational
Education Association, said the directive would have “serious implications” for
schools, which he says are “already badly affected”.

The Association of Secondary Teachers Ireland (ASTI) and the Teachers’ Union of
Ireland (TUI) directed teachers not to cover unfilled management posts of teachers
who resign or take maternity leave. The TUI said the “devastating effect” of the
moratorium on schools would be “greatly worsened” in due to further retirements.
Many teachers were reluctant to become involved in any activities that were perceived
as extra curricular activities. Therefore this environment may have influenced the
level of uptake and involvement in the research study.

It was within this economic context and working environment that this research study
took place.

As explained in the methodology chapter the three case study sites have been named
as follows:

- St. Mary’s
- Annacotty Community School
- Cedar Hill.
Chapter 5: Research Findings

Each case study is presented under the following broad headings:

- General profile of the school
- Computer Facilities
- Profile of the students
- Profile of the teachers
- Sessions

**St. Mary’s**

**General profile of the school**

St. Mary’s is a co-educational school with a population of some 600 students.

The Sisters of Mercy provided second level education in St. Mary’s from the time they arrived there in 1863. In 1955 the Convent School became a Voluntary Secondary School, catering for three hundred girls, including eighty boarders. Then in 1932 The Christian Brothers School opened and provided secondary education for boys from a wide catchment area. In 1985, the two schools amalgamated to form St. Mary’s combining the philosophies of Catherine McAuley and Brother Edmund Rice; this was a natural progression as a spirit of co-operation existed between the two communities since the 1930’s. In 2003 when St. Mary’s College ceased to provide secondary education, St. Mary’s became the only secondary school in the town. The school strives to do the best for each individual student. The school spirit is enshrined in the school crest “**Misericordia**” (Mercy to all) and there is no doubt that this school has a strong religious ethos.
According to the school principal the school endeavours to:

- Provide a caring, safe and disciplined environment in which all students are challenged and supported to reach their educational and personal potential.
- Ensure all students to leave the school as well adjusted, responsible and enterprising individuals capable of meeting the challenges of a changing society.
- Strive to further the Christian and moral development of each student within an atmosphere that reflects the Mercy ethos and long tradition of education.

The school corridors are decorated with students’ artwork. The pieces are consistently of a high standard and some trophies and other awards sit on the window sills. Photos marking achievements of pupils, both past and present, also have a presence in the corridors. The atmosphere of the school corridor seemed to change according to what was happening in the school. For example, while the school musical production of Grease was underway there were plenty of posters advertising the show on the walls of the corridor while on another occasion one of the school visits coincided with a school mass and each of the windows in the corridor had been decorated with a bunch of lilac blossom.

In 2002 the organisational structure of class grouping at St. Mary’s moved away from streaming to a mixed ability grouping. This was a major change for students and teachers and has been successful to varying degrees depending on subject, resources and student profiles. Teachers at St. Mary’s find this new structure challenging at
times: “Tailoring subject plans and learning strategies to engage students of a wide ability span and concurrently cover defined syllabus content requires a huge differentiation and focus on the individual, while meeting the needs of the majority. This continues to be an ongoing challenge at St. Mary’s”.

**Computer Facilities**

Improvement was predominantly seen in terms of recent infrastructural developments. As a result of a fire in 2006 the PC lab had to be refurbished. Consequently the PC lab was brand new at the time of this study. Computers are being used in technical/vocational subjects and the integration of ICT as a teaching and learning tool in other subject areas is at an early stage of development. There are also data projectors in upwards of 60% of the mainstream classroom.

**Profile of the students**

The participants from St. Mary’s were in 1st (group A) and 2nd year (group B and group C) and the groups comprised roughly an equal number of boys and girls. The majority of students were born in Ireland with a very small minority (2) born in Poland. Many of the students are from a rural background. The initial first visit to the school for the purposes of meeting with the principal and teachers took place during the national ploughing championships in September 2008. This event was spoken about in the staff room and the principal said that some students were gone to the event.

**Profile of the teachers**

Two class groups took part in the pilot phase of this research study. The teacher of the third potential class felt that she couldn’t participate as she hadn’t the time. However,
after the Easter break (April 2009) this teacher (Teacher C) did become involved with the research project. She had spoken with her colleagues and felt that the classes had gained from the experience and she wanted her class to also have the opportunity to use the resource. She used the learning object with her class for a six week period. The two teachers involved in the pilot study had very different attitudes to incorporating an ICT element into their class time. The first teacher (Teacher A) was in her early forties and was quite enthusiastic about becoming involved with the project. The second teacher (Teacher B) was in her fifties was very openly apprehensive about using the learning object with her class. None of the teachers wanted the students to access the resource at home as they felt it would divide the class and would be unfair.

**Teacher A**

“This (research study) is a good incentive for me. I don’t even have an email account so this will force me to be more aware of what I could use the computer for in school. I’d like to use more resources and there’s a lot of material there that would make the class more interesting for them (the students)”.

**Teacher B**

“I don’t know if I can commit to the full six weeks. I’ve the novel to get through before Christmas and I don’t usually give as much time to poetry but we’ll give it a go. I’d like them (the class) to be included because the other group are using it (the learning object)”.
The teachers at St. Mary’s recognised that the computer facilities had been significantly upgraded in the academic year 2008-2009. In addition to the two new computer labs every classroom had at least one computer with broadband access. The teachers wanted to use these new facilities in a meaningful way to aid learning and they acknowledged that such a challenge would involve a new set of skills for planning and classroom management. The teachers got involved with this research study as a means of exploring how they could incorporate some element of ICT into their teaching. The teachers felt that they could also use the experience as a pilot study that would benefit them and their students. The teachers involved were all teaching mixed ability groups and felt that using a learning object may be a means to get the weaker students to engage with the text to a greater degree while also offering the stronger students more autonomy over their learning.

**Pilot Study**

The pilot study took place from October to December 2008. The first visit allowed the researcher to meet with the principal and teachers to speak about project and the potential participation of the classes. The second visit allowed the researcher to speak with the students about their computer use and attitude to using the computer both at home and at school. As the Christmas exams began on the 22\(^{nd}\) of December the students used the learning object for a total of five weeks.

**Session 1: Siegfried Sassoon’s “Base Details”**

Before the students used the learning object the researcher spoke with them as a group to get some information about their computer use at home and at school. Their teacher was present for this. All 18 students from group A had computers at home and all students had Internet at home. Some students had used their home PC to help them
with their homework. One girl said that she normally used the internet to help with her History, Geography and German homework. The others agreed with her that used the internet to help with some of these subjects. They had a cultural studies project for German and had to get slides and other pictures. They used Google and Wikipedia to source information and pictures.

Outside of school this group all used their home PC for:

- Youtube; to view videos and watch music.
- Football games.
- eBay.
- Solitaire/Pinball.
- Red Alert.
- Bebo; A total of 14 out of the 18 had Bebo sites. The four who didn’t have Bebo sites did not seem embarrassed or left out.
- Fan Web sites such as Man United and Chelsea.
- MSN Messenger.
- Uploading music to their iPod/MP3 player.
- Watching DVDs with friends.
- Looking up pictures of celebrities and celebrity gossip (this was mainly the girls).

The first day that students began to work with the learning object was on November 11th 2008. The date is meaningful as November 11th 1918 marked the end of the first battle of the Somme. At the 11th hour, on the 11th day of the 11th month the Allies and Germany observed the agreement to end the “War to End All Wars” while the world surveyed the cost of four years of war. The first poem (of the six available
poems) that the pilot study used from the learning object was Siegfried Sassoon’s “Base Details”.

Fig 8: Screenshot from “Base Details”

Group A

This group were in 2nd year and were the supposedly weaker group. Teacher A said that they were one of the weakest, if not the weakest, that she has ever taught. Yet the class is supposed to me of mixed ability.

Before we started:

Discipline issues before starting the class had to be addressed. Two students who had misbehaved on Monday evening had to be dealt with on Tuesday morning. Role call also had to take place before the students were able to move from their own scheduled classroom to the computer room. The teacher stated that this group were quite weak overall and could be a difficult group to work with. The teacher was very eager to use the resource with the class. She felt that a lot could be gained from using an innovative teaching tool. The technical assistant was more than accommodating and
set me up with a password to access the PCs in the school. They were very welcoming and enthusiastic. I did not feel that I was encroaching on the “normal” school day.

**During the session:**

The room that we used for the first group was not ideal, there were only 20 PCs for 28 students, The teacher allocated PCs to those students that she would make the most effort and the best use of their time. This meant that there was a small group of eight were left out. The solution to this was to ask them to act as observers. These eight sat close to those working on PCs and took notes. However, as we began the session we were unable to use three of the PCs in the room. Some three students were unable to login to the PCs and their friend’s login details were not accepted either. The school has a technical person to hand to deal with such problems. When he arrived he suggested a restart and had to run to another problem elsewhere in the building. The restart didn’t help so the three students watched others and at the end of the class they got to try the software themselves.

Once the group had settled into their respective roles they used the software for about 20 minutes. They viewed all screens and didn’t miss anything. The girls tended to spend more time on the screen outlining the poetry terms. As the group is a first year class they had only just begun to explore this vocabulary and were covering it in class aswell. The boys tended to focus more on the visuals. The group was split into lots of little groups... For example, there were three boys who sat together. They all took out copy books and as they worked together on two PCs they wrote out the answers to the questions presented on screen. They worked together quietly and they looked about a year (or more) younger than the rest of the boys. They all engaged with the software on some level.
Fig 8: Poetry Terms

After the lab session:

They described the benefits of using some kind of digital resource like this as being better than "just reading"... “it's different to what we usually do”. They usually read through the poem together in class and than there is a teacher-led discussion. They enjoyed using the resource and would like to use similar resources in the future. They didn't think that they had nearly enough time to use it and the general consensus was that they would have liked to have had an hour with it. This could not be accommodated at school but perhaps they could use it at home?

I asked the group what they disliked about the software. Some of the group stated that they had experienced problems “getting in”. The questions were described as "middling" one boy said that more definitions would have been useful. He said that he didn't understand what the term “satire” meant. One of the other boys said that this term was explained and he showed the boy how to access the page. If they were
designed something similar/a similar type of resource for their peer group they
would include more pictures and more video clips.

This class had already covered six other poems, some short stories and some drama.
They particularly liked poems that were funny and out of the six poems that they had
covered they only remembered the two humorous ones. “Nuke” and "Yellow Butter".
The drama classes included scripts from “Fawlty Towers”. They had all seen the
series at home but they would have liked to have watched the DVD in class.

**Group B**

This group were in 1st year and were, according to both teachers, the stronger of the
two groups. This session was held in the larger of the two PC rooms in the school.
There were more than enough PCs in this room. There was a match on that afternoon
and about eight of the boys were missing. Teacher B confided that this missing group
comprised many “messers”. They were present for the following week’s class and the
group did have a slightly different dynamic. Again, the teacher was quite eager to use
the resource with the class. She felt that a lot could be gained from using an
innovative teaching tool.

**During the session**

The group bounced into the lab. They all took a CD off the top desk, sat down,
logged in, and waited for the minute or so required. As it was a smaller group they all
had the software open within a few short minutes.

Once the group had opened the software they worked away in a much more excited
manner than the class from the morning session. They viewed all screens and didn’t
The group displayed a high level of motivation. The girls tended to spend more time on the screen outlining the poetry terms. As the group is a first year class they had only just begun to explore this vocabulary and were covering it in class as well. The boys tended to focus more on the visuals. The group, in contrast to the morning group, did not segregate into lots of little groups. They all talked loudly to each other while they worked. They exclaimed quite loudly that the visuals were “cool” and a couple of the younger boys sat watching the video clip from the First World War with completely focused attention. They commented that the music was “so sad”. A couple of the girls read the poem aloud to themselves. They worked out how to zoom in on the screen so that the video clip filled their screen. The girls, having seen this technique, did the same thing and then began looking at other items on screen. The banner crest from the *Times* was enlarged and they called their teacher over to see it. There was definitely a high level of engagement. While they were watching the video clip their teacher reminded the class that the day marked the end of the First World War.

**After the lab session:**

I had prepared a survey using Survey Monkey. However, as there was no time for them to fill this out I spoke with the students for 20 minutes after the session in the lab. Their teacher was present for this discussion. All 20 students from group B had computers at home and all students had Internet at home. There was some discussion about which games they played at home. The boys and girls had very different preferences. When any of the girls spoke the boys made comments such as “Sims is only for girls” and “that’s a stupid game”. Some students had used their home PC to help them with their homework. They all said that they normally used the internet to
they used Google and Wikipedia to source information and pictures.

Outside of school this group all used their home PC for:

- Youtube; to view videos and watch music.
- Football games.
- eBay.
- Solitaire/Pinball.
- Red Alert.
- Bebo
- Fan Web sites such as Man United and Chelsea.
- MSN Messenger.
- Uploading music to their iPod/MP3 player.
- Watching DVDs with friends.
- Looking up pictures of celebrities and celebrity gossip (this was mainly the girls).

They described the benefits of using some kind of digital resource like this as being “better than reading a book”...Interestingly, this phrase “better than reading a book” was used by a 12 year old boy during my usability testing session last July. The group commented that they liked using the software as “it’s different to the normal stuff”. Normally their poetry class allows them to read through the poem together and than there is a teacher-led discussion. They enjoyed using the resource and would like to use similar resources in the future. They liked using the PC. The liked watching the movie clip. One boy said that he liked “Learning about the poem but
not just with words”. A couple of boys said that they liked the “video and the history”.

I asked the group what they disliked about the software. There wasn’t anything that they really disliked. While the teacher was present it was felt that the group’s answers were honest. I asked them what else they would include if they were designing something similar/a similar type of resource for their peer group they would include more pictures and more video clips. A few of the boys said that they would like to have “less reading” however, in the next breath they did say that they would like a “fact file type thing” included. I asked them what they meant by this and they said “like a card or something … if it was about the war it could be about Hitler”. I think that they liked the idea of the surplus information about the poets but would prefer this text condensed into a few bullet points.
Session 2: Stevie Smith’s “Not waving but drowning”

Group A

For this session the students looked at the poem “Not waving but drowning”. This session took place during the first class of the day and the students were alert and very keen to start using the learning object. As with the previous week work stations 17 and 22 were not working so the students at these machines sat beside someone already logged in. This group had little trouble accessing the courseware. Many remembered how to open and access the learning object from the previous week’s session. They logged in very quickly and accessed the resources folder with the poetry file.

Fig 10: “Not waving but drowning”.

The students were interested in exploring the material and many of them used the zoom feature to look at elements in more detail. They did seem to enjoy the class. Some of the students had remembered to bring earphones. Some had no ear phones but managed to hear the file through the speakers. Many of the girls said that they liked that the poem was read by the actual poet. They said it “made the poem more real” for them.
The students all looked at the biography screens. They did seem to enjoy using the software. The teacher said a few words to focus the class. They responded well to this. The volume level in the class dropped at the prompt that there would be a Q&A session in class the following day. A few of the group asked about the questions on survey monkey, they were unable to access the survey online. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem. One of the boys really wanted praise. He demanded attention and wanted to know if his answers were correct. He gave a text book answer to his teacher in response the questions posed on the points to ponder screen.

When I spoke with the teacher after the class she said that she noticed an improvement on the previous week. She said that she was quite happy to continue with the project. There were no disciplinary incidents during the session. Overall, the students were much more competent this week.
**Group B**

This class was held in the second computer lab and was the first period after lunch and was to be followed by PE. As a result the class were not wearing their uniform and were in fairly high spirits during the session. While they did engage with the material they were in a rush to finish and seemed very distracted for the duration.

**Teacher B** told me that a parent teacher meeting had taken place the previous day and that one of the parents in particular did not understand why the students were using computers to learn poetry. The teacher for the afternoon class also expressed concern regarding the material being covered. She said that "She was concerned about the level of learning" in the class. She said that after the "Base Details" session, when she asked the class, the students could hardly tell her what the poem was about.

This week the group did have time to answer the questions online. The teacher had a look through these answers and most of the students identified the key aspects of the poem. The answers given were not elaborate and this was down to time constraints of a 40 minute class.

Based on observation it was felt that the weaker 2nd year class, group A, got more out of the session than the afternoon class.
Session 3: Seamus Heaney’s “Midterm Break”

For this session the students looked at the poem “Midterm Break”. This session took place during the first class of the day and the students were alert and very keen to start using the learning object. As per the previous week work stations 17 and 22 were not working so the students at these machines sat beside someone already logged in. This group had little trouble accessing the courseware. The majority remembered how to open and access the learning object from the previous week’s session. They logged in very quickly and accessed the Resources folder with the poetry file. This week the majority of the class had remembered to bring earphones.

The students were interested in exploring the material and many of them used the zoom feature to look at elements in more detail. When some students had finished with the questions they began to open Word Documents and copy images from the learning object to the new document. They were anxious to do more but didn’t know what they should be doing. They all looked at the interactive screen describing the
attic room that Seamus Heaney uses as a study and writing room. They liked “Being able to click on the picture and then it would tell you about that part of the picture”. They seemed to enjoy using the software. Like the previous week the teacher said a few words to focus the class. They responded well to this. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

**Teacher A** said that she was happy that her class were participating in the project and that she felt they were engaging well with the software. There were no disciplinary incidents during the session.

**Group B**
For this session the students also looked at the poem “Midterm Break”. This session took place during the first class after lunch. The students logged in very quickly and accessed the resources folder with the poetry file. The majority had forgotten to bring earphones with them so many of them shared a set of earphones or tried to listen to the audio from the computer speakers.

The students were interested in exploring the material and many of them watched the video content several times. When some students had finished with the questions they began to talk loudly and seemed quite unsettled. The students seemed to enjoy using the software. Like the previous week the teacher said a few words to focus the class. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem. **Teacher B** said that she felt that the class had worked better this week. However, when the class had left the room we (teacher and
researcher) looked at the quality of answers that the students had given there were quite a few entries where work was not to a good standard. For example;

**Sample poor response from individual student:**

Question: What was your favourite line of the poem?
Response: “d 2 one”.

Question: Why was this line your favourite line?
Response: “i dont no”.

Question: How would you rate this resource?
Response: “I didn't like using it”.

Question: What was your favourite part of the resource?
Response: “dont no”.

Question: What did you learn about the poet (if anything)?
Response: “how to ryme”.

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**Sample poor response from individual student:**

Question: What was your favourite line of the poem?
Response: “to many to choose”.

Question: Why was this line your favourite line?
Response: “sorry i didnt pick”.

Question: How would you rate this resource?
Response: “I didn't like using it”.

Question: What was your favourite part of the resource?
Response: “reading the poem”

Question: What did you learn about the poet (if anything)?
Response: “no”
Sample good response from individual student:

Question: What was your favourite line of the poem?
Response: “My favourite line was ‘Counting bells knelling classes to a close’”.

Question: Why was this line your favourite line?
Response: “It was my favourite line because it hinted to you about what the poem was about”.

Question: How would you rate this resource?
Response: “I really liked using it and would like to use similar resources in class”.

Question: What was your favourite part of the resource?
Response: “Being able to click on the picture and then it would tell you about that part of the picture”

Question: What did you learn about the poet (if anything)?
Response: “I leared that the poet exoerienced death when he was young”

Many of the others had copied from one another and had entered the same answer to many of the questions. Teacher B was not satisfied with this level of interaction and said that she would speak to the class about it the following week.
Session 4: Merrill Glass’s “But You Didn’t”

For this session the students looked at the poem “But You Didn’t”. As usual group A were attentive and very enthusiastic to start using the learning object. As per the previous weeks a couple of the work stations 17 and 22 were not working so the students at these machines sat beside someone already logged in. A couple of the student login details also caused problems. This meant that there a number of pairs working together.

Fig 13: Opening screen and screen with video and audio from “But You Didn’t”.

This group had no trouble accessing the courseware. The students were interested in exploring the Billy Joel video material and many of them used the zoom feature to look at images in more detail. They also enjoyed listening to Paul Hardcastle’s song “nineteen”.

As per the previous week, when finished with the questions, many began to open Word Documents and copy images from the learning object to the new document. They enjoyed using the software. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.
There were no disciplinary incidents during the session.

**Group B**

Before the class started Teacher B spoke with them:

“Last week a lot of you were very unsettled. Some of you didn’t complete the work that you were supposed to and there was a lot of talking. I looked at the answers that you gave and some of you were just messing. That’s not good enough. If you don’t work properly today you will not be allowed to continue using the computers”.

This settled the class.

The students had no problems accessing the resource and logged in very quickly. They engaged with the material and were much more focussed than the previous week. The level of noise in the room was much lower than previous weeks. They all took notes from the learning object and wrote in their copy books.

When answering the questions the students did not copy from each other’s work this week. The standard of answer was a lot better. Teacher B said that she felt that the class had worked better this week.

**Sample answers from students:**

Question: What did you like most about today's poem?

Response: “im not sure”.

Question: What did you like least about today's poem?

Response: “nothing i didnt like”.

Question: What did the poet do that might have annoyed her boyfriend?
Response: “flirt with other boys”.

Question: What kind of relationship do you think the couple had?
Response: “a very strong 1”

Question: How do you think the poet felt when her boyfriend didn't return from Vietnam?
Response: “very emocional”

Question: Can you write a summary of this poem in three short sentences?
Response: “maybe il give it a go... ahh hem.. it is about a girl with a boyfriend who was with her through the good times and the bad times. he never left her. and then he never showed up”

Question: What did you like most about today's poem?
Response: “it talked about reality. xoxoxo”.

Question: What did you like least about today's poem?
Response: “there wasnt enough enphasis about the man... :(XxxxxX”.

