Information Communication Technology and Higher Education Institutions: Evidence from Students in the North West of Ireland

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ABSTRACT

The way in which students learn is changing all the time and Information Communication Technology (ICT) is now a major element. In this research project ICT and the Virtual Learning Environment (VLE) are examined from different angles such as use within the classroom, changes in ICT and the need for training for students with regards to the use of ICT and VLE.

The research methodology represents the student views towards ICT and VLE. It aimed to establish if students felt they needed training overall how they perceive ICT and how important they value it. The data collection method was a survey of two hundred and thirty eight students within a public Higher Educational Institution (HEI) in the North-West of Ireland and supplemented with an experts review of the findings.

The findings suggest that student view ICT as being important, many will continue to use ICT in their future careers. The data collected would also suggest that students are satisfied with the training they receive for ICT and for the knowledge of the VLE but they would require more practical experience training for using the VLE.

The author would like to hope that this paper identifies recommendations for HEI management and course delivers along with identifying areas of further research in the field.

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List of Aberrations

ICT   Information Communication Technology

VLE   Virtual Learning Environment

HEI   Higher Education Institution

HE   Higher Education

IDA   Industrial Development Authority

TCO   Total Cost of Ownership

CSO   Central Statistics Office

NCCA   National Council for Curriculum and Assessment

Chapter 1 - Introduction

1.1.   Introduction

Many of the Higher Education Institutions (HEIs) in Ireland have a high focus on Information Communication Technology (ICT) which is both used by the academic and the staff. While this focus is important as Information Communication Technology (ICT) is a major component of today business especially within Ireland as the Industrial Development Authority (IDA) state that "Ireland has one of the highest concentrations of ICT activity and employment in the Organisation for Economic Co-operation and Development (OECD)". The ICT area within Higher Education is a sizeable area dealing with Online learning technologies such as the Virtual Learning Environment (VLE) to the Hardware in each class room. Key areas can be identified and form topic areas on their own. The area must first be narrowed to create a focus.

It is important that HEIs consider training for the correct use of the various ICT elements as this training will both help the acceptance of new ICT within the HEIs and will be better prepare the students for the future. This training becomes a Total cost of Ownership (TCO), or part of the cost of implementing the new or ungraded ICT in the HEIs. Training can have substantial costs and some of these costs can be an ongoing element. However, these students may not continue to use ICT after they leave the HEIs so it may only be a short term gain of knowledge with no future benefit.

1.2.   Dissertation structure

This dissertation structure is laid out in chapter format starting with the introduction chapter and ending with the conclusion. Each chapter has been divided into relevant sections and in some cases will extent to sub sections.

Chapter one is the introduction and sets the background of the project including the objectives and the research process.

Chapter two is the literature review which exams the existing material and theories in the area of ICT. This chapter also highlights the existing research conducted and also explores the gaps in the existing research. This chapter also has an effect on moving forward with this research project and this is outlined

Chapter three is the methodology which states the objectives arising from the previous chapter (the search of the existing material and the gap identified). It will also outline the primary research methods selected and the data collection tools used.

Chapter four is the Findings and Analysis, this chapter shows the results of the survey undertaken and provides a contrast between the Research objectives and the results found providing answers to the objectives.

This will be followed by an expert review in the form of a semi – structured interview with an expert in the area of ICT and student interaction in the

northwest of Ireland comparing the results from the survey with what they would expect to find from years of experience.

Chapter five is the discussions chapter which reviews and reflects the findings and links the literature review findings with the primary data.

Chapter six is the Conclusions and Recommendations and it provides an overall conclusion of the research project drawn from the material discovered and the identification and recommendation of areas of further research in the area of ICT and training.

1.3. Research objectives

The objectives of this research process include a focus on Irish students in higher level education to establish if they believe there is enough training provided for in the use of ICT within the classroom environment. The process will identify finding by key researchers in the area as well as highlighting from the secondary research, the view of the students identifying their perceived skills before entering HEIs and their perceived views after being enrolled in the HEIs for a period of time.

Another research objective is to establish the ICT used in classrooms and how effective this ICT is, and whether it could be used in a more effective way. The Virtual Learning Environment (VLE) is a new ICT element which has been rolled out in HEIs around the world and as such the researcher would aim to establish

the perceived benefit of the VLE by Irish students who are currently using the various VLE suites across the Irish HEIs.

There are also other research benefits:

1. There will be a benefit to higher education institution as they will gain feedback on the student views and the effect of learning, establishing if the current training is adequate.

2. Studies show similar Research conducted by researchers such as Bonecchi (2003) who conducted research on "The impact of Information and Communication Technologies on higher education systems." Showing the effect that ICT has had on learning in Higher Education, Jameson (2004) who studied the gap between traditional teaching pedagogies and the modernistic ICT methods, and Means (2010) who studied the student views towards ICT change within learning in the classroom, highlighting an importance that students opinions toward the VLE should be gathered in a futher study to satify the existing gap in the existing secondary research.

3. This process should also cause students to evaluate their knowledge of ICT.

4. Other Research aims are to gather information from the primary research in four main areas;

I. ICT – to establish how students value the training they recieve and if they feel their ICT skills are at an appropriate level.

II. The VLE – to establish student views towards the VLE and if they feel there is adiquaite training provided within HEI.

III. Training Costs – to discover if there is a cost benefit to the training costs and establish if there is a future purpose/benefit to the training.

IV. Student views towards ICT and the VLE – to conclude the overall view towards ICT and the VLE and establish if students view ICT and VLE as an important element of their HE experience.

