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**Masters of Arts
In
Digital Media Development for Education**

**‘An investigation into factors affecting teachers use of
ICT in an Irish Post Primary School.
A case study approach’**

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Submitted to the University of Limerick (March, 2010)

Declaration

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

Signed: _____

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An abstract of the thesis of Elma Kent (Student Id 0769207) submitted for the award of Masters of Arts in Digital Media Development in Education, March 2010.

Abstract

“An investigation into factors affecting teachers use of ICT in an Irish Post Primary School. A case study approach”

Over the past number of years there has been a move towards using ICT. This study explores factors that affect post-primary teachers use of ICT in the teaching and learning environment. The researcher used a case study approach to investigate ICT use in a recently established community school in Ireland. A self-administered questionnaire was issued to all teaching staff (n=70). A random sample of teachers (n=7) were interviewed on their ICT practices and attitudes towards using ICT. School management were also interviewed to ascertain their views on ICT use within the case study school.

The results recorded show that there is a high level of ICT use in the case study school. Factors identified as affecting teachers use of ICT in the teaching and learning environment were identified. The following factors were found to affect ICT use in the case study school - positive attitudes towards using ICT, level of ICT training and support, lack of time, lack of a detailed ICT policy, both teachers and managements' attitude towards using ICT, easy access and availability of ICT hardware and software and the teaching group. The study did not identify teacher pedagogy, age and gender as significant factors affecting teachers' ICT use in the case study school.

The paper concludes by noting that while there may be significant benefits and potential in the use of ICT in the teaching and learning environment it is important to understand the factors that affect teachers' willingness to embrace and use this technology. If educators are aware of the factors affecting ICT use it allows both teachers and management to continue to progress and develop their ICT use in the teaching and learning environment.

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LIST OF ABBREVIATIONS

DES	Department of Education and Science
DfEE	Department for Education and Employment
ICT	Information Communication Technologies
Fig.	Figure
n	Number
NCTE	National Centre for Technology in Education
OECD	Organisation for Economics Co-operation and Development
Ofsted	Office for standards in education

Chapter 1

Introduction

1.1 Background

Although digital technologies have become common tools within our lives, teachers have yet to embed them within their daily teaching practices.
(Cuban, 2001 cited in Park and Ertmer 2007, p.247)

In recent times there has been an shift towards using technology in the teaching and learning environment. Teachers are being encouraged by their various subject associations to incorporate ICT technology into their lessons. Student teachers are expected to use technology in their classrooms. The days of technology being something new and unfamiliar are gone. There is an expectation amongst society that technology will be used in the teaching and learning environment. Many studies have been undertaken into the use of technology. The author has decided to undertake an investigation into the use of ICT by teachers' in a newly amalgamated (September 2007) post primary school in Munster. The author will examine teachers' ICT use in the school and explore factors identified as affecting ICT use in the teaching and learning environment.

1.2 Rationale

ICT has entered the educational environment in a persuasive way some may argue it has entered evasively. It is clear that ICT good or bad is here to stay in the Irish classrooms. Anecdotaly, teachers in post primary are encouaged to incorporate ICT into their teaching and learning environment. The author proposes to examine how teachers use ICT and the factors that influence individual teachers ICT use. Research (Scrimshaw, 2004) highlights that although ICT is viewed as a golden key in facilitatiing technology-

enhanced, student-centred teaching and learning environments the current level of ICT implementation has not yet reached a widespread audience. It is obvious that the gap between the innovative implementation objectives set down by Government initiatives to encourage ICT and the actual adoption of ICT in the classroom needs to be investigated further to gain a more informed insight into the current situation in post primary schools. The author proposes that by identifying factors that both contribute positively and negatively towards teachers use of ICT in the classroom that this investigation may provide some insight and answers as to why some teachers embrace ICT and others do not.

While it appears that a number of research studies have been undertaken exploring the different aspects of computer use in primary schools there is very limited data available relating to Irish post primary schools. For these reasons the author concluded that this area warrants further investigation.

1.3 Aim

The aim of this study is to investigate and determine the factors affecting teachers use of ICT in the Irish post-primary context.

1.4 Research approach

A case study approach to this research question will be followed. In order to investigate the research question two research instruments will be administered. A quantitative questionnaire will be administered to all teaching staff in the case study school. The researcher will use semi-structured interviews to gather qualitative data from both teachers and the school Principal. The Interviews will be used to elicit more detailed feedback on the participants experience and to gain an understanding into the reasons

for responses recorded on the written questionnaire. All collected data will be collated, analysed and presented in the research findings chapter.

1.5 Scope and Limitations

The researcher recognises that this study is not representative of the all post primary schools in Ireland. The study was convenience sample as the author had easy access to the group. The relatively small number of participants in this study (n=70) makes it difficult to generalise the findings but the researcher believes that the findings offer an insight into ICT use in a modern newly established post primary school.

1.6 Summary of Chapters

The literature review follows this introductory chapter presenting current research and findings on ICT use in education. The methodology chapter outlines and justifies the research instruments selected by the researcher and their limitations in this study. The research findings are presented in chapter four. Chapter five provides a detailed analysis and discussion of the findings recorded in chapter four. Chapter six presents the main conclusions and recommendations arising from the study.

Chapter 2

Literature Review

2.1 Introduction

The growth of the knowledge society and the pervasiveness of technology represent a major challenge and a major opportunity for education.

(OECD, 2001, p.9)

There is no doubt that the use of ICT in education is increasing, in the past number of years the majority of countries have experienced investment in school ICT facilities. The Irish government has invested significantly in the provision of ICT resources at both primary and post-primary level. The investment in ICT has been broadly welcomed by educators but this provision of resources has led many researchers to investigate how ICT is being integrated into the classroom and to examine the factors affecting ICT use by teachers. Teachers use of ICT has been simplified by Ertmer et al. (2000) into two categories those that view ICT as an inspiration or those that view ICT as an intrusion. Researchers differ in their methods for measuring ICT use with many reporting figures based on the actual number of teachers using computers in their classrooms whilst other studies report on the amount of time spent on computers and the number of different computer applications used. The lack of continuity between different studies makes it difficult to make direct comparisons between research but they do help in identifying that the factors affecting ICT use in post-primary schools warrants further investigation. The author will present a background picture of ICT in schools and follow with a review of literature on current research on factors affecting teachers ICT use.

2.2 Role of the teacher and ICT

Professional teachers are at the forefront of ICT in education today. Teachers are expected to take on the challenge of ICT in the teaching and learning environment. In order for teachers to embrace this challenge they must be provided with the technical and pedagogical skills to integrate ICT into the classroom. The need for the provision of continuous professional development of teachers ICT skills is recommended by the OECD (2001) stating very strongly that without professional development – “effective technology integration into schools cannot succeed” (p.16). In the Irish context professional development in ICT is provided to post-primary teachers by the NCTE. A large number of the teacher training colleges now have ICT as a compulsory module for students to ensure they are equipped with the necessary skills. Teachers must be provided with the opportunity to develop their ICT skills in order to apply these skills effectively in the classroom.

2.2.1 Role of school management and ICT

The role of management in the integration and use of ICT in schools should not be underestimated. Management have a valuable role to play in the integration and adoption of ICT in schools. Many studies have reported on the importance of management opinions and attitudes towards ICT directly effecting ICT use in the school. Mooij and Smeets (2001) found that lack of interest and commitment by the school management in the implementation of ICT in a school has a negative impact on ICT in the school. Similiarly, Demetriadis et al. (2003) reported teachers willingness to undertake ICT training was influenced by the managements’ attitudes towards ICT. If management expressed a positive attitude towards ICT training teachers’ were more likely to display a similar positive attitude.

2.2.2 Rationale for using ICT in schools

The rationale for using computers has been a constant question in the minds of many educationalists since the advent of ICT. The more traditional behaviourist teachers tend to question the validity of using ICT seeking the benefits of the technology to be clearly identified and quantified before they consider changing their teaching and learning environment. The consistent querying as to the rationale for using ICT has resulted in a number of studies reporting on the issues of concern.

The clearest outline of the rationale for using ICT in schools is presented in the OECD (2001) report on ICT in schools which included Irish data. The OECD divide the rationale for using ICT into three main areas – Economic, Social and Pedagogical rationale. The economic rationale for using ICT is based on perceived needs that students must have ICT skills to gain employment. The social rationale is based on ICT skills being a prerequisite for successful participation in the workplace and society. ICT skills are viewed as a valuable lifeskill helping to create a digitally literate society. The pedagogical rationale for using ICT is focussed on enhancing teaching and learning. The three rationales for using ICT highlight the overwhelming belief by society that ICT should be incorporated into teaching and learning. ICT has the potential to make a significant contribution to both student and teachers overall development through motivating and promoting higher-order thinking creating new and exciting opportunities helping to create independent creative thinkers. It is clear from this report that there is a very clear rationale for using ICT in the teaching and learning environment -

ICT can increase the breadth and richness of learning, not least through the topicality and realism that the new resources can bring.

(OECD, 2001, p.11)

2.2.3 ICT adoption in schools

Anecdotal, it would appear that schools have embraced ICT as computers, software and Internet access are available in all Irish post primary schools today. Although the physical evidence of the presence of ICT is visible it is difficult to assess how successful schools have been in the adoption of ICT. The difficulty arises out of the suggestion that schools did not have a choice in whether to adopt ICT or not. Society expects that schools will integrate ICT regardless of curriculum restraints. Many studies have highlighted that not all teachers are willing to incorporate ICT into their teaching and learning (Mumtaz, 2000 and Watson, 1997).

The OECD (2001) reported that ICT was not envisaged as part of the school curriculum but has arisen from external ICT developments and the perceived need for ICT to be incorporated into the teaching and learning environment. For this reason it has been difficult for researchers to assess ICT adoption in schools. The difficulty arises when researchers have different ways of defining “adoption” . In some studies ICT adoption is referred to as having computer hardware or software other studies view ICT adoption as teachers using ICT in the classroom or schools using ICT for administrative purposes. Tondeur et al. (2008) undertook an extensive study of the educational use of computers in a Flemish school and sought to clarify how best to measure ICT use he developed a measurement for assessing ICT use in education. The study identified three types of ICT use – (1) Basic computer skills, (2) Computers as an information tool and (3) Computers as a learning tool. Through the development of this measure it is now easier for researchers to comment and compare studies relating to ICT use thus allowing for a more realistic picture of actual ICT adoption by schools to be presented.

2.2.4 ICT Policy

The importance of ICT policies at European, National and school level cannot be underestimated. The European Union have embarked on the eEurope 2002 plan with the goal that all students will be digitally literate when they leave school. The general trend in Europe is to introduce ICT through cross-curricular activities rather than as a stand alone timetabled subject.

Used wisely it enhances knowledge, language and communication skills, collaborative learning, understanding and respect for others.

(OECD, 2001, p.20)

The constructivist approach is embedded in an ICT environment promoting autonomous learning with the correct level of teacher support.

...simply to say that computers are being used in school does not, in itself, necessarily imply any particular change in teaching style.

(OECD, 2001, p.32)

The OECD (2001) highlight the serious difficulty of integrating ICT into a closed curriculum. Tondeur et al. (2007) also reported that ICT policy is desirable as it assists ICT integration in the teaching and learning environment by building on the willingness of teachers and school principals professional attitudes. The research is critical of schools not having an ICT policy as ‘..informal policy expectations cannot guarantee that all pupils will achieve’ (Tondeur et al., 2007, p.963). It is clear that ICT policy needs to be present in order to integrate ICT into the teaching and learning environment.

2.3 ICT and teacher professionalism

OECD (2001) highlights the need for teachers to be actively involved in evaluation and selection of educational software. It is believed that this will lead to improved professional development. The report suggests that as teachers become more confident using ICT they will become empowered by its potential and strive towards further ICT integration. Teachers who become skilled ICT educators are better equipped to use ICT more effectively in their teaching.

Teachers with a changed and extended role are central to the way ICT is adopted and used at the classroom and student level.

(OECD, 2001, p.73)

If the significant investments in ICT are to reap rewards there is a need for a clearly defined policy towards ICT use. The teachers has a central role to play taking responsibility for the successful management of the learning environment. ICT has expanded the role of the teacher therefore it is vital that the necessary professional development is provided to allow teachers to modify their existing pedagogy to accommodate the full potential of ICT. The OECD (2001) report states that a teachers own pedagogical views have a very important role to play in teachers adoption and integration of ICT. It has been found that teachers who just use the Internet do not change their teaching pedagogy dramatically. Niederhauser and Stoddard (2000) reported that changing teachers pedagogical beliefs is both time consuming and complex. For teachers to become proficient in using ICT adequate time and resources must be provided to all teachers to develop confidence and competence in displaying ICT skills. Teachers have been making progress in ICT through engagement in collaborative learning and teaching and this method is encouraged by the OECD-

.....there needs to be a psychological transition from working and learning alone, with a belief that knowledge production belongs to others to a radically different self-conception which, in conformity with interactive models, see the co-production of knowledge with colleagues as a natural part of a teachers professional work. At the

system level ways have to be found to bring teachers together in such activity....it cannot be assumed that teacher-to-teacher collaboration will develop without encouragement.

(OECD, 2001, p.76)

Demetriadis et al. (2003) reported that teachers professional status an important motivation for teachers to learn ICT skills.

2.3.1 ICT and the Learner

The enevitable question asked by many educationalists is – Why use ICT?. ICT is a relatively new phenomenon in the teaching and learning environment. It is not unreasonable for teachers in particular those with experience to question why should they change or adapt their tried and tested teaching methodologies to incorporate ICT.

Becker and Riel (2000) reported that there are teachers who do not wish to incorporate ICT into their teaching they are content to continue using traditional teaching methods.

Anderson (1999) reported simliar findings that not all teachers are willing to embrace change in the classroom viewing ICT as an “unnecessary intrusion”. Cuban (2001) stated that for technology to be used in the classroom it should be assessed and examined to identify what value, if any, it brings to the teaching and learning environment. Teachers by their nature tend to be sceptical of change, and this has resulted in studies being undertaken to identify the opportunities that ICT presents to the educator and learner.

Sloane (1997) reported on the positive pedagogical opportunities of incorporating the World Wide Web into the classroom as a source of up-to-date information while also encouraging independent thinking and learning amongst learners. Abbott (2001) also

observed the huge potential of ICT in supporting and enhancing home schooling.

Pownell (2005) comments on the opportunity for collaborative learning online presented by ICT. The encouragement of discussion and sharing of resources can be of

benefit to both the teacher and the learner. Boyles and Nicol (2003) concur that ICT in particular students involvement in online communities through the use of wikis and blogs can be successful in encouraging students that are reluctant to participate in normal classroom discussions. This active online involvement has been reported to improve students writing skills (Yarrow and Topping, 2001). The OECD (2001) report is very supportive of ICT use in the classroom stating that "...it has the potential to transform the process of learning and teaching ...and provide a resource-rich environment and a learner centered approach" (p.19). The majority of research suggests that ICT supports different ways of learning, thinking and working while also encouraging individuality, diversity and creativity.

2.4 Factors affecting teachers use of ICT

It would appear that there are many factors that may or indeed may not affect a teachers use of ICT in the teaching and learning environment. In this section the author will explore a number of the factors that have been identified in the reviewed literature as factors that affect ICT use. Many researchers have labelled the factors affecting ICT uptake as "barriers to change". A number of studies have reported findings on ICT use in schools over the past number of years. Mumtaz (2000) presents a summary of the main factors identified by many studies they include the following:

Technical issues included -

- Lack of on-site support

- Lack of help supervising students using ICT
- Lack of ICT teachers to teach students ICT skills
- Lack of computer availability

Teaching and learning issues included -

- Lack of teaching experience with ICT
- Lack of time available to successfully integrate ICT into the curriculum
- Lack of financial support

For the purpose of this research study the researcher will examine the factors affecting teachers use of ICT by exploring the technical issues and teaching and learning issues that have been reported through research carried out.

2.5 Technical issues

It is clear that use of ICT in the teaching and learning environment requires the user to have a basic understanding of the operating system and basic troubleshooting knowledge in the event of a technical issue arising. Research has highlighted lack of technical support as a factor that inhibits teachers use of ICT. This is supported by Demetriadis et al. (2003) who reported lack of ICT technical support as a significant factor effecting teachers' motivation to use ICT. Teachers' were reluctant to use ICT where they felt they may not possess sufficient ICT competences.

2.5.1 School resources and ICT support

It has been recognised by many studies that ICT in schools cannot be effectively integrated into schools without sufficient levels of equipment, software and support. The OECD (2001) recommends the granting of financial support to schools and highlights the importance of continuing to up-date and replace ICT equipment. A barrier to using ICT in the classroom is created if the resources and support needed to incorporate ICT are not readily available in the teaching and learning environment.

2.5.2 Availability of ICT equipment

Research (Tondeur et al. 2008) has found that good availability of ICT resources i.e. hardware and software effects teachers ICT use positively. It is clear that if schools want to foster a positive attitude towards encouraging teachers use of ICT that adequate investment is needed in the provision and availability of these resources.

2.5.3 Time

Time and the lack of it is a constant issue arising from the research carried out on the factors affecting ICT use. Studies have identified lack of training time, lack of time to prepare resources, lack of actual class contact time and lack of time to access the full potential of ICT in the classroom as the main 'time' issues when using ICT. The OFSTED (2002) report found that teachers found working on ICT training materials outside of school hours was not agreeable as a result of other priorities on their time. Galanouli et al. (2004) reported that over-exploitation of teachers' personal time and lack of time given to training as the key problems experienced by teachers.