Question: What did the poet do that might have annoyed her boyfriend?
Response: “flirted with other boys, dented the car, frogot to say the dance was formal.!!!!!xxxxx”.

Question: What kind of relationship do you think the couple had?
Response: “a very good and thrustworthy one....xoxoxo”

Question: How do you think the poet felt when her boyfriend didn't return from Vietnam?
Response: “sad and dissapointed!!!!!!!!!!!!!!!!!!!!!!!!!!!!! x o x o”

Question: Can you write a summary of this poem in three short sentences?
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Response:” the girl did things that she thought would make the boy angry but he
wasnt. Then the boy went off to vietnam and fought in the army. then in the end the
boy died and the girl was sad because her boyfriend died!!!!! :( :( :( :( :( :( :( :( :( :( :(
:( :( :(
xoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxoxo”

Question: What did you like most about today's poem?
Response: “i liked the way they forgave each other”.
Question: What did you like least about today's poem?
Response: “the way she never got the chance to tell him how forgiving he was”.
Question: What did the poet do that might have annoyed her boyfriend?
Response: “the poet flirted with other boys”.
Question: What kind of relationship do you think the couple had?
Response: “i think they were very close”
Question: How do you think the poet felt when her boyfriend didn't return from
Vietnam?
Response: “i think the poet regreted not being able to tell her boyfriend how forgiving
he was”
Question: Can you write a summary of this poem in three short sentences?
Response: “the boyfriend was always forgiving, the poet was always anoying him,
one day he went to vietnam "but he didnt come back"”

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Session 5: William Shakespeare’s “Sonnet 130” and William Butler Yeats’s “The Lake Isle of Innisfree”

This was the final session with the learning object for both classes. For this session the students were given a choice. They could look at either “Sonnet 130” or “The lake Isle of Innisfree”. All students looked at both poems. Before starting Teacher A told the group that this material may appear on the Christmas exam the following week.

The students were, as usual, interested in exploring the material and many of them used the zoom feature to look at elements in more detail. They seemed to enjoy using the software. They responded well to this. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

The audio and the short video on iambic pentameter were the most popular features of this interactive poem. Many of the students listened to the poem being read a number of times and were not inclined to hurry through the screen. They told their teacher that they “liked the voice” and that “it was easier to listen to it than to read it”.

Fig 14: Introduction screen and text and audio screen from “Sonnet 130”.

The students were, as usual, interested in exploring the material and many of them used the zoom feature to look at elements in more detail. They seemed to enjoy using the software. They responded well to this. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

The audio and the short video on iambic pentameter were the most popular features of this interactive poem. Many of the students listened to the poem being read a number of times and were not inclined to hurry through the screen. They told their teacher that they “liked the voice” and that “it was easier to listen to it than to read it”.

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Teacher A said that she was very happy that her class had participated in the project and that she felt they had benefited from using the object. The students told me that they had enjoyed the experience and they presented me with a small plant as a thank you.

Group B

Before starting the session Teacher B told the group that this material may appear on the Christmas exam the following week. The students were told that they could look at either “Sonnet 130” or “The lake Isle of Inisfree”. All students looked at both poems. They also looked through the “poetry terms” section in great detail. The teacher was conscious that the class were exam driven and used this to her advantage.

Fig 15: Introduction screen from “The Lake Isle of Inisfree”.

The site Survey Monkey was experiencing technical difficulties so it was not possible to get the students to fill in the online questionnaires. Instead more observation notes were made.

The screen that the students spent the longest looking at was the screen with the audio. This features a picture of an old fashioned wireless and when the students click on the buttons they can hear Yeats reciting the poem. This audio recording also
provides a context for the poem. Yeats speaks about what inspired him to write the poem. The students like these additions.

Teacher B said that she felt that the class had worked better in the last two week’s and that she was happy to have the chance to use the learning object with the class. She said that she found that because she had been involved with the project she had been under more pressure to cover the syllabus in her other classes with this group. She felt that the students had not covered as much of the novel as she would have liked.
**Teacher C's class**

Teacher C had received positive reports from her two colleagues relating to their classes involvement in the research study. She therefore wanted her class to have a chance to use the learning object. However, she wanted her class to use the learning object in a more autonomous way. Over the course of five weeks the students worked in pairs on each of the six poems. The teacher did not join in the class. She sat at the top of the class at a PC while the students carried on with the task. Teacher C was interested in the learning object but seemed quite apprehensive about facilitating the class.

The learning object that this group used had very minor changes made to it. The most significant change was in how the learning object was to be accessed. Instead of each student getting a CD the learning object was uploaded to the school’s intranet and stored in a poetry folder. The class found this to be a much easier way of accessing the learning object.

This class took place on Friday afternoons. Every week there were some students missing for a match.

**Session 1: Siegfried Sassoon’s “Base Details”**

For this session the students looked at the poem “Base Details”. This session took place after lunch. The students are rarely let use the computer lab and as a result they were keen to start using the learning object. This group had little trouble accessing the courseware. The students logged in very quickly. The students worked in pairs
and helped each other to open and access the learning object. All of the students had remembered to bring earphones.

The students like the screen with the interactive poetry terms. They said that it “helped them to see” where the terms were. Most of the students jotted notes into their copybooks from this screen. They also commented that they like the images used and some of them recognised the characters from the television series Blackadder.

**Teacher C** said that she was happy that her class were participating in the project and that she felt they were engaging well with the software. She also said that because there were a few missing for a match they were easier to deal with in the computer lab. There were no disciplinary incidents during the session.
Session 2: Stevie Smith’s “Not waving but drowning”

For this session the students looked at the poem “Not waving but drowning”. The teacher said a few words to focus the class. Many remembered how to open and access the learning object from the previous week’s session.

The students were interested in exploring the material and many of them used the zoom feature to look at elements in more detail. They all looked at the biography screens. They did seem to enjoy using the software. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

When I spoke with the teacher after the class she said that she was happy to continue with the project.

<table>
<thead>
<tr>
<th>Question:</th>
<th>Respose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you think the phrase “not waving but drowning” means?</td>
<td>that the man was calling for help but his friends thought he was just waving to them</td>
</tr>
<tr>
<td>What is your favourite line in the poem? Why?</td>
<td>&quot;I was much to far out all my life&quot; because it explains that he felt isolated all his life</td>
</tr>
<tr>
<td>The poet tells us that the man &quot;always loved larking&quot;. Why did he love to &quot;lark&quot; do you think?</td>
<td>so he could hide his problems behind a joke</td>
</tr>
<tr>
<td>How many &quot;voices&quot; or speakers are there in the poem?</td>
<td>2</td>
</tr>
<tr>
<td>What do you think this poem is about?</td>
<td>a man drowning in a sea of his own problems</td>
</tr>
<tr>
<td>What advice would you give to someone who feels like the man in the poem?</td>
<td>talk to someone about it and dont keep your problems bottled up</td>
</tr>
</tbody>
</table>

Sample answers from student
Session 3: Seamus Heaney's “Midterm Break”

For this session the students looked at the poem “Midterm Break”.

The students were interested in exploring the material and many of them used the zoom feature to look at elements in more detail. They all looked at the interactive screen describing the attic room that Seamus Heaney uses as a study and writing room. Just as the group from the pilot study had liked “Being able to click on the picture and then it would tell you about that part of the picture” this group also enjoyed that feature. They all liked watching the video in the learning object. They listened quietly to the poem as it was read aloud. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

Teacher C said that she was happy that her class were participating in the project and that she felt they were engaging well with the software. There were no disciplinary incidents during the session.
Session 4: Merrill Glass’s “But You Didn’t”

For this session the students looked at the poem “But You Didn’t”. As usual the group were attentive and very enthusiastic to start using the learning object.

This group had no trouble accessing the courseware. As with the pilot study the students were interested in exploring the Billy Joel video material and many of them used the zoom feature to look at images in more detail. They also enjoyed listening to Paul Hardcastle’s song “nineteen”. They enjoyed using the software. The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

There were no disciplinary incidents during the session.
Session 5: William Shakespeare’s “Sonnet 130” and William Butler Yeats’s “The Lake Isle of Innisfree”

This was the final session with the learning object for the class. For this session the students were given a choice. They could look at either “Sonnet 130” or “The lake Isle of Inisfree”. All students looked at both poems. Before starting Teacher A told the group that this material may appear on the summer exam the following week. As it was the final week using the learning object the group also looked at the screens relating to “Poetry terms”. A few students copied the definitions into their copybooks.

The majority of students took notes by hand as they used the resource and they talked to each other quietly about the poem.

Teacher C said that she was very happy that her class had participated in the project and that she felt they had benefited from using the object. She was happy that they “weren’t left out”. She also said that she was surprised that they had behaved themselves so well in the computer lab. She usually would not bring them to lab as they tended to misbehave. However, as there were a few missing every week due to school matches the number had been more manageable. The students told me that they had enjoyed the experience.
TL 21 Project: Teaching and Learning for the twenty-first century

In March 2008 Teacher A was involved with a research project with NUI Maynooth. Teacher A decided to use the poetry learning object to fulfil the ICT element required for the involvement in the project.

Teaching and Learning for the twenty-first century is collaborative professional development and research project between schools in the Leinster region and the Education Department of NUIM, National University of Ireland, Maynooth, Co. Kildare, Ireland. TL21 is a research project designed to enhance innovation and creativity in second-level schools in Ireland. The project will develop existing good practice in the classroom and promote fresh thinking in the teaching and learning process. A four-year professional development programme is being established with the participating schools. Workshops, seminars, conferences and research facilities will be provided. The project team will engage with teachers, principals and students on an ongoing basis. The participating schools are located in the Mid-Leinster and East-Leinster regions.

The primary aims of the project are to strengthen teachers' capacities as the authors of their own work and to encourage students to become more active and responsible participants in their own learning. The potential benefits for a participating school re as follows:

- Strengthen and affirm the school as an active learning community.
- Generate new research insights into teaching and learning.
• Foster an environment of discussion and debate on key curriculum areas.

• Enhance student participation in the learning process.

• Make available to teachers various forms of accreditation.

At St. Mary’s the teachers’ motivation for getting involved with this project according to Teacher B was:

“The objective of undertaking this project at St. Mary’s is to focus on the experiences offered to students in the conventional classroom to analyse and reflect on these experiences in order to identify opportunities for change/development. The aim is to further engage students in active learning and to foster a culture of self directed learning among students. It is also desirable that the teaching and learning initiatives developed by this project could be transferred to other areas of teaching and learning at St. Mary’s”.

The teachers involved in the TY21 project aimed to investigate the following:

• The use of ICT as a learning tool.

• Mixed ability teaching (best practice).

• Special Needs provision within mainstream classroom.

English is a subject studied by all students who attend St. Mary’s. A significant majority of students attending St. Mary’s take English at higher level in the Leaving Cert. However, the delivery of English programmes is not without challenges for teachers and students alike. English teachers are constantly looking for opportunities to aid student learning and to create a positive attitude to the study of English. The following are some specific needs that were identified:

• More effective use of ICT in teaching and learning of English Poetry at junior level. To apply an interactive approach to the teaching and learning of poetry.

• To address levels of apathy and under achievement.
• To continuously meet the challenge of engaging groups of students with a wide and varied ability span.

• To promote the development of active learning skills among students; research skills, reflective skills, group work skills, self directed learning skills.

Over the course of three weeks in March and one week in May two teachers engaged in “team teaching” to teach one class. The students covered four poems:

• ‘Base Details’ by S Sassoon
• ‘But you didn’t ’ by M Glass
• ‘And the Band played waltzing Matilda’ by E Boyle
• ‘Dulce et Decorum est’ by W Owen.

The students worked largely autonomously and researched a poet of their choice. The larger task was to form groups of 3 and create a collage on a poem of their choice. Finally, each of the students gave a presentation of three minutes on a new poem using their new skill set: ICT, research skills and presentation Skills

<table>
<thead>
<tr>
<th>Poetic Terms</th>
<th>Information Technology</th>
<th>Resources Used</th>
<th>Students Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagery</td>
<td>File management.</td>
<td>Computer Room.</td>
<td>Case Study</td>
</tr>
<tr>
<td>Simile</td>
<td>Research Methods.</td>
<td>Computer /Data Projector.</td>
<td>(Young</td>
</tr>
<tr>
<td>Metaphor</td>
<td>Image manipulation.</td>
<td>Head phones.</td>
<td>Irish Soldier</td>
</tr>
<tr>
<td>Irony</td>
<td>Word processing</td>
<td>Text book – ‘New Frontiers’</td>
<td>in WW1)</td>
</tr>
<tr>
<td>Satire</td>
<td>PowerPoint.</td>
<td>Copy Book.</td>
<td>War Images</td>
</tr>
<tr>
<td>Ballad</td>
<td>Internet search</td>
<td>Student Folder.</td>
<td>Visuals</td>
</tr>
<tr>
<td>Alliteration</td>
<td>skills.</td>
<td>Notice Boards - room 34.</td>
<td>Creative</td>
</tr>
<tr>
<td>Onomatopoeia</td>
<td>Presentation Skills</td>
<td>Paper and Art equipment. Learning Object</td>
<td>Writing</td>
</tr>
</tbody>
</table>

| Table 6: Breakdown of resources used for TY21 project | |

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The following table provides a breakdown of the daily activities for the duration of the TY21 project:

### Table 7: Breakdown of daily activities for TY21 project

<table>
<thead>
<tr>
<th>Monday 2(^{nd}) March</th>
<th>Viewing of War Images</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Video Clips, Backing Music-Data Projector (to set tone).</td>
</tr>
</tbody>
</table>

**Individual computer work**
- Poem-exploration disk. Poem-“Base Details by S Sassoon”
  (On computer poem is read aloud line by line accompanied by on screen images, video and text.)

**Student Tasks**
1. Work on colour coded exercises on computer (poetry techniques, analysis questions on poem).
2. Jot down responses in journal.
3. Homework: Write a short paragraph outlining what you think this poem is about.

<table>
<thead>
<tr>
<th>Tuesday 3(^{rd}) March</th>
<th>Use software on data projector-replay poem.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaluate 1(^{st}) class exploring poem on computer</td>
</tr>
</tbody>
</table>

**Discussion work**
- What images you remember?
- What images were the most striking?
- What were you expecting?
- What did you think of the Introduction?
- Effect of voice over?
- What did you think of colour coded exercise?
- What did you like about this presentation?
- Correct poetry questions from previous class

**Introduce ‘Satire’**
- Satire-Read note on Satire from textbook.

**Student Tasks**
1. Cloze Test on text of poem ‘Base Details’. (Differentiated Learning)
   Fill in as many blank spaces as possible before looking up text in your book “New Frontiers”.
2. Vocabulary Exercise , students correct themselves
3. Homework: Complete second cloze test (more challenging than first).
   Write a short paragraph outlining what this poem is about.
   Write a short paragraph saying what you like about the way in which we have studied this poem so far.
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
</table>
| **Wednesday 4th March** | **Case Study/Experiential Learning**  
Students provided with a box of real war mementoes (letters, weapons, telegraphs, photos, other items etc.).  
Discussion and Exploration – holding, reading and examining artefacts.  
Review and prepare personal writing exercise  
Diary entry of a soldier in WW1 (to be handed up on Monday 9th).  
**Student Task**  
1. Homework: worksheet personal response (Begin in Class) |
| **Thursday 5th March** | **Share/Discuss**  
Response to worksheet.  
Introduction to ‘social setting’ of WW1 poems.  
Brief recap of previously studied war poem –‘And the Band played Waltzing Matilda’ in textbook.  
Play this as song-C.D. (Liam Clancy).  
Poem as a “song” can have poetic features/ use poetic techniques.  
**Student Tasks**  
Homework: Begin first draft of soldier’s diary entry. |
| **Friday 6th March** | **Research/Group work** (in pairs)  
Internet search-Selection of  
1. W.W.1 Poems  
2. W.W.1. Poets/Biography  
3. General Images/Pictures of War  
**Student Tasks**  
Begin collection of images, poems, biography for collage project. |
| **Monday 9th March** | Collect Diary Entries from students  
**New Poem-PC** “But You Didn’t”(Vietnam War)  
**Student Tasks**  
Homework:  Which poem did you prefer and why (3 reasons-paragraph answer.) Comparison/Analysis |
| **Tuesday 10th March** | **Unseen Poem Exercise**  
pg 308/309-Textbook “Dulce et Decorum est…” Brief intro/assistance  
**Student Task**  
Answer questions in textbook |
**Wednesday 11th March**

**Correct** Comprehension Questions  
**Discuss** Poems – Horrors of war etc.  
**Revision** of poetic techniques.  
**Student Tasks**  
Written Exercise-Find and write out striking images, similes, metaphors from the poem ‘Dulce et Decorum est’

**Thursday 12th March**

“**Goodnight Saigon**”-Billy Joel – war images /Multimedia Software.  
**Student Tasks**  
1. What’s the difference between these images and series of images you saw at the beginning?  
2. Which of the poems you have studied do you think these images would suit? Why?  
Introduce - PowerPoint Project  
Collage Project

**Friday 20th to Tuesday 24th of March**

Collage Project in groups of 3.  
Present and display selected war images with appropriate quotations from poems, titles of poems and names of poets.  
Use some biographical details of war poets and photos (research especially war poets encountered so far).  
Write and display student’s own war poems –inspired by/modelled on studied poems  
Create and display –drawings paintings, collage art work(3D etc)  
Creative writing – display diary entries of WW1 soldiers -letters etc (from soldiers to families/sweethearts)- and vice versa  
Present /display images /models of ‘war items’ and symbols – 3D?  
Your collage should demonstrate knowledge, understanding and creativity. It should be completed in 4-5 class periods.  
Projects to be finished and displayed by Tuesday 24th of March

**May 2009**

**PowerPoint Project**  
**The following is the skill set required**  
1. I T skill set – text /Image/PowerPoint  
2. Research Skills  
3. Presentation Skills  

**Student Task**  
Using the above skill set research one of the following poems studied:  
*The Follower – Seamus Heaney.*  
*The Daffodils – William Wordsworth.*  
*The Listeners – Walter De La Mare.*  
Create a five slide PP presentation.  
Present this in 3 minutes to class group  
Student Reflection Questionnaire
Teacher Reflection on involvement with TL21

The multi-media approach (especially the accompanying war music and video clips) used in the software engaged the students immediately and set the tone and context automatically for this area of study. The class are very willing and enthusiastic overall and as such proved a very suitable group to work with on this TL21 project. The team – teaching was relatively new to the students and initially they seemed a little more subdued than usual on their responses when the second teacher was present. However they adapted very well and very quickly to the team-teaching approach and we even noticed a higher level of discussion and questioning by the students when the teachers were teaching together.

The “experienced learning” and “case study” lesson went down extremely well with all students. It seemed to bring a sense of “reality” to the poetry of war –especially for some of the weaker students. The quality of writing for the diary entry assignment which followed this lesson was particularly good and many of the “average students” produced work which was of a higher standard than usual. All of the students participated well in the group work activities. It was through these group tasks/projects that we could really see students genuinely taking on responsibility for
their own learning. Overall there was a strong sense of co-operation work and enjoyment when students worked in pairs and in groups.

On a number of occasions we noted that some previously unmotivated students were actually very enthusiastic especially when doing their computer work and they often helped each other. Many students voluntarily brought in books/items related to the war poetry (photos of war memorials they had visited on holidays, medals belonging to their own relations etc.). This was very refreshing as an indicator of their genuine level of interest and learning. The students were asked to prepare questions to be included in the student questionnaire at the end of this TL21 project. Their contribution showed good awareness of the kind of learning experience this project was aiming to foster. This project successfully reflected the amount of planning and preparation involved. No planning time was allocated so this work was done in the teachers own time. This again underlines the difficulties faced by teachers in broadening the experience of teaching and learning. Team Teaching was a new experience for the teachers involved. It was particularly beneficial in the planning stage where new ideas and different approaches were discussed. Expertise in I.C.T. in the second phase highlighted the potential for technology in the classroom. Following work on the PowerPoint presentations the students engaged in Peer teaching by presenting their work as a revision class for first years. This was successful.

One of the main objectives of this project was to explore the potential to use ICT as a learning tool in a main stream classroom. Reflecting on the project the following are useful to consider;
1. This was a mixed ability second year and there was no apparent difficulty for any student in coping with the ICT skills element of the project.

2. The ICT element of the project contributed to app 25% of the class teaching time over the duration of the project, however the extensions and the motivation provided by learning with ICT had a positive effect on the quality of student learning.

3. The framework provided in this project could be applied to any subject taught at St. Mary’s.

The teachers and students alike that found the blended learning environment benefited them greatly. They experience was a positive one and the teachers involved would be open to using more ICT in their teaching.
**Summary of St. Mary’s experience:**

ICT is positively encouraged and access to the computer room is not an issue at St. Mary’s. The room is available for use and teachers can book it for their class should they wish to. St Mary’s is very fortunate in that it has a technical assistant that looks after the day to day running of the computer labs. The computers are well maintained and for the duration of this study the students had no problems logging in, accessing and viewing the resources.

At St. Mary’s the resource was used in two very different ways. As part of the traditional class and as part of a technology in teaching project TL21.

Three groups A, B and C used the resource as part of their normal English class over a number of weeks. Group A, a group of 26 first years and group B a group of 28 second years. Even though the first year classes at St. Mary’s are supposed to be of mixed ability Group A were described as very weak by their teacher. Group B were described as “capable” by their teacher. Group C were described as “bold” by their teacher. These descriptions do not suggest that all classes are mixed ability. It was interesting that one group was referred to as a lot weaker than the "standard" given that the school does not apparently stream students at this stage of their education.

The RLO was also used in a separate project. This group were involved with a project with Maynooth “Teaching and Learning in the C21st”. This group were well behaved and quite capable.

