An investigation into the barriers associated with ICT use in the Youthreach classroom.

A Case Study of a Centre for Education in the North West.

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MA (Digital Media Development for Education)
University of Limerick
2010
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Supervisor: Noeleen Leahy
Submitted to the University of Limerick
October 2010
Declaration

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

Signed: ________________________________

Date: ____________________ 10/10/10

Student ID: ___________ 0717371
Abstract

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ICT has impacted, to some degree, on almost every facet of our lives. Children today grow up with an array of technology, both at home and at school. Educators and governments have devoted huge resources to the provision of technology in the learning environment. Schools IT2000 was launched in Ireland in 1997 with a state investment of £40 million. It committed the Irish government to equip and support our schools with the most modern ICT equipment. A further €252 million was allocated in 2007 and an additional €150 million in November 2009. However, this investment related to the mainstream sector only. The integration of educational technology depends to a significant extent, on the effectiveness and commitment of teachers. This research study investigates, analyses and interprets data, to delineate the factors that prevent teachers’ use of educational technology, at a Youthreach Centre in the North West of Ireland.

The main aim of this study was to investigate the barriers that prevent the integration of ICT in a Youthreach Centre. Youthreach is an inter-Departmental initiative for young people who have left school early. Against a background of falling prices, increasing computing power, increased network capability and the almost limitless potential of the Internet, the full integration of ICT in Youthreach Centres remains stubbornly lacking and appears to be some distance away, when compared to the mainstream second level sector. This case study was conducted in late 2009 and early 2010.

Qualitative and quantitative data were obtained from Youthreach teachers and collected by means of questionnaires, interviews, training and observation. Questionnaires were distributed to all teachers in the Youthreach Centre. Interviews were conducted with a number of Youthreach teachers and observation was carried out to obtain further data.

The findings indicate that particular factors such as lack of time, lack of training, lack of confidence, extent of ICT experience and access to resources all affect teacher perceptions and use of ICT in this Youthreach Centre.
Acknowledgements

I would like to extend my sincere appreciation to Noeleen Leahy who supervised this thesis. Her understanding, patience, sound advice, encouragement and guidance were of immeasurable benefit.

I would like to thank my colleagues who agreed to participate in the research element of this study. I thank you all for your cooperation.

I wish to express my appreciation to a number of friends who proofread various sections of the thesis. Thank you all.
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<tr>
<td>AEO</td>
<td>Adult Education Officer</td>
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<td>Becta</td>
<td>British Educational Communications and Technology Agency</td>
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<td>CAI</td>
<td>Computer Aided Instruction</td>
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<td>DES</td>
<td>Department of Education and Science</td>
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<td>EFL</td>
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<td>FETAC</td>
<td>Further Education and Training Awards Council</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>NCTE</td>
<td>National Centre for Technology in Education</td>
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<td>NCVA</td>
<td>National Council for Vocational Awards</td>
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<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
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<tr>
<td>SPSS</td>
<td>Statistical Product and Service Solutions (<em>formerly Statistical Package for the Social Sciences</em>)</td>
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<td>Vocational Education Committee</td>
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Chapter One Introduction

1.1 Statement of Topic

The ubiquitous nature of Information and Communication Technologies (ICTs) has transformed almost every facet of our society and radically changed how people live, work and play (Komza 2005). As part of that transformation, the pervasiveness of ICT in classrooms has become essential, as educational institutions must prepare students for living in ‘a knowledge society’ as part of this ‘information age’. To achieve this preparation, the need to integrate ICT in classrooms has become critical to the work of schools. The drive to achieve such integration in Irish schools, commenced formally in November 1997, with the launch of Schools IT2000 (Department of Education and Science 1997) and the establishment of the National Centre for Technology in Education (NCTE). The NCTE, an agency of the then DES (Department of Education and Science), was established to advise and support schools in relation to the integration of ICT in teaching and learning (INTO 2009, p.43).

It was hoped that in conjunction with preparing students for this technologically driven society, teachers would also adopt new and innovative teaching methods. Bielenberg (2009) claims that “throwing laptops into schools will have little positive effect without proper broadband connections and training of teachers to use computers effectively”. Teachers therefore, are seen as key players in relation to this infusion of ICT in the education process (Baylor and Ritchie 2002; Gressard and Loyd 1985; Jegede 2008; Newhouse 2002).

However, despite considerable funding, more powerful equipment and extensive support structures, it appears that ICT has not brought about the widespread changes in teaching methodologies that was initially hoped for. ICT it seems, has been merely superficially embraced by many teachers and many schools. A substantial body of research asserts that teachers have difficulty in integrating ICT because of obstacles or barriers (Balanskat et al 2006; Becta 2004; Ertmer 1999;
Jenson et al 2002; Pelgrum 2001; Schoepp 2005). These barriers, if not addressed, can have a profound influence on the integration of ICT in both mainstream secondary and Youthreach classrooms.

However the NCTE’s remit was confined solely to the mainstream sector and did not extend to Youthreach Centres. Consequently, Youthreach teachers were unable to benefit from the ICT training offered at that time. It can be assumed therefore, that many of the barriers which existed in the mainstream sector and that were addressed by this initiative, still exist in Youthreach Centres. Yet Youthreach Centres have an ethos of learner centred, self paced exploratory styles of learning, which lends themselves comfortably to the integration of ICT within the learning process.

Youthreach was established in the late 1980s as an alternative to mainstream secondary education in Ireland. It aims to respond to the often diverse needs of young people and to provide early school leavers with a second chance education. Students attending Youthreach programmes are between the ages of fifteen and twenty years. Learners come from many different backgrounds and cultures. Literacy and numeracy levels amongst students are often weak and they often have very negative attitudes towards education.

Unlike the formal state examination setting, prevalent in the mainstream secondary education system in Ireland, most learning within Youthreach is based on ongoing assessment and is accredited by FETAC (Further Education and Training Awards Council).

Previous studies on the barriers to ICT integration in the education arena have tended to concentrate on the mainstream sector. There is a lack of research on ICT barriers within a Youthreach context. This study goes some way in addressing that deficit.
1.2 Background to the Study

The author has been a Youthreach teacher since 2000, teaching a variety of subjects. During that time, the author has observed an apparent lack of knowledge and resistance to the use of ICT by some colleagues.

Youthreach teachers typically deal with much smaller classes than their mainstream colleagues and as a result can devote much more time to their students. These small numbers lend themselves to a more thorough awareness of the difficulties that a Youthreach student may be experiencing and the impact such difficulties may have on the learning process. ICT is utilised frequently within the Youthreach setting but it is often not exploited fully. One possible reason for this is that Youthreach teachers are hampered by barriers to ICT integration.

The Youthreach Centre in this study, is equipped with modern equipment, updated on a fairly regular basis. However this does not in itself guarantee ICT integration in education. Other factors, such as access, attitudes, time, training and leadership also play a role. Successful ICT implementation can be a difficult procedure, dependent on a number of complex variables.

For teachers to enthusiastically engage in ICT integration, they must not only have adequate and quality resources, unhindered access and knowledge but they also need to understand. They need to understand and value the benefits of ICT integration. There is no point in showing teachers ‘how’ to integrate ICT in their work if they do not understand ‘why’ they should do it. Basic skills training in ICT must be complemented by training in how ICT can support and enhance classroom teaching.

Educational reform of any type, can not and will not work, unless teachers and other stakeholders are consulted, feel adequately equipped and support it. Woodworth et al (2009), in a recent report on the status of the teaching profession in California, conclude that teachers need to understand the rationale for and
nature of reform. They assert that there is very little state support for professional
development in California’s high school sector, as education leaders have been
forced to ensure that schools keep running as opposed to ensuring that they run
well or are improved on. Budgetary restrictions mean that there is little
association between the professional development needs of teachers, to improve
their teaching and the professional development that they actually attain. In
Ireland, Schools IT2000 committed the government to a capital investment of €40
million, followed by €252 million in 2007 and €150 million in late 2009 to be
spent on equipment and training. However, this investment was confined to the
mainstream sector only. It would seem therefore, that the training needs of
Youthreach teachers have not been met by this initiative.

Professional development opportunities within Youthreach in relation to ICT have
been limited. Youthreach teachers were unable to avail of the aforementioned
opportunities offered to mainstream teachers since the launch of Schools IT2000.
As a result, the training available in the Youthreach sector has been sporadic and
inconsistent. Unfortunately, the current economic climate of 2010, will most
likely dictate that the little training that is available will become even further
limited.

A substantial body of research asserts that ICT integration is an extremely
worthwhile endeavour, leading to a marked enrichment of the teaching and
learning process (Condie and Munro 2007; Frear and Hirschbuhl 1999; Korte and
Husing 2007; Panagiotakopoulos and Ioannidis 2001; Wishart and Blease 1999).
However, numerous studies also assert that there are a number of factors or
barriers that hinder the successful integration of ICT in education (Becta 2004;
1.3 Research Aims

The aims of this research are to establish:

- What are the barriers preventing the integration of ICT in Youthreach education?
- What perceptions do teachers in a Youthreach Centre have in relation to the use of ICT in the classroom?
- What factors lead to successful ICT integration in the Youthreach classroom?
- Would the provision of an informal in-house ICT training session lead to greater use of ICT in the Youthreach Centre?

1.4 Purpose of Study

The purpose of this study is to investigate and identify, using a case study approach, the barriers that prevent the successful integration of ICT in a Youthreach Centre in the North West of Ireland. As technology becomes increasingly prevalent in the education sector, the manner in which educational institutions adapt to it, demands investigation. This study presents a portrayal of the experiences of teachers in relation to technology integration in a Youthreach Centre. It examines how teachers are using ICT and what factors prevent ICT use. Attention is given to internal barriers, within teachers themselves and external barriers, over which the teacher may have little or no control.

1.5 Relevance

While technology integration is an admirable objective, a significant number of teachers do not feel proficient in its use. Some Youthreach teachers are not equipped with the skills that can enable them to successfully integrate ICT in their teaching. This is primarily due to a lack of training. Unlike their mainstream counterparts, Youthreach teachers did not benefit from the training opportunities
offered by Schools IT2000. As a result, within Youthreach, there has been a tendency to use ICT, as an add-on, to existing traditional teaching practices, as opposed to integrating it into teaching. Those teachers that do feel somewhat proficient, often utilise basic applications and activities, which may not contribute to the development of higher order thinking skills, or student centred learning. Such a limited focus, means that ICT is not being used to its full potential and that educators and not just teachers, are failing to effectively integrate technology as a full partner in the learning process, allowing students to prepare themselves with skills to work and live in the information age. Too much focus has been placed on the acquisition of resources at the expense of teaching teachers how to integrate ICT. While resource acquisition is undoubtedly an important enabling factor in ICT integration, real and meaningful progress will only occur if and when there is a shift from a focus on the technology itself to the use of technology to learn.

Key obstacles or barriers affecting the integration of ICT by Youthreach teachers need to be clearly identified, in order to support the integration process itself. Future professional development courses within the Youthreach sector may need to be modified, to reflect these barriers and to cater for the specific needs of Youthreach teachers. These specific needs relate mainly to training and professional development opportunities. Attention also needs to be given, during such training, to the uniqueness of the Youthreach student. Many such students typically bring with them issues around literacy, numeracy and familial difficulties, all of which impact on the learning process of the individual learner and often their peers also.

1.6 Significance

This research study has the potential to contribute to existing research in relation to the obstacles preventing ICT integration in the learning process. This research is expected to benefit educators by extending the knowledge base that exists already, as it presents empirical evidence in relation to these barriers.
The study may be of significance to other Youthreach teachers, since many of them may also experience the same difficulties, as those encountered by teachers that participated in this research. The findings from this research could be generalised to other Youthreach Centres.

This study may help to raise awareness among Youthreach management and teachers, about the barriers to ICT integration that exist in Youthreach Centres. A thorough understanding of barriers, will inform educators, in deciding how to address them, in the hope that they can be eliminated entirely from the teaching and learning process.

1.7 Structure of Thesis

This study consists of six chapters. Chapter One serves as an introduction and outlines the area being examined, providing a brief description of the background to the study, significance and purpose of the study. It also provides a brief description and an outline of each chapter.

Chapter Two, the Literature Review, reviews the relevant literature. It clarifies the concept of ICT integration in education, in conjunction with an analysis of the benefits of ICT use in this area. The barriers to ICT integration are classified into teacher related and school related barriers. The complex relationships between barriers are reflected upon and their impact on teachers is considered.

Chapter Three, Methodology, describes the theoretical framework and the methodology adopted in the study, in the context of the literature review. It critically examines and outlines the rationale and the specific research procedure undertaken. The chapter outlines the nature of the methodology used, as well as critically examining other methodologies. The research design, sampling, instruments, data collection, data analysis, reliability and validity of the instruments are discussed. The chapter also presents a background and context to the research setting. Attention will also be given to the method of data collection and its subsequent analysis.
Chapter Four, Findings, outlines and illustrates the actual findings which emerged from the research carried out and includes the statistical analysis of the questionnaire data, while Chapter Five Discussions, comments in a more analytical manner on these findings from the previous chapter. The author draws comparisons between and expands on the findings in the context of the literature review.

The Conclusion, Chapter Six, reflects on the main issues arising from the study, in light of the findings and discussion chapters. This chapter briefly reports on and considers these issues and identifies recommendations for further research.
Chapter Two  

Literature Review

2.1  

Introduction

The use of ICT in the classroom has become important, as it provides opportunities for students to learn how to operate in an information age. The study of obstacles to the use of ICT in education may assist educators in overcoming barriers and support students in becoming successful technology adopters in the future. This literature review analyses some relevant literature and aims to identify the perceived barriers to technology integration in education.

The availability of computer equipment does not in itself guarantee ICT integration in education. Successful implementation is a complex process, determined by pedagogical values, attitudes, curricular needs and physical infrastructures (Granger et al 2002, p.480). Akbaba-Altun (2006), in a study of eighteen Turkish schools, concluded that successful integration of technology is not simple, because it depends on such interlinking variables. ICTs are radically transforming the curriculum in a number of ways, demanding that teachers reflect on traditional methodologies.

Educators themselves assert that the integration of ICT into the classroom will greatly enhance the learning experience (Sutherland et al 2004). The growth of ICT itself dictates that in order for students to adjust to modern society and the global economy, the way in which they are taught and what they are taught, requires adjustments to and around ICT (Watson 1999).

However, Balanskat et al (2006) argue that although educators appear to acknowledge the value of ICT, difficulties continue to be encountered in adopting and integrating such technologies, while Mueller et al (2008), conclude that although many teachers are comfortable with technology in general, they still may not be ready or capable to integrate such technology, in their classrooms. The following section provides a brief overview of what ICT integration means.
2.2 What is Meant by ICT Integration in Education?

In order to appreciate what is meant by ICT integration, it is first necessary to define what ICT is. Attention to the use of computers gained ground as recently as the 1980s, when cheaper personal computers became available for consumers. Global competition influenced governmental policies towards keeping pace with these technological advancements and these policies motivated the mass production of computers for schools. Many researchers assert that ICT will be an essential component of the education process for future generations (Bransford et al 2000; Grimus 2000; Yelland 2001).

Towards the end of the 1980s, the term ‘information technology’ began to replace the word ‘computer’ (Pelgrum and Law 2003). This term referred to the computer’s processing ability, indicating a shift from computing technology to the capacity to store and retrieve information. Later, the term ICT emerged, signalling the introduction of e-mail and electronic messaging with computer technology (Pelgrum and Law 2003).

It became accepted during this period, that educational systems needed to prepare students to adjust to and survive in this new technologically driven society. This meant preparing students for “lifelong leaning in an information society” (Pelgrum and Law 2003, p.20). Allied to this, early advocates of ICT integrated education, saw it as a catalyst for change, fostering skills in problem solving and critical thinking, as well as the development of student centred learning (McGrail 2005, p.6).

Kozma (2008, pp.1085-1087) identifies three rationales for the introduction of ICT into education. Firstly, the economic rationale refers to the role it can play in preparing students as future workers and in supporting economic development. Secondly, the social rationale where ICT investment aims to: increase knowledge sharing, encourage cultural creativity, increase civic participation, make government services more accessible and finally enhance social cohesion. Finally, the educational or pedagogic rationale, where ICT can advance

Drent and Meelissen (2008), identify three objectives for the integration of ICT in education. They are: the use of ICT as a ‘discipline or profession’; ICT as a ‘teaching or learning medium’ and the use of ICT as an ‘object of study’ (Drent and Meelissen, 2008, p.187). It can be gleaned from these objectives that integration involves aiding the teaching and learning process (apart from the third objective which is a discipline in itself).

Successful integration of ICT in education can lead to a number of benefits and some of these benefits will be explored in the following section.

2.2.1 Benefits of ICT Use in Education

The use of technology in the learning environment has become an unstoppable force in recent years (Cohen et al 2004; Laubsch 2006). ICT impacts on a large section of education, from record keeping and school websites to the creation of online learning communities (Bishop 2007). Educational institutions can use specialised websites to make learning resources available online at any time. Some educational institutions do not even require students to be physically present. Virtual classrooms have flourished in tandem with improved internet accessibility. The significant barriers of time and distance are rendered almost obsolete in such virtual classrooms (Stennes 2008).

However, the benefits of ICT use in the classroom depend on the success with which it has been integrated (Condie and Munro 2007). Dawes (2001) asserts that new technologies could support education across the entire curriculum, providing innovative opportunities for effective communication. ICT in education has undoubted potential, to be influential in changing teaching methodologies.
Studies have also demonstrated that computer use can result in effective literacy gains. There is empirical evidence that students, who are having difficulties with reading, can be motivated and engaged through the use of ICT (Lynch et al 2000; Ó Murchú 2000; Segers and Verhoeven 2002).

Condie and Munro (2007, p.5) conclude that the use of ICT has had positive effects in a number of subjects, as well as being constructive in assisting students that are marginalised as a result of personal or familial issues. Schofield and Verban 1988 (cited in Parr 1995), concluded that using Computer Aided Instruction (CAI) considerably diverts the teacher’s focus to weaker students.