Many teachers cite lack of time as one of the main constraints they face when trying to incorporate ICT into the classroom "The school as an institution gives little time to teachers to manage and familiarise themselves with ICT" (Robertson et al. 1996 cited in Mumtaz 2000, p.335). It takes time to learn how to create a blog, wiki, design a website

or create an interactive teaching resource. Unfortunately, in our current busy educational environment many educators find themselves faced with little time to upskill themselves in digital media.

2.5.4 Training and professional development

Research (Galanouli et al., 2004) has highlighted the need for effective ICT professional development to assist teachers in the integration of ICT into their teaching and learning. Their study identified time, technical support, social support, good equipment and resources as the factor affecting teachers' successful professional development. The importance of providing training for learners of all abilities at all levels is very important in preventing the creation of a 'digital divide' between computer literate and computer illiterate teachers. The research also suggested that if the ICT training was not at the correct level for the learner it had the potential to further discourage teachers from using ICT. The provision of appropriate ICT training to teachers was found to increase confidence levels (Galanouli et al., 2004). Schools where management supported ICT professional development and ICT leadership reported higher levels of ICT integration in the classroom (Baylor and Richie, 2002).

Watson et al. (1998) reported that although digital media provides many opportunities for teaching and learning it is unlikely to be used by many educators as they lack the technical expertise. If educators are expected to use digital media in the classroom they must receive the necessary training and the training must be appropriate to meet the needs of the learner. Abbott (2001) is critical of the training provided to teachers in the United Kingdom as it was compulsory, it was completed in the teachers own time and only after completing the course successfully were teachers eligible for a grant to purchase a laptop. Abbott (2001) is highly critical of the many barriers to training and

technological development put in place by Government. Becker (1994) reported that exemplary ICT using teachers were more likely to have extensive teaching and computer training experiences equipping them with the skills to enhance their teaching. Hadley and Sheingold (1993) cited in Ertmer (2000) concluded that as teachers become more experienced ICT users they use ICT more frequently, creatively and are more flexible in their selection of appropriate computer software applications.

2.5.5 Investment in technology

The main investment in ICT in Irish schools came in the form of IT2000 funded by the Scientific and Technological investment fund. This fund was established to provide educational institutions with ICT infrastructure and ICT training for teachers. The total value of the fund was three hundred and fifty-six million euros of which thirty-two million in capital funding was allocated to primary and post-primary schools. The fund was launched in 1997 and implemented through the NCTE. All of the funding was allocated between 1998-2003. The aim was to provide all schools with an Internet connection and at least two multimedia computers (DES, 2009). In total two hundred million euros has been invested in ICT in Irish schools since 2008. Further investment of fourteen million euros to support the upgrading of schools ICT infrastructure to support the new Technology Design and Communication Graphics syllabi was made in 2007 by the Department of education and science in the post-primary sector. Funds to promote ICT intergrations have also been provided to disadvantaged schools through the Dormant Accounts Fund. The investment in ICT infrastructure has resulted in the overall pupil/computer ratios decreasing from 37:1 to 9:1 in primary schools and from 16:1 to 7:1 in post-primary. The Government have made a commitment to continue supporting ICT in schools by allocating funding under the current National

Development Programme through the roll out of the new Schools ICT strategy that will focus on developing -

...an e-learning culture in schools that will ensure that ICT usage is embedded in teaching and learning across the curriculum, teacher professional development, the maintenance of a national broadband network for schools, the upgrading and renewal of hardware along with the provision of software and digital content for learning. The planned investment will also address maintenance and support requirements.

(DES, 2009, p.8)

To use digital media in a learning environment it requires substantial financial investment. It is obviously a major constraint on both the educator and learner if the financial backing is not present. Mumtaz (2000) found that schools that received financial support in the provision of ICT resources resulted in excellent computer integration. Conversely schools that lack ICT financial support face "...a great impediment in the uptake of ICT" (Mumtaz 2000, p.336). Lack of funding poses a serious constraint to many schools in the implementation of ICT. It is reported that "there is no sign of this immense technological and social revolution slowing down" (Abbott 2001, p.xii). If the developments in technology continue and no financial support is provided one can presume the gap between educator and learner will widen and the learning curve for educators will be very steep. Abbott (2001) is critical of the half measures in funding technology in the United Kingdom -

It was disappointing to many observers that far-sighted moves such as the provision of laptop computers to every teacher in the Australian state of Victoria were followed in 2000 in the UK only by half-hearted attempts to provide 50% of the purchase price of a laptop for ten percent of the teaching force.

(Abbott 2001, p.32)

It is difficult to understand why there is a lack of financial support available for investment in ICT as the research has shown investment in this area in education improves learning "...studies are showing investment in computer technologies result in significant improvements in learning, however it is measured" (Newhouse 2002, p.6).

2.6 Teaching and learning issues

The European Schoolnet report (2006) identified specific teacher barriers including low confidence, low competence and low motivation which were all linked to lack of or inadequate training. The existing barriers in schools were very similar to Mumtaz (2000) findings with lack of computer access, lack of hardware maintenance and lack of school planning identified as key issues directly relating to teachers computer use.

2.6.1 School ICT policy

The presence of a clear school ICT policy is reported to have a positive effect on teachers ICT use. It has been found that school cultures that are open to ICT and in particular innovativeness in ICT benefit greatly from ICT in their schools (Tondeur et al., 2008).

2.6.2 Teacher characteristics / pedagogical beliefs

It has been reported (van Braak et al. 2004) that teachers who display a positive attitude towards computers and teachers who enjoy incorporating innovative concepts into their classrooms are more likely to use ICT. Other teacher characteristics affecting ICT use include the teachers own educational beliefs. Research (Ertmer, 2005 and Becker, 2001) have found that teachers that use more traditional teacher-centered behaviourist teaching methodologies are less likely to incorporate ICT into their teaching when compared to the student-centered constructivist teaching methodologies.

Current research shows that low level computer use tends to be associated with teacher-centered practices, whereas high level use tends to be associated with student-centered or constructivist practices.

(Ertmer 2005 cited in Tondeur et al. 2008, p.496)

Tondeur et al. (2008) concluded that teachers with relatively strong constructivist beliefs who also have strong traditional beliefs use ICT more frequently. These studies also suggest that teachers' own personal beliefs about the role of technology in education have the potential to "either reduce or magnify" (Ertmer, 2000, p.55) the factors effecting ICT use.

2.6.3 Gender and ICT

As ICT becomes more present in our everyday lives, educational settings are being transformed where educators and students are expected to teach and learn, using the technology (Li, Kirkup and Hodgson, 2001; Lee, 2003). The widespread influence of ICT in education and the issues of gender differences in its use have emerged and attracted keen interest among researchers. The issue of a potential gender gap in ICT has caught the attention of many researchers and as a result, numerous studies have been conducted to study the extent of this gap (Margolis and Fisher, 2002).

Early studies undertaken in the 1980's reported that females exhibited more negative views and perceptions towards the use of computers than males (Dambrot, Watkins-Malek, Silling, Marshall and Garver, 1985; Koohang, 1987). Shashaani and Khalili (2001) reported over a decade later that female undergraduate students had significantly lower confidence than males when it came to their ability to use computers. Females also reported feeling helpless, nervous and uncomfortable around computers. Both genders, however, viewed computers as a useful tool and equally believed that computers had positive effects on individuals and society. Tsai et al. (2001) reported similar results in their study reporting no significant gender differences in the perceived usefulness of the Internet. Broos (2005) also found significant gender differences – favouring males in terms of attitudes toward new communications technology, the extent of computer use and self-perceived computer experience. Even

when females perceived themselves as being more competent in using computers, they expressed higher computer anxiety levels compared to males. This is not surprising as Liaw's (2002) study also indicated that males had more positive perceptions towards computers and Web technologies than females. Research has shown that males use of computers and Internet applications is higher than females across different countries in Europe, including Spain, Belgium, the Netherlands, and France cited in Imhof (2007). Chen (1985) found that females and males reported similar levels of interest toward computers when they possessed similar amounts of computer experience. Shashaani (1997) revealed that students who were more knowledgeable in computers had used computers more frequently and had greater access to home computers. They were also more interested in computers and had more confidence working with them. These findings suggest that the perceived differences between male and female attitudes could potentially be reduced if computer experience is controlled and both males and females had the similar exposure to computers. This hypothesis is supported by Kirkpatrick and Cuban (1998) who reported that the gender gap was narrowed when both genders were exposed to the same amounts and types of experiences when using computers. There are researchers who contradict these views for example -Kadijevich's (2000) study found that males exhibited more positive attitudes toward computers than females even when computer experience was controlled. The findings of Wong and Hanafi (2007) suggest that gender does not have an impact on the attitudes but does significantly influence confidence levels with female student teachers reporting enhanced confidence levels towards ICT when the same amount of exposure is given to both gender groups.

Studies which investigated specific uses of the Internet in more detail suggest a continued tendency for females to email more often than males on the one hand, and on

the other hand, for males to search the Internet more intensely than females (Durnell & Haag, 2002; Jackson et al., 2001) and to utilize different sites compared to females (Wasserman and Richmond-Abbott, 2005) cited in Imhof (2007).

Attitudes towards computers have been accounted for in terms of usefulness and beliefs concerning positive and negative effects of computers on one's personal life and on society in general. Gender-specific trends have been traced from early points of computer use in the public realm (Lucas, 1975). Whitley (1996) summarized that males and females both trusted that computers had a positive impact on society and that computers were useful tools. However, females were reported to express significantly more cautious opinions as to the impact of computers than males (Broos, 2005; Whitley, 1996) cited in Imhof (2007).

2.6.4 Age of teacher

Anecdotally, many educationalists suggest that age has an impact on computer use with more mature teachers being less likely to embrace ICT. This hypothesis is unsupported as Lau and Ang (1998) and Roussos (2007) found that age had no significant relationship with attitudes towards computing. van Braak et al. (2004) reported similar findings with no correlation between age and computer use observed.

2.6.5 Impact on the Learner and Teacher

There have been many studies undertaken into the benefits of integrating ICT into the teaching and learning environment. One of the most recent studies undertaken by the European Schoolnet (2006) comprehensively reviewed data collected from seventeen studies carried out within Europe to gain insight into the impact of ICT in the classroom. The study reported the main benefits for learning and learners were higher pupil motivation, better behaviour, communication and processing skills. ICT was also reported to allow for greater differentiation to meet individual learner's needs, it allows students with special needs to benefit, ICT in schools plays a vital role in decreasing the digital divide, students are able to work independently and it encourages teamwork.

The European Schoolnet (2006) study reported teachers that received ICT training had positive attitudes towards using ICT, especially if they had access to their own laptop. An astonishing ninety percent of teachers were reported to use ICT as part of their lesson preparation. ICT was found to promote collaboration amongst teachers in areas of curriculum planning promoted by access to fast, reliable broadband connections. The study reported an improvement in teacher's basic computer skills. Teachers of science, mathematics and computers were reported as the heaviest users of ICT. It was found that teachers with previous positive experiences of using ICT tend to become leaders in intergrating ICT in the school environment. Factors including culture, leadership, curriculum and assessment were all identified as factors that effect teachers use of ICT. The report very clearly states that the potential creativity of ICT is not being exploited in the classroom.

ICT is underexploited to create learning environments where students are more actively engaged in the creation of knowledge rather than just being passive consumers.

(Balanskat et al., 2006, p.5)

2.6.6 Confidence in using ICT

Lack of confidence is cited as one of the main reasons for not using ICT. Abbott (2001) observed that although the DfEE survey of 1998 reported high levels of teacher confidence in using ICT within the curriculum the actual confidence levels are lower in reality as reported by Savage (1999). Bialo and Siuin-Kachala (1996) reported that students felt more successful, are more motivated to learn, have increased self confidence and self esteem when using ICT in the classroom. It is clear that if both educator and students do not feel confident using ICT they are reluctant to view it as a learning opportunity and will continue to avoid using ICT in the classroom. Balanskat et al. (2006) highlights the importance of raising confidence levels and allowing the educator to experience the value of using ICT.

There is a growing gap between high and low e-confident teachers and schools. Where ICT is extensively used the benefits begin to take off. This 'tipping point' implies that there is a period when results do not seem to justify the investment, and then suddenly everything takes off and added value is considerable.

(Balanskat et al., 2006, p.6)

2.6.7 Teacher motivation

Teacher motivation plays a pivotal role in ICT use in the teaching and learning environment. The OECD (2001) report places serious emphasis on the importance of teacher motivation and teacher ICT use. The report identified a number of key motivating factors that encouraged teachers to engage with ICT. Teachers reported a preference to writing using a word processor rather than pen. A preference for creating more 'professional looking' documents was also recorded. The facilitation of collaborative teaching and learning through online technology was also recorded as key motivator in the use of ICT by teachers.

Other researchers have also commented on the importance of teacher motivation in adopting ICT. Ertmer (2000) reported that if teachers are not convinced that student learning outcomes will improve as a result of integrating ICT into the teaching and learning environment they will have less incentive to incorporate ICT. Demetriadis et al. (2003) found that many teachers in schools are not making effective use of ICT (Zhao and Cziko, 2001 and OECD, 2001). Zhao and Cziko (2001) identified three conditions that are necessary for teachers to use ICT. These factors are taken as the motivating factors to encourage ICT use by teachers. Firstly, teachers must believe ICT can be used more effectively or at least maintain existing standards. Secondly, teachers must not view ICT as a disturbance in the classroom and finally, teachers must believe they are in control of the classroom. The study concluded that if all of these conditions are met the teacher will be encouraged and motivated to incorporate ICT into the teaching and learning environment. It is clear from the research that teacher motivation is a key factor affecting teachers ICT use.

2.7 Conclusion

ICT use in education is developing and expanding everyday. The potential for ICT use in the teaching and learning environment is significant. It is clear that although many schools have openly adopted ICT into the teaching and learning environment and invested in the ICT infrastructure there are factors that exist that will affect a teachers use of ICT in the classroom. The literature reviewed in this chapter has identified the rationale for using ICT in the teaching and learning environment and explored a number of the factors that have been found to affect teachers ICT use.

Chapter 3

Methodology

3.1 Introduction

This chapter describes the research methods selected for this study and explains the rationale for selecting these methods. Details of the process employed to collect the data and procedures followed to ensure data collection was valid are explained.

3.2 Aim

The aim of this study is to investigate and determine the factors affecting teachers use of ICT in the Irish post-primary context.

3.3 Objectives

The main objectives of this study are –

- To establish the levels of ICT use at post-primary level
- To investigate factors that effect the use of ICT at post-primary level
- To document teachers attitudes towards using ICT at post-primary level

3.4 Background

The literature review identified many factors that affect teachers use of ICT including age, gender, teaching experience, level of ICT training, access to a computer and teachers / school management views / attitudes towards using ICT. The author decided to undertake this research study to investigate these factors using a case study approach. The data collected will be analysed and provide information on factors affecting the use of ICT and based on the data obtained make recommendations to assist the school in future ICT planning.

3.4.1 The Setting

The case study school selected for this study is a recently established community school resulting from a recent amalgamation of two secondary schools and one vocational school in Munster. The school was established in 2006 and caters for a co-educational mixed ability student population of nine hundred and fifty students approximately. The total teaching staff employed including part-time and full-time positions is seventy teachers approximately. The school offers the following second level programmes – Junior Certificate, Transition Year Option, Leaving Certificate, Leaving Certificate Applied and Leaving Certificate Vocational Programme. The school received

significant ICT funding under the school buildings programme funded by the National Development Programme and additional funds were acquired from the Dormant Accounts Fund.

In the inaugural year of the amalgamation the school management in conjunction with the ICT co-ordinator arranged a series of after-school and Saturday workshops to provide ICT training to staff. Staff were initially invited to attend a basic I.T. skills course and more advanced optional day courses were provided on specialist areas such as Adobe Photoshop and Adobe Premier Pro. This training was funded by the IT2000 initiative and provided by the NCTE. A number of staff also attended I.T. inservice training provided in their subject areas including the most recent T4 training.

A total of over three hundred thousand euros was spent on ICT provision in the school. The school has access to four computer rooms which each host thirty-one computers. The technical graphics room has been equipped with twenty-five computers under the T4 initiative. In addition, to the computer rooms each classroom and office has one networked computer with Internet access. Additional computers are available in specialist and resource classrooms. Staff have access to six computers in the staff work room and two mobile laptops with data projectors. Management invited staff to make submissions in 2006 for any additional ICT equipment they required and this resulted in the purchase of twenty data projectors, eight digital cameras and six video cameras. The school has licenced software for Microsoft Office on all computers and thirty-two licences for Adobe Photoshop and Adobe Premier Pro.

It is obvious that this school could not be considered as representative of the average post primary schools ICT provision in Ireland. This school is in a unique position where there has been a significant investment in ICT. The author decided to use this

school as a case study for this research project to examine the effect of providing a school with excellent ICT infrastructure has on teachers ICT use.

3.4.2 Subject group

For the purpose of this study the researcher decided to use a case study approach. The school was selected on the basis that it was easily accessible to the researcher. A letter (**Appendix A**) was sent to the school management a month before surveying commenced, seeking for permission to ask teaching staff to participate in the study. Subjects for this study were invited to participate in the questionnaire through the internal staff noticeboard and online intranet. A copy of the questionnaire (**Appendix B**) with an accompanying letter (**Appendix C**) explaining the purpose of the study were placed in all staff post boxes with a complementary pen to encourage higher participation rates. Participation in the interviews were randomly selected from a list of staff names. Staff selected for interviewing were approached and asked would they be willing to participate in an interview. The school principal was also invited to participate in the interviews to represent school management.

It is acknowledged that there is potential for bias in this study as the sample group is relatively small (n=70) for the questionnaire and interviews (n=8) and only from one school in Munster. However, it is hoped that the results of this study may give some insight into ICT use in post-primary schools.