1.4. Context

In order to create a context for this research the overall area must be narrowed to establish the focus area. ICT within the boundaries of the HEIs of Ireland includes both the software and hardware elements. These elements in themselves form large subject of study, for example hardware will include the physical elements such as the monitors and projectors compared with the software which includes elements such as Microsoft office packages and operating packages. For the purpose of this research hardware elements will not be considered as replacement of the hardware elements is usually straight forward redundancy costs but software elements become out of date often and replacement packages as well as updates change how the task is conducted meaning that there is a need for training in the new aspects as well as the cost of the software. Many HEIs ignore this stage of implementation (training) which leads to a lower acceptance rate of the new/updated software. The role of

training often falls to the academic who is conducting the module and often they have to train themselves first with little or no incentive. This research will highlight how the Irish students feel about the methods within their HEIs and if the methods are adequate in their views along with establishing their overall ICT skills.

1.5.   Research Process

Before conducting this research the researcher undertook a brief investigation into the area to establish if there was a gap in the existing research, this preliminary search did show indications that there was a gap in the form of training provided for students in Irish HEIs and was confirmed by evidence from the literature review.

The Methodology for this research will be divided up into three different stages, each a logical step in order to allow for ease of collecting and a clear structure.

 Stage one: will involve the review of a range of secondary data and literature on the proliferation and impact of ICT within higher education, to establish the existing research that has already been conducted. This review will establish the gap in the existing research in relation to the views of the Irish Students and establish a foundation in the area.

 Stage two: will be to survey of a sample of Irish Students. This survey will be conducted in a professional and confidential manner in order to gather the views of Irish students towards ICT and establish if there is a need for training.

Stage three: will be a semi-structured interview with an expert in the field of ICT and the VLE to review the results from stage two. The purpose of this stage is to compare the result found among the Irish Students to what an expert in the field of ICT and the VLE would expect to find.

This research process will be conducted with a broad minded approach in order to remove any bias views or preconceived ideas. Throughout the process all the evidence available will be examined in order to create the most comprehensive research findings available.

1.6.   Conclusion

In conclusion this chapter sets out the foundation of the research process including setting the context of the ICT element chosen for examination from the broad spectrum of ICT to a focused area, namely the training provided for students in HEIs of Ireland and the views of the students who are attending these HEIs. This gap in the existing area of research was discovered through preliminary investigation prior to commencement. This chapter also highlights the layout of the dissertation stating it will be in chapter format with sub heading, and the chapter finishes with displaying the research stages and outlining the various plans for each stage.

This chapter provides the rational for the research and sets the context of the research.

1.7.   Statement of Research Questions

1.7.1. Answered by the Literature Review

1. How has ICT and the VLE developed to support the work of higher education?

2. What challenges are encountered by HEIs who support the provision of ICT and VLE?

3. What impact has the proliferation of ICT and VLE had on students?

1.7.2. Answered by the Survey.

4. What views do Irish students have regarding the use of ICT and the VLE?

5. What are the views of Irish Students towards training in the use of ICT and the VLE?

Chapter 2 – Literature Review

Section 2.1.: Introduction and definition

2.1.1. Introduction

The literature review presented in this chapter is in three sections. The initial section defines the area of research and explores how Information Communication Technology (ICT) is used in the teaching and learning environment. The other areas of investigation will include the virtual learning environment, the training that is provided for students on the use of ICT. This will include a short consideration of HEIs attitudes towards ICT training for students. The main authors in the area include Biggs (1999) and Jameson (2004) who both conducted research into ICT gap that exists between traditional teaching practices methods and the modern approach of including ICT. Means (2010) conducted research into the student use of ICT and learning in the classroom. Allen and Seaman (2007) have conducted research into training provided for staff within the HEIs. Other authors who have made important contributions such as Barajas (2000), Dixon (2008), Peluchette *et al.* (2005) will be explored throughout this chapter.

2.1.2. Defining the area - What is ICT?

ICT is defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information" Blurton (1999, p. 1). This gives an in-depth value to ICT and helps create a better understanding of the area. Although this definition is from 1999 the core value is still relevant as ICT is still the wide set of technology tools and resources used to

communicate. This search for literature and previously conducted research aims to give an in-depth knowledge of the area of information Communications Technology (ICT) from a learning point of view for students. ICT has evolved over the years to become of everyday use within HEIs for delivering the class notes/key points and some institutes have stand alone programmes on the Virtual Learning Environment (VLE). The secondary research available in the area addresses many of the questions that would be relevant to ICT. However, very little of the research has been done from an Irish point of view within an unstable economic conditions and high demands on country finances leading to cut back needed in HEIs expenditure budgets.

After careful consideration of the literature such as research by Means (2010) and others the view of the Irish students engaged in third level institutes and in constant contact with ICT has become a major element of this research paper. From this basis the research was established. The area of ICT is of sizeable consideration and to look at all the aspects would be time consuming within this limited research process, but the area can be narrowed to develop a higher quality research project. Therefore, this research project will include the investigation of ICT that would be important to the students such as: the software used by the lectures, the software they will need to do assignment work with and the virtual learning environment such as Blackboard. Biggs (1999) has conducted research in the area with reference to the development of ICT and the increasing use of ICT within the classroom. Biggs (1999) explores an ICT "*gap*" between the traditional teaching pedagogies (the traditional teaching methods without ICT)

and the modernist approach (including ICT in one or more forms). Biggs outlines that in the early years the ICT gap was very narrow as ICT did not have much relevance in the classroom but as the technology developed the gap between the two elements increased. Biggs (1999) expands this gap by showing a model which outlines the growth of the ICT gap. The model highlights the need for ICT in the traditional teaching pedagogies. In 2004 further research into Biggs (1999) ICT gap model was conducted in order to develop it further; this research was conducted by Jameson (2004) by reworking the model to include elements of the online learning ICT such as the VLE. Jameson's model illustrates that in 2004 the gap between the traditional teaching and modernist teaching requires the use of ICT in almost every class and also shows a shift in thinking from the fact those students must be in the classroom environment to learn.