Research has shown that many students benefit from the use of ICT (Panagiotakopoulos and Ioannidis 2001; Frear and Hirschbuhl 1999). Wishart and Blease (1999) claim that students get immediate feedback or rewards. Papert (1993) asserts that the computer is a tool, allowing for the construction of higher order thinking, facilitating users to take responsibility for their learning, while Korte and Husing (2007) refer to its ability to motivate learning. Modern educational software uses sound, animation, video and interactivity, assisting the different intelligences proposed by Gardner (1993) in his Multiple Intelligences Theory. Forrester and Jantzie (2000) assert that the computer has enormous potential in developing the various multiple intelligences proposed by Gardner.

Kozma (2005) suggests that ICT can be used to improve delivery of and access to education. In learning ICT skills, the student becomes better equipped for the world of work, which increasingly demands such competency.

Furthermore, Kozma and Anderson (2002) claim that ICT is transforming education by introducing new curricula based on real life problems, providing different tools to enhance learning, providing students and teachers with more opportunities for feedback and reflection. Social Constructivism places emphasis on this type of student centred learning, viewing the teacher as a guide or facilitator, motivating students to discover things for themselves (Vygotsky 1978).
Schoepp (2005) claims that constructivist approaches must dominate the learning environment for technology to have a significant impact on learning.

However, it must be remembered that the use of ICT in classrooms is a relatively new phenomenon when compared to traditional teaching methods. While there have been notable critics (Cuban 2001; Kirkpatrick and Cuban 1998; Oppenheimer 1997; Palak and Walls 2009; Townsend 1997), most research strongly supports the premise that ICT enhances the teaching and learning process.

The integration of ICT into the teaching and learning process is notoriously difficult and will most likely meet a number of difficulties. These difficulties, or obstacles in this context, are known as ‘barriers’ (Schoepp 2005).

2.3 Barriers to the use of ICT in Education

A barrier can be regarded as anything that inhibits progress or achievement of an objective. Clearly therefore, according to this meaning, the removal of one or more barriers to ICT integration should assist and perhaps significantly advance the process of integration.

A recent study by the Organisation for Economic Cooperation and Development (OECD), involving 14 countries, confirmed that there were a number of barriers inhibiting the use of ICT in education. These barriers included an inconsistent number of computers to students, a deficit in maintenance and technical assistance and finally, a lack of computer skills and/or knowledge among teachers (OECD 2009f). Jenson et al (2002) classified these barriers as: limited equipment, inadequate skills, minimal support, time constraints and lack of interest or knowledge by teachers.

In a research report conducted by Becta (British Educational Communications and Technology Agency 2004), a number of other important barriers were identified.
These were: lack of confidence, accessibility, lack of time, fear of change, poor appreciation of the benefits of ICT and age.

Ertmer (1999) concurs with Schoepp (2005), asserting that if teachers are aware of and understand such barriers, they can initiate strategies to overcome them.

Research has classified these barriers in different ways. Several studies have divided the barriers into two categories: extrinsic and intrinsic. However, what was meant by extrinsic and intrinsic, differed among studies. In one such study, Ertmer (1999) referred to extrinsic barriers as first order barriers citing as examples: lack of time, support, resources and training. She referred to intrinsic barriers as second order barriers, citing as examples: attitudes, beliefs, practices and resistance to change.

Balanskat et al (2006) classified barriers as ‘micro level’ (teacher attitude) and ‘meso level’ (institutional). He added a third category called ‘macro level’, to account for the wider educational system. Meanwhile, Pelgrum (2001) identified material barriers as a lack of real or physical equipment and non material barriers as somewhat intangible entities such as lack of knowledge, confidence or time.

This literature review will classify barriers to ICT integration in education into two categories. Firstly, an investigation will be carried out into teacher related barriers, followed by an investigation of school or institutional barriers. Becta (2003) adopted a similar approach in its classification of barriers.

2.3.1 Teacher Related Barriers

Newhouse (2002) asserts that the teacher is a key component in the learning process. Baylor and Ritchie (2002), in an examination of a number of American public schools, discovered that teacher related issues were crucial in determining ICT use in the classroom. Twenty five years ago, Gressard and Loyd (1985) asserted that teacher attitudes towards ICT was one of the key factors which
determined successful integration, while Jegede (2008) recognises the teacher as a key instigator in fostering ICT integration in education.

Having established that the role of the teacher is one of a number of essential factors in ICT integration, it follows that teacher related barriers can have a negative impact on the integration process. The following section identifies and examines a number of these teacher related barriers.

2.3.1.1 Lack of Time

Many studies indicate that teachers have adequate competence and confidence but make little use of classroom technology due to lack of time. A substantial body of research identifies time constraints as an important barrier to the use of ICT in teaching (Baskin and Williams 2006; Becta 2004; Beggs 2000; Bingimlas 2009; Marcinkiewicz 1994; Schoepf 2005; Tearle 2003; Zammit 1992).

Becta (2004) in particular, found that teachers who fail to fully use technology are often restrained by lack of time. Among the major concerns expressed by teachers were the time needed to: locate internet advice, prepare lessons, explore and practice using the technology, deal with technical issues and receive adequate training. As a solution, Scrimshaw (2004) proposes the idea of ICT teaching assistants to support teachers.

Haydn and Barton (2008, p.446), refer to teacher time as “a very precious resource in education”. Bingimlas (2009), discovered that some teachers are competent and confident in ICT use, although they simply do not have the time to use technology. Gomes (2005), in a questionnaire led study in The Azores, concluded that teachers do not use ICT, because of the lack of the time needed to accomplish plans. More significantly perhaps, Gomes also discovered that some teachers felt that the use of ICT was a loss or waste of time.

There are possible solutions to this problem of time constraints. Schools could arrange for teachers to receive ICT training during school time. Teachers should
also be provided with assistance and support to learn and maintain familiarisation with modern hardware and software applications. Teachers could also benefit from specific training, designed to facilitate the preparation of multimedia learning resources.

Nevertheless, the elimination of lack of time as a barrier will not necessarily be a solution. Many teachers still lack knowledge of and competence in the use of ICT.

2.3.1.2 Lack of Knowledge/Competence

Bingimlas (2009) asserts that teacher competence refers primarily to the ability to integrate ICT into pedagogical practice. Lack of knowledge/competence is regarded as a significant teacher related barrier to ICT integration.

A teacher’s lack of knowledge serves as a considerable barrier to the use of computers in teaching methods and practices. Tezci (2009) asserts that if teachers have a high level of ICT knowledge, then there will be a higher level of ICT use in education.

Some researchers however, have found that this barrier varies from one country to another. Pelgrum (2001) found that lack of knowledge/competence in technology, among teachers in developing nations, is the primary obstacle to the uptake of ICT in education. Similarly, Albirini’s (2006) study, conducted on 326 Syrian, English as Foreign Language (EFL) teachers, found that although overall attitudes towards ICT were positive, a lack of competence in computer technology was cited as the main obstacle to ICT integration. This particular study found that, on average, respondents reported ‘little competence’ in basic computer use, such as software installation or printer control (Albirini 2006, p.382). The results of both these studies are perhaps to be expected, as lack of funding could impact on training opportunities in developing countries.
More surprising perhaps, is that findings from a study by Korte and Husing (2007) mirror Albirini’s results. They analysed an earlier report, carried out by Empirica (2006), on ICT usage among schools in 27 European countries, where funding should not be as significant an issue. The findings nevertheless, indicated that lack of computer knowledge, was a factor in preventing the successful integration of ICT. It is perhaps interesting that similar findings were discovered in both developing and developed countries.

Newhouse (2002), in a literature review on the impact of ICT on learning and teaching, prepared for Western Australian government schools, found that teachers lacked knowledge and skills to use computers and were not enthusiastic about the changes and supplementary learning associated with bringing computers into their classrooms. Newhouse goes further, predicting that teachers may build up resistance or phobias to ICT if computer equipment is not reliable, or if the completion of necessary tasks is not improved by its use (Newhouse 2002, p.41). Balanskat et al (2006) discovered that in Denmark, the non usage of ICT in teaching situations was primarily due to teacher lack of skill rather than for any pedagogical reason.

Lack of knowledge/competence, therefore, may be one of the strong barriers preventing the integration of ICT into education. Lack of competence is often one of the main reasons cited for lack of confidence, another significant barrier.

2.3.1.3 Lack of Confidence

Several studies propose that lack of confidence prevents teachers from using ICT. Becta (2004) report that many teachers, who feel unskilled in ICT, are anxious about using it in front of students, who could possibly know more themselves. Scrimshaw (2004), in a companion report to Becta (2004), notes that confidence is an extremely important quality for teachers when dealing with ICT. Becta (2004) further reports, that teachers were anxious, that when using ICT in the classroom, they would demonstrate to students, that they were not knowledgeable about
technological equipment. Such teachers were either not willing or able to use ICT in their classrooms.

Making matters worse with respect to teacher confidence, student expectations of their teacher’s ICT competence, has a considerable role in exacerbating teacher confidence issues (Becta 2004). Furthermore, the constant use of modern technology by students, puts teachers under ever increasing pressure, by almost demanding that they be knowledgeable and proficient in the use of ICT.

Even if teachers have received ICT training, they can still fail to integrate it in teaching. This inconsistency, between training and usage, is often accounted for by lack of confidence. In other words, teachers may lack the confidence necessary to put their ICT training to use (Becta 2004).

Lack of confidence is tied to other barriers affecting the use of ICT in education. For example, fear of ICT (discussed in greater detail below), can compromise confidence levels (Becta 2004). Similarly, the lack of technical assistance can contribute to low confidence levels, as does lack of competence and training quality. A study conducted by Jegede et al (2007), among 467 teachers in Nigeria, discovered that as teachers became more appreciative of the use of ICT as a pedagogical aid, interests and attitudes became more positive. The rationale therefore, is that increased interest fosters commitment to honing skills and thereby boosting competence levels.

Other studies have investigated the reasons for this lack of confidence. Beggs (2000), asserted that fear of failure caused a lack of confidence. On the other hand, Balanskat et al (2006) found that limitations in teachers’ ICT knowledge, makes them feel anxious about using ICT and thus not confident to use it in their teaching.

It is also argued in relevant literature, that lack of confidence and experience with technology, influences the motivation of teachers to use ICT (Balanskat et al 2006; Cox et al 1999b; Osborne and Hennessy 2003). On the other hand, teachers
who confidently use technologies in the classroom, understand the usefulness of ICT. Cox et al (1999a) found that teachers who have confidence in using ICT, identify that technologies are helpful in their teaching and personal work and that they need to use them more frequently.

One can conclude, therefore, that attention to a number of other obstacles to ICT use in education could eliminate many problems associated with lack of confidence. For example, if teachers were provided with solid training in computer skills and how to integrate ICT into teaching methods, it would increase awareness of ICT benefits. If they had access to technical support and assistance, then confidence levels will most likely grow, removing or at least minimising this grave barrier to ICT integration. Lack of confidence can often lead to a fear of ICT. This fear can result in teachers not using ICT at all. The next section examines the negative impact of teacher fear on ICT integration.

2.3.1.4 Fear

Computer anxiety or fear is a key barrier, limiting or preventing the use of ICT by teachers. Underlying these anxieties are a fear of humiliation when using computers and a fear of losing professional status through the downgrading of traditional teaching skills.

In Becta’s (2004) report, teachers who admitted to a lack of confidence, attributed this lack of confidence, primarily to fear. Russell and Bradley (1997), in a study involving 350 Australian teachers, concluded that a very significant factor determining the levels of engagement that teachers have with ICT, is their level of confidence in using it. They coin the term ‘cyberphobia’ to describe this fear of dealing with ICT in classrooms. They assert that cyberphobia can critically weaken the willingness and ability of a teacher to use ICT.

Research has also found that teachers had a fear that computers might challenge or compromise their vocation by downgrading their role (Becta 2004; Fabry and Higgs 1997; Scheffler and Logan 1999). However, if teachers are trained in ICT
and ICT integration, they should realise, that rather than downgrading pedagogical skills, ICT aims to enhance those skills, in the same way it aims to enhance the learning process and skills acquisition.

Fear as a barrier, is clearly tied to other barriers preventing the integration of ICT. The most obvious links are to lack of competence, training, technical support and confidence. It would appear, as mentioned earlier, that attention to adequate training and provision of technical support could remove some of these barriers.

Meaningful training and professional development can increase teacher confidence and indeed diminish these feelings of fear or anxiety. The benefits of training can be seen both in how to use ICT itself and how to use it to support teaching and learning.

2.3.1.5 Lack of Training

Successful ICT integration requires high quality frequent training and professional development. If this training is not provided, then attempts at integration will inevitably be unsuccessful.

This is significant, as another barrier frequently cited, is the lack of effective training (Albirini 2006; Balanskat et al 2006; Beggs 2000; Demetriadis et al 2003; Ozden 2007; Pelgrum 2001; Schoepp 2005; Toprakci 2006). One finding from Pelgrum’s (2001) study, was that there were not enough training opportunities for teachers in the use of ICTs in the classroom.

The training of teachers in ICT integration is particularly difficult because it involves a number of complex factors, in order to render the training effective. These complex factors include finding the time for training, training in pedagogy, skills training and the use of ICT in the teacher’s initial training (Bingimlas 2009). Becta (2004) concurs, asserting that training is particularly complex, because it is important to consider several components to ensure the effectiveness of the training. Similarly, a study conducted by Cox et al (1999a), argues that ICT
training for teachers needs to incorporate pedagogical aspects. This study concluded that when teachers received basic ICT training without considering the pedagogical aspects of ICT, they still did not know how to use ICT in class. Schoepp (2005) maintains that if new technology is going to be integrated into education, teachers should receive training on how to use the specific ICTs, while Trotter (1999) concludes that training in ICT integration must be preceded by and supplemented with basic skills training. Research by Gomes (2005) also concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom and lack of training concerning the use of technologies in specific subject areas, were obstacles to the use of new technologies in classroom practice.

Cox et al (1999a) assert that if teachers are to be convinced of the value in using ICT in their teaching, their training should focus on pedagogical issues. Crucially, these authors who analysed 135 questionnaires, found that even after teachers had attended professional development courses in ICT, they still did not know how to effectively use ICT in their classrooms. This was because too much emphasis was placed on acquiring technical ICT skills during training, as opposed to skills in how to incorporate ICT into the curriculum.

Paradoxically however, some studies assert that attention must be given to both skills training and pedagogical training (Becta 2004; Schoepp 2005; Snoeyink and Ertmer 2001). According to Newhouse (2002), some training is still needed for teachers to develop appropriate skills, knowledge and attitudes, regarding the effective use of computers to support learning by their students. He argued that this also requires continuing professional development, to maintain these appropriate skills and knowledge.

Fundamentally, when there are new tools and approaches in education, teacher training is essential if they are to integrate them into their teaching (Osborne and Hennessy 2003). Jimoyiannis and Komis (2007) investigated 1165 teachers, following their participation in ICT basic training skills and concluded that training and the acquisition of ICT knowledge and skills, can remove a number of
significant barriers to ICT integration. Similarly, Knezek and Christensen (2002), in a study of 500 teachers in Texan schools, discovered that professional development was highly effective in advancing teacher ICT skills.

Newhouse (2002) perhaps sums up this argument best, in his assertion that teachers need to be computer literate but they also need to have skills in integrating computer use into their classrooms. He argues that teachers need training in technology education (focusing on the technologies themselves) and educational technology (support for teaching in the classroom).

Adequate training can address some of the greatest barriers to ICT integration in education. For instance, adequate skills will improve knowledge and competence and by extension, confidence. This, in turn, could alleviate fear of ICT and the anxieties related to student expectations and perceptions. In this regard, adequate training for teachers should be the key component, or building block, to integrate ICT in education.

However, training will ultimately be unsuccessful if participants are unwilling to change. Research has suggested that teacher age often determines willingness to change. The following section examines teacher age as a barrier to ICT integration.

2.3.1.6 Age

Kumar et al (2008) examined 358 second level teachers in 65 Malaysian schools and concluded that age acts as a significant barrier to ICT use. In this study, 60% of teachers were aged between 20 and 30, indicating that these teachers had completed their training in the last decade or so and therefore had been exposed to computer assisted training and computer training itself.

Young (2000) asserts that younger less experienced teachers use computers more, because they are more likely to be computer fluent, had more technologically rich teacher training and are less likely to be limited by previous habits, perceptions or
attitudes, than older teachers. Lee (1997) points out that many older teachers have not had any computer education when training and as a result are in need of training to allow them to make use of computers in their work. This is possibly one explanation for the findings by Rosen and Weil (1995) in a questionnaire based study of 485 teachers in Southern California. They established that older teachers exhibited more computer anxiety, when compared to younger teachers.

Similarly Cavas et al (2009), in a study of 1071 primary science teachers in Turkey, established a relationship between teacher age and computer attitudes. Young teachers, aged between 20 and 35 years, had more positive attitudes and this differed among teachers in older age groups. Likewise, Korte and Husing (2007) conclude that younger teachers appear to be less sceptical about the benefits of ICT in learning.

A report by the European Commission 2002, cited in Becta (2004) found that age is a factor in the use of computers and the internet, arguing that the percentage of teachers using computers falls as their age increases, although the report acknowledged that the importance of this factor is declining.

Williams et al (2000), in a study carried out on Scottish teachers, compared age and ICT attitude of teachers across primary and secondary schools. While there was no distinct difference in attitudes among second level teachers in the study, it showed that among primary teachers, there was a significant difference, in that more of the older respondents had a relatively negative attitude towards ICT.

Russell et al (2000), in a study of 1258 teachers in 400 Australian schools, concluded that younger teachers had more skills than older teachers. Eighty two per cent of 20 to 30 year old teachers possessed the required basic skills, compared with only 64% of teachers over 50 years.