All of the teachers involved in this research study found that the RLO was easy to use and was set at an appropriate level/pace. The teachers found that the content was appropriate. This can be attributed to the fact that the RLO was designed with the
Junior Curriculum in mind and benefited from a huge amount of input from teachers at the design stage. The RLO also underwent usability before it was made available to the class groups. As usability guidelines were adhered to for example, the interactive visuals that are only one click away the RLO was deemed very easy to navigate through by both teachers and students.

The students themselves enjoyed having the poem read aloud. The majority of students remembered to bring headphones with them for their class and listened to the poem a number of times. The students that forgot to bring headphones tried to listen to the audio from the speakers on the computer. All students answered the questions within the RLO. They seemed to enjoy filling out the answers online even though a number of them copied the answers quite openly from each other.

Of all of the teachers involved in this research at St. Mary’s only the teacher of the first year group (Group B) would be hesitant to use something similar in the future. She did not like having to supervise the class in the PC lab. She found that the class did not behave as well as they would in the traditional classroom. This may suggest that. Using the PCs was a “treat” for her class not an activity/something she could see herself incorporating into everyday classes. The teacher using the term “cover” to refer to course work is interesting in that once the material had been read through in class it was enough to consider it finished. Whereas the other teachers were satisfied spending the class time using the RLO to explore one poem in depth.

The teachers of groups A and C would use the resources again and would like to broaden the range of resources available. The teachers of groups A and C found that the better/stronger students got more from the sessions. However, they all benefited
from using the resource. She saw a change in the weaker students in how they approached the poetry lessons. They were more engaged and the poem held their interest for longer than it normally would have. The teacher of group C knew that her class were quite motivated by the chance to improve their exam results. Therefore, if the group started to chatter during her class she would make reference to something that might appear an upcoming exam paper. It was interesting to see such a prevalent exam culture in a group of first years. This obsession with exams can promote a very superficial level of learning to take place and can stifle any opportunity for deeper learning to take place.

<table>
<thead>
<tr>
<th>Category</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization / Layout</td>
<td>The teachers and students found the overall layout of items on the screen appropriate. Information was easy to navigate to. Students did not complain of getting lost within the RLO.</td>
</tr>
<tr>
<td>Learner Control over Interface</td>
<td>The students felt that they had control over the specific features of the RLO including controlling the pace of their own learning.</td>
</tr>
<tr>
<td>Animation</td>
<td>The teachers and students enjoyed the animation features of the RLO. Feedback from students was that they would like to see more animation.</td>
</tr>
<tr>
<td>Graphics</td>
<td>The teachers and students liked the graphics (non-animated aspects of the RLO), colours, and size of text.</td>
</tr>
<tr>
<td>Audio</td>
<td>The teachers and students enjoyed listening to the audio features and found that they brought the poem to life.</td>
</tr>
<tr>
<td>Clear Instructions</td>
<td>The teachers and students found that the limited instructions were sufficient. They liked being able to start straight away.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>The teachers and students enjoyed the interactive nature if the RLO. Some students enjoyed using survey monkey to answer the questions. Others abused the online questionnaire by copying or filling in nonsense type answers and so had to return to the traditional copybook.</td>
</tr>
<tr>
<td>Incorrect Content</td>
<td>The teachers and students did not comment on any errors.</td>
</tr>
<tr>
<td>Difficulty / Challenge Levels</td>
<td>The students found the RLO challenging. They enjoyed exploring the background information on the poet and on the poem.</td>
</tr>
<tr>
<td>Useful / Informative</td>
<td>The teachers and students found that using the RLO enhanced their overall learning experience. The students could see the relevance of the RLO content to other subjects for example history.</td>
</tr>
</tbody>
</table>

Table 8: Teacher and student experience
Future:

The teacher of the first year group would be slow to use this resource again due to time constraints within the school term. She felt that she is already under pressure to cover the core material and using the RLO was a lot more time consuming than her usual teaching methods. She also felt that some of the parents of her students were not supportive of non traditional teaching methods. The other teachers involved intend to use this resource with another class. These teachers thought that handing responsibility over to the students was of great benefit as it allowed the students to take control of their own learning.

At St. Mary’s there are two computer labs and they are both available for any teacher that wishes to book them for class time. However, the computer was still seen as a reward function, by these teachers, for a class that behaved well. This highlights how peripheral computer use is to the student learning experience.

When first approached to become involved in this research study the teachers were very reluctant to allow the students to access any of the material from home. They did not want the students to either access the RLO online or on a CD. They felt that this would cause a divide among those who had access to a PC at home and those who didn’t. At the end of the study the teachers felt the same way. The impression that the researcher got of this school was that the role of the teacher included a great commitment to not only the teaching of the core material but also the all round development of the students. The teachers would not give some students any advantage if such an advantage could potentially be divisive for students and harm the positive school environment.
Annacotty Community School

General profile of the school
Annacotty Community School has approximately 1000 students. The school has used computers since its opening in 2000. The integration of ICT in different subject areas is now being attempted and is more advanced in some areas than others.

The mission of the school is the education of the individual as a whole person. In the pursuit of this ideal, the school provides a broadly based curriculum for all pupils of the community, allowing each pupil to attain the highest level of academic and skill-based attainment consonant with their interests, abilities and talents. This ideal can only be realised by the school by building on foundations which have already been laid in the home and being assisted at all times by the parents/guardians of the pupil.

Our vision is that education is a joint effort between school, home and community.

Annacotty Community School values the holistic education of the individual, enabling students to become responsible, caring members of society as well as encouraging them to reach their full potential. In our daily lives we value the principles of justice and mutual respect embracing all denominations and cultures.

We endeavour to nurture and maintain a school community which involves the partnership of staff, students, parents, trustees and the local community. In the pursuit of this ideal we provide a broad and balanced range of curricular and extra-curricular experiences for all students.

The English department set up a blog in order to publish student work and make it available for all students and teachers to enjoy. The blog has a presence on the school
website. News relating to competitions, essays and any other events relevant to English are posted on this page. The page had not been updated as regularly in the last 12 months as it had been prior to union directives.

The research study took place over 3 weeks with two different learner support groups.

**Computer Facilities**

Every teacher at this school has a laptop and they are required to use this to complete the roll call at the start of every class. The school has two computer labs. Each lab is well maintained. However, during the course of this research the classes did not use the labs but instead worked from one computer as a group.

**Profile of the students**

The participants from Annacotty Community School were in 1st (group A) and 2nd year (group B). Group A was made up of 3 boys and 3 girls. Group B comprised 6 boys and 2 girls. The majority of students were born in Ireland with a small number born in Poland (one in group A and one in group B). These students were not strong academically and many of them considered the more practical subjects to be their favourite (Metalwork, home economics, PE and SPHE). Only two students stated that English was their favourite subject.

**Teacher profile**

This teacher’s primary degree was in Science and she later retrained as an English teacher. She holds a Masters degree in Education and is very interested in professional development and keeping abreast with innovations in teaching at post-primary level.
This teacher had taken part in the needs analysis for the content of the learning object the previous year. This teacher does not use a text book with her class. Instead, she has put together her own photocopied teaching materials comprising eight poems for a semester. Each student is given a copy of this little booklet. This teacher wanted to use some ICT element in her class a means of motivating the students. However, she spoke at great length about the lack of curriculum relevant material particularly the lack of material for students at the lower levels. She had looked at the skool.ie website but felt that there was little there to meet her teaching needs. The researcher was provided with a personal copy of the photocopied material that the students receive at the beginning of the year. Some of the poems and support material from this handout were used in the content of the poetry learning object.

The teacher is an advisor for a certain number of students in first year and if any of these students are late or disruptive in another class they are dispatched to the back of this classroom. While the learner support group seemed to be able to filter out the presence of the disruptive child it was very difficult to ignore them completely. On one occasion a boy of 13 was admitted to the classroom. He swore continually and his presence was quite disruptive. Another teacher came to the room to talk to him while the class was in progress.

These two groups did fill out the initial questionnaire for this project. However, they did not fill out the same questions as the students from the other schools involved in the project. The teacher did not feel that it would be in the students’ best interests to have to answer the questions in this manner. Her classes are more discussion based and she did not want to change the dynamic of the classroom. Instead similar
questions were posed aloud by the teacher and were answered by the class as a group effort.

**Session 1: Siegfried Sassoon’s “Base Details”**

**Group A**

One laptop was placed at the top table and the students sat in a semicircle around it. The teacher introduced the lesson by stating the poem’s title and the poet’s name. Then she handed the class over to the researcher. The researcher got the student closest to the laptop to take the mouse and hover/click on the interactive areas of the screen. As this student selected an area on screen another student was nominated to read the text aloud. The class work would then discuss the content aloud as one group. This got all of the students involved with the text even though only one machine was being used. The teacher would sometimes join in. For example the teacher commented on the images on screen: “we didn’t think that the poet would look like that, did we?”

**Group B**

As this group were in 2nd year they were a little more articulate than group A. The students had more confidence when talking about the poem’s context. This group enjoyed the colour coded poetry terms screen. One of the boys complained that the poem was very old fashioned and after the lesson asked the teacher why there wasn’t more modern stuff on the course. She replied that there was certainly more modern text and that they would be drawing from other key texts in later classes. The class were very confident when they were discussing all aspects of the poem. They were
eager to contribute to the points being made and it seemed very obvious to the researcher that the student/teacher relationship was quite a strong one.

**Session 2: Merrill Glass's “But You Didn’t”**

**Group A**

The class began as per the first session. One laptop with a semi circle of students sitting around it. The teacher introduced the lesson. The students enjoyed the visuals and the audio clips. They spoke about the music and asked questions about the historical context of the poem which the teacher provided the answers to. There was a good level of constructive discussion. The students all seemed to understand the tone of the poem and were all completely focussed on the lesson. They were not keen to be nominated to read the text from the screen but they keen to provide their interpretation of the poem’s message and tone.

**Group B**

As with the previous session the students had more confidence when talking about the poem’s context. This group enjoyed the graphics on screen. One of the older boys in the class wanted to talk about the context of the poem. He said that he had an uncle that had fought in Vietnam. He told the class about some of the items that his uncle had brought back with him from his time in Vietnam. The class wanted to discuss this further. The students took turns to read aloud the text of the poem. They seemed to also enjoy listening to the audio recording of the poem.
Session 3: Seamus Heaney’s “Midterm Break”

Group A

For this session the teacher left the classroom and the researcher acted as a facilitator for the group; guiding them through the learning object and leading the discussion. The group were engaged and needed little prompting. As usual with this group the laptop was placed at the top table and the students sat in a semicircle around it. The researcher introduced the lesson by stating the poem’s title and the poet’s name. The researcher got the student closest to the laptop to take the mouse and hover/click on the interactive areas of the screen. As this student selected an area on screen another student was nominated to read the text aloud. Some of the students were hesitant to read the text aloud and did not give the impression that they were confident readers. At times the student reading from the screen had difficulty and needed to be prompted by the researcher.

The class then discussed the content aloud as a group. The students enjoyed exploring the poet’s writing space; hovering over the interactive areas on screen to learn more about the objects in the room. They commented that being able to access this personal space made the poet seem “more real”. They all enjoyed the multimedia aspect of the video even though “it makes you feel sad”. The students said that watching the video helped them to “get the poem much quicker”. They seemed to connect with the sense of loss in the poem very quickly and the mood of the students seemed to significantly affected by the video. They were subdued yet eager to talk about the poem and poet.
Group B
For this session the teacher left the classroom and the researcher acted as a facilitator for the group; guiding them through the learning object and leading the discussion. The group were engaged and needed little prompting. As usual with this group the laptop was placed at the top table and the students sat in a semicircle around it. The researcher introduced the lesson by stating the poem’s title and the poet’s name. The researcher got the student closest to the laptop to take the mouse and hover/click on the interactive areas of the screen. As this student selected an area on screen another student was nominated to read the text aloud. This group did not have any problems reading the text aloud.

The class then discussed the content of the RLO aloud as one group. The students enjoyed exploring the poet’s writing space; hovering over the interactive areas on screen to learn more about the objects in the room. As with group A the group enjoyed being able to access the poet’s personal writing space. They also enjoyed the multimedia aspect of the video. The students said that watching the video helped them to “understand the poem much quicker”.

**Summary of Annacotty Community School's experience:**

ICT is encouraged and the school policy is that access to the computer room is accessible to all. However, during the six sessions that the researcher had at Annacotty none of them were held in the PC lab. Teachers at Annacotty were adhering very strictly to the union directives and so only one teacher participated in the research study with two of her support group English classes. This teacher had a few out of date computers at the back of the class that were completely redundant but were deemed to be in use for the school. Therefore, one laptop was used for the small group sessions. This meant that all of the sessions were very facilitator/teacher centred. However, given the ability of these students this type of use worked very well and suited them better than each having their own machine. Students, when nominated, read the material form the screen and discussed various points with the teacher/researcher. The students commented on visuals and other features that they liked on screen.

There were some issues with disruptive behaviour in the classroom. This was not caused by the class. The teacher is a year advisor to a number of students and if one of these students causes trouble in another lesson this teacher’s classroom is used as “time out” room for these disruptive and abusive students. Surprisingly this student’s presence did not seem to impact on the class in any discernable way. This suggests that the students are used to this type of disruption. Both of the groups were very weak and will probably be sitting a Foundation/Ordinary level English paper for their Junior Certificate exam.
The teacher involved in this research study found that the RLO was easy to use and was set at an appropriate level/pace for her students. This teacher had contributed to the content for the RLO and was very happy that the questions that she had supplied were now on screen. The students themselves enjoyed having the poem read aloud. As these students were weaker they enjoyed the level of detail that was supplied with the poems. All of the students contributed to the discussion without being prompted. The teacher has a great rapport with her students and she enjoyed being able to use technology with them to bring the poem to life.

The teacher will use the RLO again and would like to broaden the range of poems available. She felt that her students got more from the sessions than from the traditional poetry lesson. She saw a change in the weaker students in how they approached the poetry lessons. They were more engaged. This teacher would use something similar in the future but would like to design something bespoke for these “learner support” groups. She spoke with the researcher about the possibility of collaborating to create further RLOs.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Organization Layout</td>
<td>The teachers and students found the overall layout of items on the screen appropriate. Information was easy to navigate to. Students did not complain of getting lost within the RLO.</td>
</tr>
<tr>
<td>Learner Control over Interface</td>
<td>The teacher and researcher acted as a facilitator during these sessions. While they dictated the pace of the lesson the students were free to comment on specific features.</td>
</tr>
<tr>
<td>Animation</td>
<td>The teachers and students enjoyed the animation features of the RLO. Feedback from students was that they would like to see more animation.</td>
</tr>
<tr>
<td>Graphics</td>
<td>Both of these groups particularly liked the graphics (non-animated aspects of the RLO), colours, and size of text. Seeing the poet’s photo had great impact on the beginning of the lesson.</td>
</tr>
<tr>
<td>Audio</td>
<td>The teachers and students enjoyed listening to the audio features and found that they brought the poem to life.</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Clear Instructions</td>
<td>The teachers and students found that the limited instructions were sufficient. They liked being able to start straight away.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>The teachers and students enjoyed the interactive nature of the RLO.</td>
</tr>
<tr>
<td>Incorrect Content / Errors</td>
<td>The teachers and students did not comment on any errors.</td>
</tr>
<tr>
<td>Difficulty / Challenge Levels</td>
<td>The students found the RLO challenging. They enjoyed exploring the background information on the poet and on the poem.</td>
</tr>
<tr>
<td>Useful / Informative</td>
<td>The teachers and students found that using the RLO enhanced their overall learning experience. The students could see the relevance of the RLO content to other subjects for example history.</td>
</tr>
</tbody>
</table>
Cedar Hill

General profile of the school

Cedar Hill is a girls’ secondary school with a population of 400 students. The school traces its history back to 1844 when the Bishop invited the Foundress Marie Madeleine d'Houet to open a school. In 1845 the Faithful Companions of Jesus had purchased the property. The school began with 33 day pupils and 11 boarders. Since these beginnings the school has expanded and evolved as part of the international network of educational establishments to become a leading school in Ireland. The school motto is “Courage and Confidence in the pursuit of excellence”. The school felt a lot less open than either of the other two schools. Visitors, on arriving, have access to one very small waiting area before they are met by a school representative. This was in contrast to the other two schools where it was possible to enter the school corridors without first reporting to the school secretary. However, although it felt more formal the welcome was just as warm.

Cedar Hill encourages students to participate in extra curricular activities.

One statement relating to this on the school’s website is: “Extra curricular activities are an integral part of a student's development”. The teacher saw this project as an opportunity to marry curriculum with extra curricular. The researcher felt welcome at all times and the experience was a profitable one for the teacher, students and the researcher.

Computer Facilities

While the school did not have a history of ICT use, a substantial investment from the Schools IT2000 initiative has enabled the school to start some developments in this
area. The school has one computer room but students also have access to computer facilities in the school library. The machines are well maintained.

**Profile of the students**

The participants from Cedar Hill were in 2nd year. All students were born in Ireland. The initial first visit to the school for the purposes of meeting with the teacher took place in the school library. The location was quiet and felt like a productive study space. The students participating in this study were described as average by their teacher. They weren’t the best class but they weren’t weak and would be expected to sit a Higher Level English paper in the Junior Certificate exam. The students are largely from a middle class background and the teacher told me that all of his students would have access to a PC at home. He described his class as “a nice group pf girls”. He said that they worked and that he tended to not have any problems with the class. In contrast to the two other schools the researcher had absolutely no contact with this class.

**Teacher Profile**

This teacher was in his mid forties and very enthusiastic. The teacher recognised that there is a challenge for students to adapt and engage with online media in their daily lives. While he hadn’t used ICT as part of his teaching before he had used multimedia (video, CDs) to augment the teaching and learning experience. Students had watched films and listened to audio as part of their English classes for years. He encouraged the students to get involved in the project and promoted the discussion forum in class. It was very obvious from talking to this teacher that he enjoys his work and that he has a great relationship with the class. He also participated in extra curricular activities, such as debating, with his older students. In contrast to the two
other schools the researcher had very little contact with this teacher. After an initial meeting where the researcher did a “show and tell” type presentation of the resource most of the subsequent communication was either by phone or by email. The researcher emailed the teacher with the instructions for the students and the teacher updated the researcher with the class progress (largely by phone). The researcher was able to log in to the VLE and also check on the level and type of activity that students were engaging in.

<table>
<thead>
<tr>
<th>On Sun, Apr 27, 2009 at 13:15 PM, ___________&gt; wrote:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi Ann</td>
</tr>
<tr>
<td>The class are up and running with the online poetry resource. I hope that they'll be waving and not drowning by the end of it. Very generous of you to give a prize to the best student. No need for that. They love the idea of it. I'll be in contact with you to give you updates.</td>
</tr>
<tr>
<td>All the best</td>
</tr>
<tr>
<td>____________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>On Sun, Apr 26, 2009 at 8:47 PM, Ann.Marcus.Quinn <a href="mailto:ann.marcus.quinn@ul.ie">ann.marcus.quinn@ul.ie</a> wrote:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi ____________,</td>
</tr>
<tr>
<td>I've put some questions relating to the poem &quot;Not Waving But Drowning&quot; into the Discussions Forum on the Sulis site. They should be easy enough to locate. When you click on Discussion Forums in the Menu on the left hand side of the screen the Discussions area will display. The questions are all located in the Class Discussions area. To respond to a question you need to click on &quot;post reply&quot;. I have an iPod as a prize for the student who contributes the most to these questions over the next few weeks. Also if after using these &quot;online poems&quot; the students would like to make a powerpoint poem presentation (similar to my resource) there will also be a prize awarded for the best one. They can pick any poem they like (from the Junior Cert course).</td>
</tr>
<tr>
<td>Thanks a million for your help.</td>
</tr>
<tr>
<td>If there is anything else that you need or if you have any problems accessing the material please let me know.</td>
</tr>
<tr>
<td>Thanks again,</td>
</tr>
<tr>
<td>Ann</td>
</tr>
</tbody>
</table>

Table 9: Email communication between researcher and teacher


**Student Tasks**

Before the class got involved with the research study the teacher set up an email account that all of the students could use to login, use the learning object and make comments in the discussion forum. The University’s Virtual Learning Environment allows for multiple logins of individual members. This meant that each student could have the same login details (for privacy concerns and ethics). However, they could sign their name at the end of their comments if they wished. They all signed their name to their contributions. The teacher organised that the student teacher (studying English at University) took the class once a week for three weeks. During this class the students would login to the University of Limerick’s Virtual Learning Environment where a project site had been set up for them.

The students used this resource for three weeks. They used it in school but they were also encouraged to use the learning object at home. The students were given control of the discussion forum. Although both the teacher and researcher logged in and observed the type of discussion/activity taking place neither the researcher nor teacher acted as moderator. They did not provide feedback or any online facilitation in the discussion forum. The students responded to the questions posed and signed their name at the end of the comments. The students felt that this was their space. The standard type of answer that each student provided was high.

Fig 17 below is a screenshot of the welcome screen for the participating students. An announcement outlining the nature and duration of the project was displayed. Students were invited to view this before accessing the learning object in the
resources folder. Despite very little support none of the students reported any problems using either the VLE or accessing and using the learning object.

Fig 17: Welcome screen in Sulis

Fig 18: Resources folder in Sulis.

Fig 19: Class discussions list in Sulis.