Students' views are the centre of this research process, so in order to establish the views perceived to be held by students it is prudent to look at the existing material in the area. Dixon (2008) conducts intensive research into the attitudes of students in the Western Australian University to establish how the students there view ICT. The findings show that forty percent of the student felt they had better than average ICT skills while only seven percent felt they had excellent skills and none thought they had poor skills. This opens up a view into the training that may be required for students as these results were establish with new students entering the college. Dixon (2008) also established that the majority of the students felt ICT would be important in their future career. Dixons result set up good findings to move forward and see if a correlation can be discovered.

Dorup (2004) conducted an exploration of students' opinions regarding ICT among first year students and found that eighty percent of participants had computers at home and seventy one percent of those who had computers felt their ICT skills were sufficient meaning more training would not be required.

2.1.3. ICT used in the Classroom

Within the classroom learning environment there are many different forms of ICT used to aid learning such as PowerPoint to view the notes, and excel for calculations. All these applications are used as teaching/learning aids; Sheryn (2002) conducted research into changing from traditional methods to the students engaging with ICT. Sheryn (2002) discovered that Students did not want to engage on an instruction basis but preferred action learning, this also caused consideration of the teaching aids available to the course deliverers. Sheryn (2002) discovered that ICT used in the classroom was mainly implemented because of changes in the curriculum requiring ICT and that the main excuses for not implementing new ICT was due to the lack of time the course deliverers felt they had.

Traditional ICT that was used in classrooms depended on the knowledge of the course deliverer so it was basically the course deliverer knowledge of using ICT elements, mainly due to that fact the main use of ICT began with data projectors used for displaying notes. Parker *et al*. (2009) conducted research into the technology that was provided in the lecture halls of HEIs and stated that the rooms were well equipped with technology however earlier research by Peluchette *et al*. (2005) concluded the highly equipped classroom were more to

draw the students into the courses but the most of the technology used in the rooms was the "low tech" end of ICT such as overhead projectors rather than data projectors. A large focus is on the technology used in the classroom, some course deliverers use more than other and it usually comes down to how comfortable and confident they feel with ICT made available. Carlson (2002) starts from a basis that ICT in the classroom all too often collects dust as it is not used. Carlson (2002) highlights the missing link which is causing ICT to "gather the dust" is the lack of training for the deliverer of the course. With this in mind Carlson conducted research to reflect this but puts the lack of training down mostly to the lack of funding and the lack of support for the training. Research such as Means (2010) and Carlson (2002) highlights the lack of training resources for the course deliverers in relation to the implementation of the new ICT. This lack of uptake towards new ICT means that there will be a time lag between the skills of students and the pace of the real world. Perez (2002) and Papenhausen (2009) have conducted extensive research into the time delay that occurs between the release of new ICT and the implementation in HEIs and have concluded that there are stages that education goes through before the new technology is accepted and implemented. Means (2010) has conducted research into ICT and the importance of it in the classroom environment, the focus of this research was around the opinion of the students as noted by the academics teaching the students. While the opinion of the students would satisfy the importance of the use of ICT in the classroom, Means (2010) discovered that students will assist with the VLE and ICT if four conditions are met by the HEIs:

establishment of a consistent instructional vision; principal support for software use; teacher collaboration around software use; and satisfactory on-site technical support. This then gives the HEIs the option to use this model for effective implementation of ICT.

2.1.4. Software changes

Microsoft and such companies like to change their software on a regular basis as this is their method of making money but what effect does this have on the ICT that is used in the classroom? Stensaker *et al.* (2007) develops the idea that this updating or software changing is usually in line with more modern ways of doing things. The course deliverers have to spend time updating themselves first in the new ICT by spending time on the new software and only then can they bring the knowledge into the classroom. Stensaker discovered that most HEIs do not reward the course deliverer for the time spent to update the technology and there would be a greater uptake and welcoming factor to new ICT if such a reward structure was to be offered. Hardware changes exist also but usually hardware changes are in relation to broken or redundant pieces of hardware, the difference between ICT software and hardware is that hardware is commonly known as tangible and software as intangible. As the purpose of this research is the software element due to the uncertainty of when the software updates are due or how often the changes will be made. An example of such changes would be Microsoft's office package, their 2003 package was unchanged till 2007 but the 2007 office was replaced in 2010.

Section 2.2: Virtual Learning Environment

2.2.1. Introduction and definition of the Virtual learning Environment

The Virtual learning Environment (VLE) is a method of learning, the traditional definition refers to learning by means of a virtual aid. A definition would be:

"Any combination of distance and face-to-face interaction, where some kind of time and space vitality is present" Barajas (2000, p. 1).

It is important to note that while there can be a definition of the VLE there is no one definition that will cover all HEIs as each Institute have their own definition of the VLE in the form of what they use. The VLE is a relativity new method of class delivery and as such has not been fully utilised by many HEIs in Ireland. Research has been conducted in the area to establish the cost of implementing such an environment within a HEIs; however most of this has not been conducted in Ireland. Coen (2003) has developed a cost evaluation in order for the HEIs to perceive the total cost of ownership of implementing a VLE system. Coen defines the breakdown of the total cost of ownership of a VLE as capital costs, revenue cost and staff cost. Studies by Bonecchi (2003) suggests that there are two engagement levels of the VLE, it can be used as a standalone programme were the course is delivered via the online delivery only or as an add on method whereby the course deliverer will use the VLE to provide notes for students and there may also be a participation require which can only be done using the VLE.