However, Bradley and Russell (1997) point out that, although computer anxiety may increase with age, this does not mean that training or professional development should be specifically targeted at older teachers. They strongly
dispute the notion that because computer anxiety may increase with age, younger teachers are unlikely to need training in ICT.

Despite this, a substantial body of research literature strongly argues that age has no bearing on the use of ICT by teachers (Al-Senaidi et al 2009; Lau and Sim 2008; Wang and Chan 1995).

Age can determine the extent of a teacher’s experience in using ICT. Ironically, younger teachers, although perhaps more open to change, do not have great experience in the use of ICT in education. As a consequence, these teachers may be more reluctant to use it extensively and confidently in the classroom. Therefore the extent or lack of previous ICT training can act as a barrier to ICT integration in education.

2.3.1.7 Extent of Previous ICT Experience

Poor previous ICT experience among teachers can clearly be regarded as a very real barrier to ICT integration. Hadley and Sheingold (1993) concluded that at least five years of computer experience are needed in order for teachers to develop computer expertise. It is debatable, if that conclusion, reached almost twenty years ago, still stands today, given the emergence of so much new technology.

Drent and Meelissen (2008), in a study of 210 primary level teachers in The Netherlands, conclude that solid experience in the use of ICT and the changes related to ICT, support the development of a learner centred pedagogical practice, while Becker (1994a) views substantial previous computer use by teachers, as one of the key determinants, in his classification of teachers, as either ‘exemplary computer-using’ or ‘non-exemplary computer-using’. However, unlike Hadley and Sheingold (1993), Becker does not quantify how much previous computer use is necessary, for a teacher to become exemplary.

Previous experience can also lead to greater classroom management skills. A teacher with limited previous ICT experience, could perhaps be at a disadvantage
2.3.1.8 Classroom Management

Classroom management can be a barrier to ICT integration in education if there is a lack of harmony between school policies, ICT classes and teachers (Tondeur et al 2008). If all of these elements are not in accord, or ‘singing off the same hymn sheet’, then classroom management can be compromised.

The above study, by Tondeur et al (2008), was carried out in primary schools in Belgium. The study involved 574 classroom teachers and 53 principals. The findings highlight the importance of a shared vision in relation to ICT integration. A lack of coordination, or poor communication, between school management and teachers, eventually trickled down to classroom management. Consequently, ICT classroom management becomes compromised and acts as a barrier to the effective integration of ICT in education.

Approximately 50% of the principals in this particular study indicated that a lack of resources influenced the manner in which classrooms could be managed for ICT integration. If the number of computers does not correspond to the number of students in the classroom, managing ICT integration (and possibly the class) could be hugely problematic. Williams et al (2000, p.315) concur, arguing that inadequate availability of ICTs can lead to classroom management problems due to the organisation of scarce resources. As a result, integration could be abandoned altogether or unenthusiastically managed (Tondeur et al 2008). Tondeur et al’s study also found that a lack of effective coordination between individual classrooms and technical support was a significant barrier. However, teachers in Ertmer et al’s (1999) study, circumvented this resource barrier by employing better managerial and organisational classroom strategies.

As teachers represent the core of education and curriculum management within the classroom, any successful integration of ICT in the classroom requires their
coordination and cooperation (Mumtaz 2000). Incorporating ICT policies into classroom management can be challenging if there are poor overall coordination, communication and support systems. It therefore follows, that teachers should become stakeholders, are consulted and are on board with policies determining ICT planning and integration.

Ultimately however, many barriers are closely related to the teacher’s attitude towards ICT. Most barriers can be addressed but integration remains difficult if teachers have negative attitudes towards ICT. Teachers need to be open and willing to change in the first instance. They need to have a positive and encompassing attitude towards ICT and its potential benefits. Many strategies to overcome barriers will either fail or be inherently difficult to implement if the teacher has a negative attitude or is resistant to change.

2.3.1.9 Teacher Attitudes Towards ICT

Research has found that teacher attitudes and an inherent resistance to change is a significant barrier to ICT integration (Becta 2004; Cox et al 1999a; Earle 2002; Gomes 2005; Schoepp 2005; Watson 1999).

Past ICT experience can have an impact on teacher attitudes. Ertmer (1999) concludes that teacher attitudes towards technology, ultimately determine the extent of integration, while Zhang and Espinoza (1998) established that attitude levels were closely related to confidence, when using ICT. Gomes (2005), concluded that some of the teachers participating in this research study, thought that while ICT was a motivational tool for learning, it was not necessarily something that should be integrated into lesson plans.

Bingimlas (2009) discovered that some teachers felt they did not receive enough support, guidance or reward for integrating ICT and were therefore, reluctant to do so. He also found that teachers, not using ICT in the classroom, tended to be of the opinion, that ICT either has no benefits, or if it does, they are vague.
Similarly, Schoepp (2005) found that teachers did not feel that they were being supported, guided, or rewarded in their efforts to integrate ICT.

Cox et al (1999a), established that teachers are unlikely to employ new technologies, if they see no need to change their professional practice, while Watson (1999) argues that integrating new technologies into educational settings requires change and various teachers will handle this change differently.

However, it must be stated that this barrier is not pervasive. Korte and Husing’s (2007) findings in European schools, indicate that few teachers fundamentally oppose the use of ICT in the classroom. They found that only 4% of European teachers believe that using computers in class does not have significant learning benefits for pupils (Korte and Husing 2007).

Having examined a number of important teacher related barriers, the next section deals with some barriers that are not influenced by the teacher. These barriers are referred to as school related barriers and could be equally as important as teacher related barriers.

2.3.2 School Related Barriers

School related barriers can also have a significant impact on the integration of ICT. Williams et al (2000, p.313) concluded that lack of availability of some ICT resources, was the main reason given by teachers, in their study, for non use. These authors go further, asserting that accessibility issues often override all other factors in determining ICT use. There is little point in having a dedicated, enthusiastic and trained staff, that are willing to integrate ICT, if school impediments prevent this. Access to resources and ongoing support, be it training or technical, are crucial ingredients in the successful implementation of ICT integrated education.

Many of these issues centre on school leaders and the following section details the important role of school principals in the process of ICT integration.
2.3.2.1 Role of School Principal

Tondeur et al (2008) assert that school principals hold a key position, to create a shared ICT policy. This view is supported by McGarr and Kearney (2009), in a study of teaching principals in Ireland. They describe school principals as key pedagogical leaders, having a crucial influence on ICT integration. Scrimshaw (2004) and Baylor and Ritchie (2002), also view leadership as a critical determinant on the success or failure of ICT integration. The latter state that school leaders must enthusiastically join in the process, rather than merely adopting an administrative or ‘hands off’ role. Han (2002), notes in her study, how a school principal inspired and influenced her staff in relation to the use of ICT. She achieved this by being helpful, supportive and encouraging but more importantly, she understood the value and benefits of ICT.

If a school principal has a positive attitude to the integration of ICT, then this will have a positive influence on the success of its integration (Wang and Chan 1995). These researchers further discovered, that a school principal’s positive attitude and commitment, greatly impacted on the smooth facilitation of computer technology in education systems.

In addition, student learning must be at the centre of all decision making, in relation to ICT in education (McGarr and Kearney 2009). In the past, school principals supported technology but now these school principals must develop, implement and manage technology that will effect change in schools. This shift has been facilitated both by policy changes and by improvements in technology itself.

However, McGarr and Kearney (2009) acknowledge the difficulties that school principals face, with lack of time and seemingly limitless other demands, being a constant difficulty and indeed, given these difficulties, they question the appropriateness of principals being responsible for ICT leadership in schools. Given that school principals are responsible for change and that this change is ICT led, they question whether school principals have the time to govern such change.
It can be deduced therefore, that if principals lack positive attitudes, commitment and collaborative leadership, then successful and effective integration of ICT will inevitably be difficult.

School principals often influence how resources are planned and organised. Good planning and allocation of resources can increase the chances of successful integration. The following section examines how poor ICT infrastructure and organisation of resources is a significant barrier to integration.

2.3.2.2 Current ICT Infrastructure and Organisation of Resources

The provision of a good infrastructure does not necessarily mean an increase in ICT usage, or that integration in education will occur. However, schools with more ICT equipment are taking positive steps to encourage and foster the integration of new pedagogical methods into teaching.

The inability of teachers and students to access ICT resources may be the result of other factors and not just the lack of, or poor organisation, of ICT infrastructure. Sometimes a school may have high quality ICT resources but they could be inappropriately organised and therefore not optimally used. In some schools, for example, prior booking of the ICT classroom is required. As a result, teachers and students do not have the opportunity to always use ICT, according to their needs. Scrimshaw (2004) notes the possibilities offered by wireless networking, which may go some way to address and perhaps alleviate this problem.

Becta (2004) also reports that in some cases, teachers at schools with adequate and good quality resources, experience problems in accessing them, due to poor logistical organisation. Becta feels that this may be due to the tendency in many schools, to allocate ICT equipment into dedicated ICT classrooms. Consequently, access is more difficult than if equipment were allocated throughout all classrooms. This logistical decision, could send out an inadvertent message, that ICT is a stand alone subject, rather than one which is integrated throughout the curriculum. However, Empirica (2006) suggest that many schools introduce
students to ICT in such dedicated labs and only after schools have invested more intensively in ICT, does its use proliferate into classrooms and become fully integrated. Pelgrum (2001) points out that in many schools, what is perceived as a lack of access, could actually be due to poor organisation of resources, while Fabry and Higgs (1997), noted that quantity of equipment alone may not ensure sufficient access.

However, schools with adequate and good quality resources can still fail to integrate ICT if teachers are not given adequate support, have sufficient resources or indeed ample access to those resources.

2.3.2.3 Lack of Support and Resources

Lack of technical support can prevent teachers from successfully integrating ICT. Korte and Husing (2007), conclude that in a number of European countries, schools have recognised the importance of reliable technical support to motivate teachers in using ICT, a conclusion shared by Mumtaz (2000) and Williams et al (2000). These authors assert that teachers are more likely to explore and use ICT if they know that reliable technical support is on hand to deal with any difficulties or problems with equipment.

This literature review has identified a number of barriers related to lack of support and technical issues. These barriers include: technical problems, poor funding, poor administrative support, lack of incentives, scheduling difficulties, poor training opportunities and lack of skills in how to integrate ICT in education.

Relevant literature has also consistently highlighted the lack of and inadequate access to resources as a critical barrier.

The lack of high quality and reliable hardware, peripherals and appropriate educational software may also be considered an important barrier (Granger et al 2002). Poorly maintained computers are usually unreliable and likely to cause disruption. Similarly, inappropriate software does not add anything to a lesson
but could in fact disengage students from the learning process. Toprakci (2006) cited poor quality and quantity of hardware, along with a lack of software, as the main barriers to ICT integration in his study of Turkish schools. Korte and Husing (2007) report the lack of broadband connectivity as an important new barrier and found that one third of European schools do not have broadband connectivity, although Empirica (2006) discovered that on average, 96% of European schools have some form of internet connectivity.

Lack of access to resources is another important related barrier. Clearly, if there is difficulty in accessing ICT resources, then there will be difficulty in integrating these resources into the learning process. As stated earlier, issues such as the prebooking of ICT rooms can deter teachers. Becta (2004) recognises that the inaccessibility of ICT resources is not always due to the absence of ICT equipment. Rather, it may be caused by a number of factors, such as poor allocation, poor quality, inappropriate resources or lack of personal access for teachers.

Empirica (2006) found that lack of access was the greatest barrier in their study. Accessibility issues reported in this study, included a lack of computers and a lack of adequate material. Pelgrum (2001), noted that four of the top ten barriers in his study, related to access. These were: lack of computers, lack of peripherals, lack of software and lack of internet reliability.

Many of these resource deficiencies are caused by inadequate school budgets. ICT equipment can be extremely costly, both to purchase and maintain. Finance unfortunately, determines the quality and quantity of hardware and software in most schools.

2.3.2.4 Financial or Budgetary Constraints

Apart from the financial outlay of purchasing and maintaining ICT equipment, school budgets also come under pressure from the financial demands of meeting the training needs of staff. Another substantial cost is software licence fees.
These licences, usually a legal requirement, are typically needed for multiple copies of educational software. Network capable PCs are also traditionally more expensive than regular PCs.

Ak巴巴-Altun (2006) reports that budget was a particular issue for the seventeen school principals, who were part of his study. Their primary concern was in relation to ongoing maintenance of ICT equipment.

Baskin and Williams (2006) also conclude, that lack of money is a barrier, while critics such as Kirkpatrick and Cuban (1998), query the huge financial resources being spent by some schools on ICT equipment. They feel that such demands divert valuable and finite resources away from other areas of education, such as the arts, science and other practical subjects.

Having examined both school and teacher related barriers to ICT integration, the next section will attempt to determine the relationship between some of these barriers. Many barriers are closely linked to each other and perhaps would diminish if other barriers were addressed and eliminated.

2.4 Relationship Between Barriers

There are complicated and multifaceted relationships among these barriers and these relationships will be discussed in more detail in the following section.

This literature review reveals that some barriers, such as lack of knowledge and lack of accessibility, appear to be closely related to others. Other barriers, such as lack of confidence and attitude to ICT, seem to be more important than others. This section concentrates on the relationship between lack of access and lack of knowledge and other barriers, such as lack of time, lack of training and lack of support.

The following diagram, from Becta (2004), illustrates the complex and interlinking relationships that exist between some barriers.
Lack of access, as a barrier, is closely related to other barriers. Although ICT resources may be available, a lack of time may not allow teachers to access them. There may be technical equipment available but again, a lack of time prevents teachers from operating it. This may be because the number of classes in the day is unsuitable, or because there is insufficient time available during a particular class.

Another example, is that a lack of training decreases ICT integration. Resources may be available but teachers cannot use them, because of a lack of pedagogical, or skills related training. On the other hand, it may be, that the lack of access to resources, leads to a reduction in training opportunities.

A teacher may have abundant access but may not be able to use ICT in their classroom, because they do not know how to operate equipment. Teachers may need technical assistance to help them prepare for class.
Lack of knowledge is an important barrier and is related to other barriers such as lack of training, lack of time and lack of support. The first problem associated with this knowledge barrier is the lack of training. Training in the use of modern technology increases teacher ability to use ICT. Training must include basic skills, as well as instruction in how to integrate technology into interactive and effective teaching methods. Allied to this, is that if teachers are to improve their ICT skills, then they need time. Schools need to give teachers sufficient time to develop their skills.

There is also a relationship between lack of access and lack of knowledge. Teachers may not be able to access ICT resources, unless they have skills in the use of technology and can work with it efficiently in their classroom. On the other hand, access to ICT resources could assist teachers in increasing their knowledge, possibly through self training at home, although Totter et al (2006, p.95) concluded, that even though teachers had such facilities at home, they were still reluctant to use them in school. The opportunities for teacher skill development and their access to ICT resources can be increased, by providing them with enough time and adequate support.

A lack of confidence can be related to a lack of access and a lack of knowledge. If a teacher has the basic skills to operate technology, they may be motivated to integrate it into their teaching. Once again, the important issues of lack of training, lack of time and lack of support impact on this.

It is difficult to classify barriers as entirely separate entities because of these intricate relationships. For example, a lack of support, time and/or training can lead to a lack of access and/or a lack of knowledge which can in turn lead to a lack of confidence.

2.5 Summary

Numerous studies have outlined the advantages of infusing ICT into the educational arena. Proponents refer to empirically substantiated evidence of
progress, to ICT led independent learning, to its ability to provide immediate feedback and rewards, to its promotion of higher order thinking, to its facilitation of different intelligences, to its promotion of effective reflective learning and finally, to its ability to bring the real world to the student.

This review has examined a number of different barriers that may prevent the integration of ICT into teaching and learning processes. These barriers may be teacher based, school based or indeed a combination of both. There is a close relationship between a number of different barriers and such relationships can be extremely complex. Relationships can exist within teacher based barriers, within school based barriers or indeed between both.

Understanding these barriers and how they impact on teacher use of ICT can assist educators in deciding how to tackle them. Teachers need firstly, to be persuaded about the merits of using ICT in their teaching. Then they need to be provided with access to resources. Following this, they need to be able to use these resources successfully. Access to resources and the ability to use them cannot be achieved without sufficient time, effective training and support.

This study will look at a Youthreach centre in the North West of Ireland to determine what specific barriers are experienced by Youthreach teachers, who teach vulnerable second chance learners, as opposed to mainstream secondary teachers in Ireland. The following chapter discusses the methodology used to investigate barriers to ICT use in this Youthreach Centre.
Chapter Three Methodology

3.1 Introduction

This chapter outlines the nature of the methodology for the research. The research design, sampling, instruments, data analysis, reliability and validity are discussed. The chapter outlines a number of research methodologies, before arguing in favour of the methodology adopted. A background and context to the research setting is presented. Attention will also be given to methods of data collection and analysis.

3.2 Research Setting

The Centre for Education in this study houses two separate programmes: a Traveller Training Centre and Youthreach. Both programmes are run under the auspices of the Vocational Education Committee (VEC).

The Youthreach programme commenced in 1989. Its aims and objectives are set out by the Department of Education and Science (Department of Education and Science 2009). Youthreach is an inter-Departmental initiative for early school leavers. It offers a programme of integrated general education, vocational education and work experience. Initially offering NCVA (National Council for Vocational Awards) certification, it now offers FETAC certification, as well as Junior Certificate and Leaving Certificate Applied.

Currently there are 25 teaching staff on the Youthreach programme in the Centre. This study examines these Youthreach teachers and their perceptions of ICT use in education.
3.3 Research Questions

The notion of learning, permeated by ICT, has gained prominence in recent years. The potential gains from such ICT integration have been well documented and teachers are encouraged to use technology in the preparation and delivery of lessons. Consequently, the views and opinions of teachers could be important. As significant players, teachers need to be fully on board with the use of technology. The aims of this research are to establish:

- What are the barriers preventing the integration of ICT in Youthreach education?
- What perceptions do teachers in a Youthreach Centre have in relation to the use of ICT in the classroom?
- What factors lead to successful ICT integration in the Youthreach classroom?
- Would the provision of an informal, in-house ICT training session lead to greater use of ICT in the Youthreach Centre?