3.4.3 Case study approach

The author decided to follow a case study approach for this research project. This research method provides “a unique example of real people in real situations” (Cohen et al. 2007, p.253). Nisbet and Watt (1984) cited in Cohen et al.(2007) identified the main strengths and weaknesses of a case study (**Fig.3.1**).

Strengths of a case study

- The results are more easily understood by a wide audience (including non-academics) as they are frequently written in everyday, non-professional language.
- They are immediately intelligible; they speak for themselves.
- They catch unique features that may otherwise be lost in larger scale data (e.g. surveys); these unique features might hold the key to understanding the situation.
- They are strong on reality.
- They provide insights into other, similar situations and cases, thereby assisting interpretation of other similar cases.
- They can be undertaken by a single researcher without needing a full research team.
- They can embrace and build in unanticipated events and uncontrolled variables.

Weaknesses of a case study

- The results may not be generalizable except where other readers/researchers see their application.
- They are not easily open to cross-checking, hence may be selective, biased, personal and subjective.
- They are prone to problems of observer bias, despite attempts made to address reflexivity.

Fig.3.1 Strengths and weaknesses of a case study

Nisbet and Watt (1984) cited in Cohen et al. (2007), p.256

The case study approach selected for this study involves three research instruments a self-administered questionnaire and semi-structured interviews with teachers and school management.

3.5 Research instruments

There has been much debate over how ICT use can be measured. Dwyer et al. (2004) suggest that ICT use can be accurately measured by recording the amount of time spent using computers. In contrast, Kent and Facer (2004) suggest that ICT use can be accurately measured by recording the use of different software packages. Both of these studies advocate the use of quantitative research methods. Ainley et al. (2002) and Waite (2004) offer a different structure for measuring computer use focussing on qualitative research methods that assess teachers personal views and aims when using

ICT. Tondeur et al. (2008) are critical of both of these methods being used in isolation and suggest to gain an accurate picture of ICT use both quantitative and qualitative methods should be undertaken.

To successfully achieve the aims and objectives of this study two research instruments were used. Cohen et al. (2007) reported the importance of combining qualitative and quantitative research methods when collecting data as a mixed method approach results in more rounded and reliable data collection. The methods selected for this study were a self-administered questionnaire and individual semi-structured interviews with both teaching staff and management. The researcher carried out all of the interviews in person and was available to clarify any queries when the self-administered questionnaire was given out. The next section will give details of the the two research methods used for data collection in this study.

3.5.1 Questionnaire

The author adopted a similar research approach used by Hermans et al. (2008). The questionnaire will record general data on age, gender, ICT training undertaken and teaching experience. The main part of the questionnaire will focus on two distinct areas of teachers computer use dependent and independent variables that may effect computer use. The questionnaire will gather data on –

(1) Dependent Variables

This first area of the study will investigate classroom use of ICT including use of specific ICT tools and software packages, amount of time spent on computers, ICT

tasks undertaken, access to computers and Internet and teaching groups that ICT is most likely to be used with.

(2) Independent Variables

This second area of the study will investigate if the following independent variables influence teachers computer use-

- (a) Teachers beliefs – Do teachers own constructivist or behaviourist beliefs influence computer use?
- (b) Teacher demographics – Do age and gender influence teachers computer use?
- (c) Computer experience, support or training provided – Do these factors influence teachers computer use?
- (d) Attitudes towards computers – Do teachers attitudes towards computers influence their computer use?

3.5.2 Type of question

In designing the questionnaire the author aimed to incorporate questions that would provide accurate and quantitative data that would meet the aims and objectives as set out in the study. The author designed the questionnaire to be clear, concise and unambiguous for the respondent. All questions used in the self-administered questionnaire were closed questions. Cohen et al. (2007) note that closed questions allow for comparisons to be made between different groups. The author does acknowledge that the use of only closed questions in this questionnaire limits the data collection and increases the possibility of bias in the results as suggested by Oppenheim (1992) cited in Cohen et al. (2007). The author incorporated many different styles of

closed questions in the questionnaire they included dichotomous questions, multiple choice questions, rating scales and Likert scales. Dichotomous questions are very structured and only have two possible responses. The author used dichotomous questions to gather very specific information from the respondents.

Multiple choice questions were used to gather data on the respondents reactions to a range of possible suggested responses the author did allow flexibility in the respondents responses to these questions by including an 'other' option where respondents were invited to specify their response to the statement. Rating scales were used in the design of the questionnaire to measure the degree of response to specific questions.

Likert scales are used to measure the respondents response to a question between a five point scale ranging from 'strongly agree' to 'strongly disagree'. Cohen et al. (2007) advocate using rating scales as they assist measurement of opinion, quantity and quality. The use of Likert scales allows flexibility in responses whilst still allowing the data to be quantitatively analysed. Cohen et al. (2007) researchers when using Likert scales to be aware of the limitations. The researcher is dependent on the respondent to be truthful, the limiting of the scale to five responses may not allow for exact responses to be recorded. The interpretation of the data collect by using the Likert scale must be interpreted carefully. It is agreed that the use of rating scales as a data collection method is useful for exploring respondents attitudes, perceptions and opinions (Cohen et al. , 2007).

3.5.3 Semi-structured interview

The author also carried out individual interviews with a random selection of participants involved in the questionnaire (n=8). Seven teachers and the school principal were invited to participate in an interview. Interview responses were used to elicit more

detailed feedback on the participants experience and to gain an understanding into the reasons for the responses given on the written questionnaire. The school principal was asked to participate to gain an insight into managements' views of ICT in the school. Interviews are viewed by many researchers as a valuable research tool as stated by Silverman (1993) cited in Cohen et al. (2007) suggesting that they are useful for collecting qualitative data and eliciting reasons and explanations for responses. This is also supported by Bell (2005) advocating the use of interviews as a good tool for following up and explaining ideas, probing and investigating motives and delving further which is not possible in a questionnaire. The author decided to follow the semi-structured interview approach that allows the respondent greater flexibility to comment on issues of interest. The guidelines for conducting an interview outlined by Tuckman (1972) cited in Cohen et al. (2007) were adhered to in this study. Permission to record the interviews on a digital voice recorder was granted by all respondents. This allowed the interviewer greater freedom when interviewing to listen and observe all non-verbal responses demonstrated. The interview involved asking the respondents open-ended questions to allow free responses that may not be recorded on the closed question questionnaire. The open-ended questions allow for authentic, rich, deeper and more honest responses (Cohen et al., 2007). The audio responses were transcribed following completion of all interviews to allow for qualitative analysis by the researcher.

3.6 Piloting

It is important to pilot all questionnaires to establish the amount of time required for successful completion (Bell, 1999). Oppenheim (1992) cited in Cohen et al. (2007) describes the function of a pilot is to improve reliability, validity and practicability of the research tool by clarifying, checking validity of questions, eliminating ambiguities,

checking readability, gaining feedback, identify omissions, checking completion time, identify redundant questions and to identify any misunderstood questions. The questionnaire and interview questions were piloted with two teachers prior to conducting the research. It was established that the length of both research tools was satisfactory. A number of amendments were made to the self-administered questionnaire. A typing error on question fifteen was corrected and in question nine and ten the option of 'almost never' was changed to 'seldom' to make the options less ambiguous. The interview questions were reported to be easily understood and it was established that fifteen minutes was a satisfactory time frame to complete the interview.

3.6.1 Triangulation

Triangulation is a method of data collection that involves the use of two or more methods of data collection. Cohen et al. (2007) explain that triangulation assists in explaining human behaviour in more detail by using both quantitative and qualitative data. Triangulation is advantageous to use in undertaking research as Lin (1976) cited in Cohen et al. (2007) suggests that by using different methods the researcher can be more confident of accurate and more reliable data collection. The author decided to use methodological triangulation in this research project using three research instruments (self-administered questionnaires, teacher interviews and a school management interview) to gather data for this research project.

3.6.2 Issues of reliability and validity

In the collection of any data for research purposes the researcher must carefully consider and identify the limitations of the research project. The case study in this study is of one specific school that has only been in existence for four academic years.

The questionnaire and interviews took place at one particular time and may not be taken as a representation of ICT use in an all-Ireland context. The findings presented in this study may not be applied to other schools but may be taken in the context that they are presented in this study.

To improve validity three data sources: teaching staff questionnaires, teaching staff interviews and school management interviews were used to validate findings. The questionnaire helped to provide specific information on the respondent and their computer use. The semi-structured interviews allowed the author to investigate further the reasons for the respondents response. The author followed the semi-structured interview guidelines suggested in Cohen et al. (2007) when interviewing the respondents. The author must acknowledge that the interview responses may have been influenced by the Interviewer as the Interviewees were known to the Interviewer. The presence of the three sources of data collection allowed for validation providing a more consistent overview of the findings therefore reducing the possibility of making misleading interpretations of the findings. Reliability was improved through the use of a similar environment for conducting the interviews and maintenance of a similar tone and expression by the interviewer. The questionnaire and interviews (**Appendix D**) were all carried out at the same time of the academic year to improve validity. All interviews were recorded using a digital voice recorder and were transcribed for analysis. It should be noted that the sampling for this study was convenience sample as the author had easy access to the group. The results of this study therefore are not representative of all post primary teachers but of this particular case study group. The relatively small number of participants' in this study makes it difficult to generalize the findings but should give an insight into ICT use in the case study school.

Chapter 4

Research Findings

4.1 Introduction

The aim of this study is to investigate and determine the factors affecting teachers use of ICT in the Irish post-primary context. The main objectives set out by the researcher were to establish the levels of ICT use at post-primary level, to investigate the factors that affect the use of ICT at post-primary level and to document teachers attitudes towards using ICT at post-primary level. In this study, the author explored a variety of teacher and school variables to gain insight into the factors affecting computer use by post-primary teachers in an Irish post primary school. The findings are presented in this chapter.

For the purpose of this study the author designed the questionnaire and interview questions to examine specific variables identified by research as affecting teachers use of ICT. Self-administered questionnaires were distributed to all teaching staff where a response rate of seventy-one percent was recorded. Eight semi-structured interviews were conducted seven with teaching staff and one with the school management to assess perceptions regarding the value of ICT in teaching in the case study school and the perceived factors affecting teachers use of ICT.

Qualitative research analysis methods were used to assess the interview responses for observed patterns of behaviour, beliefs, values and practices associated with ICT use.

The author applied a similar variable analysis as followed by Hermans et al. 2008 when analysing the self-administered questionnaires. The author will present the findings under teaching and learning issues and technical issues.

4.2 Teacher demographics – Age / Gender/ Subjects/ Teaching experience

The researcher included a number of questions on the questionnaire to ascertain the exact make up of the case study sample group under investigation. Teacher demographics were recorded using the questionnaire, data were collected on age, gender and subjects taught.

4.2.1 Age of respondents

The age of the respondents varied greatly in this study with fourteen percent aged twenty to thirty years, thirty-four percent aged thirty-one to forty years, twenty percent aged forty-one to fifty years and thirty-two percent aged fifty-one to sixty-five years (Fig. 4.1).

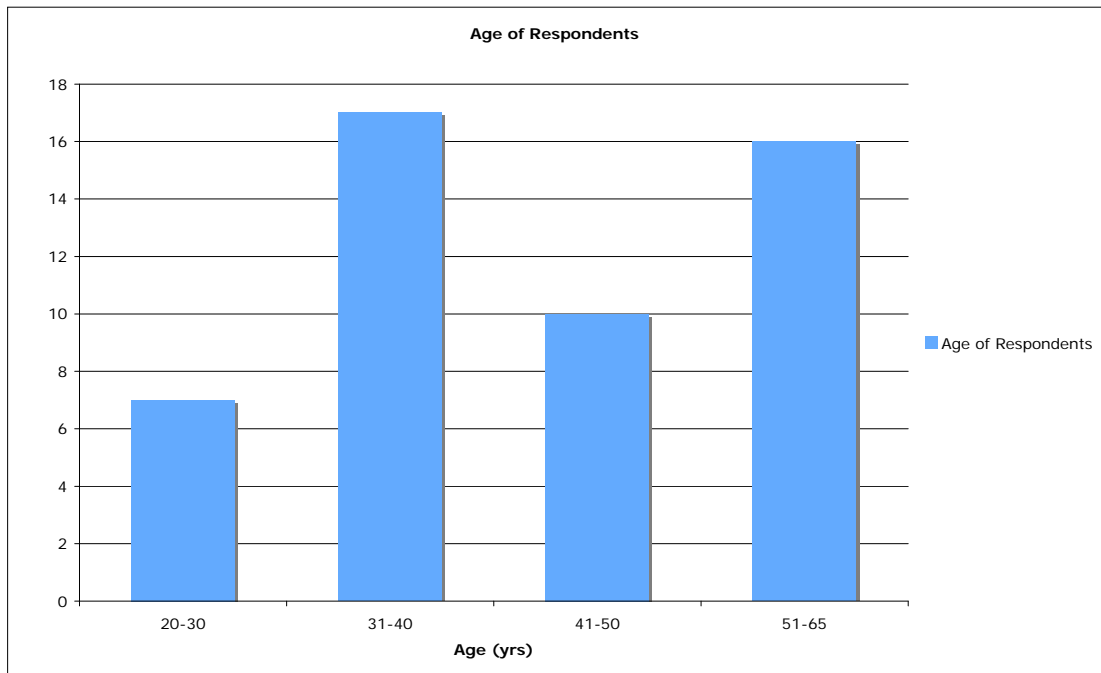


Fig. 4.1 Age of respondents

4.2.2 Gender of respondents

The questionnaire recorded the respondents gender as forty-six percent male and fifty-four percent female respectively.

4.2.3 Subjects taught by respondents

The subjects taught by the respondents in this survey are represented in **Fig 4.2**. All subjects offered in the school were represented in the study.

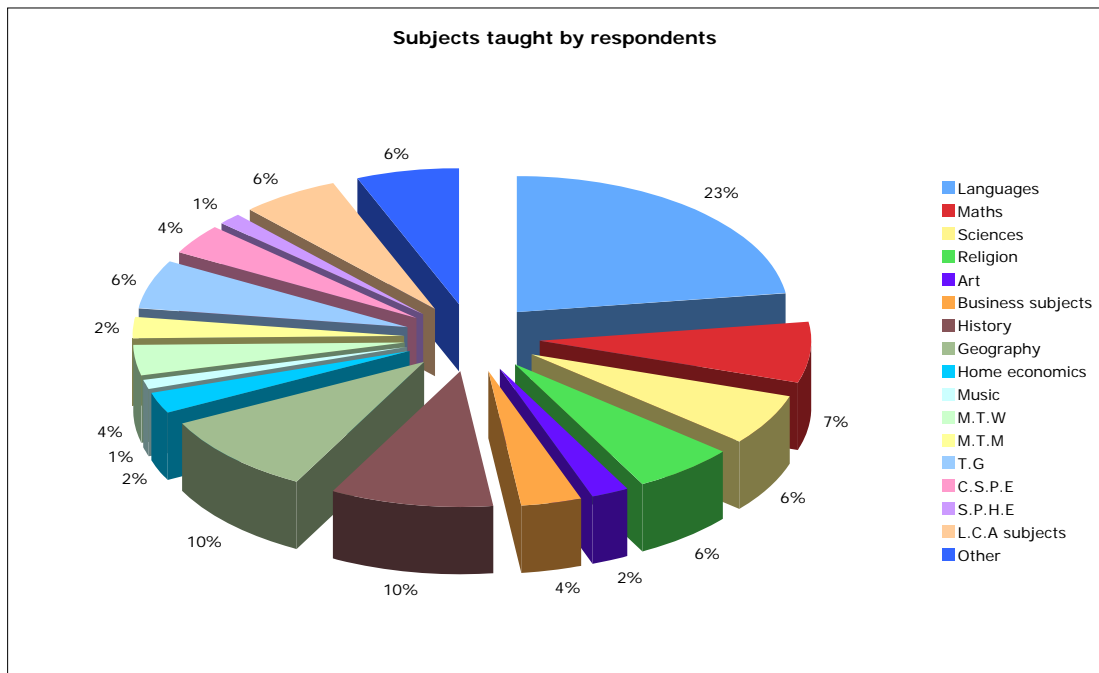


Fig. 4.2 Subjects taught by respondents in the study

4.2.4 Teaching experience of respondents

The number of years teaching experience of each respondent was also recorded. The study found that this school has high levels of experienced teaching staff with forty-two percent of staff reporting at least twenty years teaching experience (**Fig 4.3**). These high levels of teaching experience correlate directly with the age demographics of the respondents with fifty-two percent of the sample aged over forty-one years old.