Within Ireland, the National Council for Curriculum and Assessment (NCCA) is the body which advises the changes to the curriculum that are needed including

the inclusion of ICT with in the course plans and the use of the VLE. The NCCA has developed a plan in 2007 which sets out the objective in relation to ICT framework objectives. The plan set out the objectives in four points (1) Creating, Communication and Collaborating (2) Thinking Critically and Creatively (3) Understanding the social and personal impact of ICT and (4) Developing foundational knowledge, skills and concepts. While this development plan is designed for the primary and secondary level education it is important for the students entering HE to have a level of knowledge of ICT to use the VLE that they will be faced with. Janes (2005) conducted action learning research into a course which was conducted solely on the VLE using the Blackboard system. There was a number of staff on the course and both the staff and students were interviewed to gather their opinion on the course. This research is of high benefit to the area as it shows the effect and opinions of a single course in this area. The results from the students were that they felt the course was "dry".

2.2.2. Benefits of the VLE

A question which is important to ask is in relation to the benefits of the VLE. Coen (2003) touched on the cost of implementing a VLE system but the main focus of Coen research was based on the idea of cost benefits. Coen indentifies three main benefit groups (1) Educational (2) Organisational and (3) Eternal. While these three areas all show a benefit, the main focus of most cost benefit evaluations would be on the Organisation and the benefits to the HEIs. For some institutions it is important for the VLE to be in place as they are able to offer a wide variety of courses and the constraints of the size of the campus are not an issue, VLE means that the students will not require space on campus and the

demand required from academics is also reduced once initially set up. Thomas (1999) highlights the benefits of the VLE in HEIs across Northern Ireland and draws benefits like the reduction in the demand of campus space. Allen and Seaman, (2007) have conducted research over a five year period, each year gathering more information in regards to the VLE. For each of the five years they sent questionnaires to all the HEIs in the world. Their method has set a foundation for the proposed research in the area of VLE. The result in their research disproved a number of myths connected with VLE. The myths that were disproved were in relation to the functionality of the VLE such as "Online courses can be perceived as poorer quality" and "Students are not as satisfied in an online course". The work conducted by Allen and Seaman (2007) shows that the most common negative factors believed about the VLE are myths and in fact there is common usage of the VLE within Higher Education. The research that has been conducted in this area shows that the VLE, while still in early integration in HEIs, is a vital part of ICT within the sector. Once any preconceived ideas such as the myths that Allen and Seaman (2007) refer to are established as being untrue the Virtual Learning Environment will become a successful part of any college. Allen and Seaman (2007) have contributed to the research in a positive way by indentifying and disproving the main myths that existed in relation to the VLE. Allen and Seaman (2007) identified in relation to VLE that there is a positive move towards using the VLE and that it has been adapted by the majority of HEIs in some form or another, even if the use is for an add on to an existing course for note providing. While ICT has been adapted by most HEIs it is

still mostly in the early forms of implementation as suggested by the available literature but the HEIs are beginning to express a higher emphasis on the VLE as Allen and Seaman (2007) discovered over the several years that they conducted their research.

Section 2.3: Training for using ICT

2.3.1. Training Questions

ICT implementation in HEIs is beneficial for learning but does it make any difference if training is provided for the users of the ICT? Is it likely to become more beneficial to the learning environment and are the costs associated with training counteracted by the benefits? These are all questions which would need to be identified and understood to get the most out of having ICT in HEIs.

2.3.2. Training for students

There is a lack of research conducted in relation to the benefits of training for students, the main reason for this would be due to the fact that the focus of ICT in the classroom would be for use by the academics delivering the class and would rarely consider students as they would not have much exposure to using the ICT. However the VLE has caused the students to have direct use of ICT. Means (2010) conducts extensive research into the use of ICT by students, mainly new ICT element such as reading software, math helps and the language help tools. Students were provided with training on a regular basis in the classroom in the form of extensive use of the software and each week had to compile a report of the software in order to better understand their needs. The conclusions of this research identified four main conditions (outlined in the introduction above) by

which ICT will become most effective and students will be most likely to except the new methods.

Research has been conducted by Seung *et al.* (2010) into students' engagement with ICT in the classroom and the level of participation and ICT literacy of students, the findings presented interesting information showing that the level of ICT literacy among students is still unknown even though ICT has become an important point of learning. Seung *et al.* suggested in conclusion to their research that there should be a review of ICT literacy at the end of each year and a training programme developed from the findings in order to have students better able to use ICT effectively. Other articles highlight the need for more training and better implementation process in HEIs such as Albirini (2006) who identifies that the HEIs in the country of Syrian have ICT in their institutions but have not provided successful implementation by providing training for the users, namely the course deliverers and students. Albirini (2006) argues that if the implementation process was better ICT would be even more effective. From the research into the literature on students' engagement and training with regards to ICT there seems to be a gap in the research and little evidence to convince one way or the other. This then has formed part of the basis for the justification of the chosen area. The gap identified shows that there is need for more research in the area.

2.3.3. The cost of training programmes.

The cost involved with the training is important as this will be a major part of HEIs decision in relation to the training so it is important to discover what secondary research exists in relation to the cost of training. Bakia (2000) conducted research into the cost of implementation of an ICT system in HEIs but concluded that at the time of research there was insufficient benchmarking to establish the training costs, but did note that the training costs should be included in the overall cost of the implementation and that the costs are hard to estimate. Muirhead *et al.* (2005) also researched into cost and established the average cost in 2005 for implementing the blackboard (a VLE platform) is around $30,000 USD. Muirhead *et al.* also identifies ways to reduce the training costs, such as paying for the training per hour and having a group of learners to a paid trainer. Another method of reducing the training costs as suggested by Muirhead *et al.* was to buy training videos/DVDs and play them thus having no tutor costs and after the initial set-up costs of purchasing the material it would be relatively low cost training. While this research is focused on academic training the methods could easily be adapted for students training. Dugan (2002) conducted research into what he called the cost of ICT in HEIs. Dugan's research had two main cost focuses, the initial costs (referring to the implementation costs) and continuous costs that occurred on a yearly basis. Dugan included the training costs in both the initial and the continuous costs show that there are two elements to the training costs. Dugan created a costing model for HEIs to follow when budgeting for ICT costs in order to show the real cost of the ICT. However, as Dugan's research was conducted in 2002 the majority of his findings would be unusable as ICT would have evolved

and changed, and the current economic crisis has put extra pressure on HEIs and the sale/upgrades of ICT. The existing research in the area shows that there is also a lack of information regarding training costs, especially of the more modern type showing relevant data in accordance with present and future ICT used within HEIs and again this has identified another gap in the available literature and shows the need for updated or new research in respect to costing.