3.4 Background to the Study

This is a case study based in a Centre for Education in the North West of Ireland. The overall aim is an investigation of the barriers that hinder the use of ICT in Youthreach education. Specifically, the research aims to establish teacher perceptions towards ICT within Youthreach and if the provision of informal training could lead to greater use of ICT in the Youthreach Centre.

From its tentative first steps in schools, ICT promised to change the way teachers teach and learners learn. Early proponents of ICT in the classroom were hugely optimistic about its potential, claiming that technology would facilitate a change in education “from using ICT to deliver and control instruction to using it to support the learner’s creation of knowledge, investigation and thinking” (Cohen et al 2004, p.68).
However, Haydn and Barton (2008) conclude, that this admirable vision has not been fully realised. Against a background of falling prices and increased capacity, the full integration of ICT in education remains stubbornly lacking and some distance away within the Youthreach sector.

3.5 Methodological Approaches

A number of research methodologies were investigated and considered as an approach to this particular study. These methodologies are outlined below.

3.5.1 Action Research

Action research, combining practical problem-solving along with scientific research, is concerned with thoughtful inquiry into the researcher’s practice to change or improve that practice (Bell 2005). Therefore, it involves deep inquiry and examination of existing practice. The researcher examines their work to discover opportunities to improve, through ongoing reflection. The premise therefore, is that something could be done in a better way (Cohen et al 2000, p.21).

Denscombe (2007, p.122) asserts that action research “is seen as research specifically geared to changing matters”, while Cohen et al (2000, p.241) argue that it involves “identifying a problem, planning an intervention, implementing the intervention and evaluating the outcome”. The action researcher both acts and seeks to learn from the various actions taken.

Somekh (1995) claims, that action research bridges the gap between research and practice, as the dual processes of action and research are integrated. Action research is a continuous process, of reflection on practice, taking an action, reflecting again, followed by further action. The researcher obtains better understanding as the process continues and this underpins improved actions and practice.
The primary advantage of action research is that its constant action and reflection, tackles problems in a practical nature. Paradoxically, its main disadvantage is its focus on the workplace. Another critical disadvantage is that, unlike positivistic approaches, the action researcher may find it difficult to detach themselves from the research.

3.5.2 Experiments

Experiment, as a research methodology, sits comfortably within the social and physical sciences. Experiments are concerned with establishing the reason for any changes to the entity being studied. It attempts to investigate underlying relationships among issues, or test a proposition. It could be used to help explain problems, corroborate or challenge theoretical assumptions. At its most basic level, the experiment seeks to make an observation, present a question, establish a hypothesis, examine it, evaluate the results, make a conclusion and communicate results.

Denscombe (2007, p.48) refers to the experiment as “an empirical investigation under controlled conditions designed to examine the properties of and relationship between specific factors”.

The major strengths of experiments are that they are repeatable, precise and credible. On the other hand, they are sometimes conducted in artificial settings and could be considered unrepresentative.

3.5.3 Case Study

A case study can be described as a thorough study of a single individual, group, incident, or community (Bell 2005). This approach involves a detailed, examination of a single instance, event or case. The case study has as its major strength, an ability to study something in-depth. Cohen et al (2000, p.182) see the case study as “a rich, vivid and holistic description and portrayal of events, contexts and situations”.

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Case studies allow the researcher to look at events, gather data, analyse information and present findings. They can allow the researcher to understand why something happened and what might need further research. Another significant strength of this approach is that things are examined within real life contexts. Yin (1994) sees the case as a natural phenomenon, existing prior to, during and after research. He refers to case studies as empirical inquiries within a real-life context. The issue, or case, therefore does not become detached for the researcher and remains tangible.

An important advantage of the case study is that it allows the researcher to investigate the deep and underlying reality of a situation. Denscombe (2007, p.45) argues that case studies enable the researcher “to grapple with relationships and social processes”. Another advantage is that it facilitates the use of a variety of research methods and sources of data, enhancing validity through triangulation.

However, some critics contend that case studies rely too much on rich descriptive qualitative data, which may be ill-suited to statistical analysis or evaluation (Denscombe 2007, p.46)

3.5.4 Approach Adopted

Following careful consideration of a number of alternatives, a case study methodology with an open approach was employed. The case study methodology is the most appropriate vehicle in examining this particular issue, as it involves the study of a particular group and their interaction with ICT.

Bell (2005) and Yin (1994) conclude that a case study approach can be appropriate, as it provides an opportunity to study a problem; while Flyvbjerg (2006) asserts that the case study holds up well when compared to other methods. Denscombe (2007, p.38) concurs, arguing that “the use of more than one research method sits comfortably with the case study approach”.

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Action research was dismissed as a methodology, as the author, in this particular instance, is not seeking to improve practice, but to examine the lack of ICT use among colleagues. Similarly, experiment was dismissed, as the author is not attempting to explain a change among colleagues in the Centre.

3.6 Research Instruments

In this research study, the questionnaire (quantitative) was the dominant research instrument, while interviews and observation (qualitative) added depth to the research and validated the data.

Research findings were obtained using triangulation, encompassing questionnaires, interviews, training and observation. Triangulation is the use of several research methodologies when examining an issue, affording an opportunity to combine the qualitative method with the quantitative one (Guion 2002). Furthermore, it ensures the authenticity, credibility, validity and robustness of results and could mitigate researcher bias (Denzin 1978; Carter 1990). Similarly, Yin (1994) advocates the use of multiple sources of evidence.

The philosophical assumption underpinning the qualitative research is ontological, in that the nature of the reality of the setting (Centre) is being researched. A naturalistic approach was adopted, as the researcher believes that participants cannot be considered, outside of the context of their own worlds and their experiences cannot be understood in total objectivity. The social constructivism paradigm in qualitative research demands that the researcher: relies on the participant’s view of the situation, develops meaning from the emerging data, accepts that background may shape data and that questions used are broad and general.
3.6.1 Questionnaire

The first stage in the research process was the distribution of a preliminary question (Appendix A), determining staff views on ICT use in the Centre. The review of the literature was then guided by the responses from this preliminary question.

Quantitative research continued with a questionnaire (Appendix B), which had been pilot tested by five teachers from a different Centre. This pilot testing raised a number of issues, particularly in relation to layout and aesthetics. As a result the questionnaire was revised before distribution. All Youthreach teachers indicated their willingness to complete the questionnaire following a request by the author at a staff meeting in November 2009.

The questionnaire data was analysed and presented using SPSS (Statistical Product and Service Solutions). The questionnaire contained open-ended and close-ended questions. Open-ended questions have no single definite answer, while closed-ended questions have a predetermined set of answers, from which the respondent must pick.

The questionnaire was distributed and collected by the author, ensuring a high response rate. Edwards et al (2002) concluded that response rates will be significantly increased if respondents are contacted prior to questionnaire distribution.

Likert scales were used to measure responses to statements in relation to ICT. Likert scales are used in questionnaires to assess the respondent's feelings about something. The respondents indicate their response on a rating scale.

3.6.2 Interviews

Interviews in research, involve the collection from individuals, of detailed information, on thoughts, feelings and behaviours. A number of Youthreach
teachers had indicated on the questionnaire, their willingness to participate in an interview. The respondents chosen represented a varied spectrum of teachers in the Centre, one an English teacher, the other a science teacher. The perceived access of both these teachers to ICT within the Centre could vary greatly. Interviews of a conversational, face-to-face nature, with structured and unstructured questions, were conducted to establish teacher perceptions towards ICT (Appendices C and D). Structured interview questions attract quantitative data, while less structured questions attract qualitative data. Interviews took place at a time convenient to interviewees and were recorded with their permission. However, it needs to be remembered that interviewing is prone to subjectivity and should be complemented by other methods (Cohen et al 2000).

3.6.3 Observation

Observation was carried out to add to the qualitative data findings. Since part of this study was to look at the effectiveness of the informal training, observation was crucial in determining the outcomes of the training session. Moreover, classroom observation triangulated the findings with the findings from the interviews and questionnaires.

The researcher should be as inconspicuous as possible when engaged in direct observation, in order to have a detached perspective and prevent any bias. They are observing certain situations or people and should avoid engagement. Observation allows the researcher to study people in their natural setting, giving a more holistic view of the topic being researched.

For the purpose of this study, observation was carried out of how a teacher interacted with ICT in the Centre (Appendix E). In particular, observation was carried out, after training involving the teacher, wishing to use a digital camera in class. This teacher was selected as she had indicated her willingness to participate and to extend her knowledge in this area. She had a solid knowledge of the basics in relation to ICT and displayed a positive attitude towards its use but had poor
knowledge of digital photography. She was therefore considered appropriate for training.

The training lasted for one forty five minute morning session on Thursday March 18th 2010 and took place in the classroom that the teacher uses to teach (Room 9). This was important as training should involve the same equipment that the teacher uses daily. The use of familiar equipment and a familiar environment is important as the teacher felt at ease and more receptive during the session. The session was informal in that it was unaccredited and of a conversational nature. There was no pressure put on the teacher and demonstration was repeated until the skill was mastered.

Prior to this session, the teacher was hindered by a lack of confidence and consequently avoided trying to teach digital photography.

The observation was carried out shortly after the training session. It took place during a class on digital photography which the teacher took. The classroom observation looked for evidence of how effective the training was, how exactly the teacher used the training, how comfortable she was in teaching the topic and finally how the class was managed.

During the classroom observation, the author kept written notes which included the basic information of date, place of event, participants, the physical setting, and occurrences of interaction and activities that had taken place (Appendix E).

3.7 Ethical Considerations

Ethical integrity is important to ensure the protection of the participants being researched, the researcher and the research itself. Research should be honest respectful, objective and confidential. Cohen et al (2000, p.47) assert that readers have a right to expect that research is conducted “rigorously, scrupulously and in an ethically defensive manner”.

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Permission was granted to gather data for this case study from the Adult Education Officer of the VEC (Appendix G) and the Youthreach Coordinator in the Centre (Appendix H). Following this, a verbal request was made to staff, in relation to the preliminary question, questionnaires and interviews, at a staff meeting in November 2009.

The following additional measures were undertaken to ensure ethical integrity:

- All research material was securely stored.
- All interview data were strictly confidential.
- All interviewees were identified by letter only. Interviewees could check interview notes, providing them with the opportunity to verify that interview material was fair and accurate.
- Questionnaire respondents were not required to identify themselves.

### 3.8 Sample Group

Sampling refers to the process of selecting a small number of people, from a larger population, allowing conclusions to be made about the population. The sample group chosen, consisted of twenty five Youthreach teachers, (19 female and 6 male), in the Centre and was a purposive and convenient sample. The sample was convenient in that it is easily accessible to the researcher and was purposive in that it was made up of individuals believed by the researcher to be typical of the population being studied.

### 3.9 Possible Limitations of Study

The author in conducting this research must acknowledge his own role. As a teacher in the Centre and as the researcher, personal bias, to some extent, is being brought to the research. This could possibly be seen as a limitation of the study.

Another possible limitation relates to the sample group. The sample group for this study was confined to a particular educational institution and may not be
representative. Consequently it could be regarded as institution specific. Restrictions in time and manpower meant that this is a relatively small research study. This could affect the credibility and reliability of the research findings. The possibility of applying the research findings to other groups of teachers could be affected. Another possible limitation is that respondents knew the researcher and may have tailored their responses to what they believed the author wanted, or to make themselves appear more ICT proficient.

Nevertheless, the findings from this study provide strong indicators, of the presence of a number of barriers, to the integration of ICT in the Youthreach Centre.

3.10 Reliability and Validity

Joppe 2000 (cited in Golafshani 2003), asserts that reliability refers to the extent to which research findings are consistent over time and an accurate representation of the population under study. Golafshani (2003, p.2) sees reliability as the potential to replicate results, while Wiersma (1995), asserts that reliability is concerned with both procedures and findings.

Mertens (1998) asserts that any piece of research is worthless unless it is valid, while Joppe 2000 (cited in Golafshani 2003), refers to validity as whether the research measures that which it was intended to, or how truthful the research results are. Wiersma (1995) argues, that validity refers to the interpretation and potential to generalise results.

In simple terms, reliability is whether or not the result can be replicated from a small sample to a population, while validity, is concerned that the research instruments are accurate and that they are actually measuring what they intend to measure.
3.10.1 Reliability in This Research

Qualitative data in this study is reliable, as participants were allowed freedom to elaborate during interviews, allowing for honesty, richness and depth. An important feature of qualitative research is its depth.

Quantitative data also displays reliability in that sampling was careful, appropriate instruments were used and the data was analysed appropriately, using recognised statistical analysis software (SPSS).

3.10.2 Validity in This Research

Validity was enhanced in this study, primarily through the use of triangulation. This is the use of a number of differing research methodologies. The preservation of original authentic data also enhanced validity, as did the opportunity for interviewees to check notes taken during interviews, ensuring accuracy.

The following chapter presents these findings in light of the Literature Review conducted earlier and in particular, analyses them to compare if the actual findings of this research correspond with findings from previous studies.
Chapter Four  Findings

4.1  Introduction

This section will detail and illustrate the research findings of this case study. The research consisted of questionnaires, interviews, training and observation by the author, as these were considered the most effective and appropriate means of obtaining data. Questionnaires were distributed and interviews were carried out within the Centre, while the training and observation were carried out within a classroom.

Twenty five questionnaires were distributed and all (100%) were returned (Appendix B). Cohen et al (2000) assert that a response rate of between 40% and 50% is adequate. Two teachers were interviewed, having earlier indicated their willingness to participate (Appendices C and D).

4.2  Demographic Profile of Respondents

Of the 25 respondents, 19 were female (76%) and 6 were male (24%). A significant number of teachers were in the 46+ age category (Fig. 4.1).

![Figure 4.1 Age profile of respondents](image-url)
However, length of service was not as skewed and was spread more evenly, with most teachers either having 6-10 or more than 15 years of teaching experience. All respondents had at least two years teaching experience (Fig. 4.2).

![Length of Service](image_url)

**Figure 4.2** Length of service of respondents

A significant number of respondents claimed that ICT has had a positive impact on their teaching and was a valuable resource (68%). One teacher said ICT was "a fantastic opportunity for me and the learners. We will both learn from it" (Appendix F). Only 4% claimed that it has had a negative impact and 28% have not noticed any impact.

Significantly, in terms of weekly computer usage, over a quarter of teachers state that they do not use ICT at all in their teaching. This lack of use is appreciably more pronounced among teachers in the 46+ age bracket (Table 4.1).

<table>
<thead>
<tr>
<th>Weekly Computer Use</th>
<th>None</th>
<th>0-1 hours</th>
<th>1-2 hours</th>
<th>2-5 hours</th>
<th>5-10 hours</th>
<th>10+ hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Stated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>18-25</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>26-30</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>31-35</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>36-40</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>41-45</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>46+</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>25</td>
</tr>
</tbody>
</table>

**Table 4.1** Weekly computer use and age
This is perhaps tempered by the fact that 72% of teachers use ICT to some extent in their classes, with most using it for 1-2 hours per week (Fig. 4.3).

![Weekly Computer Use](image)

*Figure 4.3  Weekly computer use*

Similarly, 96% of respondents disagreed that ICT should be a standalone subject and felt that it should be used in all subjects. A number of teachers referred to its ability to “enhance all subjects” and to “enhance teaching and learning” (Appendix F). The nature of ICT use was spread fairly evenly between: Schemes of Work/Lesson Plans (31%), Preparing lessons (26%), Lesson materials (24%) and Keeping Records (19%).

A variety of different subjects were taught and for ease of analysis these were grouped into five different categories (Table 4.2).

<table>
<thead>
<tr>
<th>Communications</th>
<th>Practical</th>
<th>Business</th>
<th>Sciences</th>
<th>Social Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Art &amp; Design</td>
<td>Business Studies</td>
<td>Maths</td>
<td>Social Education</td>
</tr>
<tr>
<td>Literacy</td>
<td>Woodcraft</td>
<td>Office Procedures</td>
<td>Science</td>
<td>Childcare</td>
</tr>
<tr>
<td>Communications</td>
<td>Textile Craft</td>
<td>Work Experience</td>
<td></td>
<td>Personal Development</td>
</tr>
<tr>
<td>Gaeilge</td>
<td>Cookery</td>
<td></td>
<td></td>
<td>SPHE</td>
</tr>
<tr>
<td>French</td>
<td></td>
<td></td>
<td></td>
<td>HRF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vocational Preparation</td>
</tr>
</tbody>
</table>

*Table 4.2  Subject groupings*
There is a wide spread throughout all these subject groupings, although the Communications grouping clearly has more teachers (Fig. 4.4).

![Main Subject Taught](image)

*Figure 4.4 Teacher numbers by subject groupings*

### 4.3 Presentation of Findings by Research Question

The remaining research findings will be presented by research question. The first research question, enquired as to the barriers preventing the integration of ICT in education. A number of barriers emerged from the research, some being more significant than others.

#### 4.3.1 What are the Barriers Preventing ICT Integration in Youthreach Education?

Lack of time emerged as the most significant barrier followed closely by Lack of training and the inaccessibility of resources.
Seventy two per cent of teachers cited lack of time as a factor affecting their use of ICT (Fig. 4.5).

![Lack of time to use computers](image)

**Figure 4.5  Lack of time to use computers**

Similarly, 68% of respondents (17 teachers), either agreed or strongly agreed with the statement ‘I do not have enough time to use computers in class’ (Fig. 4.6), while 80% of teachers disagreed with the statement ‘I have adequate time to plan for technology use in my class’.

![I do not have enough time to use computers in class](image)

**Figure 4.6  Lack of time – Likert rating**

Teacher A says “I don’t seem to get the time to ever just close the door, sit at the laptop and and do things like that, I don’t seem to have the time now” (Appendix C).
Similarly, Teacher B highlights “Preparation time, lack of time to prepare and I mean there’s so much in teaching that you have to prepare already” (Appendix D).