Fig 19 is a screenshot taken from the student discussion forum. Every week a new set of questions were posted to this forum which the students would then respond to. On one occasion, without being prompted, one of the students posted her own topic for her class to respond to. This student posted the question “could the man have been saved?”. A number of her classmates responded to the question. They gave consideration to the content of their answers before posting but typos were still present in the text. All of the responses to this topic were also signed.
Fig 20: Topic posted by student “Could the man have been saved?”
The teacher reported that the girls had enjoyed listening to the audio recordings in the learning object. He considered this as one of the major benefits of using the learning object with the class: “Hearing the poem helped some of the weaker students to understand the significance of the tone”.

The students enjoyed using the online discussion forum in particular. Below is a sample of student comments from the thread “How was this experience different from your normal poetry lesson?”:

“My normal surroundings when we study poetry is a classroom with twenty-nine other students and one teacher the good thing about the online poetry is its kind of one on one even though the rest of the class are doing it too you have your own computer and your own thoughts on the poem instead of getting notes which sometimes you don’t properly understand”.

“My normal poetry lesson involves a poetry discussion but online we don’t have to listen to everyone else and it gets things done a lot faster. Also we got to hear how the poems are meant to be spoken which gives a feel to the tone of the poems. We also got to look at the background of the each poem and poet which helped understand more”.

“I loved using this online learning as it was fun. Unlike the boring environment of the classroom, this online resource was a great way to learn poetry by great poets. It gave mme a lot of insight into how technology can help learning”.
“I really enjoed this style of learning it made poetry a lot more interesting than reading straight from a book. It made it easier to learn and improved my skills on the computer”.

Fig 21: Responses of students to topic: “Please write a short paragraph about your experience of using this online learning environment”.

In response to the question: “What did you like most about using these online resources?” many of the girls stated that they liked listening to the authentic voice. Where provided they particularly enjoyed listening to the actual poet reading their work:
“It had the poets voice speaking instead of a teachers which I thought was nice because their accents made it more interesting than the same voice over and over again”.

“In these multimedia resources we are given a background to each poem and poet which I feel gives us a better understanding of the poems”

![Image](image.png)

Fig 22: Responses of students to topic: “What did you like most about using these multimedia resources?”

After the students had finished using the VLE in the classroom they were invited on a voluntary basis to create their own learning object. The students could use PowerPoint to create this resource. The deadline for creating this learning object coincided with the end of the school year and house exams so neither the researcher or the teacher anticipated much response. However, four of the students did create
poetry learning resources using PowerPoint. The standard of these was quite high and the students told their teacher that they had really enjoyed being involved in the project. A representative of the class also contacted the researcher when the project had finished.

From: katelynch08@hotmail.com
Sent: 21 May 2009 16:57
To: Ann.Marcus.Quinn
Cc: katelynch08@hotmail.com
Subject: thank you

Dear Ann,
Thank you very much for taking the time to help us with poetry it meant a lot to all of us. I would also like to thank you for choosing me for the second prize.

Thanks again....

Fig 23: Communication from student on completion of study
**Summary of Cedar Hill’s experience:**

Cedar Hill has a very positive attitude to extra curricular activity. The teacher that was involved with this research study also coached the school’s debating team. He was very interested in allowing his students to take advantage of any innovations that may enhance their learning experience. The girls were described as “not the best class” and of mixed ability. However, the teacher did expect that they would all be sitting the higher level Junior Certificate exam paper.

Access to the computer room not an issue in this school. All 30 girls had individual PCs both when using the RLO at school. All of the girls had access to a PC in their homes and consequently they were able to contribute to the online discussion when they were at home. As access to a PC was so available the students were also able to work on the PowerPoint presentation at home. The students had no problems logging into the off campus Sulis site and viewing the resources.

Both the teacher and the students involved found the RLO easy to use and that it was set at appropriate level for their needs. The teacher and students found that the content was also appropriate. The students particularly liked hearing the poet read their poem aloud. They felt that this connected their learning experience more directly to the poet.

This group of students used a VLE to discuss each of the poems. All of the students answered the questions by contributing to the online discussion. A couple of the participants added their own discussion topics taking ownership of the online space.
The feedback from the teacher was that the students enjoyed using the discussion forum and that they were used to this format (bebo).

After the group had finished with the research study the teacher said that the experience had been a success for his class and that he would use something similar in the future. However, he would space these sessions out more (one or two days using the RLO a month). He said that he would use it in a more blended manner the next time and would set some “creative writing” assignments to get more use from the material. It was very encouraging to get this feedback about the RLO. Not only had the teacher felt that this experience of using it had been worthwhile but they were planning how they would use it with the next group of students.

The teacher found that the better/stronger students got more from the sessions. However, they all benefited from using the resource. He saw a change in the weaker students in how they approached the poetry lessons. They were more engaged and motivated. This teacher found that handing responsibility over to the students was of great benefit.

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<tr>
<td>Learner Control over Interface</td>
<td>The teacher handed control over to the students.</td>
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<td>The teachers and students enjoyed the animation features of the RLO. Feedback from students was that they would like to see more animation.</td>
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<td>This group particularly liked the graphics (non-animated aspects of the RLO), colours, and size of text.</td>
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<tr>
<td>Audio</td>
<td>The teachers and students enjoyed listening to the audio features and found that they brought the poem to life.</td>
</tr>
</tbody>
</table>
## Clear Instructions
The teachers and students found that the limited instructions were sufficient. They liked being able to start straight away.

## Interactivity
The teachers and students enjoyed the interactive nature of the RLO.

## Incorrect Content / Errors
The teachers and students did not comment on any errors.

## Difficulty / Challenge Levels
The students found the RLO challenging. They enjoyed exploring the background information on the poet and on the poem. They enjoyed using the VLE to comment on the RLO and to discuss related topics.

## Useful / Informative
The teachers and students found that using the RLO enhanced their overall learning experience.
Common findings from the three schools:
On the basis of the data collected the common findings from use of the learning object are as follows.

Computer ownership and use:
The majority of the students at all three schools claimed to have a PC at home. At St. Mary’s the teachers were very mindful of educational equity and that not every student would have access to a computer at home or indeed access to the internet. Therefore they decided to not make the RLO available to anybody outside of school in case any student would be disadvantaged. The students told the researcher that they used the home PC to regularly look up information from such sites as wikipedia to help them with their homework.

The students in the learner support groups at Annacotty Community school did not access the RLO outside of school as these groups did not ordinarily receive homework. The teacher felt that making the RLO available outside of school hours could put too much pressure on the students.

The students at Cedar Hill all had access to a PC at home and used this machine to login to the VLE at home.

ICT use:
Students today have grown up with technology. They have mobile devices, internet email at their disposal. It’s a natural extension to use ICT in the classroom and reflect the visually stimulating world that they live in. Many students across the three schools associated the word “boring” with the traditional lesson. This is not to say that they
were bored in class. However, when they were asked to comment if they had enjoyed using the multimedia RLOs they all said that they preferred the experience to the alternative book-led lesson. Having interactive elements including visuals audio and video brought the poem to life for the students and they felt that they got a much better sense of the poem. All of the teachers said that a common challenge is getting weaker students to describe the tone of a poem. However, the audiovisual aids, especially the video clips, made this much easier for the students to grasp quickly.

**Ease of use:**

The majority found the resource easy to use and stated that they felt the material was set at appropriate level/pace. Being able to set the pace of their lesson appealed to students.

**Type of student use:**

The very nature of this RLO lends itself to a wide variety of uses (discussed in next chapter). Today’s classroom should not be concerned with memorising the facts that they need to know. The new set of literacies discussed in the literature review requires that students need to know how to find information, validate it, combine it with other information, be able to communicate it, collaborate with their peers and use this information to problem solve.

**Student ability and use:**

This RLO was used in three completely different ways depending on the needs of the individual teachers. This is discussed in more detail in the next chapter. At Annacotty College the RLO provided the very weak support groups with the information that
they needed to have a constructive discussion around the poem’s text. Providing the students with the necessary vocabulary to discuss the poem in a more communicative manner gave these less articulate students the confidence to contribute to the discussion.

At St. Mary’s the TL21 group used the RLO to encourage students to research independently and to demonstrate their learning in a variety of ways (production of a group collage and presentation).

At Cedar Hill the RLO prompted an active online Community of Practice to organically develop. Many students actively engage with social networking sites such as bebo. If students are communicating using social networking sites, email, instant messaging and text these avenues of communication should not be banned from schools. Enabling students to participate in a VLE allowed these students to bring their schoolwork into a relevant part of their lives. This interaction online also allowed the students to reflect on their learning in a manner that they were not accustomed to.

**Teachers’ practices:**

Not all teachers subscribe to using a text book with their class. This means that they are constantly looking for resources that they can use in the classroom. Even teachers that do use a core text with their students will try to augment this text with supplementary resources. This RLO provided a rich amount of supplementary curriculum specific content for the poems. These teachers were open to adapting their existing classroom practices to include the diverse range of opportunity available
outside of the school. All of the teachers rated the experience as a positive one but acknowledged that it required a time commitment.

**Exam culture:**
All of the students involved in this research study were either in first or second year of post-primary education. Yet even at this stage they were very exam aware. If they were told that something may appear on an exam they would work in a more focussed and quiet manner. One of the teachers had to opt out of the research study one week early due to pressure from parents. A small minority of parents felt that the time given to using the ICT component was not preparing their students for the upcoming Christmas exams and was therefore not in the students best interest. Unless there is shift within the current system with the emphasis on learning rather than grading then there is little chance of a higher uptake of ICT by schools.

**Issues raised for similar projects:**
The research study also identified a range of issues that would be of interest to those carrying out a similar study:

1. Involving the teachers in the design and development stage of the RLO is crucial to the success of the RLO. Likewise, carrying out usability is imperative.
2. Practicalities of using computers in class very dependent on availability of PC lab.
3. In a computer lab where some machines are known to give trouble regularly they should be marked as problematic. A lot of time can be wasted with students logging in to a non functioning machine.
4. When ICT is incorporated into a traditional class it takes a lot of organisation in terms of time management of the classroom.

5. Teachers need to feel confident about using the PC themselves. Professional development in this area is crucial.

6. Discipline can be more of an issue in the PC lab. Students may need to be monitored to ensure that they are not browsing the web when they are supposed to be doing another task.

7. Students enjoy using a VLE. This could be exploited to a greater degree.

8. Students have a great capacity for autonomous activity if a project allows for it.
Chapter 6

Discussion

For the purposes of this discussion and conclusion this chapter will focus on a number of the research findings and on the implications for the future design, development and use of RLOs at post-primary level in Ireland. Until now, there has been little established research regarding the design and use of RLOs in the Irish post-primary classroom. There are many possible reasons for this that will also be explored in this chapter. As such, integrating the multimedia poetry resource into this distinct learning context has revealed a number of important considerations regarding the demands associated with the introduction of ICT into the classroom.

To prepare students for life in a modern world we need to move with the huge advances in technology. As discussed in the literature review the world has changed. Modern citizens must be equipped for the challenges of this world. This means educating our school goers to be digitally literate. As numbers of students attending school is due to rise significantly over the coming years. A recent OECD report (2010) stated that countries such as Australia, Ireland, Spain and the partner country Israel may face challenges arising from an increase in the school-age population, as their population aged 5-14 is expected to increase by more than 10% up to 2020. Teaching methods and resources may have to be adapted to best serve these growing numbers.
In this new environment schools and teachers being tied to publishers is an old and model. As resources become more stretched maybe the use of learning objects is one way forward in terms of best use of limited resources and in terms of best preparing students for a modern digital world. This transition from traditional to digital is already being explored by some. An example of this new approach is the recent curriculum redesign of Leaving Certificate Maths. Teaching resources have been developed by teachers for teachers for Project Maths and have been disseminated online at no charge (discussed later in this chapter).

In light of the research questions and the findings to emerge from this study, this chapter is divided into a number of sections. The first section examines how teachers use RLOs in the classroom and constructs a theoretical framework which can be used to plot the nature of teachers’ use based on the findings of this study. The second section discusses ways in which RLOs can be designed to increase their flexibility and develops a model incorporating issues to emerge from the research study and previous work completed by Boyle (2001, 2003, 2005, 2009) and Becher (1999). The final section discusses the implications for practice.
Section 1: How do teachers use RLOs in the classroom?
One of the key research questions aimed to explore how teachers used RLOs in the classroom and this research question was supported by a number of objectives. Among them, they included an investigation into current ICT practices in schools. While a study into existing levels of ICT usage in schools was not a key focus, some issues that have emerged are quite alarming and merit discussion. Therefore the first section of this chapter will briefly discuss the role of ICT use in schools, which can help to explain why the RLOs designed were used in the way they were.

Disappointingly, the actual level of ICT use in schools has not progressed beyond the level of use that was in evidence in the mid to late 1990s (DES, 1998; Mulkeen, 2002). Two of the three schools involved in this case study are seen externally as innovative in terms of their ICT facilities and approaches to ICT however on closer inspection this reputation could be questioned. For example, within these schools, for teachers and students the use of the ICT resources was still seen as a novelty. While only three schools were used in the study and this is in no way attempted to be a representative sample the consistency across the three schools is noteworthy.

The literature review outlined the various initiatives put in place by the Irish government which built on the Schools IT2000 project. This study revealed that despite the many initiatives in place many teachers still feel that they have no way of bringing ICT into their classroom. So how have schools been using ICT? This study has found that within the participating schools, in spite of this low level of use for general classroom practice there has been a proliferation of ICT use for presentations.
When used primarily as a presentation device the technology could be seen as a way of teachers using it as a means of maintaining a very teacher-centred learning environment. The OECD (1991) and TALIS reports (2009) drew attention to the authoritarian nature of the teacher-student relationship in Irish post-primary schools and more recent studies have also identified the influence of this prevailing culture on ICT use (Glesson et al 2001; McGarr, 2009). Therefore this study supports the view held by Cuban (1998) that technology is in many ways an amplification device that amplifies the dominant pedagogical approaches rather than attempting to change them. This would suggest that changes need to take place in teaching and learning in Irish classrooms before there is a suitable environment for ICT to be embedded. The study also identified several barriers to the future integration and these largely mirror the work of others that highlight the effect of prevailing classroom practices, lack of suitable material, access to technology, the influence of state assessment, suitable technical support (Ertmer, 1999; Laurillard, 2002; McGarr, 2009; Cleere, 2009).

Despite these low levels of use and the barriers that the teacher reported the software was effectively implemented. However in returing to one of the key research questions, how do teachers use RLOs in the classroom?, a number of issue are worth discussing in light of this study.

As with all learning resources educational software has a multitude of uses in the classroom context. At a very basic level any educational resource can enhance the role of the teacher whereas on the opposite end of this spectrum educational resources can have a much more significant and fundamental change to the teaching /learning
environment. On completion of the learning resource it was envisaged that the RLO
developed in this study could be used in two quite different ways:

1. As primarily a teacher resource sued to enhance the role of the teacher as the
   imparter of knowledge. In this context, the teacher, using a projector, may direct
   learners through the resource and the activities on screen.

2. The second type of use is where the students would use the resource completely
   autonomously with little/no direction from the teacher.

However, having completed the case studies for this research a second dimension has
since emerged. While software can be used to enhance the role of the teacher or
liberate the learner to become more independent, autonomous and self-directed there
is a second intersecting dimension which involves whether the software is used as it is
intended and designed or whether the teacher subverts and adapts elements of the
resource to suit their educational needs. What is important in this aspect is that these
needs may be teacher centred or student centred. The diagram below highlights these
intersecting dimensions and is a very useful visual representation of the various
possible uses of the resource developed for this study.
Fig 24 Visual representation of the nature of use of learning objects in the classroom

The type of use may be categorised into quadrants: open, closed, teacher-centred and student-centred. It is interesting that these very different types of use are all catered for by one learning resource. If anything is to demonstrate the crucial role of the teacher to the classroom it is this. How the object is used rests primarily with the choice of teaching strategy that the individual teacher engages in. It is not, as some mistakenly believe, the software that determines the pedagogical use in the classroom.

Fig 25 Upper right quadrant: teacher centred and open.
The upper right quadrant describes a use that is teacher-centred, open flexible use – but what is meant by this and how could one describe the nature of use in this quadrant? The teacher will direct how the resource will be used. The teacher may decide to use individual aspects of the RLO with class and may not use others. Therefore a teacher may decide to draw students’ attention to the audio material or a photograph of the poet but they may decide not to use other elements such as any the activity material available. In this scenario students have little or no level of opportunity for autonomous use. The student progresses through each of the screens in the manner and pace that the teacher dictates.

**Teacher Centred**

*Used by teachers to enhance the presentation of information*

- *Teacher directed mechanical type use*
- *Teacher dictates pace*
- *Students no opportunity for autonomous use*

**Closed**

*Used as intended by instructional designer*

*Fig 26 Upper left quadrant: teacher centred and closed.*

The upper left quadrant describes a type of use that is quite mechanical. This type of use is teacher-centred but closed rigid use. In this scenario the power is again primarily with teacher and the student is more passive. The teacher will direct how the resource will be used. However, this type of use tends to be quite linear in nature. The teacher will go through all of the on screen elements before progressing to the next screen. Students have no opportunity for autonomous use. The teacher may nominate students to read aloud from the screen. The teacher dictates the pace at which students progress through each of the screens. The students may write the
answers to the questions in their copybooks. Annacotty College experienced this type of use. As the class was a weaker support group they needed the teacher to take more of a role in their use of the resource. Where students encountered new vocabulary or where some element needed further explanation the class were able to ask the teacher without drawing negative attention to themselves. This type of use tends to occur in a classroom where the focus is more didactic Callan (1997) and Mackey (1998).

**Fig 27 Lower right quadrant: open and student centred**

The lower right quadrant describes a use that is both student-centred and open. This type of use is quite flexible and is for creative users. This type of use occurred at St. Mary’s where the students used the RLO for the TL21 project. In this instance the students were able to adapt elements from the resource for their own project work. In this type of use the teacher may assign a task but students are allowed to carry it out at their own pace. The teacher may not provide any direction for how the resource will be used. The student progresses through each of the screens autonomously. The students may write the answers to the questions in their copybooks or they may chat among themselves to discuss the possible answers. This scenario sees students engage in self-directed learning where the power lies primarily with the student. In
this environment the students seemed to greatly enjoy personalising their learning experience.

Fig 28 Lower left quadrant closed and student centred

The lower left quadrant describes a use that is student-centred but closed. The teacher will direct how the resource will be used. This type of use may be described as off the shelf learning. Students have a lot of opportunity for autonomous use. The pace at which students progress through each of the screens can be negotiated so that it is either student led or teacher led. Cedar Hill used the learning resource in this manner. While they had homework tasks assigned to their use of the resource how they used the resource was completely at their own discretion. These students also had the additional facility of the VLE. Their learning experience was very positive and their teacher also reported that he was confident that learning had taken place in a very positive manner. There are many advocates of this type of autonomous learning in the existing literature. Many have identified the benefits of such an environment eg Kupetz and Ziegenmeyer (2006) as discussed in the literature review.
There is a body of work to be found in the literature endorsing each of these types of uses. Each type of use certainly has merit and it is up to individual teachers to decide which type of use works best for them. One of the most important things to note from the experience of this study is that ICT can be made as flexible or as fixed as an individual teacher is comfortable with. This echoes Cuban’s theory where technology may be seen as an amplifier for the existing classroom activities.

The lower right quadrant where the type of use is both student-centred and open is arguably the most ideal learning environment for the student. Control of the learning process is handed over to students. What are the contributing factors that will promote this type of use being adopted over other types of use? Arguably, the most influential factors on type of use are environmental and professional. If we see environmental factors as lying along the horizontal axis and professional factors lying on the vertical axis then it is possible to identify what the barriers to the most ideal type of use are and what measures can be put in place to address them. The SETT framework (Zabala, 1995) considers four elements when considering the use of assistive technology with students: Student, Environment Tasks and Tools. As the classroom grows more diverse and students may not be streamed until later in the school years this framework should not be limited to the area of assistive technology but can be seen in any classroom environment which adapts technology.

How a teacher rates their own techno-pedagogical competence determines how the resource will be used. This is their competence to use technology for pedagogical reasons, competence to integrate technology in teaching

**Towards teacher led integration of ICT**

The current assessment models for the junior certificate English examination do not encourage this type of learning environment. Teachers must be able to produce hard
metrics at the end of the class. Where a teacher is not presented with evidence that all students have navigated through all of screens they cannot vouch for the work of the individual students. This raises the uncomfortable question: Should the most ideal pedagogical model be compromised/influenced by what the state dictates should be assessed? Would it not be better to have students capable of interacting with a piece of text and assessing it for truth themselves rather than being fed information in the manner of the Nurnberg funnel?

This research study is a recent example of how teacher designed curriculum specific learning objects can result in a higher uptake of ICT in the classroom. Therefore in addition to looking at how teacher/student centred and open/closed a resource is it is important to also examine a framework for another set of criteria that affect the success of ICT implementation in the classroom. Curriculum specific software designed outside of the practitioners (teachers) perspective may come loaded with a different set of beliefs which may be in conflict with those held by the teachers. While such software may be ideologically driven in terms of the pedagogy it may fall short of the realities faced by the teachers in the classroom. These RLOs were constructed around the existing pedagogical content knowledge (PCK) of practising teachers. Pedagogical content knowledge is knowing how to combine pedagogy and content effectively for a specific group of learners (Shulman, 1986). Rokeach (1968) cited by Pajares (1993) suggested three activities that may help promote belief change among teachers.

- Requiring student teachers to prepare and teach lessons in ways that conflict with the ways they believe these lessons should be prepared and taught and having them experience success with the new method
• Providing new information from significant others that is incompatible with students' existing beliefs.