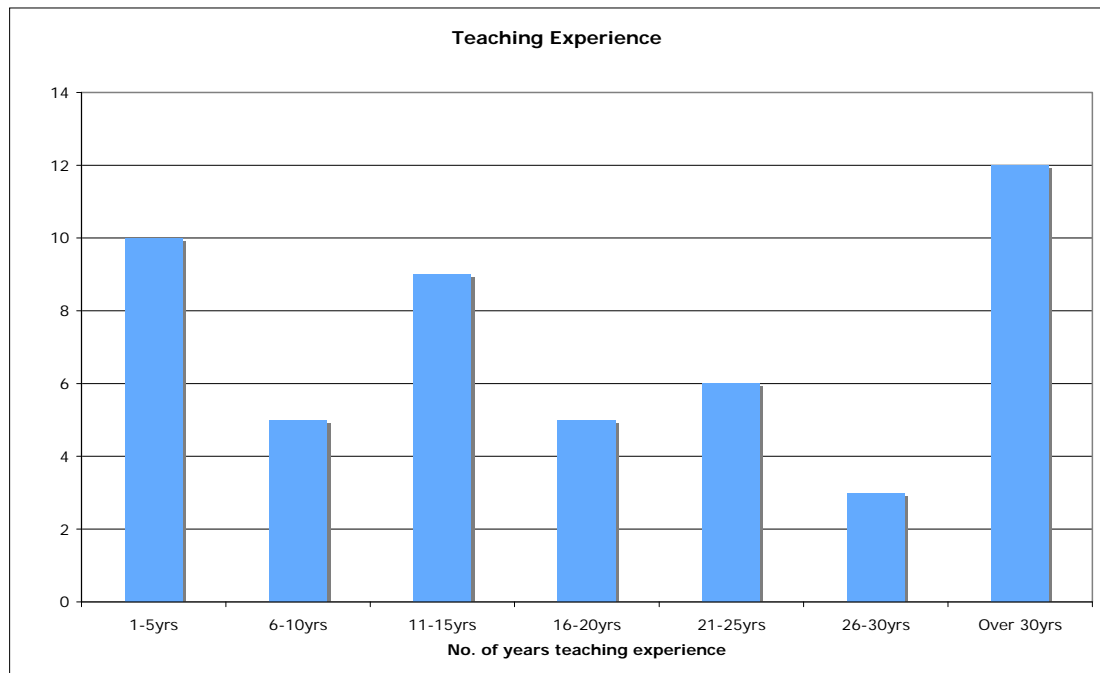


Fig 4.3 Teaching experience of respondents

4.3 Teaching and learning issues

This study investigated independent variables associated with teaching and learning that may affect teachers ICT use. The independent variables examined included teachers beliefs. Do teachers own constructivist or behaviourist beliefs influence computer use?. Do teachers computer experience, support and training influence teachers computer use?. Finally, do teachers attitudes towards computers influence their computer use?.

4.3.1 Teachers beliefs

Teachers constructivist or behaviourist teaching beliefs were identified and recorded during the semi-structured interview. The teachers interviewed reported conflicting results. Fifty percent of the interviewed respondents believed teachers that followed the behaviourist teaching theory were less likely to use ICT. The remaining fifty percent of respondents believed that teachers who follow a behaviourist teaching theory were able

to adapt and integrate ICT into their teaching. A number of the Interviewees did acknowledge that teachers following the behaviourist methodologies may experience higher levels of anxiety initially but over time they adapt to the new teaching and learning tools.

Maybe their a bit still apprehensive because they may not be fully trained in how to use the new technology.

Interview A

I think teachers need encouragement so if chalk and talk has worked for you successfully I think you might be inclined to stick with it.... I think the presence of ICT equipment in the classroom here encourages the usage.

Interview D

The researcher investigated respondents attitudes towards using ICT in the classroom in the questionnaire. When asked if the respondent experienced frustration using ICT in the classroom twenty-six percent 10% + 16% agreed or strongly agreed. A further forty-four percent 24% + 20% of repondents disagreed or strongly disagreed with this statement whilst thirty percent of respondents neither agreed nor disagreed with the statement (**Fig 4.4**).

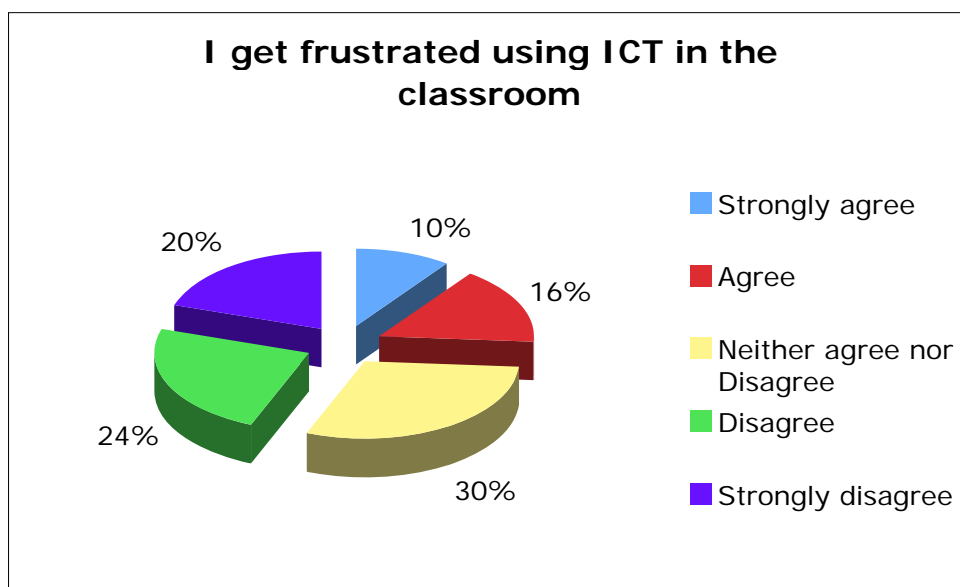


Fig 4.4 Frustration experienced using ICT in the classroom

The questionnaire also investigated respondent's own personal beliefs into whether students learn more or less when ICT is used in the classroom. Fifty-eight percent of respondents 34% + 24% agreed or strongly agreed that students learn more when ICT is used in the classroom. A very small four percent disagreed with the statement whilst a large thirty-eight percent of the respondents neither agreed nor disagreed that students learn more when ICT is used in the classroom (Fig 4.5).

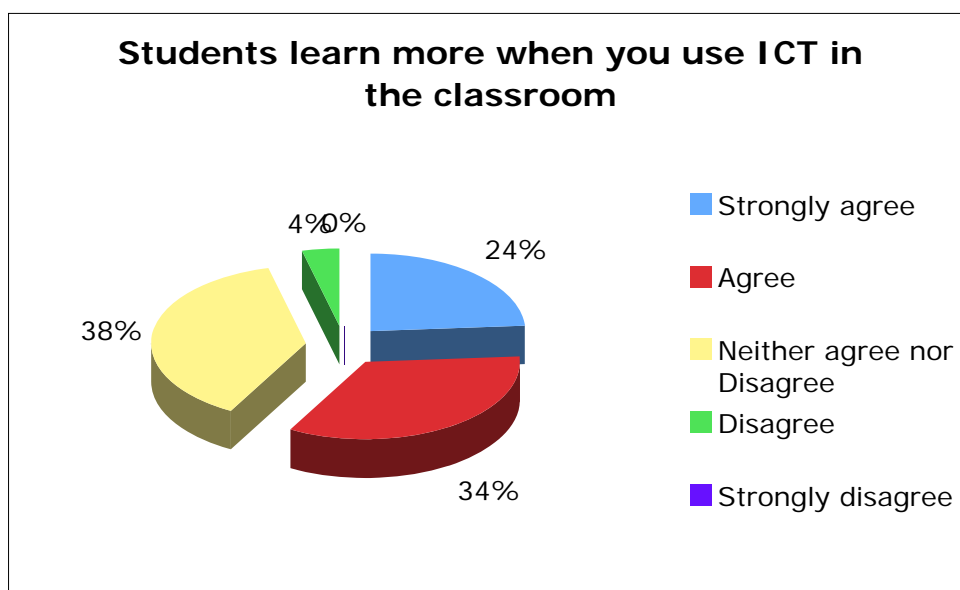


Fig 4.5 Students learn more when ICT is used in the classroom

Forty-two percent 20% + 22% of respondents disagreed or strongly disagreed that students learn less when ICT is used in the classroom. Twenty-two percent 6% + 16% of respondents agreed or strongly agreed that students learn less when ICT is used in the classroom whilst thirty percent of respondents neither agreed nor disagreed (Fig 4.6).

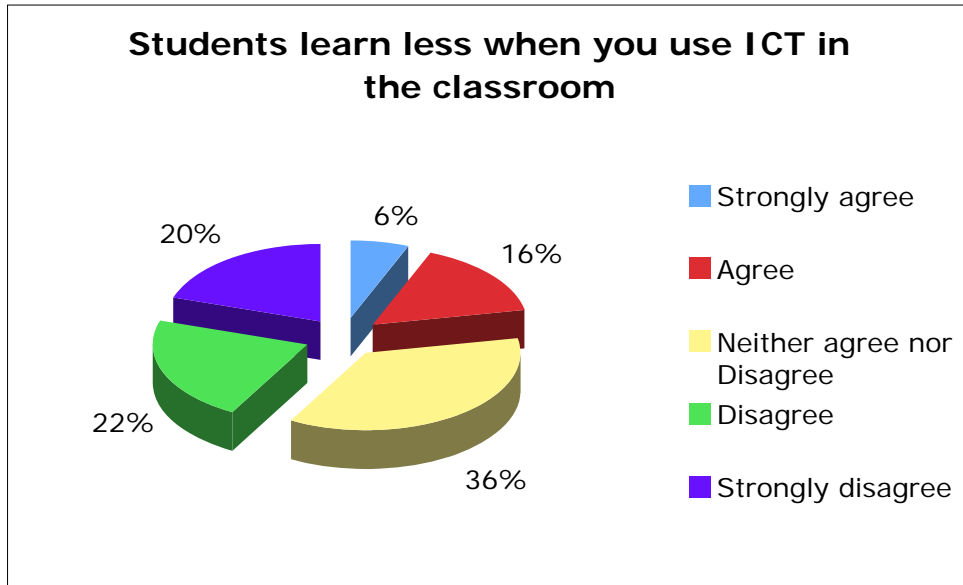


Fig 4.6 Students learn less when you use ICT in the classroom

Respondents were asked if they would like to use more ICT in the classroom to ascertain if respondents viewed ICT as a tool that they would like to use more in the teaching and learning environment. Sixty-two percent $38\% + 24\%$ of all respondents reported a positive response that they would like to use more ICT in the classroom. Eight percent of respondents disagreed with the statement and thirty percent of respondents neither agreed nor disagreed with the statement (**Fig 4.7**).

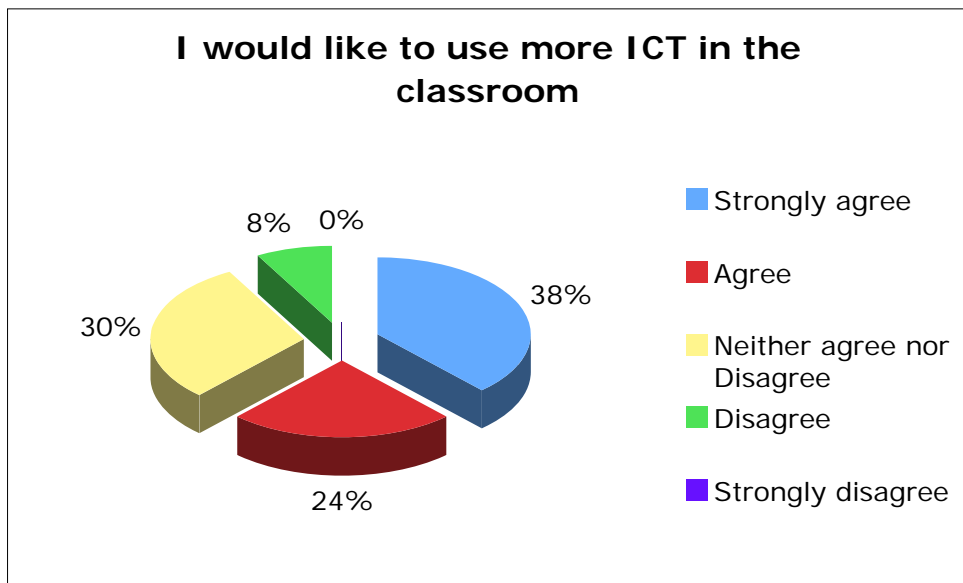


Fig 4.7 Use more ICT in the classroom

4.3.2 Computer experience, support and training

Teacher computer experience and supportive use of computers were recorded using the questionnaire. Questions related to computer experience, access to computers at home and in school, use of ICT hardware and software and amount of time spent on a computer. The levels of computer experience, support and training received were assessed in this study (**Fig 4.8**). The levels of ICT training undertaken by respondents varied greatly with twenty percent reporting no formal computer training and a twelve percent of respondents reporting ECDL qualifications. The study found forty-eight percent of respondents had completed a basic ICT introduction course. It is worthwhile noting that the school management organised a basic ICT introduction course in the school in 2006 where participation rates were recorded at thirty percent of teaching staff. The results of the Interviews undertaken with staff correlated with the questionnaire results with thirty-eight percent reporting low levels of computer experience, support and training. The remaining sixty-two percent of Interviewees reported high levels of computer experience, support and training with fifty percent of these interviewees reporting levels of computer training that exceeds basic computer training and experience.

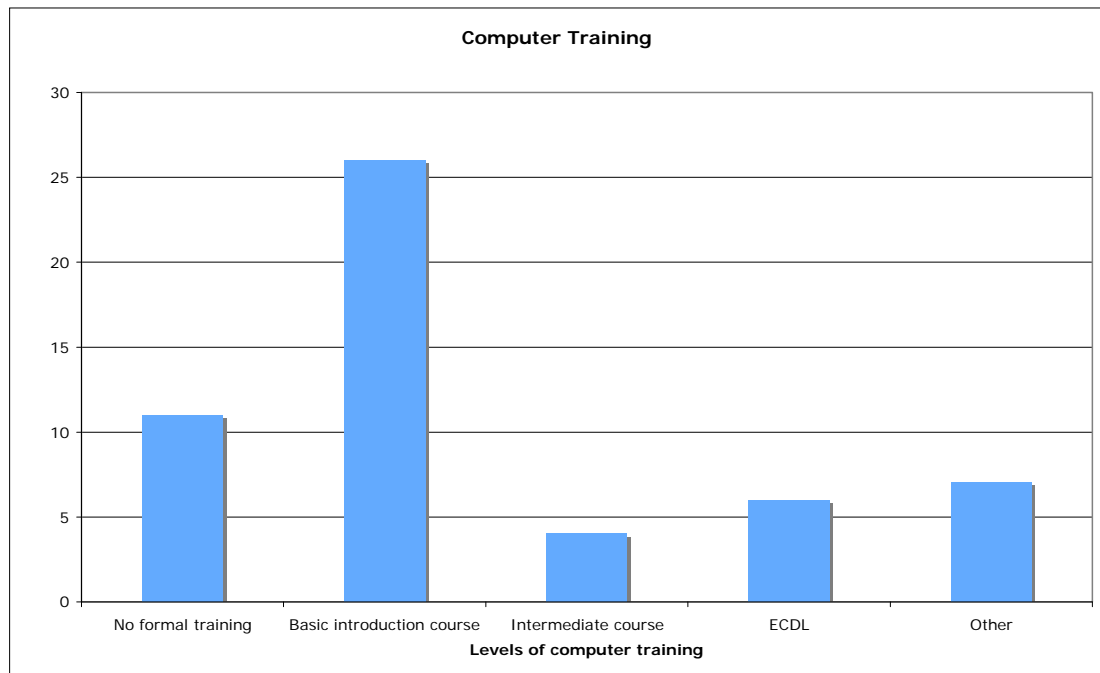


Fig 4.8 Levels of computer training

Computer training provision by the school was assessed on the questionnaire and through interview questions. The questionnaire findings reported fifty-two percent 34% + 18% of respondents strongly agreed or agreed that ICT training in the school was satisfactory. Twenty-two percent 12% + 10% of respondents disagreed or strongly disagreed with the statement suggesting they were dissatisfied with the level of training provided by the school (**Fig 4.9**). In the interview responses all respondents declared a desire to improve ICT skills.

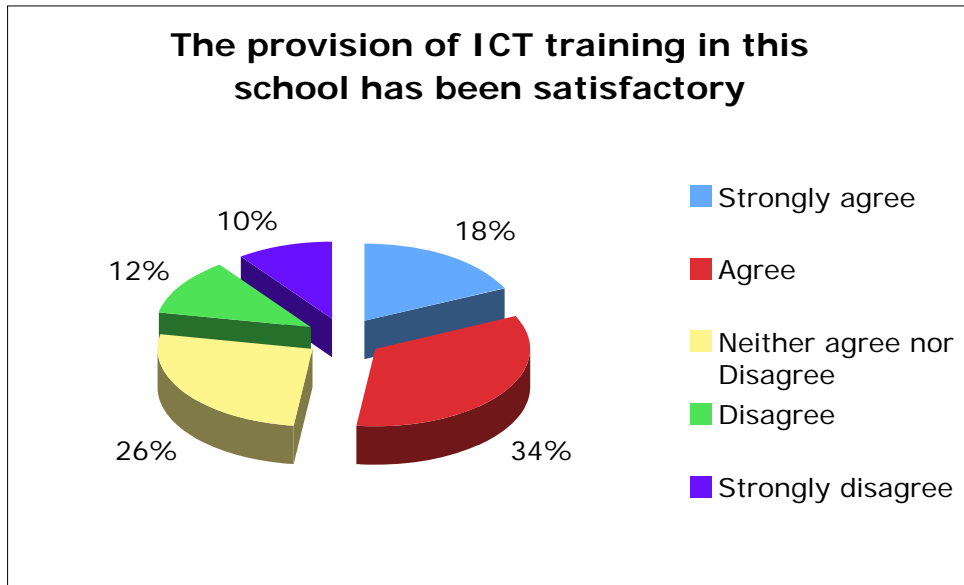


Fig 4.9 Provision of satisfactory ICT training

Seventy-six percent 56% + 20% of respondents believed that further ICT training should be provided (Fig 4.10).