Lack of training was cited as a barrier by 60% of teachers, with comments such as “I feel I need training” to “I think ICT could be very useful but I need to learn more about it” (Appendix F). However 80% of teachers claim to use applications regularly, with MS Word (88%) and Internet Explorer (80%) the most frequently used. Some 16% of teachers claim that they use computers extensively in their teaching.

Eighty per cent of teachers have benefitted from some type of training, with ECDL and JEB the most frequent type of application training cited (Fig. 4.7).

Forty eight per cent of teachers that had undergone ICT training, had funded it themselves. Both Teacher A and Teacher B, in their interviews, highlighted the importance of ongoing training, with Teacher A recommending regular refresher courses, while Teacher B thought that such courses should consist of short bursts of information “as opposed to teachers taking whole days maybe to go and do things” (Appendix D).
In response to a likert statement ‘I feel that I need more training in computers’, 21 teachers (84%) agreed or strongly agreed (Fig. 4.8), while 60% disagreed that there are adequate professional development/training opportunities in ICT.

![Bar chart showing the level of agreement with the statement: I feel that I need more training in computers.](image)

**Figure 4.8 Need for more training**

Such significant data indicates that lack of training is a very real barrier to ICT integration in the Centre. Teacher A states that she would like to be competent in basic skills, saying “I just want the basics to take me through a class without making a mistake” (Appendix C).

However, some disparity with this requirement for training emerged with two likert questions in relation to experience and ICT integration. Teachers were asked to respond to the statements, ‘I know how to work a computer but have no idea how to integrate it into my teaching’ (Fig. 4.9) and ‘I do not have enough experience in using computers’ (Fig. 4.10). Similar results emerged for both statements.
The ability to integrate ICT in teaching does not necessarily come from having experience in using computers. Specialised training is required in integrating ICT. If experience in using ICT were the only prerequisite, then ICT integration would not be such a challenge. Underlying this, is the fact that 96% of teachers in this study use a computer at home, yet only 48% claim to know how to integrate ICT in their class.
Accessibility has also emerged from this study as a significant barrier, with 64% of teachers claiming that computers are not accessible. One teacher stated “I think it is a good resource for classes when the Computer Room is available” (Appendix F), while another says “I try to incorporate ICT in my craft sessions but only have access to one computer with no internet connection for research purposes” (Appendix F). This teacher went further and referring to the lack of internet facilities in her classroom stated “I have to leave the students to their own devices in the Computer Room. This can cause them to divert to something not relevant to their subject” (Appendix F). Similarly, in response to the statement ‘It is difficult to arrange to take my class in the Computer Room’ 80% of teachers agreed or strongly agreed, with only 4 teachers (16%) disagreeing (Fig. 4.11).

![Figure 4.11 Difficulty taking class in Computer Room](image)

Most teachers use ICT in the Staff Room (56%), followed by classrooms (40%) and the Computer Room (28%).

While respondents were dissatisfied with access to computer resources, they expressed satisfaction with equipment in the Centre. Eighty eight per cent of respondents disagreed that computer equipment was unreliable, while 80% disagreed or strongly disagreed with the statement that ‘The equipment available to me at work is unreliable’. Sixty per cent of teachers disagreed or strongly
disagreed that ‘There is an issue with computer resources in the Centre’, while 76% agreed that there are sufficient computer resources.

Teacher B nonetheless, points out during her interview, that lack of accessibility can add greatly to the time pressure already involved and indeed can exacerbate lack of time as a barrier “you know if everything is not accessible because then you have to add…you know going looking for the resources when you’re when you’re going to teach the lesson and the fact then that you don’t have all these computers and things accessible in the normal classroom” (Appendix D).

Although age was identified as a barrier, both in the literature review and by staff in the preliminary question, it did not feature strongly in the findings.

![Bar Chart: I am too old to learn how to use a computer](image)

**Figure 4.12   Age as a barrier to ICT use**

Ninety two per cent of teachers disagreed that age was a barrier, while 84% (21 teachers) disagreed or strongly disagreed with the statement ‘I am too old to learn how to use a computer’ (Fig. 4.12). Similarly, 86% disagreed or strongly disagreed that ‘Computers are a thing for young people’. Teacher A though, does mention age as an issue in her interview, particularly in the context of confidence when using computers “I think that’s a lack of confidence in myself, Noel, in that, you know I’m nearly fifty years of age” (Teacher A).
4.3.2 What Perceptions Do Teachers in a Youthreach Centre Have in Relation to the Use of ICT in the Classroom?

Overall, respondents displayed positive attitudes towards ICT. Extensive use is made of a wide array of hardware and software (Table 4.3).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Regularly</th>
<th>Sometimes</th>
<th>Rarely/Never</th>
<th>Not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photocopier</td>
<td>96</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Laptop/Desktop Computer</td>
<td>80</td>
<td>12</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Data Projector</td>
<td>20</td>
<td>16</td>
<td>64</td>
<td>0</td>
</tr>
<tr>
<td>Interactive Whiteboard</td>
<td>84</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Word Processing</td>
<td>80</td>
<td>12</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>E Mail</td>
<td>72</td>
<td>16</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Internet</td>
<td>80</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Digital Camera</td>
<td>36</td>
<td>40</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>8</td>
<td>32</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>Databases</td>
<td>4</td>
<td>28</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>4</td>
<td>32</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>4</td>
<td>12</td>
<td>80</td>
<td>4</td>
</tr>
<tr>
<td>Paint</td>
<td>4</td>
<td>24</td>
<td>72</td>
<td>0</td>
</tr>
<tr>
<td>Subject Specific Software (e.g. Literacy)</td>
<td>5</td>
<td>28</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>CD/DVD using a Computer</td>
<td>36</td>
<td>48</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 4.3 Use of ICT resources by teachers*

However, some specialised resources, such as the interactive whiteboard and Desktop Publishing software are not used as extensively.
A number of teachers expressed positive comments on how they felt about using ICT in their subject (Fig. 4.13).

![Pie chart](image)

**Figure 4.13  Teacher feelings about using ICT in their subject**

Many recognised the value of ICT as a teaching resource. One teacher said that ICT "enhances all subjects" (Appendix F) while another stated "I feel it enhances my teaching skills. It makes the learning more enjoyable and interesting" (Appendix F). Another teacher saw ICT as "a fantastic opportunity for me and the learners. We will both learn from it" (Appendix F). Teacher A states "I just feel more in control of my teaching because it's there and the two computers in the classroom" (Appendix C), while Teacher B refers to the interactivity offered by ICT "people now expect things to be a little more interactive and a little more exciting and it does add that element to teaching" (Appendix D).

Eighty eight per cent of teachers reported positive incidents arising from the use of ICT in their teaching. One stated "all of my interactions with ICT have been positive" (Appendix F) while another said ICT was helpful to "design literacy friendly workbooks for learners" (Appendix F). A considerable number of teachers commented on the potential to use the internet as a source for learning materials (Appendix F).
This positive attitude towards ICT, is perhaps best exemplified by the fact that 80% of teachers had undertaken ICT training and the most frequent reason given was to use ICT in class (Fig. 4.14).

![Reason for training](image)

**Figure 4.14  Reason for undertaking ICT training**

Ninety two per cent of teachers were clear on the benefits of ICT in education. Only 8% displayed a negative attitude, stating that they were unsure how useful computers were (Fig. 4.15).

![Not sure how useful computers are](image)

**Figure 4.15  Usefulness of computers**
4.3.3 What Factors Lead to Successful ICT Integration in the Youthreach Classroom?

Confidence was identified in the literature review as an important prerequisite to successful ICT integration. The results from this study show that 24% of teachers saw lack of confidence as a barrier. One teacher stated “I can see the benefit but not confident enough” (Appendix F) while another stated that they were “very unsure” about ICT use (Appendix F). Teacher A refers to the pressure of teaching young people who could have superior ICT skills “I just think that the generation coming behind us are so good at them and so proficient and I find myself teaching people that have far far superior skills than I have and it can be a wee bit daunting sometimes just” (Appendix C).

The earlier examination of this barrier also showed that it was linked to fear, another significant barrier. One teacher supports this stating that they are “afraid but would be willing to learn” (Appendix F). With 20% of teachers in this study citing it, fear is a significant barrier to ICT use in the Centre (Fig. 4.16).

Teacher A highlights this stating “A fear of doing something and doing it wrong, a fear of losing material on the laptop that is important, a fear of a younger person..."
that you’re supposed to be teaching telling you you’ve done something wrong, it’s a fear of all of that” (Appendix C). Indeed, she goes further, in reference to the fear of looking stupid, saying “Absolutely, that’s the big fear” (Appendix C).

Teacher knowledge and competence are also important for ICT integration. Thirty six per cent of teachers in this study cited the lack of knowledge or competence as a barrier. Despite this, 48% of respondents claimed that they did not have the necessary skills to use ICT in their subject (Fig. 4.17). One teacher states that they “need to learn more” in relation to ICT (Appendix F).

![Diagram: Necessary skills to use ICT in your subject](image)

**Figure 4.17  Necessary skills to use ICT in subject**

Previous experience with computers proved to be a more significant barrier in this study with 36% of respondents agreeing that it impacted on their use of ICT. Similarly, 44% agreed or strongly agreed with the statement ‘I do not have enough experience in using computers’.

Respondents did not agree in great numbers that classroom management would be more difficult if ICT was used. Nevertheless, 20% felt that they would avoid using ICT in class because of this.
The literature review proposed that the principal can have a significant influence on the integration of ICT in an educational setting. In this study, 28% of teachers felt that management influenced their use of ICT.

Significantly, those teachers that felt a lack of support from the principal, used ICT much less that their colleagues, who felt there was support from the principal (Table 4.4). This suggests that principals need to be seen to clearly and actively support and encourage the use of ICT among staff.

<table>
<thead>
<tr>
<th>There is clear support from the principal</th>
<th>Hours per week of computer use</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>None</td>
<td>0-1 hours</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>False</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

*Table 4.4  Computer use and perceptions of support from principal*

Fifty six per cent of teachers agreed or strongly agreed that they are encouraged to make use of computers in their teaching, as opposed to only 12% who disagreed or strongly disagreed. However, 40% of teachers felt that there was an absence of support from the principal and there was a lack of ICT planning (Fig. 4.18).

*Figure 4.18  Clear support from principal*
Similarly, there was significantly more computer use among teachers that received support from colleagues than those who felt that such support was absent. Of the 80% (20 teachers) that felt such support existed, only 4% (1 teacher) felt that they were not encouraged to use of ICT in their teaching (Table 4.5).

<table>
<thead>
<tr>
<th>Source of support</th>
<th>True</th>
<th>False</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Friends</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Teacher</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Colleague</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4.5 Computer use and support from colleagues**

Teachers in this study felt that they received most ICT support from other colleagues rather than the principal/management (Fig. 4.19).

**Figure 4.19 Source of support**

Most negative comments offered by respondents in relation to their interaction with ICT, centred on lost files and other hardware/software issues. One teacher
bemoaned the absence of day to day technical support “when equipment doesn’t work” (Appendix F). Another refers to “not being able to set up equipment” (Appendix F) and the obvious disruption such an issue might cause. However, the provision of effective and relevant training should overcome many of these issues.

Lack of support was also expressed in relation to the technical aspects of ICT use. Almost half (44%) of teachers in this study, felt that the lack of technical support was a barrier. However, 62% disagreed or strongly disagreed with the statement ‘There is never any help if something goes wrong’. Similarly, 56% felt that there is reliable technical support if something goes wrong.

4.3.4 Would the Provision of an Informal, In-house ICT Training Session Lead to Greater Use of ICT in the Youthreach Centre?

Most respondents agreed with the provision of such training. Eighty per cent of teachers in the Centre have already shown commitment to the use of ICT, by undertaking training themselves. The ability to use ICT in class, featured strongly as a motivation for such training.

When asked if training courses put pressure on them and if they would prefer something more relaxed, 40% of respondents agreed or strongly agreed (Fig. 4.20). Although a significant percentage did not concur, it behoves management and training providers to cater for the needs of all staff and it would be remiss of them to ignore the type of training that some require or prefer.
Training courses put pressure on me. I would like something more relaxed.

Figure 4.20 Pressure of training courses

More significantly, when asked directly, if the provision of an informal, in-house training session would help develop their ICT skills, respondents were almost unanimous in their opinion that it would (Fig. 4.21).

Would an informal, in-house training session help develop your ICT skills?

Figure 4.21 Support for informal, in-house training

What such training should focus on is not as clear however. A wide variety of topics for training were suggested, ranging from the basics to more advanced applications such as discussion boards and the interactive whiteboard (Appendix F).
Informal training in digital photography was provided in the Centre for one teacher on Thursday March 18th 2010. This short (45 minute), one-to-one session, focussed on taking photographs, downloading them to a PC, moving them to a folder and then printing. The teacher concerned had expressed a desire to teach this process to a class but was unsure of the procedure herself. The training was informal in that it was non accredited and casual.

Both the teacher and the author felt that the training session had worked well. No significant difficulties were encountered and the procedure was repeated a number of times to reinforce the learning. Teacher B states “I found the training extremely helpful and it actually...you know I thought it was a task that perhaps was beyond me so it was very reassuring to be able to accomplish it as well, so the training actually was very helpful” (Appendix D).

The author then sat in on the actual class to carry out observation. Teacher B reports that she was confident but apprehensive prior to the class, “I suppose you’re always a wee bit apprehensive when you’re doing something for the first time” (Appendix D).

However, despite her reservations, the class proved extremely successful. Having introduced the topic, the teacher then proceeded to demonstrate the steps involved in this process to small groups, while the remaining students worked on a task. Students were attentive and anxious to learn. Many commented that they were able to take photographs without difficulty but then either viewed them on the camera or had them printed commercially. Teacher B concurs, stating “the students were very interested and I think it also was an area for them... you know that they thought was sort of difficult and beyond them” (Appendix D).

Prior to this, photography in the Centre was mainly carried out by the author. With the benefit of this training and further classes, many students will be equipped to take over this role.
4.4 Summary of Main Findings

The following is a summary of the main findings from the research:

- The main barrier to ICT use among Youthreach teachers is lack of time.
- Other significant barriers include: lack of training, accessibility and lack of confidence.
- There is a high degree of satisfaction with the level and quality of ICT resources in the Centre.
- Age is not a significant barrier to ICT use in the Centre.
- Youthreach teachers value and have a positive attitude towards ICT and are clear in relation to its potential benefits.
- Most Youthreach teachers receive support in relation to ICT from other colleagues, as opposed to management and this impacts on whether or not they use ICT in their teaching.
- There is strong support for informal training. Such training should be brief but recurrent.

The next section, Discussions, reflects on these research findings in a more analytical manner and considers them in light of the literature review in Chapter Two.
Chapter Five       Discussions

5.1    Introduction

This section will elucidate the research findings and comment further on them in light of the previous literature review. The chapter will be presented by research question.

5.2    What are the Barriers Preventing ICT Integration in Youthreach Education?

The literature review outlined a number of obstacles or barriers, that prevent the successful integration of ICT in education. The aim of this study was to identify the specific barriers experienced by Youthreach teachers, as opposed to mainstream second level teachers in Ireland. Although Youthreach teachers in this study acknowledge the benefits of ICT in education, difficulties nevertheless are experienced with this process.

The research findings from this study show that lack of time is the most critical barrier faced by Youthreach teachers. Even teachers that claim to be competent in the use of ICT, highlight the lack of time as a constant difficulty.

Seventy two per cent of teachers in this study cited lack of time as a barrier to their use of ICT. Time has been identified as a barrier in numerous other studies. Fabry and Higgs (1997), noted that time was important, for both formal training and self directed exploration. However, these authors also felt that teachers lacked time to prepare ICT resources for lessons. Teacher B, in her interview concurs, stating that “Preparation time, lack of time to prepare and I mean there’s so much in teaching that you have to prepare already” (Appendix D). Teacher A also highlights time as a barrier to the use of ICT, stating “I just don’t have time, I just would love to but I don’t seem to get the time to ever just close the door, sit at
the laptop and and do things like that, I don’t seem to have the time now” (Appendix C). The research findings indicate that teachers are unable to fully exploit technology in the Youthreach Centre because they lack the time needed to prepare and research lesson materials. Learning to use ICT takes time and teachers have many other commitments to contend with.

Albirini (2006) suggests that teaching time be reduced to allow teachers to plan and experiment with new ICT based approaches. Watson (1999) is of a similar view, suggesting that working time as opposed to private time should be made available for such learning and planning.

Lack of time therefore, is a significant barrier to ICT use, as it impacts both on teachers that are trained in integration and also on those that need such training. Fabry and Higgs (1997) concur, stating that teachers feel they need more time to learn computer basics, then plan how to integrate technology into their lessons and finally they need time to actually use technology in the classroom.

Almost twenty years ago, Hadley and Sheingold (1993), identified lack of time as a critical determinant to the integration of ICT in education. They claimed that not alone did teachers lack time to prepare computer based lessons; there was also a problem in scheduling enough time in schools for computer based instruction. Given the proliferation of ICT applications, particularly over the last decade, it is perhaps not surprising that this barrier has remained a significant difficulty for teachers wishing to integrate ICT into their practice.

Within the mainstream second level system, management and school principals are reluctant to provide such time for teachers due to the focus on targets, particularly the points race at senior level. Within Youthreach, there is perhaps less focus on academic outcomes, although accreditation of learning remains important. Other areas, such as personal development, vocational training and inter-agency collaboration are also significant. Allied to this, is a seemingly never-ending volume of associated administrative paperwork.
Youthreach centres are well resourced in terms of equipment, derived from annual non-pay budgets. However there is a distinct lack of ICT training for staff. Many staff do not have the time to engage in such training, due to time constraints associated with these ongoing administrative duties.