• Getting student teachers to highlight inconsistencies in the students' own belief systems

The experience of this study suggests that providing teachers with highly relevant curriculum specific learning objects will override everything else. Regardless of an individual teacher’s beliefs if the learning object has been used successfully by their peers and has been recommended for use they will trial the object with their class. The level of use then may be quite mechanical on the part of the teacher. They may make the object available for use and that may be the full extent of their engagement with the class. If this is the case then the result is that the object is used in an open and student-centred manner (bottom right hand quadrant). This is the most autonomous and liberating type of use for learners to experience. This at first seems to be conflict with the work of Dexter et al (1999):

“A simplistic view of computer as catalyst of instructional change is misleading because it disregards what we have learned about teacher development and the change process. Specifically, it underestimates the impact teachers' beliefs have on how they teach, it simplifies the process of how teachers develop and learn professional knowledge, and it diverts the examination of how social norms and structures might support or contradict a proposed change”.

(Dexter et al, 1999, p15)

Change is required if the ideal learning environment is to be created where graduating post-primary students will meet the demands of the modern world. There must be a shift from an assessment driven curriculum towards a much broader set of generic skills that are not subject specific. This then raises a further number of questions:
Is the current post-primary school system ready to integrate this technology into the classroom? The existing curriculum is predominantly assessment driven. Where does how students interact with/use technology slot in with this assessment? The simple answer is that student interaction with technology is not assessed. This is what needs to change if ICT is to be implemented in any significant way.

**What comes first?**

Should the conditions be established for effective use of software in schools first rather than implementing software into schools and exploring ways in which we can modify the software to meet the needs of the existing system. Fullan’s work (1983) on strategies of effecting change in the school system discusses the various approaches that could be taken. Fullan sees strong leadership at the top with small steps at the grass roots as the way forward in bringing about successful change.

> “Putting (strategies) together in a particular setting on an ongoing basis is difficult and requires leadership with both a commitment to and skills in the change process. In some situations of high conflict and internal or external crises (sometimes called turbulent environments), it will not be possible to bring about any of the improvements ..., until the issues of conflict are addressed or subside. Timing, readiness, and preconditions must be considered. When successful improvements are accomplished, they involve individuals working in small groups and other collective ways, attaining technical mastery, a sense of success, and new meanings”

(Fullan, 1983, p418).

What is evident from both the literature and the findings from the schools involved in this study is that there is a sense of anticipation surrounding ICT. Government reports from all countries recommend the opportunities that ICT can deliver to schools. The business world not only recommends the rapid uptake of ICT in education but decries the current lack of ICT use in our schools. Teachers and schools want to embed some element of ICT to equip students with the skills required for our modern world. There is no doubt that we are at the cusp of new developments in ICT usage at post-primary in Ireland. Once it is accepted that this change is coming it is time to examine the
best way to implement ICT in our schools. Therefore, all stakeholders in the education system, teachers, parents and students, need to be actively involved when planning an ICT strategy for their school. Asking the right questions early in the policy making stage will lead to a better outcome.

**Section 2: Flexibility of Learning Objects**

One of the key aims of the research was to explore the factors that increased the reusability of the RLO. This section discusses the flexibility of RLOs in light of the findings of this study.

As the literature review has highlighted, there is considerable interest in the area of RLOs, based on the ‘build it and they will come’ philosophy. This line of thinking suggests that if educators have access to subject specific material then ICT use and adoption will take place.

“Reuse” and “recycle” of existing teaching-learning resources have always been a common practice in the world of education. However, it had never been in the centre-stage of educational debate as it is in the recent past. The reasons for educational material reuse are: the need to provide greater access to quality education, shrinking financial resources, pressure to provide education in cost-effective ways, and the overall impact of the information and communication technology (ICT) in educational practices. In fact, with the advent of ICT it has become easier to store, retrieve, share, and reuse educational materials. Though for individual teachers, the practice of preparing learning materials (also called “learning objects”) and their reuse have been simpler” —Mishra (2004)

One of the main aims of this study was to test this theory and to design a curriculum specific resource that would indeed attract teachers to use it. However, perhaps it is more complex than this. From this study it can be concluded that in order to get teachers to integrate some ICT element into their classroom what is needed is access to a bank of teacher endorsed learning resources which can be either be used as they are or broken down and reused in their individual components. It would seem to be irrelevant whether or not the resources are made by teachers themselves. For ICT to
be successfully integrated it must be the teachers themselves that recognise a quality learning resource that can be used. They must then share it among their peers. When this is happening ICT will have a natural home in the traditional classroom.

“The full advantages of cohesive, RLOs can only be achieved by creating communities that develop and exchange learning objects” Boyle (2003).

Many see learning objects as highly reusable units of information to be repurposed according to an individual’s needs. Due to high cost, in terms of both time and money of producing digital learning resources it is important that there be a high degree of reusability built into the objects. Wiley (2002) sees learning objects as units of educational content which can be broken down into small chunks that can be reused in various learning environments. Nelson (1997) cited in Wiley (2002) suggests that teachers when they locate instructional materials break them down into the various components and reassemble them in the manner that they wish to use them in the classroom. Therefore, it could be said that if the teachers were to receive the materials already broken up into the granular elements it would save not only time but would also render teaching material much more reusable.

At the moment the majority of teachers are not developing their own reusable learning materials. The majority of teachers do not have the technical skills required to develop their own custom made learning objects. Schools are directed to www.scoilnet.ie and www.skool.ie. During the course of this study many teachers admitted that they didn’t use these resources with their classes. They cited a variety of reasons mainly because of availability of Internet in the classroom. Of the teachers who knew of these resources the main reason for not using them was that there was
little “extra” content and it wasn’t worth going to the computer room to use the resource alone. These poetry resources have not been modified in the four years that they are available.

The NCTE website does feature some individual teachers integrating ICT across the post-primary curriculum. The number of teachers using ICT is relatively small but the very fact that they are carrying out this type in spite of all of the documented barriers to implementation of ICT of activity is noteworthy. Encouraging examples of teachers using existing resources are given on the NCTE website and they include a spectrum of activity; from augmenting traditional classroom activities to hugely innovative activities such as basic film production. Below are two brief descriptions of such work that the NCTE advocates:

“Pippa Brady sees many uses for ICT in her English classes. She employs it in class, she uses ICT to help her prepare classes, creating worksheets and slideshows, and she also uses it in her record keeping and administration. Pippa has gone further and adapted her classroom itself, creating a video wall to allow the film and drama sections of the syllabus to come alive. Instead of discussing film, the students become film makers and learn by doing. Pippa also recommends drawing on the techie know how of students who are willing and able to help”.

“Sandra Doyle and her students don’t use textbooks for senior German, she and her students stay current with the language and bring the language alive by using the Internet in class. The students enjoy classes because they are so colourful and visual. The multi-media element of the Web brings a little piece of Germany into the classroom”.

(NCTE, 2010)

There is a growing number of teachers who are interested in making their classroom a more digital zone. Answering this demand, the NCTE provides ICT courses for those interested in CPD in this area.

“NCTE-funded professional development activities are offered in partnership with the regional network of Education Centres. In addition, NCTE facilitates programmes of ICT professional development with other educational partners, e.g. INTO, the Colleges of Education, curriculum in-service teams and other government agencies such as Discover Science and Engineering. This includes the provision of funding, course development and review, supply of course
materials and tutor training. 11,549 ICT professional development places for teachers were funded through the NCTE’s CPD initiative in 2007”.

(NCTE, 2010)

Table 10 below displays the NCTE course participation for 2007.

<table>
<thead>
<tr>
<th>Provider</th>
<th>Attendance</th>
<th>Primary</th>
<th>Post-Primary</th>
<th>Mixed</th>
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<td>INTO Summer Programme</td>
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<td>Mary Immaculate College</td>
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<td>Liberties Learning Initiative</td>
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<tr>
<td>Other tutor training</td>
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</tr>
<tr>
<td>Total</td>
<td>11,549</td>
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</tr>
</tbody>
</table>

Table 10: NCTE Course participation in 2007.

Communities of Practice

Wenger et al’s (2002) work on communities of practice sees these communities as:

“groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis”


Kirschner et al (2007) discuss the growth of CoPs, how they work and how they can be sustained in an educational community. Kirschner’s research revealed that while teachers are willing to seek out the support of their fellow teachers in a face-to-face situation they are less likely to participate in an online community of practice.

This behaviour by the teachers is in stark contrast to the students at the Cedar Hill school in this study. As discussed in the Literature Review the generation of digital natives (Palfrey and Gasser, 2008) taking part needed little prompting or
encouragement to start to nurture an active online community. While the students were under no obligation to participate in the virtual learning environment the researcher had provided an incentive\(^1\). Therefore in spite of an element of competition, the online discussion remained collaborative and students shared their ideas and were not afraid of taking risks.

The cohort of students involved in this study embraced the experience of self directed learning and enjoyed the autonomy afforded by the online learning environment. It was a pity that the group did not continue to have access to such an online space after this project finished as it would have been interesting to see if and how the community would have continued or if the community would have fizzled out after the initial flurry of activity. It would seem that if students are given the chance to reflect on the learning experience through the use of a Virtual Learning Environment that would engage with the VLE. In this case the students responded to questions posed in the Discussion fora. There was intentionally no moderator present in this online space. This was to explore the possibility of a natural community of practice establishing itself in an organic manner.

The NCTE, on their Website advertise, that they have a VLE in place which teachers can use. This VLE has been developed by the education company Fronter.

“The primary purpose of the VLE software is to help teachers manage online educational courses. The Leadership Development for Schools (LDS) initiative was the first initiative to be facilitated with access to the VLE and they continued to use the system, which was upgraded with increased functionality, for their professional development programme for school management. Some 3,000 school leaders work through the VLE while a further 400 use the Fronter environment for an NCTE online course and assorted activities”.

(NCTE, 2020)

\(^1\) The student who was deemed to have contributed the most to the online forum received an ipod.
If this VLE is available to all post-primary schools then why are more schools not using it? Having a local intranet is acceptable where students and teachers alike can have a rudimentary eportfolio but if schools are to move out of the “take off stage” of ICT adoption then they need more than this level of provision. They need support on the ground. This is another example of a top-down initiative not really reaching the teachers at the chalkface.

CoPs could be one of the ways forward in terms of getting teachers to adapt to using RLOs in their classroom. Project Maths, for example, was launched in 2008 and the first cohort sat their project Maths exam in 2010. A support Website was set up at http://www.projectmaths.ie. The group behind this Website comprises a number of experienced teachers who provide support to teachers teaching the new Project Maths curriculum across the country:

“team of experienced teachers of mathematics recruited to provide professional development support to post-primary teachers of mathematics across the country as part of Project Maths. Our team was first established in 2008 to provide support to the 24 schools involved in the development and piloting of the curriculum. The initial team of National Coordinator and 6 Regional Development Officers has since been expanded to provide support as part of the national roll-out of the programme of professional development. We are now a team of 18 - 1 National Coordinator, 1 Assistant National Coordinator and 16 RDOs. We are a growing team as recently we have been joined by a group of 60 Local Facilitators who will work with us to provide additional and complementary support to teachers of mathematics through the national network of Education Centres”.

What is really interesting about the resources available on the project Maths site is that there is an area with teaching resources that have been created by teachers for teachers. This supports that notion that if a teacher is inclined to try to integrate an element of ICT into their teaching they are more likely to do so if the learning resource can be vouched for by their peers. In stating explicitly on this website that the material has been created by teachers other teachers will more readily view the
resource and entertain the idea of using in their classroom. Even though the teachers developing the online teaching materials have been recruited by the DES for that distinct purpose this is still a working successful example of teachers collaborating and supporting each other to teach a shared subject.

Fig 29 Project Maths Website

The success of the learning resource created for this study was based on the fact that the target group of teachers were involved in the design and development of the material. This learning resource was highly context specific. It was designed to teach six poems and the poetry terms from the English Junior Certificate curriculum.

Assessment was intentionally embedded into the learning resource. The design and
development process of the poetry learning object has been detailed in the
Methodology chapter.

Levels of Reuse of RLOs
Perhaps ambitious in its outlook, one of the intended aims of the study, as outlined in
the research questions, was to explore the development of a framework for the future
development and use of RLOs. This section outlines a possible framework and
discusses its potential.

Earlier in this chapter the types of use of the learning resource were discussed within
the context of how open/closed teacher-centred/student-centred the classroom
experience allowed. In this section the level of reusability afforded by the learning
resource will be discussed. The level of reuse of the learning resource in this study
can be charted (see fig 37) where the type of use may be categorised into four
quadrants: context specific, universal, activity embedded and little/no activity
embedded.
### Fig 30 Visual representation of the reusability of learning objects in the classroom

The upper right quadrant describes a learning resource that presents universal hard knowledge with little/no assessment. This is the most reusable zone. RLOs that meet these criteria could potentially be shared across curricula. This could potentially be the most reusable of RLOs. Even more usable would be a bundle of items which when combined could be used to create a number of learning objects.

The upper left quadrant describes a RLO that presents hard knowledge information with embedded assessment. While the object is reusable it is not as reusable as a RLO where the activity has been separated from the raw information.

The lower right quadrant describes a RLO that lends itself to some level of reusability. While this type of RLO contains little/no embedded assessment the nature of the knowledge itself is highly contextualised (e.g. politics) soft knowledge and so the RLO will not be as universally relevant as a hard knowledge RLO.
The lower left quadrant describes a RLO that comprises soft knowledge with embedded activities/assessment. The RLO for this research study belongs to the lower left quadrant; arguably this quadrant describes the least reusable type of resource. However, given that the resource was designed collaboratively with the target user group of teachers it is highly reusable by this group.

In the last decade more corporate training is delivered online. Such training is expensive and the use of RLOs enables material to be modified and repurposed at a lower cost. Chyung (2007) in writing about the flexibility of RLOs refers to the use that some large corporations have made of RLOs.

“Autodesk Inc. and Cisco Systems, are early adopters of RLO strategies (see Hodgins, 2002 and Cisco, 2003). Built upon Autodesk’s content model Cisco has developed its own e-Learning framework and guidelines, describing the design of modular e-Learning contents in hierarchical format. One way to understand a hierarchical content structure of an e-Learning course is to think about how a textbook is usually organized. As shown in is adapted from Cisco’s framework, a textbook may contain several chapters, each chapter has several sections, and each section contains text that accompanies some photos or diagrams. Similarly, you can design an e-Learning course with several lessons, each lesson has several topics, and you can present each topic with multimedia such as text, images, audio, and video clips”.
(Seung Youn Chyung, 2007)

In recognising that there are different levels of learning objects material becomes more relevant, reusable and more cost effective. Boyle (2001) cites the model that Autodesk use to illustrate the different levels at which design for learning can be focused:
Fig 31 Autodesk’s model for content analysis as described by Boyle

This content analysis model illustrates the granularity principle applied to RLOs. If a RLO comprises a number of smaller objects which can be decoupled (Boyle and Cook, 2001), it is possible to gather, group together and separate chunks of learning content in a variety of different ways, as required by the teacher at a given time.

The design guidelines provided by Cisco to design and develop RLOs is relevant if the time and expense invested in creating RLOs is to be capitalised on.

Cisco’s guidelines refer to a set of an overview and a summary included in a lesson as a wrapper. The beginning part of a wrapper (the overview part) prepares learners to acquire new knowledge, and the ending part of a wrapper (the summary part) helps them reflect on the lesson they have just completed. In a way, designing an e-Learning lesson is similar to making a hamburger. A hamburger is served with a bun, sliced in half (i.e., a wrapper), and you choose what goes inside the bun based on what you want. Similarly, the main ingredients of an e-Learning lesson are a series of topics with practice, wrapped by an overview and a summary. You can assemble a different set of topics to design a lesson depending on the needs, just like you may make a single cheeseburger without onions for your child, while you make a double cheeseburger with a slice of tomato and onion for yourself.

(Seung Youn Chyung, 2007 p)

Perhaps if the assessment components of RLOs for schools were stored separately as activity RLOs this would render the original learning resource more reusable. As
mentioned earlier in this chapter Nelson (1997) suggests that teachers break learning resources down into the various parts before reassembling them in their preferred manner for use in the classroom. At a conference for Computer Assisted Language Learning in 2006 (EUROCALL) there were a number of presentations which focussed on integrating largely flash-based learning objects into the traditional lesson. This is actually one of the inspirations behind the design of this poetry object. David Brett has created a number of learning objects which he shares with other teachers of languages. Brett’s work is highly reusable as he also provides all of the source files. His website states that his work is twofold:

“I.) to explore and expand the types of interactive exercises currently available, with a particular view to those for learning second languages (CALL - Computer Assisted Language Learning); 2.) to ensure that these exercises can be created even by those with very basic computer skills. Many of the most attractive exercise types e.g. drag’n’drop, traditionally require a large amount of code. I have developed several templates that sidestep this completely. Unfortunately, making things simple for others is very hard work, so things are going fairly slowly, albeit, I might add, surely. This work has been carried out using almost exclusively Macromedia Flash (now called Adobe Flash), certainly one of the most powerful and wide ranging programmes currently available for the production of material to be published on the Web”.

(Brett, 2008)

Boyle and Cooke (2003) in their work on learning objects address the question of identifying the “basic unit of reuse” (p31). Boyle and Cooke cite Polsani’s (2003) definition of a learning object as: “an independent and self-standing unit of learning content that is predisposed to reuse in multiple educational contexts”. Boyle and Cooke have proposed a cohesion and decoupling model for the creation of RLOs.

“The first principle in that of cohesion - each unit should do one thing and only one thing (Sommerville, 2000; Pressman & Ince, 2000). A direct link can be made to the idea of learning objectives in pedagogical theory. This mapping suggests that each learning object should be based on one learning objective or clear learning goal”. In order to provide this freedom to order learning objects a further design principle is important. This is the principle of ‘de-coupling’, or more accurately minimized coupling. This principle states
that the unit (software module/learning object) should have minimal bindings to other units. Thus the content of one learning object should not refer to and use material in another learning object in such a way as to create necessary dependencies. One object then cannot be used independently of the other (Sommerville, 2000; Pressman & Ince, 2000). This principle is crucial in design for reuse. The learning object should, as far as possible, be free standing. For example, a learning object on one type of programming loop should not refer specifically to content covered in another object. If we move the object it should still be fully understandable and function to achieve its learning objective. The vision then is of a group of cohesive and decoupled learning objects”.

(Boyle and Cooke, 2003, p 47)

Boyle, in his work, states there are many layers on which learning design works.

Below the specific lesson plan level these layers should focus on learning activities and tasks for understanding key concepts and procedures.

“The idea of capturing successful learning designs and making these the basis for reuse, rather than content, is at the core of the concept of generative learning objects (GLOs)”.

(Boyle, 2009, p 2)

The Centre for Excellence for Teaching and Learning in Reusable Learning Objects in London has developed a tool for creating Generative Learning Objects. This tool allows teachers to develop highly flexible multimedia learning objects. The authoring process is design driven as opposed to content driven. RLOs created using the tool are easier to adapt and are therefore highly reusable in nature.

Another significant question to emerge from the case studies in this research study is: Does the nature of the discipline increase/reduce the reusable nature of the object?

For the purposes of this study the learning object was created for the English curriculum. The English curriculum in an Irish post-primary school is quite different from the English curriculum offered to students undertaking English at a secondary school in the UK or even at high school in America. While some international material may be covered the poetry and prose tend to be largely culture specific. The
curriculum specific literature will differ greatly while the activities surrounding the
literature may be very similar. In contrast to this a learning object created for
mathematics may be far more reusable. It may not need to be localised and may not
have any culture specific information that would have to be removed before the object
could be reused in another country. Therefore, such an object would be highly
reusable. Scientific subjects, where core course material is universally accepted, is
highly reusable. Scientific formulae do not need to be translated.

<table>
<thead>
<tr>
<th>Pure Knowledge</th>
<th>Hard Knowledge</th>
<th>Soft Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. Chemistry, Physics etc</td>
<td>Discovery of the ‘new’</td>
<td>e.g. Sociology, Political Science</td>
</tr>
<tr>
<td></td>
<td>Analysing specific elements of a problem</td>
<td>- Re-examining ideas within different theoretical contexts</td>
</tr>
<tr>
<td></td>
<td>Finding universal truths</td>
<td>- Synthesis, focus on complexity of inter-linkages</td>
</tr>
<tr>
<td></td>
<td>Explanations are strong</td>
<td>- Finding patterns which fit particular contexts</td>
</tr>
<tr>
<td></td>
<td>Research is value free</td>
<td>- Explanations are weak, due to the multiple ‘causes’ and ‘effects’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Research is value laden as it deals with human subjects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applied Knowledge</th>
<th>e.g. Engineering, Medicine</th>
<th>e.g. Education Studies, Social Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draws on hard pure knowledge but differs in the following respects:</td>
<td></td>
<td>Draws on soft pure knowledge but differs in the following respects:</td>
</tr>
<tr>
<td></td>
<td>Use of trial (and error) as methodology</td>
<td>Knowledge is less stable than hard applied knowledge, and has less of a sense of progression as ‘answers’ become critically re-evaluated.</td>
</tr>
<tr>
<td></td>
<td>Focused on addressing problems, rather than ‘discovering’ truths</td>
<td>Trial (and error) are commonly used as methodologies</td>
</tr>
<tr>
<td></td>
<td>May be many solutions to problem (rather than one truth)</td>
<td>May be many solutions</td>
</tr>
<tr>
<td></td>
<td>Effectiveness rather than ‘discovered truth’ is criteria of judgement</td>
<td>Pragmatic utility is criteria of judgement</td>
</tr>
</tbody>
</table>

Table 11: Becher (1989)
If we look at table 11 above, Becher’s classification of academic disciplines (Becher, 1989), the type of information categories are divided into hard and soft knowledge and pure knowledge and applied knowledge.