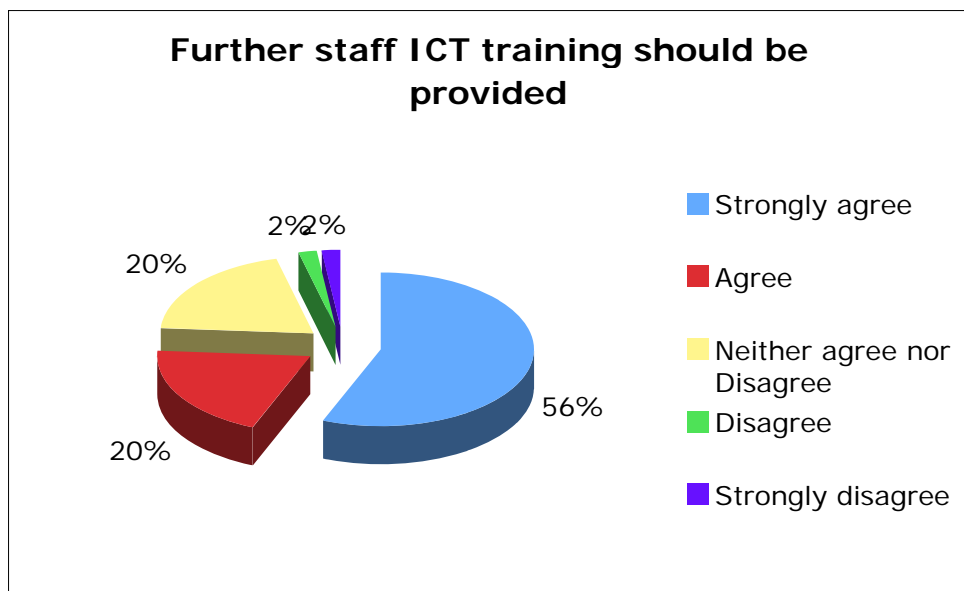


Fig 4.10 Provision of further staff ICT training

In question sixteen on the questionnaire respondents responses indicated that thirty-eight percent identified lack of sufficient ICT training as a barrier to teachers using ICT in the classroom.

4.3.3 Teacher and management attitudes

Computer attitudes were measured using an adapted version of van Braak and Goeman's (2003) 'General attitudes towards Computers' scale. The question is composed of a list of fifteen statements designed to ascertain respondents confidence levels using ICT, anxiety levels towards using ICT and attitudes towards ICT support. The five point Likert scale is used where responses range from strongly agree to strongly disagree. The lower the scale score the more positive the attitudes are towards using ICT. The use of Likert scales are advocated by Cohen et al. (2007) as they allow for flexibility in quantitative analysis of responses stating that the Likert scale "...afford the researcher the freedom to fuse measurement with opinion, quantity and quality" (Cohen et al., 2007, p.327). These authors do point out that the researcher needs to be aware of the limitations of this scale as responses may not be truthful and the scale may limit responses. The questionnaire found eighty-two percent 62% + 20% of teaching staff agreed or strongly agreed that they have a positive attitudes towards using ICT in the case study school (**Fig 4.11**). Eight percent 4% + 4% of respondents disagreed with the statement that they have a positive attitude towards ICT and ten percent of respondents neither agreed nor disagreed with the statement.

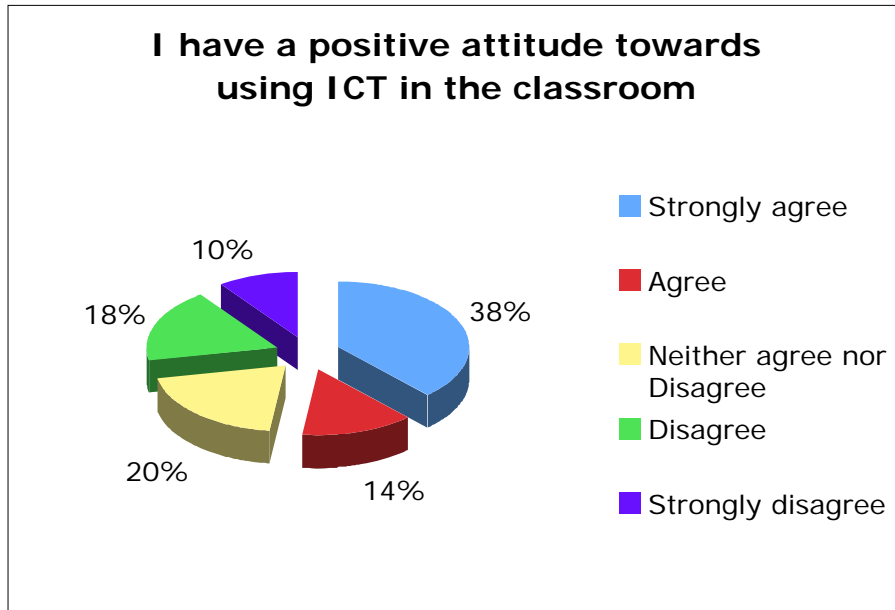


Fig 4.11 Positive attitude towards using ICT in the classroom

Fifty-two percent $38\% + 14\%$ of teachers in the case study reported feeling competent and confident using ICT in the classroom. A further twenty-eight percent $10\% + 18\%$ disagreed or strongly disagreed to feeling competent and confident using ICT in the classroom. Twenty percent of respondents neither agreed nor disagreed with the statement (**Fig 4.12**). The responses for question sixteen reported fifty percent of respondents identified lack of confidence using ICT as a significant barrier to using ICT in the teaching and learning environment.

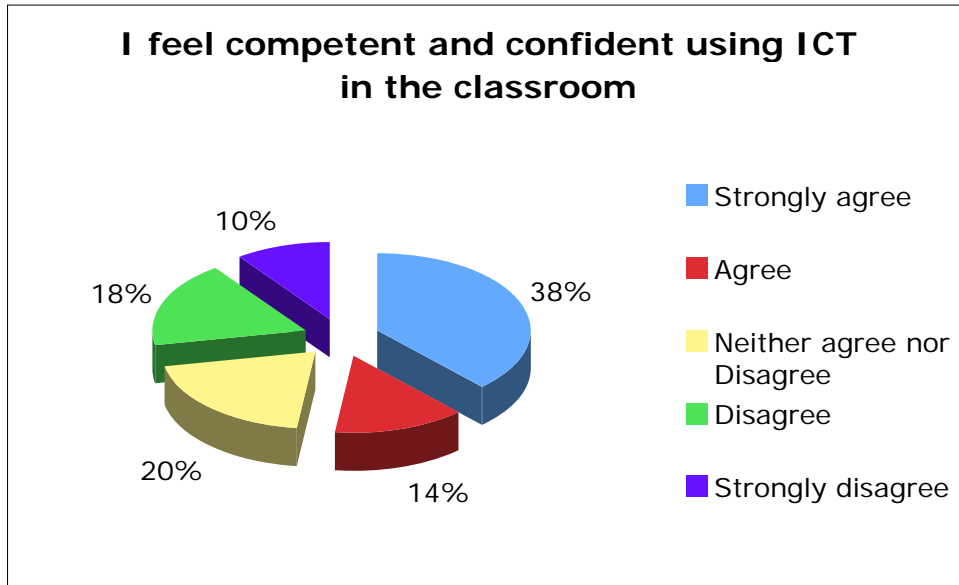


Fig 4.12 Competency and confidence levels using ICT in the classroom

Management attitudes towards ICT were recorded in an interview. Respondents were also asked in the questionnaire if they believed management supported teachers use of ICT. Sixty-eight percent 38% + 30% agreed or strongly agreed that management supported ICT use. Eight percent 6% + 2% disagreed or strongly disagreed that management supported ICT use (**Fig 4.13**).

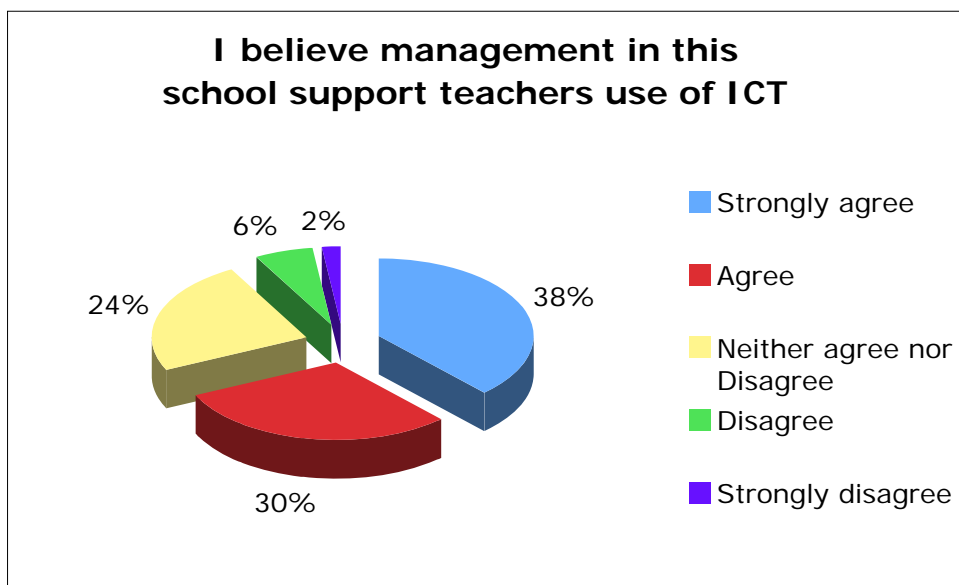


Fig 4.13 Management in this school support ICT

Ten percent of respondents reported that they believed management did not view ICT as a priority. For triangulation purposes these questionnaire findings were compared to the teacher and management interviews to better understand the results. Management responses during the interview supported ICT use within the school.

Yes, absolutely it's a great skill (ICT) to be able to use and I would encourage any teacher to embrace it (ICT) in the classroom.

A conscious effort was made to equip our school with state of the art I.T facilities to allow for skills development. Obviously, our goal now is to maintain and update this equipment over time.

Interview H

4.3.4 Use of specific ICT tools and software packages

Question nine on the questionnaire and question three in the semi-structured interviews were designed to investigate the specific ICT tools being used by respondents in the teaching and learning environment. The results of the questionnaire are presented in the following table (**Table 4.1**) reflecting the ICT tools and the frequency of their use by teachers. The most frequently used ICT tool was the computer with sixty-two percent 24% + 38% of respondents using it often or very often. The data projector was the second most used ICT tool with respondents reporting forty-two percent used this tool often or very often. The digital camera, video camera and scanner reported very high levels of never being used by the respondents. A very high ninety-two percent of the respondents reported never using the interactive whiteboard.

	Never	Almost Never	Sometimes	Often	Very often
(a) Computer	6%	10%	22%	24%	38%
(b) Printer	28%	10%	22%	14%	26%
(c) Data projector	28%	10%	20%	26%	16%
(d) Digital camera	56%	22%	14%	4%	4%
(e) Digital video camera	86%	8%	6%	-	-
(f) Scanner	74%	4%	16%	4%	2%
(g) Interactive Whiteboard	92%	4%	2%	2%	-

Table 4.1 Use of ICT tools by teachers

Use of ICT software by respondents was also investigated on the questionnaire and question three in the semi-structured interviews. The following table (**Table 4.2**) recorded the ICT software and frequency of use by teachers in the school. The respondents were found to be more likely to use Microsoft Word and the Internet when compared to other ICT software. Very low usage of creative software for photo editing, video editing, website design and computer aided design was recorded.

	Never	Almost Never	Sometimes	Often	Very often
(a) Microsoft Word	16%	6%	12%	18%	48%
(b) Microsoft Excel	52%	12%	18%	12%	6%
(c) Microsoft PowerPoint	28%	8%	24%	10%	30%
(d) Internet	10%	2%	24%	18%	46%
(e) Email	42%	20%	12%	6%	20%
(f) Digital photo editing	82%	8%	4%	-	6%
(g) Digital video editing	90%	8%	2%	-	-
(h) Music editing/ downloading	88%	8%	2%	-	2%
(i) Website design	92%	8%	-	-	-
(j) Computer Aided Design	86%	2%	4%	2%	6%

Table 4.2 Use of ICT software by teachers

The results recorded on the questionnaire correlate with the interview responses to similar questions in relation to use of ICT software. A general desire to improve and learn how to use a wider range of ICT software was observed. When asked to describe what ICT skills the respondent would like to learn the following responses were recorded.

Yes, I'd like to learn more about more modern ICT software.
Are there any specific areas?
Photoshop and all those the more creative areas of ICT.

Interview B

I would definitely like to do Excel I think it could be a very useful tool for me for record keeping.

Interview D

Yes, yeah web design..... it's definitely something like that something with the more fun element , creative element because I would definitely have been more structural.

Interview E

4.3.5 ICT use with specific teaching groups

Respondents were asked to identify the teaching group that they use ICT most frequently with on the questionnaire. The study found teachers used ICT most frequently with senior cycle classes. Transition year ICT use was reported at eighteen percent and sixth year use reported at seventeen percent representing high usage. Lower levels of ICT use were reported with junior cycle classes while a relatively low four percent of teachers reported never using ICT in their teaching (**Fig 4.14**).

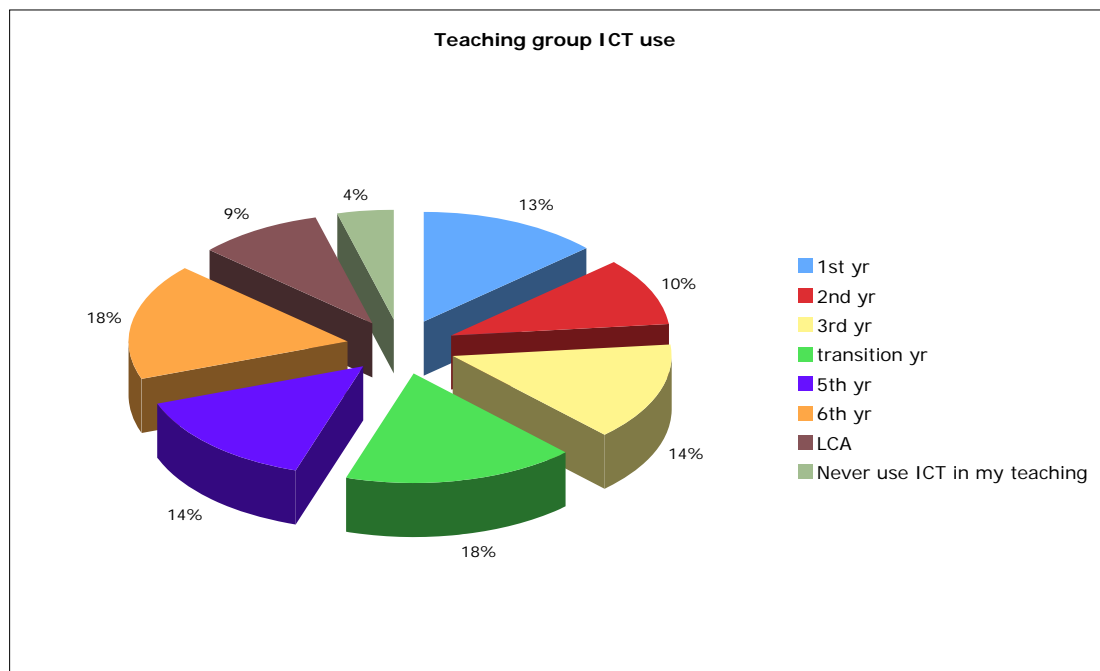


Fig 4.14 Teaching group and ICT use

4.4 Technical issues

The second area that this study will focus on is how technical issues may affect teachers use of ICT in the teaching and learning environment. The study investigated a range of technical issues that may arise through the use of ICT in the teaching and learning environment. Results were recorded in the questionnaire and interviews. Areas explored include the technical skills to use specific ICT tools and software packages, the amount of time spent on computers, the level and type of ICT tasks undertaken by the teacher, training undertaken by the teacher and access to computers and Internet.

4.4.1 Time

The questionnaire examined the area of time as a factor affecting ICT use. Respondents were asked to give details of the amount of time they spend on average using computers in school and at home on an average day. The data was recorded and is presented in **Table 4.3** and **Table 4.4**.

(a) I never use computers in school	6%
(b) Up to 20mins	14%
(c) Up to 40mins	28%
(d) Up to 1hr	22%
(e) Up to 2hrs	20%
(f) Other	10%

Table 4.3 Amount of time using computers in school on an average day

(a)	I never use computers at home	10%
(b)	Up to 20mins	23%
(c)	Up to 40mins	22%
(d)	Up to 1hr	30%
(e)	Up to 2hrs	12%
(f)	Other	0%

Table 4.4 Amount of time using computers at home on an average day

The results show that in both environments at school and at home a very low six percent of respondents reported never using computers at school and ten percent at home. In question fifteen respondents were asked to use a Likert scale to find out if using ICT in the classroom takes up too much time. Thirty percent 10% + 20% agreed or strongly agreed that using ICT takes up too much time. Conversely, forty-six percent 32% + 14% disagreed or strongly disagreed with the statement that using ICT takes up too much time (Fig 4.15).