This study also discovered that a need for further ICT training was cited as a barrier by 84% of Youthreach teachers. The literature review outlined how a lack of training can trigger other barriers such as lack of confidence, lack of knowledge and fear. Despite this, the author found that a substantial number of teachers remain positive about the use of ICT in the Youthreach Centre. One teacher says “I feel it enhances my teaching skills. It makes the learning more enjoyable and interesting” (Appendix F). Some staff have undertaken training in their own time with the aim of using it in their own classrooms. Numerous other studies have discovered that teachers recognised the advantages of ICT use in school and are enthusiastic about enhancing their skills in this area.

In this study, the commitment to training is underpinned by the fact that 80% of teachers had trained in the use of ICT and almost half of these teachers had financed this training themselves. Zammit (1992), recognised that many teachers invest substantial time and energy in developing their computing skills. These findings are corroborated in this study. Demetriadis et al (2003) concur, finding that teachers welcome training but it needs to be supplemented by consistent support and further training if necessary. Both Teacher A and Teacher B, in their interviews, recognise the need for ongoing training with Teacher A advocating regular refresher courses, while Teacher B thought that such courses should consist of short bursts of information “as opposed to teachers taking whole days maybe to go and do things” (Appendix D).

Becta (2004), in a study of barriers to ICT in teaching, assert that effective training is crucial if teachers are to implement ICT. The key element in Becta’s observation, is their use of the word effective. Training may be effective for one teacher but entirely ineffective for another. Training therefore should be differentiated, according to teachers’ experience and skills in using computers. A
number of studies advocate the notion of differentiated training that responds to the individual needs of teachers.

The literature review outlined a dilemma in relation to the provision of basic skills training versus the provision of integration training. A number of studies discovered that even with skills training, many teachers still had no idea how to integrate ICT into their teaching. In this scenario, teachers that had received ICT training failed to integrate ICT because, although proficient in computer use, they lacked skills in integration. The author, in this study, discovered that although 80% of teachers had received ICT training, 84% claimed that they needed further training. Almost half of the teachers in this study claimed to have no idea how to integrate ICT into their teaching.

Cox et al (1999a) claim that one possible reason for this inconsistency is because too much emphasis is placed on acquiring technical ICT skills during training, as opposed to skills in how to incorporate ICT into the curriculum. Haydn and Barton (2008) refer to the overloading of teachers with volumes of information that is overwhelming and unrealistic during such basic training. Teacher A in her interview supports this view, pointing out that material learned in a previous ECDL course had been forgotten quickly “Absolutely because sometimes you only use the bits that are relevant to yourself and then maybe two years later some other part comes up and you think oh.. you know I need that again” (Appendix C). Scrimshaw (2004), concurs, referring to teachers being frustrated by the large amount of information provided and the limited time to take it in.

However, the dilemma is that integration cannot realistically be achieved unless teachers fully understand the basic operations of the computer. Totter et al (2006) assert that it is not enough to train teachers in ICT skills. Such training must be combined with pedagogical training. Snoeyink and Ertmer (2001) and Newhouse (2002) suggest that this impediment could be addressed by providing training that is initially focussed on the basic operations of technology followed by pedagogical training.
Similarly, the provision of adequate equipment, will not necessarily lead to increased ICT integration. The findings from this study, demonstrate that teachers are very satisfied with equipment and resources in the Centre. Seventy six per cent agreed that there are sufficient resources. One teacher states “The equipment in the Centre is excellent and seems to be updated regularly. The maths software available to me is state of the art” (Appendix F).

However, the study discovered that although teachers were satisfied with ICT resources, accessing them was difficult. The Becta (2004) study, on the barriers to the use of ICT in teaching, also outlined the challenge in some schools, where resources are located in dedicated computer rooms. Consequently, ICT classrooms may have to be pre booked. Similar difficulties were uncovered in this study. A number of teachers noted that the non availability of the Computer Room impacted considerably on their use of ICT. In response to the statement ‘It is difficult to arrange to take my class in the Computer Room’, 80% of teachers agreed or strongly agreed, with only 4 teachers (16%) disagreeing. During her interview, Teacher B says “you don’t have all these computers and things accessible in the normal classroom” (Appendix D). Albirini (2006), also discovered that access to resources was a difficulty for teachers, while Williams et al (2000) assert that access to technology tends to override all other factors in determining use.

The findings by the author from this study, are supported by Snoeyink and Ertmer (2001), who assert that the inability of a teacher to gain access to ICT resources may not necessarily occur because there is a paucity of resources within a school. In this study, the findings demonstrate that teachers are extremely satisfied with the resources in the Centre but still had difficulty accessing them. These findings are supported by Schoepp (2005), who discovered that scarcity of technology was the least cited barrier in his study. Pelgrum (2000) makes a similar observation, suggesting that accessibility issues may be related to poor organisation of resources, rather than an actual lack of resources. Likewise, Fabry and Higgs (1997) argue that numbers of computers alone may not necessarily guarantee adequate access. These authors further argue that it is important to position the
appropriate numbers and types of technology where they will be used most effectively.

The Becta (2004) study of ICT barriers concurs; pointing out that the popular policy for schools to have dedicated computer suites contributes to this barrier. Many teachers in the Becta study, as in this study, note that equipment and resources are kept and used in ICT rooms. This causes problems when a number of different teachers wish to use the room/equipment at the same time.

Nevertheless, a number of studies have pointed out that even when teachers have sufficient ICT access at home they still fail to use it at school. Totter et al (2006, p.95) concluded, that even though teachers had such facilities at home, they were still reluctant to use them in school. In this study, 96% of teachers use a computer at home, yet 76% use ICT for less than two hours per week in their classes. Tezci (2009) promotes the idea of teachers having ubiquitous ICT access to counter this problem, while Totter et al (2006) assert that arrangements for technical and pedagogical support need to be put in place.

The findings from this study therefore indicate that the barriers to ICT integration in Youthreach are lack of time, lack of training and difficulty in accessing ICT resources.

5.3 What Perceptions Do Teachers in a Youthreach Centre Have in Relation to the Use of ICT in the Classroom?

The findings from this study indicate that teachers are extremely positive towards ICT use in education. Ninety two per cent of teachers stated that they were clear on the benefits of ICT in education. These findings compare to a number of studies which also conclude that teachers are strong advocates of ICT use in education (Korte and Husing 2007; Lau and Sim 2008; Russell et al 2000).
Findings from this study also correspond to Albirini’s (2006) study, in relation to teacher acceptance of the rationale for using ICT in schools. Teachers in this study, with low levels of competence, still had positive views in relation to ICT in education. Comments from teachers included that “it was a great resource” (Appendix F) and it “enhances my teaching skills” (Appendix F). Of the 20% of teachers with no ICT training, all thought that ICT should be integrated throughout all subjects. Similarly, among the teachers that have no ICT qualifications, 93% were equally enthusiastic, that ICT should be integrated throughout all subjects. One such teacher states that ICT “enhances all subjects” (Appendix F).

A significant number of teachers in this study had undertaken training of some nature, demonstrating this strong support. Similar findings were discovered by Jimoyiannis and Komis (2007), who found that the majority of teachers in their study, had a positive attitude about the role that ICT can play in education and the integration of ICT in the educational process. Tezci (2009) also discovered that teachers had positive attitudes towards computers.

The findings from this study therefore, correspond closely to those of Beggs (2000), who discovered that lack of interest was a negative barrier. Teachers have a positive view in relation to ICT use and non use could not be attributed to a lack of interest or apathy. Lack of interest therefore, was not a barrier among teachers in this Youthreach Centre.

5.4 What Factors Lead to Successful ICT Integration in the Youthreach Classroom?

Lack of confidence and apprehension in relation to ICT also emerged from the findings as a significant barrier. Twenty four per cent of teachers in this study saw lack of confidence as a barrier. One teacher stated “I can see the benefit but not confident enough” (Appendix F) while another stated that they were “very unsure” about ICT use (Appendix F).
Teacher A refers to the pressure of teaching young people who could have superior ICT skills “I just think that the generation coming behind us are so good at them and so proficient and I find myself teaching people that have far far superior skills than I have and it can be a wee bit daunting sometimes just” (Appendix C). She goes further, adding “kids watch you and because they’re so good themselves, they’re nearly looking at you wondering how you don’t know what to do” (Appendix C). She claims that the possibility of looking stupid is her big fear (Appendix C).

This fear was also highlighted in Becta (2004) and Beggs (2000), where teachers expressed concern about revealing their limited ICT knowledge to pupils and furthermore, pupils’ attitudes and expectations could contribute to this anxiety. Teachers therefore, can feel anxious about using ICT in front of a class who perhaps know more than they do. Teacher B is of a similar view, saying “you know the students are so much more aware of these things than we are, even what the computer can do” (Appendix D). Teacher A elaborates on her fear, saying that she fears doing something wrong or losing something on the computer (Appendix C).

Bradley and Russell (1997) assert that competence and anxiety reciprocally influence each other, a feature strongly displayed by Teacher A in her interview. Meanwhile, Russell and Bradley (1997), identify a ‘cyberphobia’ that exists in some teachers. The term relates to teachers who are reluctant to engage with ICT as a result of such anxiety. Teacher A claims that “in fact if I have a really good proficient class in here, I don’t even turn on the laptop, I’d rather keep it off than use it and be seen to be not proficient at it” (Appendix C).

However, Rosen and Weil (1995) assert that such teachers are role models and their actions, (either overt or covert), demonstrate that computers are not easy to learn, are scary and are to be avoided. Indeed, Teacher A goes further, claiming that her role as a teacher is sometimes threatened by her lack of competence allied with her students’ proficiency (Appendix C). This bears a striking resemblance to
findings by Fabry and Higgs (1997), who suggest that a fear of computers could stem from a fear of losing professional status as a teacher.

Becta (2004) claims that teachers who are reluctant to engage fully with ICT, are also unenthusiastic about training programmes, that involve addressing an extensive set of competencies. Teacher A confirms this, in her desire to achieve basic competency only, saying “I don’t want to go to any higher level than ECDL; I just want the basics to take me through a class without making a mistake” (Appendix C).

School principals play an important role in ICT integration. The findings from this study reveal that 28% of teachers felt that management influenced their use of ICT. More significantly, teachers that felt a lack of support from the principal, used ICT much less than colleagues, who felt such support existed. Similarly, there was significantly more computer use among teachers that received support from colleagues, technical or otherwise, than those who felt that such support was absent.

McGarr and Kearney (2009), describe school principals as key pedagogical leaders with a crucial influence on ICT integration. They must enthusiastically join in the process. Baylor and Ritchie (2002) concur, asserting that administrators wishing to nurture a technology culture need to promote it, not only in words, but also in actions. However, Scheffler and Logan (1999), while acknowledging the role principals have in nurturing ICT, state that there is no evidence that computer knowledge or training is required by principals. Tondeur et al (2008) concur, saying that successful ICT integration is clearly related to actions taken at the school level, and that school principals have to develop a more collaborative approach and not necessarily be skilled in ICT.

Support is vital for teachers to embrace and use ICT. Lack of support is a very real barrier that can hinder this process. Cox et al (1999a) regard the lack of support as a school level barrier in the uptake of ICT in teaching; while Cuban
(1999), asserts that the lack of available technical support is likely to lead to teachers avoiding ICT.

Teachers in this study felt that they received most ICT related support from other colleagues. One teacher when asked if he ever had a negative ICT experience replied “Not really. I have been lucky enough to get a colleague to help me” (Appendix F). Demetriadis et al (2003), place importance on the provision of such support, which they see as vital in overcoming difficulties. Lack of support, they claim, can significantly decrease teachers’ motivation to work with computers.

Russell et al (2000) point out that some private schools in Australia now appoint experienced teachers as learning technology coaches, as well as network support staff to assist teachers, while Granger et al (2002) see the availability of such support equally as important as up-to-date equipment, in the drive towards curricular integration. Mumtaz (2000) argues for the provision of a support network within schools, while Yelland (2001) asserts that the funds for such support should be unequivocally provided in all schools.

It would appear therefore that the factors that could lead to successful ICT integration in the Youthreach classroom are confidence, knowledge and competence as well as clear leadership complemented by consistent and reliable support.

5.5 Would the Provision of an Informal, In-house ICT Training Session Lead to Greater Use of ICT in the Youthreach Centre?

Ninety six per cent of teachers in this study agreed with the provision of informal training. Some studies have demonstrated that teachers prefer such training as opposed to sessions where copious amounts of information are distributed and teachers are sometimes left to wade through it themselves. Gomes (2005),
discovered that a substantial number of teachers in his study, felt that the way schools organise training fails to motivate teachers to integrate ICT. Both Teacher A and B also felt that training needs to be ongoing (Appendices C and D). Teacher B states “I think ICT training should be constant” (Appendix D). This observation was also put forward by Newhouse (2002), who argues that the on-going provision of professional development will assist in maintaining skills and knowledge. The findings from this study, support Lau and Sim (2008), who argue that training should be offered to teachers on a continuous, rather than a one-off basis, so that their ICT knowledge is upgraded over time. Scrimshaw (2004), notes the importance of schools having a culture of collaboration and mutual support.

The findings from this study also correspond with those of Akbaba-Altun (2006), who discovered that such in-house training was much more convenient for teachers. In support, Russell et al (2000), found that teachers have a preference for training based on existing school resources.

The informal training session carried out in this study proved successful. Teacher B, in her interview suggested that such informal training should be short (Appendix D). The training lasted for one class session. Teacher A also recommended short refresher type training sessions saying “it’s like first aid, you do a refresher” (Appendix C).

Prior to the training session, Teacher B did not have the confidence to attempt teaching digital photography saying “you know I thought it was a task that perhaps was beyond me” (Appendix D). After the session she gained confidence and was much more positive about her ability to deliver the class. She says “Well I was confident that I knew what I was doing” (Appendix D). This is supported by Becta (2004), who established a link between competence and confidence.

The training session lasted for one forty five minute class session. It is unlikely that this could be sustained over a long term period for a variety of reasons, mainly logistical. The author, as the training provider, also has time constraints
and would be required to carry out training instead of timetabled teaching. This would require a replacement teacher. Teachers undertaking training would need to be timetabled, both at the same time as each other and the trainer and also need to have their classes covered. For this reason, training would need to be carried out with groups of teachers, rather than on a one-to-one basis. Differentiated training would be necessary, as all teachers would not require the same training. All of these complications perhaps give an insight into the difficulty faced by management in organising training of any nature.

A number of studies have concluded that training leads to more positive attitudes towards the use of ICT. Jimoyiannis and Komis (2007) concluded that training and the acquisition of ICT knowledge and skills, overcame barriers to ICT integration. Similarly, Knezek and Christensen (2002), found that training was highly effective in fostering positive attitudes. Teacher B recognised the need to practice and employ the knowledge and skills gained from training, saying “now it’s just up to me now I suppose to use it more and to get more practice at it” (Appendix D). Ertmer et al (1999) assert that teacher use of technology evolves as they gain experience. Scheffler and Logan (1999) are of a similar opinion, stating that teachers need to continually work at updating their skills and knowledge in the area of ICT.

5.6 Summary

The findings from this study indicate that the use of ICT in the Youthreach Centre is affected by a number of factors. Teachers feel that they lack time to implement ICT integration effectively. Numerous studies have concurred, pointing out that teachers lack time for formal training, for self directed exploration, to prepare ICT based lessons and to actually use ICT in class.

Allied to this obstacle is a lack of training. Teachers require training to use ICT. Such training ranges from formal, accredited professional development, to more informal school based knowledge sharing. The most effective training is often
carried out within the workplace and consists of mutual support between teachers. However, the lack of time can again be an issue for many teachers.

The literature review outlined a number of possible solutions to this problem. Differentiated training, provided by schools during working time, may address this issue. However, such training needs to be complemented by ongoing support, allowing teachers to initially learn about and then maintain competence in ICT applications.

While there was a high level of satisfaction in relation to resources and equipment in the Centre, there is an issue in relation to access to these resources. This issue surrounds the lack of access to the Computer Room. A number of teachers expressed frustration at being unable to access these facilities. One teacher states “I have to leave the students to their own devices in the Computer Room” (Appendix F). The literature review also outlined the risk of such dedicated rooms sending out a message that ICT is a standalone subject. Although logistically more convenient to have such dedicated rooms, ICT equipment should nevertheless, be distributed throughout the Centre and teachers and students should be able to access it at any time.

Teachers in this study, whether skilled/qualified/trained in ICT or not, had very positive attitudes towards the use of ICT in education. The amount of training undertaken by staff, often at their own expense and in their own time, perhaps best demonstrates this positivity and commitment to ICT.

Teaches appreciate and recognise the support shown by colleagues. While there may be an issue with unclear support from management, teachers are motivated and encouraged by their colleagues to use ICT. There is a clear preference for ongoing informal training. Such training should be differentiated and complemented by consistent meaningful support, technical or otherwise.

However, schools can only do so much. The actual use of ICT depends to a large extent on teachers themselves and their own attitudes to ICT.
Chapter Six  Conclusion

Information and communications technology has become an integral part of our personal and working lives. The students of today have been born into this age of technology. The prevalence of ICT requires educators to ensure that all students are capable of full participation in this digital world.

This final chapter outlines the key conclusions reached from the research and offers some recommendations to address the issues raised.

6.1  Time, Training and Access

Lack of time has emerged as an impediment to ICT integration in this Youthreach Centre. Youthreach teachers need adequate time to explore and prepare for ICT use in their classes. They also need time to train and engage in ICT related professional development activities. Such training should be held in the Centre and use the ICT equipment that teachers use everyday. Incentives could be offered to ensure high participation levels. Such incentives might range from meaningful certification to reduced teaching time.