“Becher identifies that the way in which inquiry is understood is often entirely different in different academic disciplines. He suggests that academic disciplines can be (loosely) characterised in terms of whether they engage in the study of ‘hard’ or ‘soft’ data, and in terms of whether their findings are intended to be ‘applied’ or ‘pure’. While these dimensions function best as continua (rather than as separate categories) and while different fragments and practitioners within a discipline may differ in terms of where they would place their discipline, his approach can illustrate some key oppositions within academic disciplines”.

(Tormey et al, 2010)

This corresponds with the earlier framework for the representation of the reusability of learning objects in the classroom.

The following figure is a synthesis of the concepts surrounding RLOs that are prevalent in both Boyle’s work and Becher’s model. This new model illustrates RLOs integrated into the top levels of instruction and delivery: course and lesson. This model (see fig 39) sees two distinctly different types of RLO emerging; RLOs that are predominantly content-based and those that are activity/task-based where the pedagogical task is independent of the actual information.

![Fig 32: Synthesis of Boyle’s and Becher’s models.](image-url)
MIT’s open courseware provides a case in point. The Open courseware initiative is a web based publication of MIT course content. The material is freely available without any cost to users and does not require registration. MIT recognises that the development of such material is prohibitively expensive for many institutions and so has made the content

“Each course we publish requires an investment of $10,000 to $15,000 to compile course materials from faculty, ensure proper licensing for open sharing, and format materials for global distribution. Courses with video content cost about twice as much, but your feedback about the significant value of these video materials helps to justify the cost”.

(MIT, 2010)

Published online is a list of the most visited courses based on monthly Internet traffic. The most visited course materials for August 2010 include: Computer science, classical mechanics, calculus, algebra, electricity and magnetism and biology. These subjects fall into the “pure knowledge” category. Language and culture have the least impact on the reuse of such resources.
### Most Visited Courses

Below is a selection of our most visited courses based on August 2010 site traffic.

<table>
<thead>
<tr>
<th>MIT Course #</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.00</td>
<td>Introduction to Computer Science</td>
<td>Fall 2008</td>
</tr>
<tr>
<td>9.01</td>
<td>Physics I: Classical Mechanics</td>
<td>Fall 1999</td>
</tr>
<tr>
<td>18.01</td>
<td>Single Variable Calculus</td>
<td>Fall 2006</td>
</tr>
<tr>
<td>18.06</td>
<td>Linear Algebra</td>
<td>Spring 2010</td>
</tr>
<tr>
<td>24.00</td>
<td>Problems of Philosophy</td>
<td>Fall 2005</td>
</tr>
<tr>
<td>6.002</td>
<td>Circuits and Electronics</td>
<td>Spring 2007</td>
</tr>
<tr>
<td>18.02</td>
<td>Multivariable Calculus</td>
<td>Fall 2007</td>
</tr>
<tr>
<td>18.05</td>
<td>Differential Equations</td>
<td>Spring 2006</td>
</tr>
<tr>
<td>6.031</td>
<td>Structure and Interpretation of Computer Programs</td>
<td>Spring 2005</td>
</tr>
<tr>
<td>6.037</td>
<td>Practical Programming in C</td>
<td>IAP 2010</td>
</tr>
<tr>
<td>7.012</td>
<td>Introduction to Biology</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>5.111</td>
<td>Principles of Chemical Science</td>
<td>Fall 2009</td>
</tr>
<tr>
<td>18.001</td>
<td>Calculus Online Textbook</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>18.05</td>
<td>Computational Science and Electronics 1</td>
<td>Fall 2009</td>
</tr>
<tr>
<td>9.03</td>
<td>Introduction to Psychology</td>
<td>Fall 2004</td>
</tr>
<tr>
<td>6.005</td>
<td>Signals and Systems</td>
<td>Spring 2010</td>
</tr>
<tr>
<td>6.096</td>
<td>Introduction to C++</td>
<td>IAP 2009</td>
</tr>
</tbody>
</table>

**Fig 33 MIT’s Open Courseware**
Management of Reuse of RLOs

As discussed in the Methodology developing resources is a costly and time-consuming process. It makes sense to render resources as accessible and easy to locate. In addition to making the actual learning object as reusable as possible the management of reuse must also be considered. Therefore, the descriptive data associated with the learning object (metadata) should be as accessible as possible to facilitate the discovery and retrieval process of obtaining RLOs.

If teachers are encouraged to share their learning materials, whether or not they are the authors of the material, the process of locating and accessing the files will need to be managed. Making the metadata as detailed as possible also allows for the learning object to be accessed by a much wider community.

Metadata is used to facilitate the understanding, use and management of learning resources. Metadata is information which describes each learning resource in the repository. This resource has been uploaded to the National Digital Learning Repository (NDLR) see Fig 41 for Metadata fields. The agreed metadata stored for objects in the NDLR includes general information, language of the resource, author, and role of author, date of publication, rights and conditions. This metadata is typically stored as an XML file. The NCTE participated in the EU Metadata projects where it worked with 13 European ministries of education to develop a fixed set of metadata standards and WEB 2.0 systems for sharing educational content between teachers and learners across Europe.

"MELT (Metadata Ecology for Learning and Teaching) is a content-enrichment project built on existing technical architectures to form a network of content repositories so learners and teachers can easily carry out federated searches’ to find content. During 2007 the final metadata schema was agreed by the partners and was applied to all relevant Scoilnet resources. Metadata links for some 1,350 Scoilnet resources were put into the Learning Resource Enclave (LRE) and translated into
Irish and Spanish. A European review of the project to date was positive and in 2008 it is planned to connect the Scoilnet website to the metadata repository”.
(NCTE, 2007 p23)

The NDLR service has been extended to teachers in both the primary and post-primary sector as of April 2011. It is hoped that teachers will take advantage of the opportunity to either upload their own material to share with colleagues. Teachers will also be able to access and download objects from the repository which they can then use in their own classrooms. The NDLR is also planning to offer a federated search facility to enable members to search other significant repositories such as JORUM and MERLOT for relevant teaching materials. This is probably the closest that we will get to a global repository of learning objects.
Fig 34: Metadata fields for resources uploaded to the NDLR
Section 3: Implications for Practice

ICT use in schools

At the top level we have almost an outcry for more ICT to be embedded across the curriculum. We are constantly told that our school leavers must be more ICT literate, more technologically adept, digitally literate, able to think in a critically. As the literature reveals there is a growing concern has emerged among governments and the business community including IBEC relating to the adequacy and quality of graduate produced by the Irish education system. Within an Irish context the DES plan regarding the integration of ICT is to integrate through national projects changing teachers’ perceptions and beliefs about ICT use.

“The experience of the SIP 1998-2002 showed that innovative projects can lead to sustained change. The Literacy and ICT Project 2005-2007, a collaborative multi-agency developmental project which explores how a targeted intervention using ICT can support literacy in Irish classrooms, is already yielding tangible gains. Teachers describe it as “a hugely enriching experience for teachers and pupils alike … [it] has enabled us to enhance the literacy levels in the school”. Projects like these and others such as FÍS, Hermes, the Liberties Learning Initiative, Empowering Minds and the Laptops Initiative allow best practice to be explored in an Irish context. This, in turn, will provide us with both content and practice to disseminate and mainstream as models of integration that we know will work in Irish teaching and learning situations”.

(NCTE, 2008 p 25)

However, this research identifies the development of relevant resources as being the most crucial aspect of ICT take up. Access to curriculum specific resources designed by teachers for teachers seems to be more important that beliefs/fears of individual teachers. This suggests that the model of ICT uptake and integration will be more like the model of an infection at work (network models). If enthusiastic early adopters can have that level of influence it could see a greater level of uptake.
Digital divide in post-primary schools
This research observed a digital divide in how schools integrate the students’ home use of ICT into their overall learning. This research study observed both sides of the spectrum. Some teachers had a “head in the sand” attitude to student use of computers outside of school hours. In contrast to this some teachers actively promoted the use of computers outside of school. The researcher did feel that some teachers may be acting from a position that if they don’t allow any student to avail of the opportunities that the computer can offer then all students are receiving an “equal” education. However, equally disadvantaging all students in one school is arguably doing all students an injustice. This study found that the students attending Cedar Hill a predominantly middle class school were given every possible chance to develop outside of school. This experience was similar to that described by Warschauer, Knobel and Stone’s (2004) work; which explored the digital divide that exists in a number of secondary schools in California. Their study concluded that in order to overcome the digital divide schools need to put more effort into moving from the “take off stage” and support teachers in moving to the next stage of use:

“The narrowing gap in numbers of computers in high- and low-SES schools, both in our sample and in the nation at large, is an important first step toward helping overcome a digital divide in education. However, there is much work that remains to be done. Greater attention to technology use for academic purposes rather than for mastery of software programs is an important next step. This requires increased peer mentoring among teachers and better support for students who lack home computers”.

(Warschauer et al, 2004 p 587)

Another way of overcoming the digital divide may lie in the type of RLO developed.
The classroom observations of the poetry RLO revealed that regardless of the intended designed use it can be used in numerous ways dependent on contextual environmental factors and teachers beliefs, attitudes and knowledge.
Designers need to recognise this and perhaps cater for it otherwise uptake will be limited. Teachers need to engage with designers early in the development process.

For those teachers that are using ICT the steps involved to encourage teachers to move from the first instance of use the top left quadrant to the more open type of use associated with the bottom left quadrant need to be examined. This research study suggests that the software itself, while it will play a crucial role, will not be the catalyst that leads to a greater uptake of ICT at post-primary level. For this to occur; a fundamental reconceptualisation of Teaching and Learning at post-primary is needed.

**Flexibility of Learning Objects**

At the outset of the development process it is important that designers in consultation with the teacher determine whether the RLO is hard knowledge or soft knowledge based. As more teachers adapt to using RLOs in the teaching the metadata of such RLOs is crucial. The distinction between content RLOs and activity based RLOs should be clear. A more advanced development could see activity-based RLOs that are universal being applied across different contexts for example; tasks exploring the political system could be applied to different units of raw content. Designers developing RLOs for hard knowledge could embed the tasks and activities within the object whereas for greater levels of reusability RLOs developed for soft knowledge objects would arguably have a higher level of reuse if the tasks and activities were decoupled.

The research findings from this study suggest that a strategy for leadership and continuing professional development are just as necessary as providing the
infrastructure if ICT is to be successfully adopted in schools in any meaningful manner.

**Limitations of the research**
The limitations that were encountered during the course of this research study have been detailed in the Methodology chapter. To summarise, this study was dependent on gaining access to schools. In the current economic climate this proved difficult and so a small sample of schools was used. However, the schools that did participate were typical schools and the findings of this study are very relevant to many Irish post-primary schools ICT experience. It was always the intention of the study to highlight issues of significance surrounding the use of such ICT in the traditional classroom. Therefore, although the sample in this study was small, the research was grounded in an interpretative and qualitative paradigm.

In order to get schools to become involved in this research study the RLO was promoted as “covering” exam related material. The poems chosen are all on the Junior Certificate curriculum. However, even though the poems themselves were exam related the method in which they are presented (as digital objects) was perceived by some teachers and parents as non traditional and peripheral to core classroom activities. Consequently, some teachers and parents deemed the whole exercise as nonessential to the core curriculum and therefore did not merit any class time. If the use of ICT became more mainstream in the teaching and learning of English it would be interesting to see what impact this change would have on the perception of the RLO.

This study also recognised that English, as a Humanities subject, is not generally recognised as a heavy user of ICT. Therefore the low level of ICT that was apparent
may not be indicative of other subjects at post-primary level. It may be the case that pockets of good practice exist in other subject areas. For the purposes of this research study the RLO was used across all three sites for a relatively short period of time. This meant that there was no chance to see if the RLO could be implemented into the daily practices of the teachers involved. However, the teachers at St. Mary’s did use the RLO in another project.

This research study raises issues surrounding ownership and reuse of RLOs. The experience of the use of this RLO in schools questions whether greater levels of ownership surrounding the RLO would emerge if it were used more regularly by teachers. If this were to happen could such ownership lead to the RLO itself evolving to meet the needs of specific teachers? When the RLO was developed for the purposes of the study maybe the design brief was too rigid?

The final chapter will present the conclusions drawn from this research study.
Chapter 7

Conclusion

It is now more than a decade since the Schools IT 2000 initiative. However, many Irish post-primary schools are still not offering students the chance to develop critical ICT and digital literacy skills. Statements like the following are plentiful:

The use of ICT in appropriate contexts in education can add value in teaching and learning, by enhancing the effectiveness of learning, or by adding a dimension to learning that was not previously available. ICT may also be a significant motivational factor in students’ learning, and can support students’ engagement with collaborative learning.

(NCCA 2010)

However, there is a huge gap in the rhetoric of ICT in schools and the practice of ICT in schools. This research study found that under the current organisation of post-primary schools there was little opportunity for the integration of ICT into classrooms. This research study found that the existing school environment is not conducive to integrating technological approaches into present classroom practice. There is a high level of difficulty associated with doing anything that is perceived as outside of the norm. These difficulties almost prevented the research study from taking place.

This research is ground breaking in that it is the first in its attempt to use a RLO to teach English in the post-primary classroom. This research study is a very detailed example of the process of collaborating with teachers in designing and developing curriculum specific RLOs. There are signs of movement towards the development of electronic text books and teaching materials (e.g. Wikiwijs program in the
Chapter 7: Conclusions

The development model that has emerged from this research study could be use to inform this process.

The RLO developed for this research study was used in very different contexts and highlights the potential and flexibility of RLOs to cater for very different student needs. The theoretical model that has emerged from this research study shows the symmetry between the type of RLO and the type of use of the RLO. This has implications for the design and development of any RLO.

One question that we faced was in developing the RLO first and then observing use were we putting the cart before the horse? It is the experience of this research study that in order for schools to successfully adopt RLOs into daily classroom practice it needs to be very clear what RLOs are available for teachers to access and how they can be used. Therefore, the development model and the framework of use that has emerged from this study is a necessary first step towards integrating RLOs into daily classroom practice.

ICT is seen by many as a catalyst for educational change and the integration of ICT raises questions surrounding the teaching and learning that is taking place in schools (OECD, 2001). It unsettles the dynamic of the teacher parent and student dynamic. The RLO was created as an object to use within a system. This challenges us to look at the system. The RLO provided us with a lens with which to look at the school as a site of learning. It raises and highlights issues surrounding the culture of schools. How conducive is post-primary to innovative pedagogy?
Given the current global economic climate curriculum review is quite topical. Technology is ubiquitous in our daily lives yet many post-primary schools have not moved from the take off stage of ICT adoption and integration. If our education system is to produce the type of global citizen that today’s technological world demands then schools will have to implement a thorough ICT strategy to meet this need.

**Reflexive Analysis**

The study took place over four years and comprised three main stages the development of the courseware, the fieldwork and observations of use and the analysis and write up of the research study. My interest in ICT grew largely from working on a Reusable Learning Resource with a colleague in the Languages Department in 2004. The RLO that was developed in 2004 has undergone annual revisions and it continues to be used with great success (Geraghty and Marcus-Quinn, 2008, 2010).

It is widely recognised that different researchers bring different theoretical and personal insights and bias into their observations and data analysis. A researcher with a similar background to my own may focus more on the answers that students provided to the questions on each poem. They may use this data to carry out a high level of discourse analysis or indeed they may focus on the existing literacy level of the class. This was not the purpose of my study although given that I have this data I may revisit this topic at a later date. The purpose of this study was to design and develop curriculum, in collaboration with teachers, specific courseware for a poetry lesson and to observe and analyse the type of use favoured by teachers.
Previous experience brought me to the study with the following assumptions about how this research might take place:

- Schools would be enthusiastic and would be interested in getting involved with a research project of this nature.
- Students would be motivated to use the RLO.
- Teachers would have basic IT skills.
- Schools would be suitably equipped to be involved with the project.
- School policy would be to encourage students to use their home PCs to advance their school work.

Some of the above assumptions were completely inaccurate while others were not entirely wrong. There are many research projects competing for participation from schools and this makes it quite difficult to even secure an appointment with the principal/teachers of a school let alone to actually persuade them to become actively involved with a research study.

Were I to carry out a similar study in the future I would approach the project in a different manner. I would develop a RLO for a subject that is traditionally more ICT aware; probably one of the Science subjects. I would also choose from a list of teachers rather than from a list of schools. Teachers that participate regularly in the Young Scientist competition could be approached to collaborate with.

One quote that will remain in my head long after this study is from one of the teachers at St. Mary’s. She told me that a parent teacher meeting one of the parents confided in her that they were “concerned about the learning” and that this had also made her more “concerned about the learning” that was taking place with the use of the RLO. It seemed to me that because working with a computer was not on the terminal Junior Certificate exam then any activity involving the computer was at risk of being called into question by both parents and teachers alike. I found this troubling as I had presumed that a core function of schools is to equip students with the necessary life
skills that enable them to live in a modern world. It would seem that in some cases the terminal assessment is what dictates what students are exposed to. This raises some concern, in extreme cases is the validity of PE and other areas that are perceived as peripheral activities and therefore not assessment driven called into question?

This research study was a positive experience and one that has allowed me the opportunity to observe how teachers try to deliver what they believe is best for their students. Over the course of this research study I learned that with adequate supports in place schools are open to exploring new approaches to teaching using the available technologies.

**Recommendations for further practice and research**

This research focussed on the design, development and observation of use of a curriculum specific RLO. Despite the attempts to integrate ICT across the curriculum of all post-primary education systems in the developed world there remains low levels of use. This is particularly evident in subjects which have not had a tradition of ICT use in the past. This research study reports on the development of quality curricular specific courseware for the teaching of poetry at Junior Certificate level in Irish post-primary schools and describes the design, development and usability testing of the courseware. The RLO was used by 12 to 14 year old students. The research raises a number of issues for the development of such tailor-made solutions and highlights opportunities for future developers.

The availability of high quality RLO development tools facilitates relatively low cost development of highly reusable curricular relevant materials. This has the potential to radically reconceptualise use of ICT across the curriculum in Irish schools,
particularly in the Humanities area, an area that has not traditionally incorporated ICT. In this study the technology was used to address a very specific issue which would not traditionally be addressed in ‘off the shelf’ commercial courseware products. Tailor made solutions, such as the one addressed in this study, puts the teacher back in the centre of the design and development of learning resources enabling more effective and responsive educational solutions, which can be modified to address different levels of abilities and different learning situations. There are of course challenges and opportunities created with this type of ICT use in English particularly in relation to the nature of pupil learning, the transferability of the skills acquired and their level of engagement with the developed product. The implications of this type of use of the technology on the informal and formal educational experiences of the learners requires further research. Research into actual classroom usage in Ireland as this is an area that needs development. Research that explores and identifies the contributing factors that can cause teachers to move from closed teacher-centred uses of RLOs to more open student-centred uses would also be useful.

Specific to this research it would be interesting to examine students’ levels of actual media literacy. This study was aware of this but didn’t explore it in great detail. It would also be of great benefit to further examine the role of RLOs in the post-primary classroom using the model that has been developed as part of this research. If the application of this model could be examined it would contribute to the existing literature on the use of ICT resources at post-primary in Ireland. Testing out the applicability of decoupled RLOs would also contribute to the growing body of research that is emerging.
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Appendix 1: Excerpt from a needs analysis interview session
Transcribed from Session June 2006, Annacotty.
Duration of meeting 1 hour 30 minutes.

The researcher had contacted the school by letter, email and by phone to set up a meeting with teachers of English. Only one teacher was able to meet with the researcher.

<table>
<thead>
<tr>
<th>Context</th>
<th>Quote</th>
<th>Code</th>
</tr>
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<tbody>
<tr>
<td>The researcher meets with the teacher in her classroom in the school.</td>
<td>“My own background is science…. I was a science teacher first”.</td>
<td>Teacher’s background.</td>
</tr>
<tr>
<td>She briefly introduces herself and her background. The teacher also</td>
<td>“I use the internet for email and sometimes shopping… I’d prefer to</td>
<td>Existing comfort level with</td>
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<tr>
<td>describes her background and how she became a teacher. The researcher</td>
<td>read the newspaper”.</td>
<td>technology</td>
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<td>then invites the teacher to describe her personal experience of</td>
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<td>using technology in all aspects of her life. The teacher has a personal</td>
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<tr>
<td>email account and uses the internet to carry out online shopping with</td>
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<td>sites like Amazon and Ryanair. She does not read the News online,</td>
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<td>instead favouring the traditional print media. After this general</td>
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<tr>
<td>discussion on technology in our daily lives the researcher shows the</td>
<td></td>
<td></td>
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<tr>
<td>teacher some examples of learning objects that she has made for other</td>
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<tr>
<td>disciplines including Humanities. The teacher looks at these and the</td>
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<tr>
<td>discussion moves on to using technology in the classroom.</td>
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<td></td>
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<tr>
<td>The teacher says that she has not used technology in the classroom.</td>
<td>“I would like to use some kind of technology with them (the class) but</td>
<td>No existing materials relevant to class</td>
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<tr>
<td></td>
<td>there’s nothing there for them. As a class they are quite weak I</td>
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<td></td>
<td>teach the support groups as you know and</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Class ability</strong></td>
<td><strong>Poetry themes as class focus</strong></td>
<td><strong>New teaching strategies and resources</strong></td>
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<td>----------------------------------------</td>
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</tbody>
</table>
| The researcher asks what she means by too much. | “A book would intimidate them. They only need a few poems so I try to have a good variety of themes in a few poems. They have everything they need there for the exam but it’s not too much. They know that what they have done is enough and they don’t worry because they can do it. All of the themes that are in the poems we cover are common exam questions so they know that they are prepared for the exam (Junior Cert)”.
| The researcher asks about the type of activities that the teacher currently uses in class. | “I’m always looking for ways to engage with them and get them to talk about the poetry. We play word games. We also talk about what’s in the news and what’s on TV. Anything to get them talking and discussing in class. It’s important that they are confident to talk in the group. They’re good to talk now but some of them can be quiet”.
| The researcher asks if the teacher currently uses any element of technology in the classroom: | “I don’t use anything at the moment. I could do though I have my own laptop for the class. We have to do all of our administration online so I always have my laptop with me in class. I don’t know what I could use with them. I’d love to be able to develop something for them that was just for them. There’s nothing really for them. The books don’t really suit the group. It would be fantastic if there was a solution using the technology just for them. I’d love to see that there for them”.
| The teacher then brought the researcher to see the computer lab that would | “This lab is great, we don’t really use it now but if we had something to use on the computers we would use it. I
be available for the students to use: can book it and the class can have access to it. That’s not a problem. We’ve two very good size labs here. I also have the computers in my own classroom. There’s four in the room aswell”.