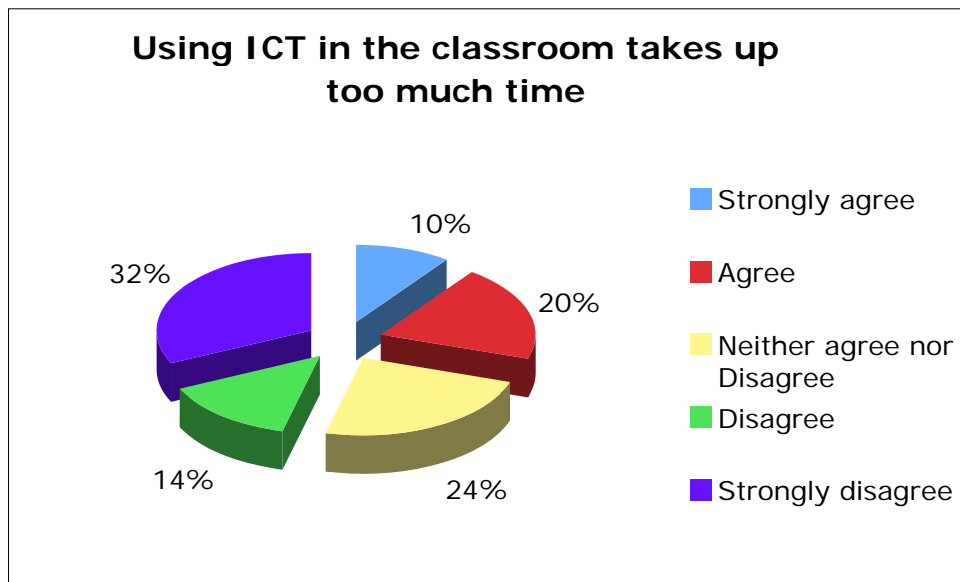


Fig 4.15 Using ICT in the classroom takes up too much time

The area of time was further investigated in the questionnaire where respondents were asked to identify the barriers that they believed were inhibiting ICT use in the classroom. The results show that thirty-six percent of respondents believe there is not enough time to learn how to use ICT, fifty-eight percent believe that there is not enough time to prepare ICT resources for class use and fifty-four percent of respondents agreed that there is no time allocated to discuss or share ICT resources in their subject areas.

4.4.2 Access to ICT

Respondents access to computer and Internet at home and in school were assessed in the questionnaire. The level of access to computers and the Internet was very high. The respondents reported ninety-eight percent had access to a computer at home and ninety-two percent had access to the Internet at home. When questioned on the type of Internet connection at home eighty-two percent reported having a broadband connection, nine percent used a dial-up phone line connection and the remaining nine percent used a mobile broadband connection.

When questioned about access to computer access in school ninety-six percent reported having access to a computer in their main classroom with seventy-four percent reporting Internet access in their main classroom. The discrepancy between access to computers and Internet access is surprising as all computers in the school are networked to the Internet server in the school. These findings may suggest that some computers in the school may have technical problems in accessing the Internet or that the respondents were unable to connect to the Internet.

4.4.3 Access to other ICT equipment

The questionnaire asked respondents to indicate if they believed the school had very good ICT facilities. The results show ninety-two percent 70% + 22% agreed that the school has very good ICT facilities (Fig 4.16)

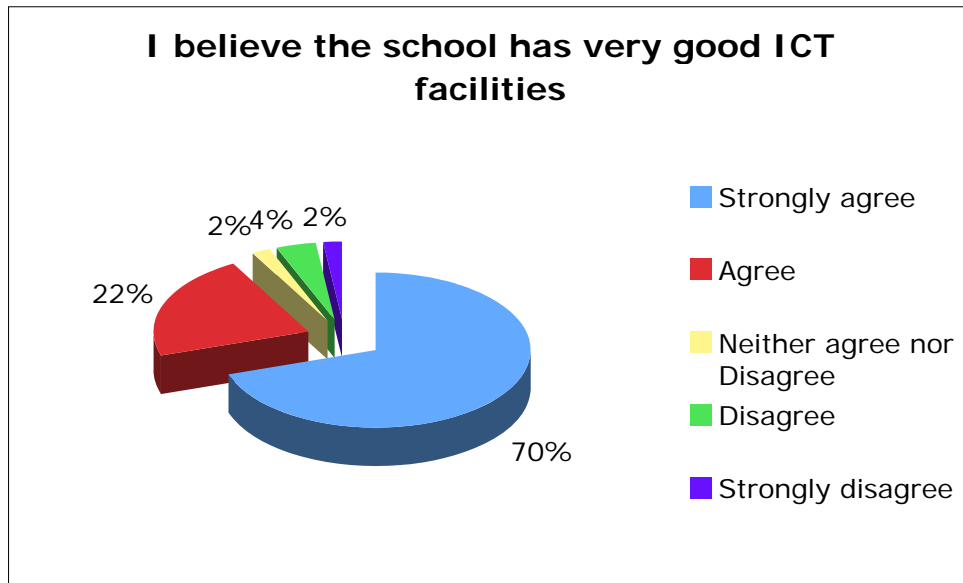


Fig 4.16 The school has very good ICT facilities

The positive response recorded in the questionnaire was also recorded in the interview responses. All eight interviewees reported very high satisfaction levels with the ICT facilities in the school. Interviewee D commented "I think it's excellent". When questioned on access to other ICT tools and equipment in their main classrooms a large fifty-two percent of respondents had access to a data projector. Lower access levels of six percent were reported for digital cameras, two percent for digital video cameras, eight percent for scanners and four percent for interactive whiteboards.

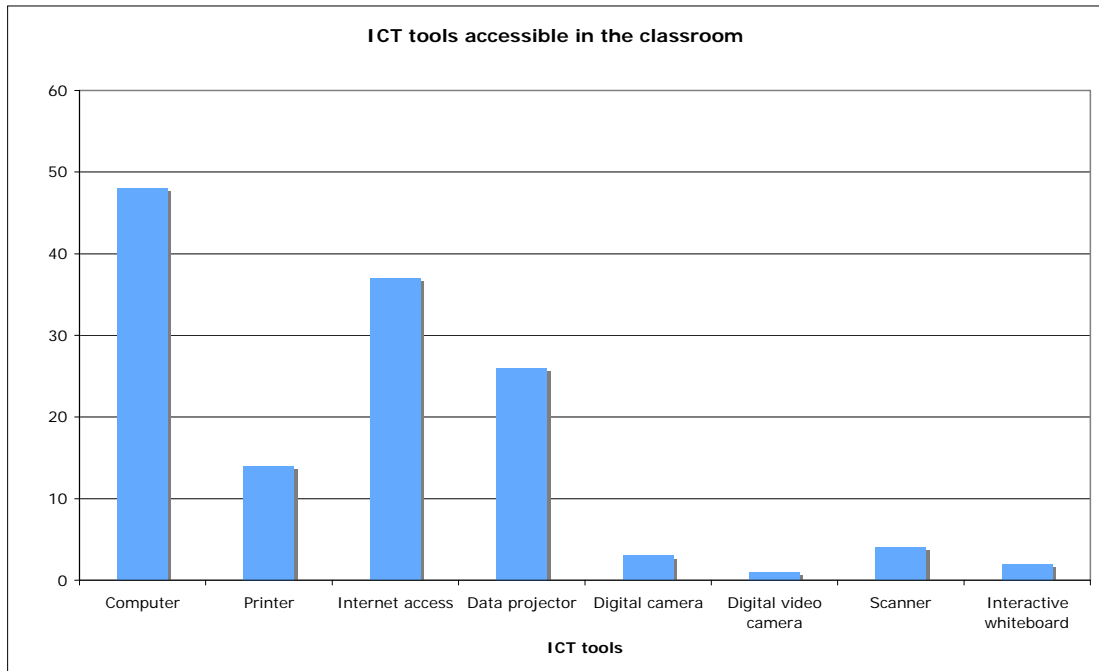


Fig 4.17 Access to ICT equipment in the classroom

Respondents were also asked if they were satisfied with the current computer room booking system in the school. Fifty-four percent $26\% + 28\%$ of all respondents reported being satisfied while twenty-four percent $16\% + 8\%$ of respondents disagreed or strongly disagreed that the computer room booking system in the school was satisfactory (Fig 4.18).

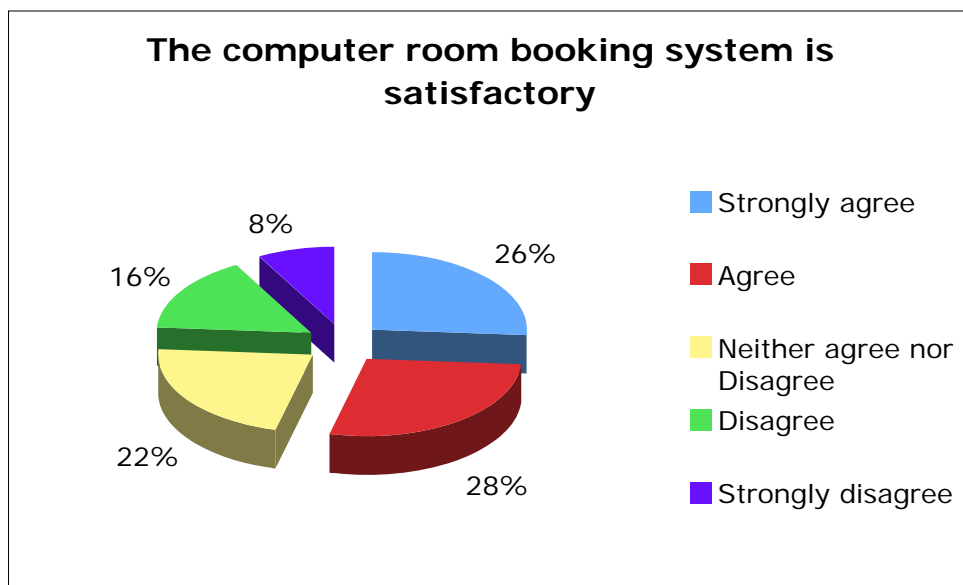


Fig 4.18 Satisfaction levels with computer room booking system

4.4.4 ICT tasks undertaken

The questionnaire gathered information on the tasks that teachers use ICT for and how often they perform these tasks (**Table 4.5**). The majority of respondents reported very low levels of using ICT to create quizzes, wordsearches, download video clips and to send or receive e-mail. In total eighty-four percent 12% + 28% + 44% of respondents reported using ICT to prepare examination material for students. Respondents also reported using ICT for class content preparation and for preparing worksheets. Collaboration was evident with thirty-six percent of respondents reporting that they use ICT sometimes to contact other teachers and to share resources. Only four percent of respondents reported using ICT often or very often for sharing resources.

	Never	Almost Never	Sometimes	Often	Very often
(a) Creating Quizzes	42%	18%	24%	10%	6%
(b) Creating Wordsearches	56%	16%	14%	12%	2%
(c) Creating PowerPoint's	24%	10%	28%	8%	30%
(d) Downloading video clips	58%	16%	20%	4%	2%
(e) Sending / Receiving Email	44%	20%	16%	4%	16%
(f) Preparing Exam materials (e.g. papers / marking schemes)	16%	-	12%	28%	44%
(g) Reviewing Subject Association online resources	16%	12%	16%	26%	44%
(h) Maintaining student records	40%	12%	24%	14%	10%
(i) Completing project work	34%	6%	28%	18%	14%
(h) Using online translators	72%	6%	16%	-	6%
(i) Preparing content for class	12%	6%	26%	24%	32%
(j) Preparing worksheets/ handouts	12%	2%	22%	24%	20%
(k) Contacting other teachers- sharing ideas / resources	32%	28%	36%	2%	2%

Table 4.5 ICT tasks in your teaching

4.4.5 ICT support and maintenance

Respondents were asked to report on the level of ICT support in the school on the questionnaire. Thirty percent 14% + 16% strongly agreed or agreed that the level of ICT support in the school was satisfactory. Forty- four percent 42% + 2% of respondents disagreed or strongly disagreed that the level of ICT support was satisfactory (Fig 4.19).

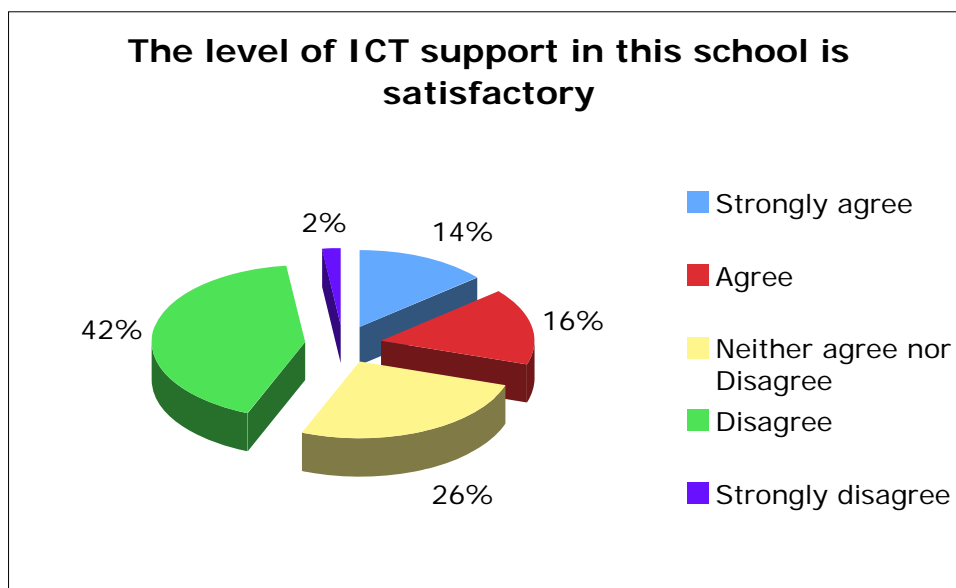


Fig 4.19 ICT support in this school is satisfactory

Respondents were asked if they believed the maintenance of ICT equipment in the school was satisfactory forty-eight percent 26% + 22% agreed or strongly agreed with the statement. Forty percent 28% + 12% of respondents did not believe maintenance of ICT was satisfactory (Fig 4.20). Thirty-four percent of all respondents identified lack of technical support as a significant barrier to using ICT in the teaching and learning environment.

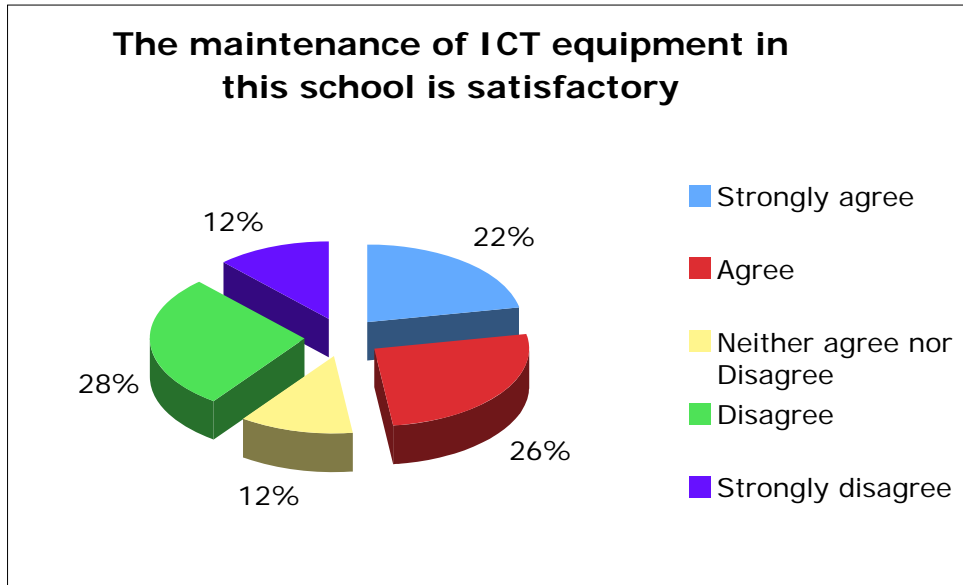


Fig 4.20 Satisfaction levels of ICT equipment maintenance in the school

The Interview responses with respondents also reported levels of dissatisfaction with ICT maintenance within the school.

Well if the equipment isn't working and your ready for it that could be a big / major problem and there is always the downfall that not all the computers would be working.

Interview A

Well I suppose in general teachers don't have a lot of time to learn new skills and if you have a technical problem it can be annoying.

Interview

Chapter 5

Discussion of Findings

5.1 Introduction

This study set out to investigate the factors affecting post primary teachers use of ICT in the teaching and learning environment. The literature review highlighted a number of factors identified in other studies that affect teachers ICT use. The research findings chapter of this study reported on ICT use by teachers in the case study school. The findings also provided evidence of teachers' personal beliefs and attitudes towards engaging in ICT use in the teaching and learning environment. This chapter will further analyse and discuss the main findings reported from the case study questionnaire and semi-structured interviews undertaken.

5.2 Teacher demographics – Age / Gender / Subjects / Teaching experience

This study represented a wide range of ages from newly qualified teachers in their early twenties to pre-retirement teachers. The researcher found that by having a diverse spread in teacher demographics the study is representative of the teacher profiles within the case study school. It would appear from the results that age was not a significant barrier affecting ICT use in the school. During the interviews the more experienced teachers did not display any significant negativity towards using ICT, conversely these teachers' expressed a strong desire to continue upskilling their ICT competencies. This finding is supported by similar findings in a study by van Braak et al. (2004).

The results of both the interviews and questionnaires found no significant differences in responses based on gender. The findings of this study are similar to those reported by Chen (1985) and Shapka and Ferrari (2003) whose findings reported gender did not affect computer use.

All subjects taught within the school were represented in the study. From analysis of the findings all subjects reported using ICT in the teaching and learning environment. The limitations of this study did not allow for further analysis of the specific use of ICT by subject. The researcher would recommend that future analysis based on subject specific department use of ICT warrants further exploration and investigation.

The teaching experience of each respondent was recorded. Forty-two percent of the teaching staff reported at least twenty years teaching experience with thirty percent of staff reporting less than ten years experience. The researcher concluded that the even distribution of number of years teaching experience amongst staff in the case study school was very useful for examining factors that affect both experienced and inexperienced teachers use of ICT.

5.2.1 Teachers beliefs

Teachers' pedagogical beliefs were recorded in the study. Interestingly, the results of the interviews and questionnaires were conflicting on this topic. Fifty percent of respondents interviewed believed teachers using behaviourist teaching methodologies were less likely to use ICT. A number of Interviewees suggested that traditional behaviourist teachers' may experience higher levels of anxiety using ICT in the classroom. The literature review has reported on a number of studies (Becker, 2000; Ertmer, 2005; Tondeur et al., 2008) that found teachers' with strong constructivist teaching methodologies positively affects their ICT use. The results of the present study highlight the need for continued support and encouragement of teachers to integrate ICT into their teaching methodologies irrespective of teachers' own personal preferences for behaviourism or constructivism –

A computer does not embody one single pedagogical orientation; it offers a spectrum of approaches to teaching and learning.