However, such training could be of little value due to difficulties in accessing ICT equipment. Poor or restricted accessibility, as discovered in this study, could hinder ICT integration. Traditional practices of isolating equipment into dedicated labs needs to be reconsidered. An inadvertent signal could be sent out that ICT is a stand alone subject

Recommendations

- ICT training should be provided in the Centre, during teaching time, making use of the ICT equipment that Youthreach teachers themselves use. Training should be compulsory or have incentives and should consist of short, relevant frequent sessions.
• Hardware and software resources should be made available in all Centre classrooms. Where this is logistically impossible or difficult, management should ensure, as a minimum, that dedicated ICT rooms are timetabled to facilitate equal access for all students and teachers. Furthermore, Youthreach management could investigate and consider the possibilities offered by laptops and wireless technology in providing accessibility, connectivity and portability.

6.2 Teacher Perceptions

A positive attitude towards ICT is essential in the integration process. Youthreach teachers need to appreciate the value of ICT. Teachers that are not ICT competent could find it difficult to promote ICT permeated learning. Youthreach teachers also need to clearly understand the rationale for using ICT in education. Such understanding and appreciation of ICT infused learning should be an integral element of teacher professional development in the Youthreach Centre.

Recommendation

• ICT training should be underpinned by a focus on the technical skills, the rationale for ICT use in education and finally on developing the skills required to successfully integrate ICT into teaching. Youthreach teachers willing to undertake ICT training outside of work should be facilitated as much as possible.

6.3 Knowledge, Support and Leadership

Effective training leads to confidence and competence. These two key factors are imperative for successful ICT integration and leads to the elimination of many barriers. Allied to these factors, is the need for ongoing support. Such support, whether technical or merely encouragement, should be constantly available, consistent and reliable. Support should be provided amongst colleagues in
Youthreach. The most effective training is often of an informal knowledge sharing nature, between colleagues.

This study has demonstrated that there are deficiencies in how ICT is promoted by leadership within Youthreach. As a result, some Youthreach teachers are not using ICT as much as others. Youthreach management are failing to articulate a signal that ICT use is to be promoted. A clear ICT plan should articulate the Centre’s shared vision for the role of ICT. This plan should be designed, by a collaboration of relevant stakeholders, with the needs of students at its core.

**Recommendation**

- Youthreach teachers need consistent and reliable support, technical or otherwise, in their interactions with ICT. Such support must be complemented by unequivocal leadership. Management in particular, must drive the integration process, leading from the front. A clear, collaboratively created, ICT plan should provide the blueprint for this.

### 6.4 Finance

The elimination of many ICT related barriers could be achieved with minimal capital investment. Timetable adjustments could address many issues. The reorganisation of existing resources merely requires forward planning and strategic thinking.

Nevertheless, some barriers can only be tackled with a financial input. The provision of training, particularly during teaching time, will inevitably cost money. The provision of adequate hardware and software will also involve considerable financial outlay.

However, if the goal of full ICT integration is to be achieved, then such costs are unavoidable. Youthreach teachers need to be provided with incentives to ‘buy in’ to the integration process. Teachers in this study have displayed considerable
enthusiasm and creativity, despite working with limited and sometimes difficult to access resources. It is not unreasonable to propose therefore, that these teachers would be even more enthusiastic, if they were provided with further incentives.

**Recommendation**

- Youthreach management should explore timetabling options that might assist in ICT integration. Existing resources should be used to their full potential and reorganised if necessary. Youthreach teachers need to be encouraged, through the use of incentives, to promote ICT throughout the Centre.

### 6.5 Further Research

This study was carried out within a Youthreach Centre in the North West of Ireland and it dealt exclusively with teachers. Students did not form part of this particular study, as it dealt solely with the barriers faced by Youthreach teachers. Further information could perhaps be obtained from these students in the Centre. Their observations on the use of ICT, in the delivery of their subjects, could be considered an important source of data.

Similar studies could be carried out in other Youthreach Centres. The findings from such studies might indicate if other Centres had similar or entirely different issues, in relation to ICT integration. Such a comparative study could influence and inform any potential strategies, formulated to tackle these barriers. Furthermore, the findings might provide a contrast, between the difficulties that Youthreach Centres experience and the difficulties that mainstream secondary schools experience.
6.6 Summary

The findings from this study point to a number of barriers which are hindering the integration of ICT in Youthreach. These are a lack of time for teachers to engage with ICT. In addition a lack of training also emerged as a significant barrier. Finally, while teachers in the Centre expressed satisfaction with ICT resources, there was a difficulty in accessing such resources.

The results from this study demonstrate that Youthreach teachers, whether ICT capable or not, are generally positive in relation to ICT’s role in education. They are clear about the potential benefits of an ICT permeated education process. A number of teachers in this study acknowledged the potential of ICT as a teaching resource, while a number of teachers have undertaken training in their own time and at their own expense.

The factors that lead to successful ICT integration appear to be confidence, knowledge and competence, as well as clear, consistent and reliable support from other colleagues and the principal.

Informal in-house training is a worthwhile endeavour as it brings positive experiences, leading to greater knowledge and competence. Greater knowledge inevitably leads to an increase in confidence and the alleviation of fear and apprehension.

Full ICT integration will only be achieved when barriers are eliminated or substantially alleviated. There needs to be in place a vision for ICT. This far reaching vision, articulated in a collaboratively designed and regularly reviewed plan, needs to be proactively driven, particularly by management. This drive to achieve integration needs to be supplemented by modern resources, skilled and enthusiastic educators, consistent and reliable support and unhindered access.
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Appendix A

Preliminary Question
Preliminary Question

Dear colleague

As you may be aware, I am currently undertaking a Masters Degree in Digital Media Development for Education with University of Limerick. As part of this, I am carrying out some research here in the Centre. I would appreciate if you could respond to the question below.

As a follow up I will be distributing questionnaires after Christmas.

What reason(s) prevent you from using ICT in your teaching?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Many thanks
Noel
Appendix B

Questionnaire
Questionnaire on ICT use

1. Sex  Male  Female
2. Age  18-25  26-30  31-35  36-40  41-45  46+

3. How long have you been teaching?
   0-1 years  1-5 years  6-10 years
   11-15 years  15+ years

4. Main Subject taught ______________________________

5. How would you rate your experience with computers? (Tick all that apply)
   1. I have never used a computer and do not intend to
   2. I have never used a computer but would like to learn
   3. I use applications such as word processing, spreadsheets, the internet etc
   4. I use computers extensively in my teaching

6. Currently I use computers for _____ hours in my classroom each week.
7. **What type of computer training, if any, have you had?**
   1. None at all *
   2. Basic computer literacy (on/off, loading software) *
   3. Applications (e.g. ECDL) *
   4. ICT integration (using computer to teach in class) *

8. **Why did you undertake this training?** (Tick all that apply)
   - Required to do it
   - Increase career prospects
   - Personal interest
   - To use ICT in class
   - Other (Please state) ____________________________

9. **Do you hold any professional ICT qualifications?**
   - Yes
   - No
   If Yes please give details _____________________________________

10. **How much computer training have you had over the last two years?** __________

11. **How did you receive any computer training you ever had?**
    1. Self financed
    2. Paid for by Centre
    3. Paid by VEC
    4. Paid by Department of Education

12. **Do you use a computer at home?**
    - Yes
    - No

13. **Number of years since you last had ICT training of any kind** __________
14. What factors affect your use/non-use of computers in the classroom (Tick all that apply)

- Lack of time to use computers
- Lack of knowledge about computers
- Lack of confidence
- Fear
- Lack of training
- My age
- Little previous experience
- Not sure how useful computers are
- Computers not accessible
- Management don’t care if I use computers or not
- Computer equipment is unreliable
- No support if something goes wrong with computer

15. What impact has ICT had on your teaching?

- Positive
- Negative
- No effect

16. If you use ICT in the Centre, where do you normally use it?

- My Classroom
- Staff Room
- Computer Room
Please read each statement and then circle the number which best shows how you feel.

<table>
<thead>
<tr>
<th>SD = Strongly Disagree</th>
<th>D = Disagree</th>
<th>U = Undecided</th>
<th>A = Agree</th>
<th>SA = Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. I do not have enough time to use computers in class                          1  2  3  4  5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18. I could look stupid if something goes wrong                                    1  2  3  4  5</td>
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<tr>
<td>19. I feel that I need more training in computers                                  1  2  3  4  5</td>
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<tr>
<td>20. I know how to work a computer but have no idea how to integrate it into my teaching  1  2  3  4  5</td>
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<tr>
<td>21. I am too old to learn how to use a computer                                     1  2  3  4  5</td>
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<tr>
<td>22. I do not have enough experience in using computers                             1  2  3  4  5</td>
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<tr>
<td>23. Computers are a thing for young people                                           1  2  3  4  5</td>
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<tr>
<td>24. It is difficult to arrange to take my class in the Computer Room                 1  2  3  4  5</td>
<td></td>
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<tr>
<td>25. I am encouraged to make use of computers in my teaching                         1  2  3  4  5</td>
<td></td>
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</tr>
<tr>
<td>26. There is never any help if something goes wrong                                  1  2  3  4  5</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>27. The equipment available to me at work is unreliable                              1  2  3  4  5</td>
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<tr>
<td>28. There is an issue with computer resources in the Centre                        1  2  3  4  5</td>
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<tr>
<td>29. Training courses put pressure on me. I would like something more relaxed         1  2  3  4  5</td>
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</tbody>
</table>
Please read each statement and then tick true or false

30. ICT should be a stand alone subject and not used in other classes

31. I have the necessary skills to use the computer for teaching my subject

32. I avoid using computers in my classroom

33. There are sufficient computer resources (printers, software, etc.)

34. There are enough professional development/training opportunities in ICT

35. There is effective access to the Internet

36. There is good quality software available to me

37. There is clear support from Principal/Clear school based ICT plan

38. There is support from other teachers for me to use ICT

39. There is reliable technical support if something goes wrong

40. I have adequate time to plan for technology use in my class
41. How do you feel about using ICT in your subject?

____________________________________________________________________________________________________________________

____________________________________________________________________________________________________________________

42. Have you ever had a positive incident in relation to computers in your work? (Please give details)

____________________________________________________________________________________________________________________

____________________________________________________________________________________________________________________

____________________________________________________________________________________________________________________

43. Have you ever had a negative incident in relation to computers in your work? (Please give details)

____________________________________________________________________________________________________________________

____________________________________________________________________________________________________________________

____________________________________________________________________________________________________________________

44. If an informal in-house training session in ICT were to be offered in the Centre, what would you like it to focus on?

____________________________________________________________________________________________________________________
### 45. How often do you use the following ICT equipment? PLEASE TICK

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Regularly</th>
<th>Sometimes</th>
<th>Rarely/Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photocopier</td>
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<td></td>
</tr>
<tr>
<td>Laptop/Desktop Computer</td>
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<tr>
<td>Data Projector</td>
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<tr>
<td>Interactive Whiteboard</td>
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<td>Word Processing</td>
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<td>E Mail</td>
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<td>Internet</td>
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<tr>
<td>Digital Camera</td>
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<td>Spreadsheets</td>
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<td>Databases</td>
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<td>PowerPoint</td>
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<td>Desktop Publishing</td>
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<tr>
<td>Paint</td>
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<tr>
<td>Subject Specific Software (e.g. Literacy)</td>
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<tr>
<td>CD/DVD using a Computer</td>
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</table>
46. **From whom do you receive support in relation to ICT use at work?**

- Family
- Friends
- Computer Teacher
- Other Colleague(s)
- Management
- Other (Please state) ________________________________

47. **What is the purpose of your ICT use?** (Tick all that apply)

- Preparing Lessons
- Keeping Records
- Schemes of Work/Lesson Plans
- Lesson Materials

48. **What applications do you use most often?** (Tick all that apply)

- MS Word
- MS Excel
- MS Access
- MS PowerPoint
- Internet Explorer
- Other (Please state) ________________________________

49. **In your opinion would an informal, in-house training session help develop your ICT skills?**

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<tr>
<td>Yes</td>
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<td>No</td>
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</table>

50. **Please indicate here if you are willing to participate in an interview to further explore these issues**

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<td>Yes</td>
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<td>No</td>
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**Thank you for your time**
Appendix C

Interview Transcript
Teacher A
Interview with Teacher A conducted on the 18th March.

Good morning, I would like to thank you first of all for taking time to answer the questionnaire and for agreeing to be interviewed today. I want to assure you that you will not be named in either the questionnaires or in this interview. Confidentiality will be important at all times and your responses won’t be divulged to anyone. In the final thesis, you will be referred to as Teacher A.

Can I ask you first of all how long have you been teaching?

I am teaching now for twenty years in Youthreach.

Okay.

Twenty years this year.

And what subjects do you teach?

I suppose my main subject would be Communications, which is Literacy and at different times over the twenty years I have done Drama, I have done a lot of work with Work Experience and then a lot of the Social Ed. stuff like Positive Mental Health and Sexual Health.

Okay and in general would you use ICT or computers much in your teaching?

No Noel, I’ll have to tell you here I wouldn’t. I would like to but I don’t.
Interviewer  And the little bit you do use, how do you use it?

Teacher A  I just use it in the last two years, I’ve got a laptop for my own work and I put that in the classroom and I refer to stuff on that if I have to. I have two other computers in the room and I’m just starting to get in to using them now.

Interviewer  And the little bit again that you do use, would you see it as a positive or negative aspect of your teaching?

Teacher A  I would see it as a very positive thing; I only wish I could use them more proficiently. Yes I would see it as a positive.

Interviewer  Why is that?

Teacher A  Well for my own benefit, that everything’s on hand, you don’t have to leave the classroom to get anything, you feel you have a better record of what you have if you’ve kept it ah on the laptop or on your stick. I just feel more in control of my teaching because it’s there and the two computers in the classroom, I can send somebody to type on one if they’re.. if they need timeout you know, I use it for those kind of things.

Interviewer  And have you done any training in ICT?

Teacher A  All I’ve ever done Noel is ECDL.

Interviewer  Okay and why did you do that?

Teacher A  Well I did it, I asked for it at the time because I knew I was ah…I knew I didn’t really have anything and I just wanted
it for my own benefit to be able to use it in the classroom situation.

**Interviewer**

Okay and would you think that ICT training needs to be a regular thing or a once off thing?

**Teacher A**

Oh I think it needs to be ongoing. You know I remember a good bit of ECDL; there are parts now I forget that I really wish I knew again, I would love to sit in on it again.

**Interviewer**

So you would recommend sort of refresher courses.

**Teacher A**

Absolutely because sometimes you only use the bits that are relevant to yourself and then maybe two years later some other part comes up and you think oh.. you know I need that again.

**Interviewer**

Okay and in your questionnaire you mentioned a number of things that prevent you from using ICT in class and just maybe we could discuss a few of those now. The first thing you highlighted was lack of time.

**Teacher A**

Well I teach twenty hours a week, I have admin hours which are fifteen and I just, I just don’t have time, I just would love to but I don’t seem to get the time to ever just close the door, sit at the laptop and and do things like that, I don’t seem to have the time now.

**Interviewer**

Okay and the next thing you mentioned was a lack of confidence.

**Teacher A**

I think that’s a lack of confidence in myself, Noel, in that, you know I’m nearly fifty years of age, I never did
computers, we never had one at home obviously, I never ever did it five years at school, three years in college, never and I just think that the generation coming behind us are so good at them and so proficient and I find myself teaching people that have far far superior skills than I have and it can be a wee bit daunting sometimes just.

**Interviewer**  Okay and I suppose that ties in now with the next one which is fear, ah.. a fear of what?

**Teacher A**  A fear of doing something and doing it wrong, a fear of losing material on the laptop that is important, a fear of a younger person that you’re supposed to be teaching telling you you’ve done something wrong, it’s a fear of all of that.

**Interviewer**  So, would it be a fear of looking stupid?

**Teacher A**  Absolutely, that’s the big fear.

**Interviewer**  Okay, do you think you’re role as a teacher is threatened by the use of ICT?

**Teacher A**  Threatened because of my lack of it or threatened because of their proficiency at it?

**Interviewer**  Well both.

**Teacher A**  Yes I do.

**Interviewer**  You do?

**Teacher A**  Yes I do.
Interviewer: Okay and all of these I suppose would be countered by an increase in training and you mentioned the lack of training as a barrier to your use of ICT.

Teacher A: Yeah.

Interviewer: What sort of training and why?

Teacher A: I’m just talking about something as simple as ECDL again, it’s like first aid, you do a refresher, you do ECDL, you pass it, you use what you want but yes I would certainly need to get back in there, I don’t want to go to any higher level than ECDL; I just want the basics to take me through a class without making a mistake.

Interviewer: And the last point you mentioned was that you’d little previous experience and you’ve outlined that during the interview. How does that impact on your day to day teaching now, that you’ve little previous experience in ICT?

Teacher A: Well you know, fifteen years ago we didn’t need it, there was one person in the Centre had it and she did anything that was necessary, we didn’t use it in class, if we wanted something done we asked her. Now it’s just one of those things that every single teacher needs in every single class and kids expect it, kids watch you and because they’re so good themselves, they’re nearly looking at you wondering how you don’t know what to do, in fact if I have a really good proficient class in here, I don’t even turn on the laptop, I’d rather keep it off than use it and be seen to be not proficient at it.
**Interviewer**

Thank you very much, that’s it.

**Teacher A**

You’re very welcome.
Appendix D

Interview Transcripts
Teacher B
Pre and Post Training
Teacher B – Pre-Training Interview

Interviewer  Interview with Teacher B taking place on the 11th March 2010. First of all I would like to thank you for taking time to answer the questionnaire firstly and for agreeing to be interviewed. I want to assure you that you won’t be named in either. Confidentiality will be maintained at all times and your responses will not be divulged to anyone. In the final thesis, you will only be referred to as Teacher B.

Interviewer  First of all can I ask you how long have you been teaching?

Teacher B  I have been teaching twelve years.

Interviewer  Twelve years thank you and what subjects do you teach?

Teacher B  I’m a Science teacher, a qualified Science teacher but I also do IT and then Literacy and Communications as well.

Interviewer  Okay and in general do you use much ICT in your teaching?