The researcher and teacher then go through the photocopied booklet of poems that the teacher makes for her class every year. They discuss what elements of this could be included in the learning object. “It would be great if the poem could be read aloud for them. They’d like that. I explain all the new words and that would be useful too…. They find the theme difficult. They know what it is but they still find it hard to describe… some help with that would be good. ‘Base Details’ is the hardest one for them because there’s so much in it but then they have a really strong question to work with so that would definitely be one to include for them”.

The meeting concludes with the researcher confirming that she will contact the teacher when the resource is developed. How the resource could be used

<table>
<thead>
<tr>
<th>Positive reaction to involvement in project</th>
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</table>

<table>
<thead>
<tr>
<th>How the resource could be used</th>
</tr>
</thead>
</table>

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<tr>
<th>Positive reaction to involvement in project</th>
</tr>
</thead>
</table>

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Appendix 2: Excerpt from a pre-use interview session
Transcribed from Session, 25th September 2008, St. Mary’s.
Duration of meeting 30 minutes.

The researcher had contacted the school principal by letter, email and by phone to set up a meeting with teachers of English. On this first visit to the school the researcher initially met with the school principal who was very enthusiastic about the project. The school principal introduced three English teachers to the researcher in the school staff room. This is an extract from the initial interview with Teacher A (early forties).

<table>
<thead>
<tr>
<th>Context</th>
<th>Quote</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>The researcher meets with the teacher in the school staffroom. She briefly introduces herself and her background. The teacher also describes her background and how she became a teacher. The researcher then invites the teacher to describe her personal experience of using technology in all aspects of her life. The teacher describes herself as very technically challenged. She does not have a personal email account.</td>
<td>“I don’t even have an email account. I’m quite nervous about using the computer. I’ve never really used one. We have a computer at home but my husband uses it...I’d like to be able to type up some of my material for class. Some of the teachers do that here but I write everything by hand. It’s something that I really want to change this year. This is just the thing I need to get me started. Paul (ICT expert in the school) is very good to help here”,</td>
<td>Teacher’s background.</td>
</tr>
<tr>
<td>The researcher asks the teacher about the ability of her class in general.</td>
<td>“They’re a mixed ability group but they are one of the weakest I’ve taught. They’re quite weak. There are a few of them with problems. They would really like to use the computer in class. One of the other teachers here did a project on birds with them and they got the information and pictures from the internet. They really enjoyed the project and they were motivated. I just use the book really. I can lend you a copy if you’d like”.</td>
<td>Class ability</td>
</tr>
<tr>
<td>After this general discussion on technology in our daily lives the researcher shows the teacher the learning</td>
<td>The teacher says that she has not used technology in the classroom. “I haven’t used anything like that in class. It’s really colourful. I like it. How many poems are there?”</td>
<td>No existing similar materials relevant to class</td>
</tr>
</tbody>
</table>

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objects that she has created for poetry in collaboration with other secondary teachers. The teacher looks at the RLO and the discussion moves on to using technology to enhance the learning experience of today’s students.

The researcher tells her that there are six poems and a supplementary area with poetry terms.

“They are all poems that I cover anyway. They’ve already looked at ‘Base Details’ but they’d like to use this. I like the audio. Is that you? They’re the same kind of questions that I would cover with my class”.

Poetry themes as class focus

The researcher asks about the type of activities that the teacher currently uses in class.

“I get them to talk through the poem. We read it together and then we go through the theme and get them to discuss it as a class. I think that I could really use this”.

Existing teaching strategy

The teacher and researcher then discuss how she could use the learning object. The teacher asks if the researcher will be in the room while the students use it.

“It would be great to have you there. Just the extra support so nothing would go wrong.

Support

At the end of the meeting the teacher agrees to use the learning resource with her class for 5 or 6 weeks depending on how much other work the class are able to cover. The researcher will be present for all of the sessions.

“We should be able to do it for six weeks but that does bring us right up to the exams so we’ll see what the last week is like if I have do other stuff for the exams”.

Positive reaction to involvement in project
Appendix 3: Excerpt from a pre use interview session  
Transcribed from Session, 25th February 2009, Cedar Hill.  
Duration of meeting 45 minutes.

A colleague of the researcher had contacted a teacher at the school to set up a meeting. On this first visit to the school the researcher initially met with the teacher who was very enthusiastic about the project. This is an extract from the initial interview with the teacher.

<table>
<thead>
<tr>
<th>Context</th>
<th>Quote</th>
<th>Code</th>
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<tbody>
<tr>
<td>The researcher meets with the teacher at the reception. The teacher is very friendly and invites the researcher to the school library as it is a quieter place to talk. The library is unlike any school library that the researcher has visited. It is a very well furnished comfortable room. There are plenty of well organised book shelves and plenty of quiet study space. At the end of the room there are four computers. The researcher briefly introduces herself and her background. The teacher also describes his background and how he became a teacher. The researcher then invites the teacher to describe his personal experience of using technology in all aspects of his life. The teacher says that he has a personal email address.</td>
<td>“I use the internet but that’s about it.. I have an email account and I book flights but that’s really it”.</td>
<td>Teacher’s background.</td>
</tr>
<tr>
<td>The teacher says that he has not used technology (computers) in the classroom.</td>
<td>“I haven’t used technology apart from the TV/Video like in class”.</td>
<td>Existing use of technology in classroom</td>
</tr>
<tr>
<td>After this general discussion on technology in our daily lives the researcher shows the teacher the learning</td>
<td>“I really like it. The girls would like to use it I’m sure”</td>
<td>Positive reaction to involvement in project</td>
</tr>
</tbody>
</table>
objects that she has created for poetry in collaboration with other secondary teachers. The teacher looks at the RLO and the discussion moves on to using technology to enhance the learning experience of today’s students.

<table>
<thead>
<tr>
<th>The researcher asks the teacher about the ability of his class in general.</th>
<th>“The group that would be involved are a mixed ability group of 2nd years. Some of them are quite strong. I teach 1st year as well but I think the 2nd years will get more out of it”.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The researcher asks about the type of activities that the teacher currently uses in class.</td>
<td>“We discuss the poetry. They like to talk it through and then work on it individually”.</td>
</tr>
<tr>
<td>The teacher and researcher talk about the practicalities of using the resource; how the resource could best be used with this class. Unlike the other schools the group at Cedar Hill will be using the VLE to access the resource. The researcher gives the teacher a quick demo of the VLE (Sakai) and the teacher has no problems.</td>
<td>“That seems very straightforward”.</td>
</tr>
<tr>
<td>The teacher says that he will set up one email address and this one login will be used by everyone. The students can then sign their name to their comments if they wish. The researcher and teacher set up the email together and the profile is added to the VLE site.</td>
<td>How the resource could be used</td>
</tr>
<tr>
<td>At the end of the meeting the teacher agrees to use</td>
<td>“I’ll talk to them about the project first but they are an enthusiastic</td>
</tr>
</tbody>
</table>

New teaching strategies and resources
Support

Class ability

Poetry themes as class focus

Positive reaction to involvement in project

How the resource could be used

New teaching strategies and resources

Student needs
the learning resource with his class for 6 weeks. They’d like to use the computer in class. I’m sure that they will enjoy this. They have a student teacher on Friday afternoons and she will use the computer with them”.

It is agreed that the researcher will not be physically present for any of the sessions but will be “present” online if needed.

<table>
<thead>
<tr>
<th>Positive reaction to involvement in project</th>
<th>How the resource could be used</th>
<th>Positive reaction to involvement in project</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Positive reaction to involvement in project</th>
<th>How the resource could be used</th>
<th>Positive reaction to involvement in project</th>
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</table>
Appendix 4: Excerpt from a post use interview session
Transcribed from Session, 2nd June 2009, Cedar Hill.
Duration of meeting 25 minutes.

<table>
<thead>
<tr>
<th>Context</th>
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<tbody>
<tr>
<td>The researcher meets with the teacher after his class have used the resource. They meet in the school library and briefly discuss the experience. The teacher says that the students enjoyed the experience and that none of the students had any problems.</td>
<td>“The class enjoyed using the computer. They said that they liked using the computer for a change”. “No one had any difficulty using it. The student teacher got on fine with them. They’d like to use it again”.</td>
<td>Positive reaction to involvement in project</td>
</tr>
<tr>
<td>The researcher asked the teacher how he felt his class had engaged with the VLE:</td>
<td>“They like using the VLE. I think that because they knew it was the same one that students at UL use they enjoyed it more and of course they’re already used to using Bebo… that kind of online space. They were good to discuss the questions in much the same way that they would do in class. I was very happy with the whole thing”.</td>
<td>New teaching strategies and resources</td>
</tr>
<tr>
<td>The researcher asked the teacher if he would use the resource again:</td>
<td>“I would use it again but over a longer period… so maybe I’d use it once a month or once every fortnight and have some more class activity then built into it. We used it quite intensively this time over the few weeks. If we used it over a longer time I think we might get even more out of it”.</td>
<td>Intended repeat use</td>
</tr>
<tr>
<td>The researcher asks what kind of activities the researcher might use:</td>
<td>“I think I’d have some more writing exercises in class that would work with the material that’s in the resource”.</td>
<td>How the resource could be used</td>
</tr>
<tr>
<td>The teacher thanked the researcher for including the class in the research and said that he found the experience beneficial for his class.</td>
<td></td>
<td>Positive reaction to involvement in project</td>
</tr>
</tbody>
</table>
Appendix 5: Samples of student PowerPoint projects

Hi, attached is my Powerpoint Presentation on Julie O’Callaghan.
From: Leanne Ahern, Victoire 2, Laurel Hill Secondary School, South Circular Road, Limerick.

JULIE O’CALLAGHAN

Her Life
- Julie O’Callaghan was born in Chicago in 1954
- She wrote many books and poems such as What’s What, whispers and tell me this is normal
- She won numerous of prizes such as the Michael Hartnett, Poetry Prize

BABYSITTING
- This poem shows a different side to babysitting
- The girl in the poem hasn’t given an answer yet
- The parents offer her “double pay or offer midnight and she can call anyone around the world she wants”
- This poem shows the limits people will go to just to get a night out

BYE
- This poem shows a different way to say good-bye
- Julie O’Callaghan’s way is to “Twiddle your fingers” “It is more civilised than sobbing or hysterics”

Places, everyone
- This poem starts with a real, boring office job, but then goes into a fantasy, dream job, by the end of the poem it returns to the boring office “sentence”
- The employee describes his job as a “40 years sentence”. This shows the hatred the employee has for his job to refer to it as a jail sentence.
This is my power point project on my favourite poet Julie O'Callaghan.

Kate O'Brien Mc Closkey
Victoire 2

Julie O'Callaghan

Poetry project
Kate O'Brien Mc Closkey
Victoire 2 Laurel Hill

Julie's life

- Julie O'Callaghan is a modern Irish American poet.
- She was born in the 1950s in the United States.
- In 1974 she moved to Ireland.
- Her poetry is aimed at both adults and children.

Bye

- This poem is about waving goodbye and how hard it is.
- Julie has a poem called 'Bye'.
- She says: 'It is more civilised than sobbing or hysterics'.
- It is much easier to twiddle your finger

'Babysitting'

- This poem is about someone being asked to babysit kids.
- The people try to persuade the babysitter by telling her that she can phone anyone in the world.
- The babysitter tells the parents that she will think about it.

My favourite poem

- My favourite poem is 'bye'.
- I liked this poem because I can relate to it as I know how hard it is to say goodbye to someone.
- My favourite line: 'That's why we invented the hand-flap and the eye-to-tip-read 'Bye'

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Appendix 6 Discipline in the Computer Lab

From WikEd
http://wik.ed.uiuc.edu/index.php/Discipline_in_the_Computer_Lab

Descriptions and Definitions

Discipline in the computer lab is divided into numerous issues: equipment, Internet usage, accessing files, and basic classroom behavior. Just as in a regular classroom, discipline varies between technology coordinators, however there are some basic rules which may help all educators organize and manage not only technology but the classroom itself. Since technology is still a new frontier in many aspects, we are constantly learning how it can be successfully integrated into the classroom and how it benefits the children. Also, since the Internet is the last non-regulated frontier, we as teachers must work hard to instill rules for the children, so that their technology experience is not only a pleasurable one but an educationally successful one.

Software and Hardware programs are available to help teachers maintain student discipline in the classroom as well. Much of it is expensive and difficult to implement, so it remains used in only a small number of schools.

The Equipment

The equipment in the computer lab probably makes that room the most expensive in the school. Special guidelines must be set to ensure that the machines are not damaged and used to their full potential. Here are some examples of computer lab discipline dealing with the equipment:

1. No food or drink allowed in the lab.
2. Assign the children seats for the year.
3. Students are to only touch their assigned computer.
4. Children are not allowed to touch the wiring.
5. Children will be reprimanded for banging on the keyboards or other pieces of equipment.
6. Remind the children that touching the monitor leaves oily fingerprints.
7. Attach plastic hooks to monitors to hang headphones on when they're not being used.
8. Students must ask permission to print, or for younger students, the teacher does all the printing.
9. Backpacks are not allowed in the lab or they must be left in a designated area upon entering the lab.
10. Use headphones without sponges to decrease the spreading of lice or for older students who use the lab ask them to bring their own set of headphones.

11. Do not personalize the computers, for example: installing screen savers, changing the desktop background, or changing the video and audio settings.

12. If a problem is encountered always ask the teacher for help never attempt to "fix" it yourself.

13. If you see another student disobeying the rules notify the teacher right away.

**Internet Usage**

While students are using the Internet, unsolicited communications, undesired websites and unnecessary surfing (i.e. wasting time) are the difficulties which must be addressed before students enter a computer lab. If they are not addressed they can manifest into discipline problems. One of the most common precursors to computer lab usage is an Acceptable Use Policy (AUP). An AUP contract states what is expected from the children when they are using the computer and if those expectations are not followed disciplinary action is taken. This a prime example of a rules and consequences discipline in action. While an AUP is a general discipline contract it usually focuses strongly on the dangers which can occur while using the Internet and steps if they do occur. Here is the Acceptable Use Policy that is used at St. John Fisher School in Chicago, IL. It is important too, that the parents of the children read and sign the AUP. This helps the parents to understand the dangers of improper usage, exposure to unnecessary content, but most importantly helps the parents know that acceptable use is as important to the school as it is to the parents.

Even before the children sign an AUP, the technology coordinator should have installed a firewall. Wikipedia describes a firewall as "a piece of hardware or software which functions in a networked environment to prevent some communications forbidden by the security policy". To further explore Wikipedia description you can check out the website. Just like anything else, firewalls are not perfect. Most firewalls are based on word filtering, so if an undesired word is found on a website by the firewall, children cannot access this site. However if the word is spelled just slightly differently then the firewall does not pick it up. This the same with images. The firewall may not block an image if an aspect of the picture is covered. Yet that does not mean that it is an image we want the students to see. Also some internet creators try to lure users to their site by changing the extension.

The Center for Innovation in Engineering and Science Education offers some excellent links to other acceptable use policies, companies offering firewalls and wonderful tips about safety for parents and teachers.

**Accessing Files**

The topic of accessing other student files varies based on the level of the students and the network in the lab. Colleges and universities have unique difficulties such as sharing files (such as music and movies), stealing other student files and the transferring of viruses through files. Many universities, such as the University of
Illinois try to thwart these problems by instilling strict guidelines when it comes to passwords. By enforcing strong password rules such as using a certain number of letters, alternating with numbers and using capitalization hinders the ability for hackers to access other student files. At the elementary school level, many schools are just now discovering file tampering as more and more schools discover the joys and headaches of being networked. As with every other aspect of technology, the most important form of defense is teacher observation. Discussion of deleting other students' work, stealing other students' work or even opening files that do not belong to the student should be major topics in the AUP policy. In addition, active monitoring by the teacher should also occur. Software to aide the teacher in her observation is also available. Microsoft's Small Business Server, for example, allows the administrator to backup files automatically. This allows the administrator to "turn back the clock" if a document suddenly "disappears". The software also allows the teacher to watch a machine remotely as a student works and can perform a "google type" search within the school population to look for inappropriate behavior. Apple offers a similar program called Apple Remote Desktop which works in a similar way allowing teachers to observe, control and distribute files, and even take control of the student's computer.

**Basic Classroom Behavior**

Besides the new discipline rules that come to surface, we also make sure that the children are respectful and kind. Here are some general classroom rules which are important should be followed in the computer lab.

**For younger students:**

We raise our hand to speak.

We are kind and respect each other.

We keep hands, feet and objects to ourselves.

We share.

We walk in the classroom and halls.

We keep our room neat and clean.

We listen when our teacher or classmate is speaking.

We follow directions.

**For older students:**

I will always do my best.

I will positively participate in all classroom activities.

I will stay on task without disturbing or distracting others.
I will not use ‘put downs’ or harass others.

I will respect other people’s differences and opinions.

I will raise my hand to speak.

I will enter and exit the room quietly.

I will complete all assignments on time.

I will actively listen when the teacher is speaking.

Evidence of effectiveness

Signed "life experiences", testimonies and stories

Using technology can be a difficult thing. You are usually out of your classroom in a computer lab and this takes the students out of their element. This opens the teacher up to a lot of different classroom management problems. One way to combat this is to give the students assignments that are interesting and fun. This gets them to focus on the task at hand. Another way to keep problems to a minimum is to have a program like NetTrakker ID that allows students to only get onto approved sites. This keeps the teacher at ease when it comes to students "accidentally" getting on inappropriate sites. Another thing that helps is to have the students have a seating chart. One more tip with keeping a computer lab running smoothly is to model the activity for the student. If a student is confused they will ask their neighbor or constantly ask questions. B. Moore

I just finished my first year of teaching and after my first trip to the Computer Lab, I never wanted to go again. I felt like I was running around like a chicken with my head cut off trying to help each student. After this initial trip, I did have to make some special rules such as sitting boy/girl/boy/girl, no getting up, raise your hand AND WAIT if you need help, ect. Eventually it got better, but I will never forget that first time. Now, I have two room mothers come in to help at our regular computer lab time. I find that three bodies are better than one while students are waiting to solve "technological" programs. Sometimes, they still have to wait a bit, but I suppose I could always relate that to a self-lesson in the importance of patience. --Annie Craig, 2nd Grade Teacher

I enjoy working in the computer lab every day. Students really embrace technology and want to take part in it. Discipline is held differently than in a traditional classroom. I don't have as many dicipline problems as I would in a traditional classroom because the kids seem more focused on what they are working on, and many students enjoy working on the computer. It can sometimes get a little crazy when students ask so many questions but at the same end, at least they are interested. Students are monitored using VISION software, which reduces the amount of students checking email and looking at other websites they shouldn't be during classtime.C.McCulley
I couldn't agree more with Pat Reed below. Our school also operates with a firewall and acceptable use policy. Many times the computer lab is used by students without teacher supervision. This then falls to the librarian, who does not know the assignment and can only keep the students behavior at an appropriate level. Whomever is in charge of the computers should know the complete assignment. I love the idea of offering feedback and input suggestions to improve the project. This is a much better solution than 'game playing' or 'free surfing'. Thanks for the many suggestions. M. Youngblood

The firewall and the acceptable use policy are the backbone of maintaining positive behaviors in the computer lab. However, the success or failure of a teacher in making the use of technology to enrich the learning experience for students without problem behavior is highly dependent on the teacher's strategies. Lab experiences MUST be academically oriented and clearly defined to the students. Technology can be used well or abused. My experience is that problems occur when students don't have enough work to do. The technology project must tie into the curriculum and affect the students' grades. Opportunities must exist to enrich the project for those students who finish early. Allowing "game playing" or "free surfing" when a project is completed seems to wreak havoc in the lab. Also, the teacher must continually circulate the lab, ensuring that all students are on task. The best projects I've seen have been when the teacher is excited about the topic and the students' work in progress, continually offering input and suggestions. The students are engaged when the goal is not merely to finish the project, but to make the project awesome. Cooperative learning can be very effective, or it can backfire. Some structure is needed to ensure that all students are contributing members of the group, whether it be peer grading or other means. Pat Reed

In my Instructional Technology course I use wireless laptops in a regular classroom. I teach at a university so the "discipline" is somewhat different than working with younger students. Three important issues have come up with classroom management in my class.

1. It is very tempting for students to check email while explanations are being given or content is being discussed. To remedy this situation, I ask students to "close the lids" on the laptop so that they are not distracted and I know I have the attention of the students. When it is time for the application, they can open the lids back up.