(Tondeur et al. 2008, p.2545)

5.2.2 Teachers attitudes

It has been acknowledged in many studies (OECD, 2001 and van Braak and Goeman, 2003) that teachers attitudes towards ICT are a key factor in successful integration of this technology into the teaching and learning environment. The author applied van Braak and Goeman's (2003) 'General attitudes towards computers scale' in this study. The results of this questionnaire were very interesting. Eighty-two percent 62% +20% of the respondents expressed a positive attitude towards using ICT in the classroom with eight percent 4% + 4% of respondents reporting a negative attitude towards using ICT in the classroom. The findings suggest that a high percentage of teachers' in the case study school have a very positive attitude towards using ICT. While this result is encouraging it is important to investigate further the reasons for the eight percent negative response to this question. The research has shown that negative attitudes towards ICT use adversely affect ICT use. Demetriadis et al. (2003) reported teachers' negative attitudes towards ICT as a serious concern –

...the introduction of ICT in schools, although long awaited and strongly supported, encourages significant problems related to the attitudes of the people who are responsible for its use in the classroom.

(Demetriadis et al. 2003, p.20)

Ten percent of the sample group remained undecided, suggesting that further work needs to be carried out to develop more positive attitudes towards using ICT amongst all staff in the case study school. The research found in many studies suggests that a positive attitude towards using ICT in the teaching and learning environment is linked to higher competence and confidence levels in teachers ICT use (Mumtaz, 2000). When questioned about competence and confidence levels using ICT in the classroom fifty-

two percent 38% + 14% reported a positive response with twenty-eight percent 18% + 10% reporting a negative response. The results in this study do reflect the trend suggested by Mumtaz (2000) that if teachers feel competent and confident using ICT in the classroom they display a more positive attitude towards using ICT. The research does highlight positive confidence and competence levels using ICT may not correlate the exact same response to a teachers positive attitude towards ICT. The results show a significant difference in positive responses with eighty-two percent of respondents recording a positive attitude response to using ICT while only fifty-two percent recorded a positive response to competence and confidence levels using ICT.

5.2.3 Management attitudes

The literature review has highlighted the importance of a school principals' attitude towards ICT integration. The school principal was interviewed for this study and it was noted that all responses towards ICT use and integration of ICT into the teaching and learning environment were met with a positive response. The positive attitude and commitment to using ICT within the teaching and learning environment suggest a very positive attitude towards ICT is present in the school management.

.....it's (ICT) a great skill to be able to use and I would encourage any teacher to embrace it in the classroom.

(Interview H)

It would appear from the literature reviewed that the leadership shown by the principal has a key role to play in the positive attitude reported by the majority of staff towards ICT use as suggested by the findings of Demetriadis et al. (2003). The results of this study concur with Demetriadis et al. (2003) findings as eighty-two percent 62% + 20% of the respondents reported a positive attitude towards ICT use. It is important to note

that while sixty-eight percent 38% + 30% of respondents agreed or strongly agreed that management supported ICT use eight percent 6% +2% disagreed or strongly disagreed with this statement while twenty-four percent remained undecided. These results suggest that while a significant percentage of staff reported positive responses there is a considerable number of respondents that are not convinced that management support ICT use. This negative result may be linked to the respondents response where ten percent of the respondents reported that they do not believe management view ICT as a priority. These findings may suggest that there is up to ten percent of the staff who are not convinced that the school management support ICT or view it as a priority.

5.3 Availability of specific ICT tools and software packages

Research (Tondeur et al. 2008) has found that good availability of ICT hardware and software has a positive effect on teachers ICT use. The case study school as previously detailed has received significant ICT funding. The school is well-equipped with a wide range of ICT tools and software packages. The results of the study into use of ICT tools and software packages provided interesting data. All classrooms in the school are equipped with a computer but a significant sixteen percent of respondents claimed that they never or almost never used the computer in their teaching and learning environment. This finding suggests that although the ICT infrastructure is provided teachers may not always be willing to integrate ICT into the teaching and learning environment. Sixty-two percent of respondents reported using the computer often or very often in the classroom this is a positive step towards ICT integration. It is also worth noting that the adoption of ICT in the school is relatively high when the majority of respondents interviewed suggested that they had very low levels of ICT use prior to commencing employment in the case study school. Use of the data projectors was

significantly lower at forty-two percent when compared to computer use reported at sixty-two percent. A possible reason for the discrepancies between these figures may be that all computers do not have direct access to a data projector. The use of data projectors may have been higher if there were more available for use in the classrooms. Low levels of use of digital cameras, video cameras, scanners and the interactive whiteboard were recorded. The low levels of use may be a result of the limited availability of these resources this argument is supported by the findings of Mumtaz (2000) and Tondeur et al. (2008). The school has one interactive whiteboard located in a fixed location within the school therefore it is not surprising that ninety-two percent of respondents have never used this ICT tool. Teachers need to have easy access to ICT resources in order to be encouraged to integrate them into the teaching and learning environment.

Respondents use of ICT software was also recorded in this study. High levels of use of Microsoft Word and the Internet were reported in contrast to very low levels of usage of more specialised creative software. During the interviews the majority of Interviewee responses concurred that word processing, Internet and accessing e-mails were the main software programmes used. The interview responses suggest that the majority of teachers would like to learn how to use new software.

I would like to have the skills for web design to use in class.

(Interview A)

Yes, I 'd like to learn more about ICT software..... Photoshop and all those more creative areas of ICT.

(Interview B)

I'd definitely like to do Excel I think it could be a very useful tool for me for record keeping.

(Interview C)

The results and responses suggest that there is a willingness amongst teachers to use new software but that they must be provided with the necessary skills to use these software packages.

5.4 ICT use with specific teaching groups

The study reported higher usage of ICT with senior cycle classes when compared to junior cycle classes. There may be a number reasons for the higher usage of ICT as senior cycle level. Transition year and sixth year classes reported similar high levels of ICT usage at eighteen percent each. It would appear that teachers may be more willing to use ICT in Transition year as the curriculum is more flexible allowing teacher to be more creative in planning and preparing for classes without the restrictions of the state examinations. Teachers also reported high levels of ICT usage with sixth year and fifth year classes this may be a result of the wide range of resources available through ICT that have been developed for new leaving certificate curricula over the past number of years. The positive benefits for students from ICT use in the classroom are well-documented as improved pupil motivation, better behaviour and improved communication and processing skills (European Schoolnet, 2006). Regardless of the reasons for using or not using ICT with specific teaching groups the author would suggest that ICT use needs to be continuously encouraged amongst all teaching groups to enhance the teaching and learning environment for all students.

5.5 ICT training

The questionnaire reported that ICT training amongst teachers in the case study school varied greatly. Twenty percent of respondents reported no formal computer training. This figure is relatively high when a further forty-eight percent of respondents reported basic levels of computer training. The level of computer training by teachers in the case

study school is higher than the national average of thirty-three percent of all post-primary teachers reporting no basic ICT training (Mulkeen, 1998).

The results highlight the need for continuous computer training and upskilling of teaching staff with ICT skills. The provision of further computer training would provide teachers with an opportunity for continuing professional development. The researcher does acknowledge that the school management did provide initial ICT training for staff but that ICT training should be a continuous process and not a once off event. The questionnaire results found that twenty-two percent 12% + 10% of respondents were dissatisfied with the level of computer training provided by the school. The interview responses recorded a clear willingness by all Interviewees to engage in further ICT training. It is possible that the lack of an ICT policy that includes provision for a continuous structured ICT training programme may be hindering the teachers' use of ICT in the case study school. The researcher recommends that the case study school develop a structured ICT training programme to assist in the development of teachers' ICT skills. It is clear that the majority of teachers need some guidance and support in developing ICT skills –

Classrooms can be loaded with computers, but most teachers are unlikely to realize their full potential without help.

(Rutherford, 2004, p.151)

Mumtaz (2000) suggested that with carefully planned training teachers could become aware of the wide range of uses and benefits of using ICT in the teaching and learning environment.

5.6 Technical issues

Since the advent of technology technical issues have always been associated with ICT use. The key technical issues summarised by Mumtaz (2000) are lack of on-site support, lack of supervision, lack of ICT teachers and lack of computer availability. The author examined a number of these technical issues throughout the study as Demetriadis et al. (2003) suggested that these technical issues can seriously affect teachers' ICT use.

5.6.1 Time

The first issue that will be discussed is 'time'. The results recorded on the amount of time respondents spent using computers at home and in school correlate with the figures recorded in this case study research. A small six percent of the respondents reported never using computers in school. A higher ten percent reported never using computers at home this figure may be a direct result of two percent of respondents not having access to a computer at home. The results recorded suggest that respondents spend similar amounts of time (from one to two hours daily) on the computer at home and in school. Ten percent of respondents ticked the 'other' box suggesting that they may spend more than two hours on computers in school. The researcher used the Likert scale to ascertain if respondents believed using ICT in the classroom takes up too much time. There was a mixed response to this question. Thirty percent 20% + 10% agreed or strongly agreed that using ICT takes up too much time this finding is supported by Galanouli et al. (2004) who reported that over-exploitation of teachers' time to use ICT was a serious concern amongst teachers. Surprisingly, forty-six percent 14% + 32% of respondents disagreed or strongly disagreed with this statement. This result may suggest that in the case study school there was a willingness to use ICT in the classroom

and that lack of time was not viewed by the majority of teachers' as a significant barrier. Rutherford (2004) reported that if teachers' experienced the usefulness of ICT respondents are less likely to record 'time' as a negative factor affecting ICT use. However, time does appear to be an issue for a significant number of respondents. Respondents were asked to repond to specific questions in relation to time on the questionnaire. Thirty-six percent of respondents believed that there was not enough time to learn how to use ICT. A significantly high fifty-eight percent believed that there was not enough time allocated to prepare ICT resources for class use suggesting that teachers' would welcome the opportunity to have the time to prepare their own resources. It is alarming to report that fifty-four percent of respondents agreed that there has been no time allocation to allow for discussion and sharing of ICT resources in their subject areas. It is obvious that if more time was made available to encourage and develop ICT collaboration amongst teachers' that the teaching and learning environment would benefit as reported in the findings of Pownell (2005).

5.6.2 Access to ICT

Access to ICT has been identified in many studies (Mumtaz, 2000 and Tondeur et al. 2008) as a barrier to using ICT in the teaching and learning environment. The levels of access to ICT were recorded using the questionnaire and during the interviews. Ninety-eight percent of all respondents had access to a computer at home with ninety-two percent recording access to the Internet. Both of these figures are above the CSO (2008) national figures that reported seventy percent of the Irish population had access to a computer and eighty-nine percent of the population had access to the Internet. It is positive to record that access to ICT at home in the case study school is above the national average.

The questionnaire also reported on respondents access to ICT equipment within the school. Feedback on access was very positive with ninety-two percent of the respondents agreeing that the school has very good ICT facilities with a relatively small six percent disagreeing with the statement. The positive response to the schools ICT facilities was also noted in the Interviews. These results are supported by Tondeur et al. (2008) hypothesis that good availability of ICT resources effects teachers ICT use positively. However, it is important to note that although there are very high levels of access to ICT equipment in this school there still appears to be a resistance by some teachers to integrate ICT into the teaching and learning environment.

Respondents were asked to express their satisfaction levels with the ICT room booking system to ascertain if this affected ICT use. When questioned on the computer room booking system a mixed response was recorded. Fifty-four percent of respondents reported a positive response towards the computer room booking system while twenty-four percent of respondents recorded a negative response towards the booking system. The mixed response suggests that access to the computer rooms and the operating of the booking system within the school may need to be reviewed to improve satisfaction levels.

5.6.3 ICT tasks undertaken

There are a wide variety of ICT tasks available to the ICT user. The study collected data on the type of ICT task most frequently engaged in by the respondents. The results found that teachers' in the case study school were quite limited in their use of ICT applications. Very low levels of use for creative applications to create quizzes, wordsearches, download video clips, using online translators and emailing were recorded. Seventy-two percent 28% + 44% identified their most frequently used ICT task as using ICT to prepare examination materials. Collaboration amongst teachers'

was evident as thirty-six percent of teachers' reported sharing ICT ideas and resources sometimes. It is of concern that sixty percent 32% + 28% of respondents reported never or almost never sharing ideas or resources with other teachers'. There is evidence that teacher collaboration through the use of ICT resources can enhance the teaching and learning environment (OECD, 2001). The researcher would suggest that further encouragement and provision of ICT training for specialist ICT applications may encourage increased use of ICT in the classroom.

5.6.4 ICT support and maintenance

The study recorded data on teachers' views of the level of ICT support and maintenance currently available in the case study school. The school has an appointed ICT co-ordinator who is supported for a limited number of hours weekly by a part-time I.T. support assistant. Given the significant investment in ICT within the case study school it is not surprising that the results of this study found a need for the provision of increased levels of ICT support and maintenance. Forty-four percent 42% + 2% of respondents reported low satisfaction levels with the current level of ICT support within the school. Thirty percent 14% + 16% of respondents reported being satisfied with the level of ICT support within the school. It is worth noting that when respondents were asked to comment on ICT maintenance within the school more definitive responses were recorded with less respondents undecided. A significantly higher forty-eight percent of respondents expressed higher satisfaction levels with ICT maintenance but conversely forty percent expressed dissatisfaction. Both in the interview and questionnaire responses a negative response towards ICT use were recorded when ICT support and maintenance was not satisfactory. The results of this study concur with the findings of Mumtaz (2000) and Demetriadis et al. (2003) who cite lack of ICT support and maintenance as a significant barrier affecting teachers' ICT use. Through the

provision of further ICT support and maintenance within the case study school it may be possible to positively affect teachers' ICT use.

5.7 Summary

This chapter set out to discuss and provide analysis of the research findings from the data gathered in the questionnaire and interviews. Teachers' use of ICT in the case study school was evident but a number of factors identified in the literature review as inhibiting ICT use were evident in the findings of this study. Attitudes towards ICT use were generally very positive in the case study school. It is clear from the findings presented in this chapter that further work is needed to continue to support and encourage teachers' in their use of ICT in the teaching and learning environment.

The following chapter will present the final conclusions from this study and propose a number of recommendations for the case study school.

Chapter 6

Conclusions and Recommendations

6.1 Introduction

The aim of this research project was to carry out an investigation into the factors that affect teachers' use of ICT in the selected case study school. Based on the results of this study, it appears that there are a myriad of factors that affect teachers' use of ICT in the teaching and learning environment. A teachers' ability to integrate ICT into the teaching and learning environment is a realistic expectation in today's classroom.

The present study was designed to gain a better understanding of the factors that affect teachers use of ICT in the classroom. The premise of this study was that there are factors that affect teachers' use of ICT in the classroom and that by identifying these factors educationalists can better understand the reasons why some teachers engage in high levels of ICT use and others exhibit low levels of ICT use.

The case study school featured in this study is unique when compared to the majority of post primary schools in Ireland. This school has received substantial ICT funding. The ICT infrastructure for the building was considered at the initial school planning stage and installed during the construction of the building. This situation is unlike the majority of schools that are faced with installing ICT infrastructure post-construction where many buildings have not been designed to cater for the current expanding ICT needs of the school. This study highlights the need for continuing discussion, planning and evaluation of all ICT investment in education to gain a better insight into how ICT can be integrated successfully into the teaching and learning environment. The researcher hopes that the findings of this study will enable the case study school to create an awareness of the factors that are currently affecting teachers' ICT use.

6.2 Management attitudes

The study found that the majority of respondents believe that the school management support ICT use and see it as a priority within the school. The results of this study highlight that there maybe a relatively small number of staff that are not convinced of the school managements' support for ICT use. The author would suggest that in order for the school to continue to grow and develop its ICT infrastructure there is a need for all teaching staff to be convinced of management support for using ICT within the school. This support could possibly be shown through management using ICT more visibly in the school environment for example during staff meetings, using the school E-portal system to enhance communication within the school. If management are seen to engage and promote ICT more within the school it may encourage further use of ICT amongst teaching staff.

6.3 ICT policy

ICT policy has a vital role to play in the successful implementation of ICT into the teaching and learning environment. The author recommends the case study school identifies the development of a whole school ICT policy as a school planning priority. The literature reviewed in this study highlighted the need for the establishment of an ICT policy in schools to foster ICT integration and encourage ICT adoption. The rationale for establishing an ICT policy has been well-documented by Hawkrige (1990). The lack of a ICT policy within the school on a long term basis may hinder the use of ICT within the school. The case study school does have an ICT policy but it is focussed on maintenance and use of hardware and software. The current policy is mainly concerned with students use of ICT. The research in this study has shown that the schools ICT policy needs to also address teachers' use of ICT. The integration of an

ICT policy into the overall school development plan is also recommended by Balanskat et al., (2006). These researchers suggests that by involving management and teachers in all aspects of school planning, the school plan will be more effective. The ICT policy for the school should be firmly embedded in the school ethos whilst clearly identifying the aims and objectives to be achieved through ICT use. By involving the whole school community in the development of the ICT policy it would promote collaboration amongst teachers, motivate and encourage ICT integration.

6.4 Positive attitude towards ICT

One of the key findings in this study is that a very high eighty-two percent of the teaching staff reported positive attitudes towards ICT use. Schools, in particular, management should take advantage of teachers who have positive attitudes towards ICT integration. These teachers possess many of the skills to collaborate and assist other members of staff to becoming more competent and confident ICT users. Cuban (1997) highlighted the need for teachers' to be immersed in ICT to encourage use.