Teacher B  ICT would be limited maybe in the computer classes to actually using the digital projector to demonstrate to students how to access different programs and to show them how to do it and in other ones it would be very restrictive because you wouldn’t have material that if I did have a digital projector it would be more for a sort of a PowerPoint or maybe to access a DVD or something like that.
Interviewer  Okay and you’ve jumped ahead and answered the next question, how do you use it, so I’ll jump ahead again. Do you think ICT is a positive or negative thing in your teaching and why?

Teacher B  I would see ICT a positive, ah..I suppose a positive influence on teaching, because people now expect things to be a little more interactive and a little more exciting and it does add that element to teaching.

Interviewer  Okay and have you any training done in ICT?

Teacher B  I have an ECDL and also a JEB.

Interviewer  Okay and why did you complete those courses?

Teacher B  ah.. I did the both the courses when I was a very young teacher, just starting out, because I really hadn’t a clue about computers at all, I could hardly type and I did them sort of.. it was a big challenge, it was a big step I suppose to take when you didn’t have much knowledge but that’s why I did them…professional development I suppose.

Interviewer  Okay and finally do you think ICT training needs to be ongoing all the time and how do you get over that hurdle with teachers?

Teacher B  I think ICT training should be constant because there is so many things coming out now, I mean at the minute we’re looking at facebooks and MP3 players and all kinds of things, you know the students are so much more aware of these things than we are, even what the computer can do, and really, you know even just to keep up with them it...
should be. I think through staff meetings and things it could be accomplished as opposed to teachers taking whole days maybe to go and do things, short...little short bits yeah.

**Interviewer**

And just finally in your questionnaire you mentioned a number of things that prevent you from using ICT in class and I’m just going to briefly look at both of them. The first one was lack of time, if you could elaborate that, what did you mean?

**Teacher B**

Preparation time, lack of time to prepare and I mean there’s so much in teaching that you have to prepare already and I suppose you know the computer element then adds an extra burden, you know if if everything is not accessible because then you have to add...you know going looking for the resources when you’re when you’re going to teach the lesson and the fact then that you don’t have all these computers and things accessible in the normal classroom

**Interviewer**

Okay and I want to talk briefly now about the informal training session you had with me, and why this specific training, it was digital photography we did, why did you choose that?

**Teacher B**

It’s an area that I would like to add to my teaching where instead of just importing cliparts into your worksheets or you know into your teaching that you actually would have real photographs of things that are more relevant, particularly to people with learning difficulties and that’s an element that I would like to add to my own teaching.

**Interviewer**

Okay and just looking at the training itself, did you find it helpful?
**Teacher B**  
I found the training extremely helpful and it actually…you know I thought it was a task that perhaps was beyond me so it was very reassuring to be able to accomplish it as well, so the training actually was very helpful.

**Interviewer**  
Okay and so probably it was successful if that’s the case?

**Teacher B**  
It was successful and now it’s just up to me now I suppose to use it more and to get more practice at it.

**Interviewer**  
Okay and finally, armed with this training, how did you feel then before the actual class you carried the training out with?

**Teacher B**  
Well I was confident that I knew what I was doing but I still I suppose was a little apprehensive because it would have been the first time, I was actually going to show the students then how to import photographs into their work and I suppose you’re always a wee bit apprehensive when you’re doing something for the first time and I suppose there’s always an element then that can be improved upon if you’re..you know if you’re thinking about. So I was confident that I knew what I was doing but just a wee bit apprehensive how it would go.

**Interviewer**  
Okay Thank you very much.

iv
Teacher B – Post-Training Interview

**Interviewer**  
Interview 2 with Teacher B taking place on the 18th March 2010. Good afternoon. Just a little follow up interview now in relation to the class you took this morning. You have had the training in digital photography, you took your class this morning as we said, so generally how did you feel it went?

**Teacher B**  
I think the class went very well, the students were very interested and I think it also was an area for them you know that they thought was sort of difficult and beyond them, so they were very delighted that they could actually then import the photographs and put it into their em… into their their work that they were doing you know.

**Interviewer**  
And just a wee look at how you managed the class, like, what was the logistics, did you teach them one-to-one? Did you teach them as a group? If you taught them one-to-one what were the rest doing?

**Teacher B**  
Well there were nine students in the class this morning and I talked to them as a class as a whole first to explain exactly what was happening that day and I set them a task then, it was a text task that they had to input into the computer but then I explained then we were going to put in a photograph that was relevant to what they were typing. When they all…when I was sure that they were all started and they all were typing away I took small groups of three round one of the computers and demonstrated exactly… I could have done it on the laptop but then the laptop wasn’t what they were using so I thought it would be better to use the exact
computer that they were using and I showed them then what happened and how to do it and then when they went back to their seats I went to them on a one-to-one basis, each of those three and meanwhile the rest were still typing the article. Then, when those three were happy and the picture had been imported, then I went and did another group of three, did the same thing and then the final group and then we brought the class together as a close to see how they thought of the exercise.

**Interviewer** And it all went well, there were no difficulties were there?

**Teacher B** No it went extremely well and the students you know were quite amazed and didn’t realise it was as easy as putting in a clipart.

**Interviewer** As you did yourself?

**Teacher B** As I did myself.

**Interviewer** Yeah okay so generally things went well, you were happy?

**Teacher B** Things went well and I think the students were delighted and we actually then did some student work for the notice board as well.

**Interviewer** Alright

**Teacher B** So that they could see you know that their work actually was up there as well.

**Interviewer** Okay, thank you very much.
Appendix E

Observation Record Sheet
# Record of Classroom Observation

**Date:** Thursday March 18th 2010  
**Time:** 11.30 am-12.15 pm  
**Location:** Letterkenny Youthreach, Room 9  
**Rationale:** Teacher is teaching a class on digital photography, following a training session

<table>
<thead>
<tr>
<th>Teacher Activity</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to topic</td>
<td>Clear and concise explanation. Class attentive. Teacher outlines how class will be carried out.</td>
</tr>
<tr>
<td>Organisation of class</td>
<td>Teacher divides class into three groups. Groups 2 and 3 are given word processing task.</td>
</tr>
<tr>
<td>Begins work with Group 1</td>
<td>Procedures as outlined during training are followed. Teacher shows students camera memory card. Demonstration of how and where it is inserted into computer.</td>
</tr>
<tr>
<td>Computer work 1</td>
<td>Similarity of memory card and memory stick is outlined. Navigation to picture containing folder demonstrated. Students allowed to practice finding photo.</td>
</tr>
<tr>
<td>Computer work 2</td>
<td>Copy and pasting of picture to student folders. Extensive opportunities allowed for students to practice.</td>
</tr>
<tr>
<td>Computer work 3</td>
<td>Teacher demonstrates how to place picture in a MS Word document. Students taught through demonstration how to resize, add text and briefly introduced to procedure for formatting picture.</td>
</tr>
<tr>
<td>Computer work 4</td>
<td>Group 1 students allowed to work alone and practice what has been learned. Teacher repeats process with Group 2.</td>
</tr>
<tr>
<td>Computer work 5</td>
<td>Group 2 students allowed to work alone and practice what has been learned. Teacher repeats process with Group 3</td>
</tr>
<tr>
<td>Close</td>
<td>Three groups brought together again. Teacher reinforces learning by outlining entire procedure again. Students allowed ask questions and seek clarification.</td>
</tr>
</tbody>
</table>
Appendix F

Questionnaire Responses
Questionnaire Responses

Question 41 How do you feel about using ICT in your subject?

- Very useful for researching craft subject.
- I think it is a great resource.
- I can see the benefit but not confident enough.
- Confident.
- I think it is a good resource for classes when the Computer Room is available.
- I feel it enhances my teaching skills. It makes the learning more enjoyable and interesting.
- I am happy to use ICT as it is a good resource.
- I think ICT could be very useful but I need to learn more about it.
- It is a fantastic opportunity for me and the trainees. We will both learn from it.
- I feel computers are a positive factor in our Centre.
- Don't need it.
- Not really appropriate for my class/learners.
- Don't use ICT in my class.
- I try to incorporate ICT in my craft sessions but only have access to one computer with no internet connection for research purposes.
- Enhances all subjects.
- Not easy as I want to write everything in Irish and some programs do not support this easily.
- Afraid but would be willing to learn.
- It is very useful for typing and researching information.
- Confident but need more planning.
- I feel I need training on whiteboard as I can see it would be a fantastic asset to teaching.
- Okay.
- Very unsure.
Question 42  Have you ever had a positive incident in relation to computers in your work? (Please give details)

- LCA historical aspect of their project. By researching the information on the internet discovered that Donegal was world famous for tweed. Prior to this internet research, they were unaware of Donegal tweed.
- Yes. Obtaining learning materials from internet.
- Oh yes! We found sites relevant to classwork.
- Access to information and resources.
- One class is currently completing a drugs project and are using the computers to do this.
- All of my interactions with ICT have been positive.
- Sourcing material from the internet for use in class is easier than taking from books.
- I use internet to source up to date resources.
- Yes. Last year LCA group put together a PowerPoint of all their work and did extremely well in their task because of it.
- Use the internet to print off worksheets and source information.
- Internet provides good sites for literacy.
- Yes, being able to design literacy friendly workbooks for learners.
- Great for research purposes.
- PowerPoint.
- I have found good teaching resources on the internet.
- The use of PowerPoint has provided a stimulus to presenting an otherwise boring topic!! Also handouts save students writing copious notes.
- Showing, teaching students how to draw graphs of different types from a survey they completed.
- Class more productive.
- The equipment in the Centre is excellent and seems to be updated regularly. The maths software available to me is state of the art.
**Question 43**

*Have you ever had a negative incident in relation to computers in your work? (Please give details)*

- Having no internet facility in the Craft Room. I have to leave the students to their own devices in the Computer Room. This can cause them to divert to something not relevant to their subject.
- Yes. Losing work.
- Yes where I couldn't do something and I was embarrassed.
- Only when equipment doesn't work and there is no technical support.
- Misplacing folders saved in My Documents. Losing memory stick.
- Not really. I have been lucky enough to get a colleague to help me.
- Loss of files during a backup was very inconvenient.
- Not being able to set up equipment. Losing material (files).
- Working with computers in the Centre while there has been ongoing building work is and can be extremely frustrating if the power suddenly cuts off.
- A file was deleted by someone.
- ICT equipment broken down.
- Yes people online on wrong websites etc. Not following guidelines.
- Data projector stopped working and the slideshow couldn't be used.
- Printer wouldn't work.
- Not able to log on and have a class prepared to work on them.
**Question 44**  

*If an informal in-house training session in ICT were to be offered in the Centre, what would you like it to focus on?*

- Improve my overall knowledge of computers.
- Interactive whiteboard.
- The basics.
- Discussion boards.
- Icons and what they mean. Basic view of using different programs.
- Printing digital photographs.
- Basic skills training.
- The whiteboard-putting resources for my subject onto the whiteboard.
- Using ICT to help teaching and ideas for troubleshooting.
- PowerPoint.
- Similar to ECDL training.
- ECDL advanced. Moving images from camera to worksheets. In depth excel training (we only use a limited amount).
- Refresher course on Publisher etc. PowerPoint and new technology.
- Importing videos and pictures.
- Anything.
- Everything.
- Spreadsheets and databases.
- Photography/interactive whiteboard.
- Interactive whiteboard.
- Internet.
- Word processing, e mails, spreadsheets.
Appendix G

Letter of Permission from VEC
Adult Education Officer
Mr. Noel Rodden  
Centre for Education

1/12/09

Re: Permission to carry out research

Dear Noel

I refer to your e-mail of November 25th in relation to research for your thesis as part of your Master of Arts in Digital Media Development for Education at the University of Limerick.

I am writing to inform you that I am happy for you to carry out your research as indicated.

Wishing you all the best with your studies.

Le dea-mhéin

______________________________
Adult Education Officer  
Co. VEC
Appendix H

Letter of Permission from Youthreach Coordinator
Mr. Noel Rodden  
Centre for Education  

8/12/09  

Re: Permission to carry out research  

Dear Noel,  

I refer to your e-mail of November 25th in relation to research for your thesis as part of your Master of Arts in Digital Media Development for Education at the University of Limerick.  

I am writing to inform you that I have no difficulty with this.  

Wishing you all the best with your studies.  

Yours Sincerely  

Coordinator  

Mission Statement:  

seeks to offer a balanced programme of education, training and personal development aimed at early school leavers in a safe and caring environment.
Appendix I

Charts
Q1. Sex of Respondents

![Bar chart showing sex distribution]

Q2. Teacher Age

![Bar chart showing age distribution]

Q3. Length of Service

![Bar chart showing length of service distribution]
Q4. Main Subject Taught

![Main Subject Taught Chart]

Q5. Experience with Computers

![Experience with Computers Chart]

Q6. Weekly computer use

![Weekly Computer Use Chart]
Q7. Type of Training

![Type of training undertaken chart](chart1.png)

Q8. Reason for Training

![Reason for training chart](chart2.png)

Q9. Do you hold ICT qualifications?

![Do you hold ICT qualifications chart](chart3.png)
Q10. ICT training over previous two years

![Bar chart showing ICT training during previous two years.]

Q11. Finance for training

![Pie chart showing finance for training.]

Q12. Do you use a computer at home?

![Pie chart showing computer use at home.]

iv
Q13. Number of years since ICT training

![Bar graph showing number of years since ICT training](image)

Q14. Factors affecting ICT use

![Pie chart showing factors affecting ICT use](image)
Q15. Impact of ICT on your teaching

Impact of ICT on your teaching

<table>
<thead>
<tr>
<th>Impact</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>17</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
</tr>
<tr>
<td>No Effect</td>
<td>7</td>
</tr>
</tbody>
</table>

Q16. Where do you use ICT in Centre?

Where do you use ICT in the Centre?

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Classroom</td>
<td>10</td>
</tr>
<tr>
<td>Staffroom</td>
<td>14</td>
</tr>
<tr>
<td>Computer Room</td>
<td>7</td>
</tr>
</tbody>
</table>

Q17. I do not have enough time to use computers in class

I do not have enough time to use computers in class

<table>
<thead>
<tr>
<th>Number</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
Q18. I could look stupid if something goes wrong

Q19. I feel that I need more training in computers

Q20. I know how to work a computer but have no idea how to integrate it into my teaching
Q21. I am too old to learn how to use a computer

Q22. I do not have enough experience in using computers

Q23. Computers are a thing for young people
Q24. It is difficult to arrange to take my class in the Computer Room

Q25. I am encouraged to make use of computers in my teaching

Q26. There is never any help if something goes wrong
Q27. The equipment available to me at work is unreliable

Q28. There is an issue with computer resources in the Centre

Q29. Training courses pressure me. I would like something more relaxed
Q30. ICT should be a stand alone subject and not used in other classes

Q31. I have the necessary skills to use the computer for teaching my subject

Q32. I avoid using computers in my classroom
Q33. There are sufficient computer resources (printers, software, etc.)

Q34. There are enough professional development/training opportunities in ICT

Q35. There is effective access to the Internet
Q36. There is good quality software available to me

Q37. There is clear support from Principal/Clear school based ICT plan

Q38. There is support from other teachers for me to use ICT
Q39. There is reliable technical support if something goes wrong

![Reliable technical support chart]

Q40. I have adequate time to plan for technology use in my class

![Adequate time to plan for technology chart]
### 45. How often do you use the following ICT equipment?

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Regularly %</th>
<th>Sometime %</th>
<th>Rarely/Never %</th>
<th>Not stated %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photocopier</td>
<td>96</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Laptop/Desktop Computer</td>
<td>80</td>
<td>12</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Data Projector</td>
<td>20</td>
<td>16</td>
<td>64</td>
<td>0</td>
</tr>
<tr>
<td>Interactive Whiteboard</td>
<td>84</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Word Processing</td>
<td>80</td>
<td>12</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>E Mail</td>
<td>72</td>
<td>16</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Internet</td>
<td>80</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Digital Camera</td>
<td>36</td>
<td>40</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>8</td>
<td>32</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>Databases</td>
<td>4</td>
<td>28</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>4</td>
<td>32</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>4</td>
<td>12</td>
<td>80</td>
<td>4</td>
</tr>
<tr>
<td>Paint</td>
<td>4</td>
<td>24</td>
<td>72</td>
<td>0</td>
</tr>
<tr>
<td>Subject Specific Software (e.g. Literacy)</td>
<td>5</td>
<td>28</td>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>CD/DVD using a Computer</td>
<td>36</td>
<td>48</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>
46. From whom do you receive support in relation to ICT use at work?

```
<table>
<thead>
<tr>
<th>Support from</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>4</td>
</tr>
<tr>
<td>Friends</td>
<td>1</td>
</tr>
<tr>
<td>Computer Teacher</td>
<td>16</td>
</tr>
<tr>
<td>Other Colleague</td>
<td>19</td>
</tr>
<tr>
<td>Management</td>
<td>5</td>
</tr>
</tbody>
</table>
```

47. What is the purpose of your ICT use?

```
<table>
<thead>
<tr>
<th>Purpose of ICT use</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparing Lessons</td>
<td>26%</td>
</tr>
<tr>
<td>Keeping Records</td>
<td>23%</td>
</tr>
<tr>
<td>Schemes of Work/Lesson Plans</td>
<td>31%</td>
</tr>
<tr>
<td>Lesson Materials</td>
<td>19%</td>
</tr>
</tbody>
</table>
```

48. What applications do you use most often?

```
<table>
<thead>
<tr>
<th>Applications used most often</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Word</td>
<td>42%</td>
</tr>
<tr>
<td>MS Excel</td>
<td>38%</td>
</tr>
<tr>
<td>MS Access</td>
<td>12%</td>
</tr>
<tr>
<td>MS PowerPoint</td>
<td>12%</td>
</tr>
<tr>
<td>Internet Explorer</td>
<td>0%</td>
</tr>
</tbody>
</table>
```
49. In your opinion would an informal, in-house training session help develop your ICT skills?

- Agree: 96%
- Disagree: 4%