2. Learning Microsoft Excel, as well as other applications, is very difficult to do on a laptop without a mouse. This is especially true for my students because most are being exposed to Excel for the first time. When the College of Education purchased mice for the laptops a whole new issue developed. Students were not being delicate with the mice and many prongs were bending, and several mice were useless. To solve this problem, I came up with the catch phrase "Be Nice to the Mice." The first few weeks of class I would have the entire class repeat the phrase and would demonstrate the proper way to insert the mouse into the port. This has helped greatly.

3. A third issue developed when it was time to put the laptops away in the cart. Thirty laptops with their cords is a nightmare unless done properly. I decided to assign two "computer assistants" for each night of class and required the
assistants to be responsible for the laptops being put away properly. They also check to make sure each one is plugged in to re-charge.

These three techniques have saved a lot of time and elevated the need for discipline in the class. My goals is to model these techniques to my students so they will be able to use them in the classes they will eventually teach.--Benish 08:04, 1 May 2005 (CDT)

-We have one computer lab in our school for 1400 students. Getting in is only one of the issues. The computer lab technician is also responsible for all the teachers, staff, and administrators computers. She also is responsible for the library computers as well. As a result of her varied responsibilities, she is not always in the computer lab when classes are in the lab. It is the responsibility of the classroom teacher to provide discipline in the lab. For my students, I usually have a specific purpose and a specific list of web sites for their use. I inform them, before we even go to the lab, that if anyone is on any site that is not one of the listed sites, they will be removed from the lab, receive a zero on the assignment, and they will loose all future privilege of lab use while in my class. I have never had to enforce these consequences because the students know I will enforce them. C. Watson

Computer lab behavior must remain appropriate. It must be stated that the computer lab is a classroom and conduct should remain as such. Penalties for misbehavior are heavy at our district. A form is given to parents when they register for classes that is signed and filed at the high school office. Parents understand the consequences, but only a few admonish their children to keep the rules. Far too many students have lost computer lab privileges and must complete computer-type work either at home or at the local city library. Ah, the young and impetuous - will they ever learn? M. Uhls

Honestly, my rules for using the computer lab are no different than those I have in the classroom. Students know that accessing non-acceptable sites is one of those rules, do it once and you get a zero for the assignment and sit in the corner. Do it a second time, with any teacher, and you are out of the lab for the rest of the school year. Not hard to deal with kids who think they are funny, these are the rules - deal with it. DH Heater

I agree with the statement above when they say that their classroom rules are the same as their lab rules. I also add other rules to keep the computer in as good of running shape as possible since it is our only lab. We rarely have any problems with students visiting inappropriate websites since our firewall does an excellent job of preventing this. Our biggest problem in our school is kids trying to play solitaire when they are practicing typing, but when they get a zero for doing it, it really cuts down on the number of times this happens. As more and more teachers become more comfortable using the internet in their daily classroom activities, I can see where this can become more of a problem, but in our school, I can honestly say that we have very few instances with discipline in the computer lab. -N. Hartz

My rules in the computer lab are very similar if not the same as my classroom rules. My students understand that they will be constantly watched, they sign in using their personal name and password, and have an AUP signed and on file in the office. Anything that occurs to the computer while they are on it is their responsibility. TThis
seems to help keep the computer lab a safe, fun, effective place for my students to work and learn. L. Gowler

As the "Tech guy" at my school, I have to say that the most concerning discipline issue for me is the improper use of the Internet. I am constantly worried about students deliberately or inadvertently pulling up an image that is inappropriate. Of course, other rules are necessary as well, as has been mentioned. Tip- to control the headphones/lice issue, put each pair of headphones in a ziploc bag. The ziploc, when sealed, will kill lice within 24-48 hours. -S. Yunker

One of the problems with computer lab discipline in my school has been consistancy. Whether it is teacher ignorance, or lack of motivation to correct those that are in the wrong, the students get a mixed-bag of responses to poor behavior. Often times I believe that some of the teachers just do not know enough about the computers and/or the internet to notice when things are being misused. In other cases I believe some teachers just turn the other way to avoid the confrontation with the student. When students are confronted, they either wait until the teacher turns their back to continue their game or whatever. -R. Beane

Each teacher brings his/her own class to the computer lab. This leads to many problems in use of the lab. I constantly monitor what my students are doing in the lab, and if they are not following directions, they are immediately taken off of the computer. Some day when I bring my class in, the backgrounds are changed, the settings are changed, and many other problems. School wide expectations are in place, but many teachers simply do not have the training to use the lab appropriately. In the lab, like in the classroom, teachers need to have eyes in the back of their head, but they also need training on how to use the lab. E. Kilroy

The school I work at had some issues with our computer labs. Students were messing with the wires, stealing computer parts (mouse, keyboard, etc…) and leaving garbage everywhere. To address this, the technology committee decided to make every teacher and every student accountable for their actions. When a teacher signs out the computer lab they are required to have a seating chart. The students are required to initial the seating chart to confirm that their computer work station is in good working order. The initialed seating chart is collected by our tech person. He reviews them daily and is able to pinpoint computer misuse to the period, the teacher and the student. This has done wonders for our computer labs. So far this year we have only had one mouse taken compared to the dozens lost in the past!!!! Great success! ~V. Amen

Our school had a set of notebook computers that could be checked out and used in the classroom. These computers were soon destroyed in the classroom of one junior high teacher because of a lack of discipline. It is surprising how kids can tear up property without a second thought about the expense. M. Flessner

In my building each grade level 3rd-6th has a laptop computer cart for students use. I spend weeks at the beginning of the year giving all students computer use tutorials. Part of this instruction includes proper use and care of all technology. Students are assigned a numbered laptop and they share this computer with other kids in that level. If a computer is damaged, we know which student to approach about the issue. I have found that students are very respectful of the computers and there is minimal damage
to the machines. Parents and students have to sign an acceptable use policy before the beginning of the year and internet sites are filtered in the district which makes it very hard for students to find inappropriate websites. S. Nottoli

When I was a student I remember there being very few rules in the computer lab and very few restrictions on the websites accessed, as it was the early days of the internet. I remember having to turn our "mice" up-side-down as we left the lab so they could do a quick scan to make sure no one took the trackballs. Aside from that we had to have our IDs above our monitors to show we were approved to use the computers. Now, in the elementary school that I teach in, students have to sign agreements with acceptable use of the computer and its software. It is important to hold students accountable because everyday there is one student or another misusing the expensive equipment or trying to visit inappropriate sites. E. Bostrom

**References and other links of interest**

[Parents and Classroom Discipline](#)

[Rules for Classroom Discipline](#)
Appendix 7 List of Websites

http://www.bbc.co.uk/schools/
http://www.becta.org
http://www.education.ie
http://www.education.gov.uk/schools
http://english.slss.ie
http://www.ncca.ie
http://www.ncate.org
http://www.ncte.ie
http://www.ndlr.ie
http://oeo.w.mit.edu
http://www.oecd.org
http://www.projectmaths.ie
http://www.scoilnet.ie
http://sirkenrobinson.com/skr/
https://sulis.ul.ie
http://www.teachnet.ie/SitePages/Home.aspx
http://www.ted.com/talks
http://wikiwijsinhetonderwijs.nl/over-wikiwijs/english/
https://youtube.com
Appendix 8 Thesis related papers and publications

Marcus-Quinn A., (2009). Knowing the Audience and their Cultural Preferences: An Examination of a German and an English Language News-Magazine. VDM Verlag Germany


Conference Presentations:
McGarr, O and Marcus-Quinn, A., EDUCA 03-Dec-2008 05-Dec-2008 Berlin


Geraghty, B. Marcus-Quinn, A. EUROCALL 07-Sep-2006 Granada, Spain
**Title of Research Project**
Using Multimedia Poetry Learning Resources To Develop Critical Thinking Skills At Second Level.

**Period for which approval is sought**
March-June 2009

**Project Investigators**

**3a Principal Investigator**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dr. Oliver McGarr</th>
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<tr>
<td>Department</td>
<td>Education</td>
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<tr>
<td>Position</td>
<td>Lecturer</td>
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<tr>
<td>Qualifications</td>
<td>PhD</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>2934</td>
</tr>
<tr>
<td>e-mail address</td>
<td><a href="mailto:Oliver.McGarr@ul.ie">Oliver.McGarr@ul.ie</a></td>
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**3b Other Investigators**

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualifications &amp; Affiliation</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Ann Marcus-Quinn</td>
<td>MA (University of Limerick)</td>
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**Head of Department(s)**

I have read through this application and am aware of the possible risks to subjects involved in this study. I hereby authorise the Principal Investigator named above to conduct this research project.

<table>
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<tr>
<th>Name</th>
<th>Department</th>
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<th>Signature</th>
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<tbody>
<tr>
<td>Tom Geary</td>
<td>Education</td>
<td>25/07/09</td>
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5 Study Descriptors

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<th>Please indicate the terms that apply to this research project</th>
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<tr>
<td>Healthy Adults ☐</td>
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<tr>
<td>Patient Adults ☐</td>
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<tr>
<td>'Potentially Vulnerable' Adults ☐</td>
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<tr>
<td>Physical Activity ☐</td>
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<tr>
<td>Medical Devices / Drugs ☐</td>
</tr>
<tr>
<td>Food/Drink Supplementation ☐</td>
</tr>
<tr>
<td>Measure Physical in Nature ☐</td>
</tr>
<tr>
<td>Body Tissue Samples ☐</td>
</tr>
<tr>
<td>Body Fluids Samples (e.g. blood) ☐</td>
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6 Project Design

6a Justification for Research Project (Include reference to published work)

The interest in ICT in education has seen a steady increase in the levels of ICT resources in Irish post-primary schools in recent years (Shiel & O’Flaherty, 2006). However, while resources have increased, the use of the technology has remained generally confined to a narrow range of vocational subjects. These subjects, including Business Studies and Technology, having had an ICT element since the late 1980s dominate ICT use. The challenge ahead is to explore ways in which ICT can be used across the wider curriculum. Over a decade ago the Irish government introduced a national initiative to integrate ICT across the curriculum (Schools IT2000) yet despite the considerable investment, its use within traditional core subjects such as English and Maths has been limited. There are several reasons for this limited use and most of the reasons identified appear to mirror international trends. Factors such as the limited availability of suitable content, appropriateness of software and its curricular coherence are among the reasons cited in numerous evaluations of ICT use in recent years.

In general, there appears to be a lack of understanding in schools as to what ICT should achieve as part of these traditional classes (McGarr & O’Brien, 2007; Mulkeen, 2002; O’Doherty, Gleeson, Moody, Johnston, Kiely, & McGarr, 2000). The report on the impact of the national ICT in education initiative (Schools IT 2000) highlighted that ICT use was particularly low in Humanities. Across all schools in Europe a higher proportion of teachers of Humanities tended never to use the Internet for teaching compared to teachers of other subjects. Selwyn (2000) asserts that, “When the existing (subject) culture is pupil-centred, the introduction of ICT into subject teaching is likely to be seen as less problematic, whereas in subjects with a more teacher-centre culture ICT might be seen as a threat to traditional classroom processes of teaching and learning” (p.42). In Ireland the pedagogies employed in the teaching of English tend to have a strong focus on pupil participation and, despite Selwyn’s assertion, it is understandable within this context that the integration of ICT, if perceived as a threat to this type of pedagogy, may not be adopted by teachers.

However, the technological advancements that have been made in both society and education will inevitably be integrated as part of the pupils experience. There is a general shift in pedagogy towards more independence in learning combined with the technology to facilitate such learning. Language learners can benefit enormously from the advancements. If ICT is integrated into the classroom in a meaningful manner it could make a huge difference to the learning experience of students.
6b Hypotheses or questions to be answered
This research project aims to examine the learning process of students in first year of second level. The primary aim of this research is to examine if there is evidence to show that using multimedia software to teach a greater appreciation of poetry could also be used as a vehicle for developing language skills (functional literacy) and critical thinking.

6c Plan of Investigation
This study will explore the use of interactive multimedia presentations of poetry. The research is based on the premise that if students can be encouraged to critically appraise poems on a range of subjects the skills acquired may be transferable to other contexts, in particular their abilities to critically analyse web-based media.

The participants will be provided with the poetry courseware. This is a piece of courseware developed in Flash. The courseware contains six multimedia poems which are on the Junior certificate English curriculum. In addition to the primary poetry text there is also supplementary material such as video footage and audio clips relating to the various poetry themes. The participants will work independently on each of the poems answering typical questions dealing with the poetry. It is hoped that the motivational nature of the ICT resource will encourage a deeper level of interaction with the text.

Some participants will use the courseware in the classroom. They will work independently but will be observed. Some participants will work completely autonomously either at home or at school (after hours). The responses to the questions will be recorded, catalogued and analysed.

Participants will also be asked to voluntarily create a visual representation of a poem. This project will be created in powerpoint and should include text, images and possibly audio. In creating this resource participants will display transferable skills which they can apply to other subjects on the Junior Certificate course.

6d Research procedures
Classroom observation of students
Interviews with students and where appropriate with teachers
Questionnaire
Focus Groups

6e Associated risks to subjects
None

6g Statistical approach to be used and source of any statistical advice
QSR N6, MS Excel and Survey Monkey
6h Location(s) of Project
Our Lady's Secondary School Templemore, Co Tipperary
Castletroy College, Castletroy, Limerick
Laurel Hill, South Circular Road, Limerick.
University of Limerick

7 Subjects

7a How will potential research participants be sourced and identified?
Contact will be made with individual teachers in a number of secondary schools in the
Limerick area. Through this contact student participants will be recruited for the research.

7b Will research participants be recruited via advertisement (poster, e-mail, letter)?

YES ☒ NO

If YES, please provide details below, or attach the recruitment advertisement if written.

7c How many subjects will be recruited?

Male 60 60 Female

Provide further information if necessary

7d What are the principal inclusion criteria? (Please justify)
This research will examine the learning process of students in first and second year of
second level education. The participants must therefore be studying English for the Junior
Certificate.
As the resources for this project will be delivered online students must also have access to a
PC outside of school hours (either at school or at home).

7e What are the principal exclusion criteria? (Please justify)
Students would already have completed the Junior Certificate course.
7f  What is the expected duration of participation for each subject?
   6-8 weeks

7g  What is the potential for pain, discomfort, embarrassment, changes to lifestyle for the research participants?
   NA

7h  What arrangements have been made for subjects who might not adequately understand verbal explanations or written information in English?
   NA

7i  Will subjects receive any payments or incentives, or reimbursement of expenses for taking part in this research project?

   YES ☐ ☒ NO

   If YES, please provide details below, and indicate source of funding:

8  Confidentiality of collected data

8a  What measures will be put in place to ensure confidentiality of collected data?
   All material will be held in the strictest of confidence.

8b  Where will it be stored?
   University of Limerick

8c  Who will have custody and access to the data?
8d Data to be stored for 7-10 years after publication (Please provide details of storage of data during this period)

9 Drugs or Medical Devices

Are Drugs or Medical Devices to be used?

YES ☐ ☒ NO

If YES please complete 9a to 9c

9a Details of the Drugs or Devices (including name, strength, dosage, route of administration)

NA

9b Details of Clinical Trial Certificate, Exemption Certificate or Product Licence (The Product Licence must cover the proposed use in the Project – see Guidelines No. 11)

NA

9c Details of any Risks (Both to subjects and staff; indicate current experience with the drug or device)

NA

10 Professional Indemnity

Does this application conform to the University’s professional indemnity policy?

YES ☒ ☐ NO

If NO please indicate the professional indemnity arrangements in place for this application (attach policy if necessary):
11 Information Documents

Please note: failure to provide the necessary documentation will delay the consideration of the application. Please complete the checklist below:

<table>
<thead>
<tr>
<th>Documents</th>
<th>Included?</th>
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<tbody>
<tr>
<td>Subject Information Sheet</td>
<td>YES ☒ ☐ N/A</td>
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<tr>
<td>Parent/Carer Information Sheet</td>
<td>YES ☒ ☐ N/A</td>
</tr>
<tr>
<td>Subject Informed Consent Form</td>
<td>YES ☒ ☐ N/A</td>
</tr>
<tr>
<td>Parent/Carer Informed Consent Form</td>
<td>YES ☒ ☐ N/A</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>YES ☒ ☐ N/A</td>
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<tr>
<td>Interview/Survey Questions</td>
<td>YES ☒ ☐ N/A</td>
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<tr>
<td>Recruitment Letters/Advertisement/e-mails, etc</td>
<td>YES ☒ ☐ N/A</td>
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<tr>
<td>Risk Assessment Form(s)</td>
<td>YES ☒ ☐ N/A</td>
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<tr>
<td>Acceptance of UL Child Protection Form</td>
<td>YES ☒ ☐ N/A</td>
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Please ensure any additional documents are included with this application. These should be attached as a single document and included in the e-mail submission.

12 Declaration

The information in this application form is accurate to the best of my knowledge and belief, and I take full responsibility for it.

I undertake to abide by the ethical principles outlined in the UL Research Ethics Committee guidelines.

If the research project is approved, I undertake to adhere to the study protocol without unagreed deviation, and to comply with any conditions sent out in the letter sent by the UL Research Ethics Committee notifying me of this.

I undertake to inform the UL Research Ethics Committee of any changes in the protocol, and to submit a Report Form upon completion of the research project.

<table>
<thead>
<tr>
<th>Name of Principal Investigator</th>
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<td>[Signature]</td>
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<th>Signature of Principal Investigator (or Head of Department*)</th>
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Date 25/5/09

*Please note: where the Principal Investigator is not a permanent employee of the University of Limerick, the relevant Head of Department should sign this declaration.*

1. Once completed, this form along with a single document containing and additional documentation should be submitted **electronically** to the Vice President Academic and Registrar's Office at Anne.O'Dwyer@ul.ie

2. In addition, **10 copies** of the fully signed application and any attachments should be submitted to:
   The Secretary,
   University of Limerick Research Ethics Committee,
   Graduate School,
   University of Limerick
Specifically, the following five research questions are to be addressed in the Focus Groups:

1. How do secondary school teachers use Digital Learning Objects?
2. What are middle and secondary school teachers' perceptions of Digital Learning Objects with respect to learning value, usability, and engagement?
3. How do secondary teachers' perspectives of learning, usability, and engagement compare with students' perceptions of the same three constructs?
4. How do secondary teachers' perspectives of learning, usability, and engagement correlate with student learning performance?
5. What challenges do secondary school teachers experience when using Digital Learning Objects?
University of Limerick
Letter of Informed Consent

<Date>

In signing this consent form, I agree to participate in the study conducted by Ann Marcus-Quinn from the University of Limerick.

The test will involve accessing a multimedia poetry resource, carrying out tasks associated with it and responding to questions online.

I understand that the study may take about 6 hours and that there will be a record kept of my responses to the poetry software. These responses may be used in the final report.

I understand that both my name and responses will be treated in the strictest of confidence and will not be used for anything other than in connection with this research study.

I understand that my participation is entirely voluntary and that I may withdraw my permission to participate without explanation at any point up to and during the test, and I may withdraw permission for the researcher to use my data after the test.

I may also, upon request, obtain a copy of the resulting report in full.

Researcher Signature_____________________________________

Participant Signature_____________________________________

If you have questions about this study, please contact Dr. Oliver McGarr at Oliver.McGarr@ul.ie, or by telephone at 061-202466.
Background and Use to date

1. Age

2. Gender?

3. Do you like English as a subject? Please rate from 1-7. 1 (your favourite subject) 7 (your least favourite subject)

   1.0 2.0 3.0 4.0 5.0 6.0 7.0

4. What is your favourite subject?

5. What do you think is the most important part of the English course?

6. Do you have your own computer at home or do you use a family computer?

7. How do you use your computer at home?

8. What websites do you access? What games do you play?

9. Have you ever used a computer to help you learn a subject before?

10. If you answered yes then how did you use the computer?
Questions available in Discussion forum on Sulis.

Questions for "Base Details"
1. What is the main theme of this poem?
2. What is your favourite image in this poem? Why?
3. What is your favourite line? Why?
4. Can you write a summary of this poem in three short sentences?
5. What do you like or dislike about this resource?

Questions for "The lake Isle of Inisfree"
1. What is the main theme of this poem?
2. What is your favourite image in this poem?
3. What is your favourite line? Why?
4. Can you write a summary of this poem in three short sentences?
5. What do you like or dislike about this resource?

Questions for Seamus Heaney's "Midterm Break".
1. Where was the boy when his brother died?
2. How do you think the boy felt as the men came up to shake his hand?
3. What differences are there in the mother's and the father's reactions?
4. What did you like best about using this resource for this week's poetry lesson?
5. What did you learn about the poet (if anything)?
6. What was your favourite line of the poem? Why?

Questions for "But You Didn't".
1. What did the poet do that might have annoyed her boyfriend?
2. What kind of relationship do you think the couple had?
3. How would you describe the tone of the poem?
4. How do you think the poet felt when her boyfriend didn't return from Vietnam?
5. Can you write a summary of this poem in three short sentences?

Questions for "Sonnet 130"
How does this poem compare with other love poems that you have covered?
2. What kind of relationship do you think the couple had?
3. How would you describe the tone of the poem?
4. How would you react if someone wrote a poem like this for you?
5. Can you write a summary of this poem in three short sentences?
6. What do you like or dislike about this resource?

Questions for "Not Waving but Drowning".
1. What advice would you give to someone who feels like the man in the poem?
2. The poet tells us that the man "always loved larking". Why did he love to "lark" do you think?
3. What do you think the phrase "not waving but drowning" means?
4. How many "voices" or speakers are there in the poem?
5. What do you think this poem is about?
6. What is your favourite line from the poem and why?

Concluding Questions:
**How was this experience different from your normal poetry lesson??**
**What did you like most about using these multimedia resources??**
**Please write a short paragraph about your experience of using this online learning environment**