.....know where we want to go, figure out how information technologies will help us get there,.....involve teachers deeply and continuously in on-site learning; hang in with them as the inevitable squalls of turmoil blow and recede, and finally have patience for such changes in belief and practice will take years.

(Cuban, 1997, p.xiv)

6.5 ICT training and support

ICT use in education has been changing rapidly as a result of technological change. Many educators have been reluctant to follow the technology-led changes. The use of ICT in a school is dependant on the successful exploitation of the educators in exploring the potential of ICT by developing new pedagogical approaches to using ICT in the classroom. It is clear that if educators are expected to exploit the full potential of ICT in

the classroom educators must be trained in both how and when to use ICT effectively in their teaching and learning environments. Lack of adequate training and support has been consistently reported (Mumtaz, 2000) as a factor affecting teachers' ICT use. The results of this study reported similar findings. It is clear that there is a need for the case study school to continue to provide high levels of ICT training and support for staff. The researcher suggests that if provision is made for increased ICT training within the school teacher confidence using ICT may improve. Over time as teachers' ICT skills improve and they become more proficient in using creative ICT applications it may result in a reduced demand for ICT support within the school. Similar findings were reported by Balanskai et al. (2006) who reported that as teachers' confidence levels grow 'e-confident' teachers become more involved in ICT within the school. The school has invested significantly in ICT software and hardware at the initial establishment stage. The researcher believes that it is unrealistic to expect that one ICT co-ordinator and a part-time assistant have full responsibility for ICT maintenance for over three hundred thousand euros worth of ICT equipment. The researcher suggests that as the ICT equipment becomes defunct over time there will be an increased demand for ICT support. The researcher recommends that the school management undertake a review of the role and support of the ICT co-ordinator within the school. A clear, strategic plan for the upkeep and maintenance of ICT equipment will be essential in ensuring the school maintains high levels of ICT use into the future.

The results of this study found a clear desire and willingness amongst staff to engage in further ICT training and upskilling. It appears that the lack of a clearly structured ICT training plan may be affecting teachers use of ICT within the case study school. The researcher recommends that future ICT training should be identified as a priority in this school. The results of this study have identified areas that respondents require further

training in and ICT tools that are not being frequently accessed by teachers. The delivery of a school specific structured ICT training programme has enormous potential to encourage teacher collaboration and enhance the teaching and learning environment within the case study school

6.6 Teacher pedagogy

This study found little evidence to support the hypothesis that teachers beliefs either traditional or constructivist in nature are significant determinants in teachers use of ICT in the classroom in the case study school. Constructivist teachers' are reported to be more likely to use ICT in the classroom. In contrast, the more traditional behaviourist teacher are reported to be less likely to use ICT. The research findings of this study found no significant difference in teachers' computer use based on their pedagogical beliefs. The findings contradict that of Riel and Becker (2000) who reported a high correlation between computer use and teachers who follow constructivist teaching beliefs. It would appear the findings of this study this study highlight that the majority of teachers' regardless of their pedagogical belief's are prepared to incorporate ICT into their teaching and learning.

6.7 Availability of ICT hardware and software

One of the key findings of this study is that access and availability of ICT resources does positively affect teachers' ICT use. The results highlight that computer hardware and software that was readily available and easily accessible by the user were more frequently used. However, it is important to recognise that although all classrooms were equipped with computers this did not guarantee use. Sixteen percent of all teachers' surveyed reported never or almost never using ICT in their classroom. This

finding highlights the importance of recognising that equipping a school with ICT tools is not enough to guarantee universal usage by all teachers.

6.8 Usage of ICT with teaching groups

High usage of ICT with teaching groups was recorded with only four percent of all teachers' surveyed reporting never using ICT in the classroom. It was interesting to report that teachers' in the case study school mainly used ICT with transition year, fifth year and sixth year classes. The low levels of ICT usage with junior cycle classes is surprising and warrants further investigation. The researcher would suggest that this finding may encourage teachers' to re-assess the level of ICT used at junior cycle level within the school. Increased usage of ICT with all year groups should be actively encouraged as the benefits of ICT to both the teacher and learner have been widely reported (European Schoolnet, 2006; Balanskat et al., 2006).

6.9 Limitations of the research

The author wishes to acknowledge that this research project is limited by a number of factors. The case study school is not representative of a typical post-primary school in Ireland. The level of investment in ICT within this school is not typical of the investment experienced by other post-primary schools. The study was carried out in a school to which the researcher was familiar. The number of respondents both in the questionnaire and interviews were relatively small when compared to the total number of post-primary teachers in Ireland. The researcher carried out the research over a limited period of time which may have influenced results. The researcher acknowledges that the case study school is still in its infancy as it is only recently opened. It is likely that as the school develops and grows the level of ICT use may evolve. While the researcher acknowledges all of the limitations that exist the

researcher does believe that the findings of this study do accurately reflect ICT use within the case study school.

6.10 Recommendations for further study

The researcher suggests that the case study school consider a number of recommendations for further study to improve future ICT use in the school.

- ICT infrastructure within the school is very good but the findings highlight that where there are low levels of specific hardware for example digital cameras and interactive whiteboards low levels of use by teachers is recorded. The researcher suggests that it would be worthwhile to investigate if the provision of additional specific hardware to teachers results in an increase in teachers' use of these ICT tools.
- The researcher would also recommend further detailed research into the effect of the principals attitudes and personal beliefs' on teachers' ICT use.
- Time limitations in this project did not allow for detailed gender differentiation when analysing the results. There is a significant body of research as detailed in the literature review linking computer use to gender. The researcher suggests that further analysis of the responses recorded in this study may be worthwhile.
- The researcher would advise that continuous evaluation of the use of ICT within the school be recorded and analysed on a regular basis to facilitate ICT development in the case study school. Most studies reflect particular views on

- A more comprehensive research plan is needed to assess ICT use in Irish post-primary schools as it is very difficult to make comparisons and reach conclusions when some studies have focused on different areas of computer use. The value of carrying out an ICT study is noted by Tondeur et al. (2008) who suggest that any study to gain a better understanding of factor affecting ICT use is beneficial -

A better understanding of the variety of computer use can stimulate the discussion about the adoption of specific computer-related school policies. Computer use will- as a result – become linked to teacher, classroom and school variables.

(Tondeur et al., 2007, p.205)

6.11 ICT – The Future

In the present climate of economic uncertainty ICT offers both teachers and learners many new and exciting opportunities. The continuous development of ICT skills and proficiencies will enhance our workforce. Irelands’ citizens can become more informed through ICT. The use of ICT in education has endless possibilities and may play a significant role in developing innovation encouraging economic growth in the future (Hawkridge, 1990).

ICT use helps to pursue higher-order thinking and problem-solving skills. It is believed that learning to solve problems, developing research skills and studying problems of personal interest are the key to a successful education.

(Zuga, 1993 cited in Tondeur et al., 2007, p.964)

During the interviews both with teachers and the principal there was a very positive attitude towards ICT use expressed by all Interviewees. Difficulties experienced were commented on and discussed but no extreme negative responses were recorded.

6.12 Concluding statement

Schools are constantly evolving environments. The role of the teacher and school p
Principal in today's society are changing. Teachers and school Principals need to recognise the vital role they play in developing ICT in Ireland. Limited ICT resources are often cited as a major impediment to teachers ICT use. The case study school in this study is unique as the ICT resources have been provided. The results of this study show that a well-resourced school does not eliminate issues regarding teachers' ICT use. ICT in the teaching and learning environment is more than hardware and software. There is a need for integration of schools excellent ICT faciiliites with technical back-up and training. Leadership is required to acknowledge the factors that are currently affecting teachers' use of ICT in the teaching and learning environment. This study has identified a number of these factors currently affecting teachers' ICT use. It is the responsibility of both teachers and school management to work together in a coherent manner to embed ICT within the teaching and learning environment, actively encourage innovativeness, creativity and collaboration. The opportunities offered by ICT cannot be ignored they must be embraced and integrated into the teaching and learning environment.

ICT is more than just another teaching tool. Its potential for improving the quality and standards of pupils education is significant. Equally, its potential is considerable for supporting teachers, both in their everyday classroom role and in their continuing training and development.

(Ghicas, 2007, p.7)

ICT cannot replace skilled teachers in the classroom but by using ICT as an effective teaching tool the full potential of both teacher and technology can be exploited.

Kozma (1994) noted that one cannot assume that because computers are being used that they will be effectively used. Bates and Poole (2003) suggested that for ICT use to be successful that educational supports should be made available to ensure ICT is used wisely and well. Unfortunately, the current situation in many schools is to allow the teachers to design and decide for themselves how best to use technology in the classroom. From the results of this case study it is clear that the management have provided training and inservice for teachers in ICT, but there is still room for further development. Problems and issues that have arisen from this case study need to be addressed and targeted to allow for further ICT development.

For technology to be effective it cannot exist in a vacuum, but must become part of the whole educational environment.

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APPENDIX A

Shanavine
Youghal
Co.Cork
03/05/09

Dear Principal,

I am currently completing a thesis for my Masters of Arts in Digital Media Development in University of Limerick. I am writing to you in the hope that you will allow me to undertake part of my research project in Pobalscoil na Tríonoide. My thesis is based on analysing the 'Factors affecting computer use in Post-primary schools'. I would like to use Pobalscoil as a case study example for this research project. In order to satisfy the requirements of the study I require the participation of all teaching staff in the completion of a short questionnaire on computer use. I also hope to interview a small number of staff and management on this topic.

I anticipate administering the questionnaire amongst staff before the end of term. All data collected will be treated in the strictest confidence. I hope that the data collected may be of use to the school in future ICT planning. I would be very grateful if you would allow me to undertake my research in Pobalscoil. I look forward to your response.

Yours Sincerely,

Elma Kent.

APPENDIX B

ICT Use Questionnaire

FOR OFFICIAL USE ONLY

ID Number

**Please answer the following questions
(All information is strictly confidential)**

1. Please tick the box that best represents your **main** teaching subjects:

- | | |
|--------------------------------|--------------------------|
| (a) Languages | <input type="checkbox"/> |
| (b) Maths | <input type="checkbox"/> |
| (c) Sciences | <input type="checkbox"/> |
| (d) Religion | <input type="checkbox"/> |
| (e) Art | <input type="checkbox"/> |
| (f) Business subjects | <input type="checkbox"/> |
| (g) History | <input type="checkbox"/> |
| (h) Geography | <input type="checkbox"/> |
| (i) Home Ec. | <input type="checkbox"/> |
| (j) Music | <input type="checkbox"/> |
| (k) Materials Technology Wood | <input type="checkbox"/> |
| (l) Materials Technology Metal | <input type="checkbox"/> |
| (m) Technical Graphics | <input type="checkbox"/> |
| (n) C.S.P.E | <input type="checkbox"/> |
| (o) S.P.H.E | <input type="checkbox"/> |
| (p) L.C.A subjects | <input type="checkbox"/> |
| (q) Other (please specify) | <input type="checkbox"/> |
-

2. Please tick the box that best represents your age:

- (a) 20-30yrs (b) 31-40yrs (c) 41-50yrs (d) 51-65yrs

3. Please tick the box to identify your gender:

- (a) Male: (b) Female:

4. Please tick the box that best represents your number of years of teaching experience:

- (a) 1-5yrs (b) 6-10yrs (c) 11-15yrs (d) 16-20yrs
- (e) 21-25yrs (f) 26-30yrs (g) Over 30yrs

5. Please tick the box that best represents the level of computer training you have undertaken

- (a) No formal training
 - (b) Basic introduction course
 - (c) Intermediate course
 - (d) ECDL
 - (e) Other
- Please specify _____

6. Do you have access to a computer at home?

- (a) Yes (b) No

7. Do you have access to the Internet at home?

- (a) Yes (b) No

(If "Yes" please specify the type of Internet connection)

- (a) Dial-up connection (using phone line)
- (b) Broadband
- (c) Mobile Broadband using 3G Dongle

8. Which of the following ICT tools are easily accessible in your **main** classroom?

(Please tick the box)

- (a) Computer
 - (b) Printer
 - (c) Internet access
 - (d) Data projector
 - (e) Digital camera
 - (f) Digital video camera
 - (g) Scanner
 - (h) Interactive Whiteboard
 - (i) Other
- Please specify _____

9. How often do you use the following **ICT tools** in your teaching?
 (Please tick the box)

	Never	Almost Never	Sometimes	Often	Very often
(a) Computer					
(b) Printer					
(c) Data projector					
(d) Digital camera					
(e) Digital video camera					
(f) Scanner					
(g) Interactive Whiteboard					

10. How often do you use the following **ICT software** applications in your teaching?
 (Please tick the box)

	Never	Almost Never	Sometimes	Often	Very often
(a) Microsoft Word					
(b) Microsoft Excel					
(c) Microsoft Powerpoint					
(d) Internet					
(e) Email					
(f) Digital photo editing					
(g) Digital video editing					
(h) Music editing / downloading					
(i) Website design					
(j) Computer Aided Design					

11. How often do you use **ICT for the following tasks** in your teaching?
 (Please tick the box)

	Never	Almost Never	Sometimes	Often	Very often
(a) Creating Quizzes					
(b) Creating Wordsearches					
(c) Creating Powerpoint presentations					
(d) Downloaded video clips					
(e) Sending / Receiving Email					
(f) Preparing Exam materials (e.g papers / marking schemes)					
(g) Reviewing Subject Association online resources					
(h) Maintaining student records					
(i) Completing project work					
(h) Using online translators					
(i) Preparing content for class					
(j) Preparing worksheets/ handouts					
(k) Contacting other teachers- sharing ideas / resources					

12. Please tick the teaching group that you use ICT with most frequently:

- (a) 1st years
- (b) 2nd years
- (c) 3rd years
- (d) Transition years
- (e) 5th years
- (f) 6th years
- (g) Leaving Cert Applied
- (h) I don't use computers in my teaching

13. Please tick to the nearest figure how long you spend **using computers in school** on an average day:

- (a) I never use computers in school
- (b) Up to 20 mins
- (c) Up to 40mins
- (d) Up to 1hr
- (e) Up to 2hrs
- (f) Other –please specify _____

14. Please tick to the nearest figure how long you spend **using computers at home** on an average day:

- (a) I never use computers at home
- (b) Up to 20 mins
- (c) Up to 40mins
- (d) Up to 1hr
- (e) Up to 2hrs
- (f) Other –please specify _____

15. Please complete the following by placing a tick in one space only, as follows:

1 = strongly agree

2 = agree

3 = neither agree nor disagree

4 = disagree

5 = strongly disagree

	(1)	(2)	(3)	(4)	(5)
(a) I have a positive attitude towards using ICT in the classroom					
(b) I feel competent and confident using ICT in the classroom					
(c) I believe the school has very good ICT facilities					
(d) My use of computers has increased since commencing employment in this school					
(e) The level of ICT support in this school is satisfactory					
(f) The provision of ICT training in this school has been satisfactory					
(g) The maintenance of ICT equipment in this school is satisfactory					
(h) Further Staff ICT training should be provided					
(i) The computer room booking system in this school is satisfactory					
(j) I get frustrated using ICT in the classroom					
(k) Using ICT in the classroom takes up too much time					
(l) Students learn more when you use ICT in the classroom					
(m) Students learn less when you use ICT in the classroom					
(n) I would like to use more ICT in my classroom					
(o) I believe the management in this school support teachers using ICT					

16. Please tick which of the following do you believe are barriers to teachers using ICT in the classroom

- (a) Not enough time to learn how to use ICT
- (b) Not enough time to prepare ICT resources for class use
- (c) No time allocated to discuss / share resources in subject areas
- (d) Sufficient ICT training has not been provided
- (e) Management do not view ICT as a priority
- (f) Lack of confidence using ICT
- (g) Lack of technical support using ICT in the class

APPENDIX C

Shanavine,
Youghal,
Co.Cork
10th May 2009

Dear Colleague,

I am currently undertaking a research based study in University of Limerick for the award of Masters of Arts in Digital Media Development in Education. I am carrying out a case study into computer use in Pobalscoil na Trionoide.

I would appreciate it greatly if you would take the time to complete the attached questionnaire. All completed questionnaires can be left in my post box.

Please be assured all responses will be taken in complete confidence. If you have any queries regarding this study please do not hesitate in contacting me.

I appreciate that this is a very busy time of the year for everyone and I thank you most sincerely for your assistance in completing this research.

Yours Sincerely,

Elma Kent.

APPENDIX D

Semi-Structured Interview Questions

1. Do you feel your ICT use has changed since joining Pobalscoil? Explain
2. Have you undertaken any ICT training?
3. What skills would you like to learn?
4. Do you believe it is good to incorporate ICT into the teaching and learning environment?
5. Do you believe you have adequate ICT equipment in your classroom?
6. What (if any) is the main type of ICT use you are involved in?
7. Do you believe ICT enhances your teaching/ classroom presence?
8. What do you believe are the main benefits to using ICT? Eg. preparing for class / tests / engaging students etc
9. What do you believe are the problems with using ICT in the classroom?
10. Do you feel you receive enough ICT assistance in this school? Explain
11. Would you use computers more for preparing for class / in class as a presentation tool, as an administrative tool eg. attendance records or do you have students in a computer lab working on computers?
12. Do you believe teachers are resistant to change / introducing something new into their classroom?
13. Do you / have you used any subject specific software? Did you find it useful? Was it developed for the Irish market? Are there any ICT resources you would recommend for your subject area?
14. Do you feel confident using ICT in your classroom?
15. Do you believe that there has possibly been too much emphasis on having this new technology and not enough emphasis on how to use it in the classroom?
16. Do you believe by using ICT in the classroom teachers are more professional?
17. Do you believe that teachers who follow the behaviourist teaching theory (chalk and talk) are less likely to use this new technology?