2.3.4. Do Higher Institutions ignore training?

Davidovitch (2007) outlines several fallacies (from a search of literature) that cause higher institution management to ignore training. These fallacies or false beliefs hinder the effective implementation of ICT in HEIs. From the search of the literature by Davidovitch (2007) the fallacies identified through the existing research are: "everybody can do it" meaning that no training is required because everyone knows how to do it. "omnipotence of faculty expertise'' believing that staff who are experts in their area can just automatically pick up the skills needed to develop ICT for courses. And finally the ''omnipotence of websites'' believing that websites are real life and have the full details needed by ICT users and are easy to use. Davidovitch (2007) is the main researcher in the area of ignoring training, this paper is the only ones that collects information from other literature and presents it together.

Other research in the area would suggest that the HEIs budgets would be scaled back due to the current economic conditions and that expenditure on training would not be of high priority to the HEIs costing centre. This then leads to training being ignored as it is not a priority of the HEIs management. Munteanu *et al.*

(2011) has studied HEIs budgets in Romania and has found that the HEIs has established a "per unit" cost of each student but have not incorporated training for the use of ICT in their overall cost model.

2.4. Key findings established from the literature review
Summary of the main points:

1. The ICT "gap" as identified by Biggs (1999) and later expanded on by Jameson (2004) has established the gap between the traditional teaching methods and the requirement for new teaching methods to include ICT.

2. Allen and Seaman (2007) show through research carried out over five years that ICT in HEIs is increasing, Means (2010) and Sheryn (2002) also highlight this growth fact showing new ICT being implemented.

3. ICT in the classroom is not being used effectively as Carlson (2002) illustrates showing that most ICT in classrooms is gathering dust due to lack of use. Both Carlson (2002) and Peluchette *et al.* (2005) highlight the ICT structure is in place but the training is the missing link between use and non use.

4. Evidence from Means (2010) shows that students engage better with ICT if there is a constant usage programme in place. Students feel more involved so are more likely to except the new ICT.

5. There is a lack of evidence to give an opinion on the attitudes of students towards training in ICT and the use of the VLE as most research is focused around training for staff members (academics).

The purpose of this literature review is to give the reader a better understanding of the research that has already been done in the area how the area has been defined by others. Allen and Seaman (2007) have conducted research in the area which is of vital importance in disproving a number of myths that exist in the area, including as "Online courses can be perceived as poorer quality" and "Students are not as satisfied in an online course".

From the literature there seem to be a lack of definite information with regards to the view of students towards how effective they feel the VLE is and the need for ICT within the classroom. While there are some articles covering the students opinions very few consider if the students have been trained in using the system and if they have enough knowledge in the area. The frame work from the NCCA in Ireland is promising as it would seem that they are trying to gain a higher knowledge with regards to ICT for the students before they leave second level education in pursuit of Higher Education. The article conducted by Janes (2005) is a great asset to the area as it is an action learning article; while it could be perceived as a conflict of interest as they are under self review there seem to be an honest opinion given by the students but the only fear is that they may have rated the course deliverer rather than the delivery method. Another problem is that this research only covers one HEI so in order to gather a wide view there would need to be thousands of these action learning researches conducted and a comparison carried out. The literature also identifies through the research of Means (2010) that students interact better when they have been trained to use

ICT on a regular basis and when they are able to identify the benefits of using the ICT for learning. The literature review also found a number of writings about the VLE and training which has helped to give background information into the area and indentified two major areas of research consideration defined below.

2.5. Moving forward with ICT for the classroom

The literature review has identified two major areas for further research:

1, the student views and requirements for training – An investigation is required into the student views towards training in relation to the use of ICT. There is little research in this area and course deliverers, higher institution management along with education funders would benefit from the results. There is also scope to mirror research already conducted in another location as the research knowledge would be different depending on the country/county in which it is conducted.

2, the cost of training – An investigation into the cost of training as there is a major lack of quality research into the area of costing. While some research has been conducted most would not be relevant to present ICT and would require updated research or new research to add value to the area. Research could also be conducted to see what method of training HEIs offer for both staff and students. It is important to note that this research into the cost of training will require access to HEIs financial information and this information may not be easily accessed.

2.6. Learning Benefits from the Literature Review

2.6.1. Benefit to the Research Questions

The literature review has helped to shape the research questions as it has identified the answer to three of the fundamental questions and has identified two areas which require further research, one of which has been chosen for the purpose of the primary research. The literature review has also set the background to the topic and helps give the required knowledge and understanding to continue with the primary research. As with any research project answering the key research questions is fundamental, the literature review has both answered a number of the questions and has established a focus for moving forward.

2.6.2. Questions answered by the Literature review

How has ICT and the VLE developed to support the work of higher education?

A seminal paper in the interface between higher education and ICT is Biggs (1999) who identified a gap between traditional teaching method and the requirement for the inclusion of ICT. His model was adapted later to include an even greater ICT gap which identified that there was an increasing demand for an effective ICT programme. The VLE later became an element of the ICT gap. Coen (2003) suggests that the VLE has helped to evolve the learning process in HEIs in three main ways: Educationally, Organisationally and externally. The VLE has developed to help in these three areas by creating fewer requirements for space on campus, a larger student to academic ratio and the opportunity for students to learn when it is most suited to them.

What challenges are encountered by HEIs who support the provision of ICT and VLE?

HEIs have encountered difficulty with the provision of ICT and VLE due mainly to the myths which exist in relation to the ICT and VLE such as: "Online courses can be perceived as poorer quality" and "Students are not as satisfied in an online course". Allen and Seaman (2007) provided an answer to this question, in that after the myths are overcome by the HEIs management then the challenges can be overcome. Other challenges that exist are elements of training; the primary research should provide a more holistic view of these challenges depending on how adequate students feel the training they are receiving is.

What impact has the proliferation of ICT and VLE had on students?

The changes/proliferation of ICT and VLE are an important element as companies are regularly issuing updates for software in order to increase their revenue. Students must overcome these changes. Stensaker *et al.* (2007) identifies that there is a delay in HEIs updating software due to the high costs and the students find it difficult to proceed with the new changes until they have had time to adapt.

2.6.3. How the literature review has informed the methodology?

The literature review has informed the methodology as it has identified that there is a lack of evidence of student views towards ICT, and no evidence to establish if students feel they need training or not. Therefore Students have been identified as the target audience for the survey and the lack of information from Irish

students has also shown an area of focus within the survey of students. While the literature review identified the chosen gap in the research area it also identified that most of the research conducted in the area of training for ICT has gained the data via the collection method of questionnaires/surveys and interviews. In summary the literature review has established the gap in the research already conducted, this has informed the collection methods through similar research conducted in other area such as Means (2010) and Allen and Seaman (2007).

Chapter 3 Methodology

3.1. Introduction to the Research Questions

An essential part of any research project is a review of literature and secondary data (Robson 2006). Based on the initial review of academic literature, two main areas of study emerged (stated in chapter two). The area in relation to the cost of the training is one that requires gathering an extensive quantity of confidential material in relation to the finances and training costs of HEIs in Ireland. Access and permission would also be required to survey both staff and students. It would be difficult to gain access to the HEIs except for the one the researcher is currently studying at. However, the data collected from this particular HEI could cause a conflict of interest. This research project will focus on the first gap. In order to achieve the findings there will be a survey circulated to a sample of students attending HEIs in Ireland.

3.2. Identifying the Questions

1. How has ICT and the VLE developed to support the work of higher education?

2. What challenges are encountered by HEIs who support the provision of ICT and VLE?

3. What impact has the proliferation of ICT and VLE had on students?

4. What views do Irish students have regarding the use of ICT and the VLE?

5. What are the views of Irish Students towards training in the use of ICT and the VLE?

The answers have been identified as coming from two sources: first, the primary research where the answers will be identified through the results of the survey to establish the views of Irish Students in the north-west of Ireland. And secondly, the search of the existing literature which has established the answers to the first three research questions and formed a basis for moving forward.

3.3.   Review of previous studies

Previous studies of a similar nature have been conducted by:

1. Fini (2008) who conducted research on students regarding the use of ICT, although not focused on the training his methodology used a questionnaire based around a three part structure and was only for the purpose of gathering quantitative information.

2. Albirini (2006) who also conducted a similar quantitative questionnaire to that of Fini (2008) but the target population was Professors and students as appose to only students

Other researchers in the area have used mainly questionnaire/surveys style methods of data collection such as Allen and Seaman (2007), Means (2010) and Seung *et al* (2010). Reasons for the high use of the survey as the data collection would seem to be that the surveys are easily distributed around the HEIs populations and they do not require a lot of the participants time compared to other methods such as interviews another factor could be the ease of opting out if the participant does not want to continue.

3.4. Key factors of the design

3.4.1. Methods Chosen

When designing and choosing methods of data collection there must firstly be consideration given to the type of data collected, will it be quantitative, qualitative or mixed methods. This research project included both methods, i.e. mixed methods. Creswell (2003) highlight this mixed method approach as becoming more relevant to research. Firstly a priority between the quantitative and qualitative must be established and for the purpose of this project the Quantitative survey had the highest priority as the results from the survey were required for the qualitative interview.

3.4.2. Survey

Once the review of the existing literature in the area of ICT was conducted and the finding were established the next stage of the research process was to conduct a survey of a sample of the population in order to establish the view of Irish students studying in a government-funded HEI in the north west of Ireland. This survey was primarily a quantitative survey conducted through an online survey software instrument to aid the distribution process, provide a convenient method for the participants and to be environmentally friendly by providing a paperless trail. This also meant that all the data was stored on a secure data network and there was no way a participant's identity could be discovered.

Robson (2002) outlines types of survey into two main categories, Self administration and interviewer style. The interviewer style survey can be beneficial from the point of view that any queries that the participant many have

can be answered during the survey. However the interviewer style survey would not be suitable for a large scale population, but one should note that the response rate for an interviewer style survey would be greater than the response rate of a self administration survey.

3.4.3. Semi – Structured interview

When designing the research methods it was established that a survey on its own would only provide an unbalanced result, Saunders *et al.* (2003) states that surveys on their own are in some cases stuffiest, however in most cases it is better to provide a contrast between the survey and another method of data collection. As this link can provide more detail another stage of data collection was drawn on, in that when the data was collected from the survey a short semi-structured interview was to be held with an expert in the area of ICT who had been involved with both training and teaching using ICT and getting students to use ICT. The expert will be asked to review the finding of the survey based on their knowledge in the area. The purpose of the interview was to strengthen the data collected and provide a correlation. Robson (2002) refers to the semi-structured interviews as flexible qualitative instruments, and as such don't have a list of set questions. This was decided as the best model for the review with the expert as a specific set of questions is not required to be answered but the best information that can be gathered to form an effective correlation without introducing any bias questions.

3.4.4. Instrument/method chosen

In order to establish quality data the sample chosen was one government funded HEI in the northwest of Ireland, and a sample of the students in that HEI. As the survey is delivered by means of self administration survey the response rate is expected at around ten percent but factors such as timing will have an effect on the response rate. The survey will be delivered via a mass e-mail to the entire HEI as it was not possible to select individual groups to send the mail to. The link will lead the participant to the online survey and will also inform them about the survey and their anonymity. The interview with the ICT expert will be conducted in a method that is most suited to the expert and requires the least amount of inconvenience caused.

3.4.5. Design issues

The design of the survey was adapted from a prior survey which had been conducted by Albirini (2006) and Fini (2008) who both conducted separate surveys in different locations but of a similar nature. To ensure the survey was not misleading it was piloted among a small group of Irish students. This test proved successful and after ethics approval the survey was launched. There was no major design issues as the questions were mostly rating questions, were by the participants had to rate a statement.

3.4.5.1. Justifying the circulation approach

The circulation approach of using a mass e-mail to the entire HEI can be justified as the most effective approach as all the students are given a HEI e-mail account and are required to use this account to communicate with their lectures and for all

HEI announcements. Due to this fact all the students will have access to this medium and will receive the opportunity to participate.

### 3.4.5.2.	Sample Size

The population chosen for the survey consists of three thousand students from various disciplines. The expected response rate is ten percent of the total population i.e. three hundred survey responses; this left a target response rate of between two and three hundred.

This sample is a representation of the population as the whole population will be offered the chance to respond and from each discipline within the HEI and all years. The results should be returned with representation from a sample of all elements of the HEI.

### 3.5.	Advantages of using the chosen method

This chosen method of using a quantitative survey has benefits which are specific to the target population. This data collection process is asking for time from the participants, a limited resource to many students. This survey is fact gathering and requires no more than ten to fifteen minutes to complete which is an expectable demand of the population's time. There is also an advantage in the short quantitative survey in that the review of the result by the expert in the field of ICT and the VLE will be required to spend a leaser time reviewing the results. Quantitative surveys are also excellent instruments for fact gathering and for gaining the populations opinions, thus the Qualitative semi-structured interview will provide a substance to the data similar to the contrast explained by Saunders (2003).

3.6. Limitations

Within this research process there is a number of limitation of scope in relation to conducting the planned research.

The first limitation is the access to students within the time frame. In order to create an achievable goal there had to a focus area i.e. the north-west of Ireland. In this sample there are two HEIs but access to one HEI was restricted.

While this restriction narrows the data collected it does give an opportunity for future research in the area.

The second limitation was that the response rate of the return of the population was under ten percent (based on the 3,000 students attending the public funded HEI in the north-west of Ireland) however there was a representative from each year and a cross section of different subject areas. The fact that there is a review by an expert will help resolve this limitation. The response rate was almost the expected ten percent and it is worth considering that a percentage of the three thousand students may not still be attending the HEI. Other limitation such as the method of delivery via an e-mail system may exclude members of the population who are not using the e-mail systems although all students should be using the system.

3.7. Data analysis

The surveys will be circulated among the population and left open till the end of the academic year in order to give suitable time for the repentance.

The Data collected will be analysed using mixed methods of the online system and excel software to create graphs of the results.

As the survey contained mainly quantitative findings they have been presented in pie charts showing the split in percentage form. Open-ended questions leading to unstructured answers are shown in a list format, showing the answers to the finial question.

The results of the experts review will be documented along with the findings from the surveys and shown in a summarised format.

3.8.   Conclusion

This research was conducted to establish the views of Irish students in the north-west of Ireland toward ICT, the use of ICT and the VLE, and the training provided by the HEIs to establish the adequateness of the training.

The findings of the survey and semi-structured interview (review by an expert) are examined and analysed in Chapter four showing the student views and the review by the expert.

Chapter 4 - Findings

4.1.   Introduction

This chapter highlights the finding of both methods of data collection, the self administered survey and the semi-structured interview.

4.2. Survey Findings

This section shows the findings from two hundred and forty eight respondents who are all Irish students currently studying in a HEI in the north west of Ireland. The participants are all from different academic areas such as business, science and nursing and as such have different needs and uses of ICT.

The first section of the survey was to establish if there had been a wide variety of participants across the board such as a gender split. While this information does not address the questions and objectives of the research they help understand the sample.

4.2.1. The basic spilt

The gender balance of the participants was an even split with 57% females and 43% male. There was a higher participation level among 17 – 30 year old but this could mainly be due to lesser over 30 year old engaged in Irish HEI.

The area of the course and the year of the course were also well balanced, however a higher rate of participants were from the business sector but this could be explained by the factor that there would be a larger amount of students engage in business in Irish HEI overall (CSO report 2008)

4.2.2. ICT Knowledge

The first step in gathering data to answer the aims of this research project was to establish how the participants rated their level of knowledge before entering the HEI. The results of this question showed clearly that fewer participants felt they had adequate skill to use the ICT. Only 1% felt their ICT skills level was inappropriate which begins to highlight the level of training required.

Figure 1 shows the break-down of the results for this question, from the answer to this question it could also be establish that training may be needed for some students but not all.
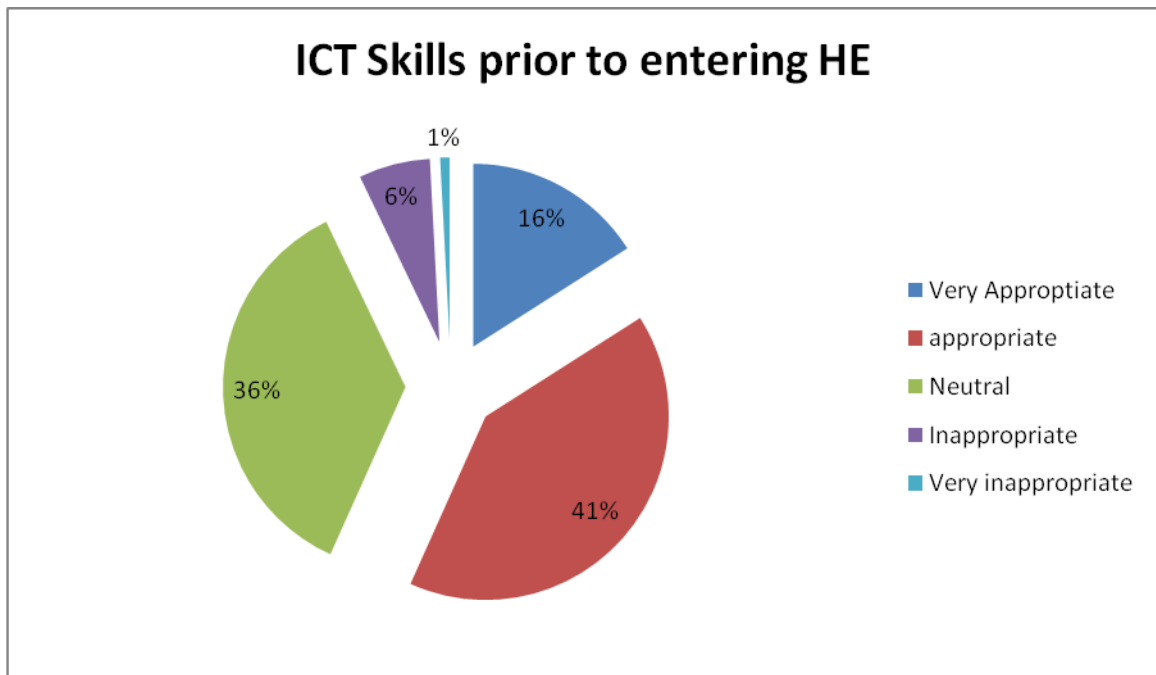
Figure 1 –ICT Skills prior to entering HE

Once the ICT skills have been established prior to entering the HEI the next step was to establish the level that the participants felt their ICT skills were at in their current point of education, i.e. after they had went through the HEI current

training programme. This showed a decrease in the number who felt they has inappropriate and very inappropriate ICT skill level to less than 2% which showed the training programme currently in place by the HEI was having an effect. Figure 2 shows the break down and it can also be seen that after being in a HEI almost 50% of the participants felt they had appropriate ICT skills.

ICT after entering HEI
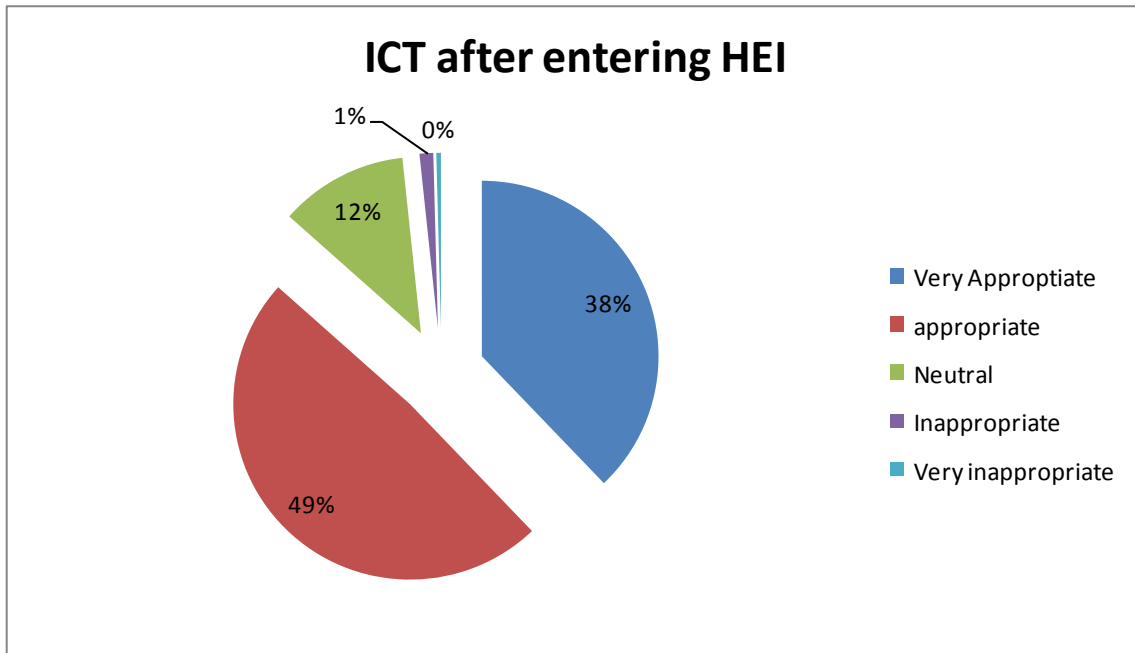
Figure 2 – ICT Skills after entering HE

Evidence gathered in relation to training for using ICT among Irish students shows that the current programme in place in the HEI is appropriate and no further training programs/modules are required, the participants (less than 2%) who felt they had inappropriate ICT skills could be first year students or maybe event part time students who would have not received full training yet.

4.2.3. VLE Knowledge

As it has been established that no more training is needed towards ICT skills for students in HEI the next step is to investigate the VLE skills in the same way to establish if more training is needed in this area.

After reviewing the VLE skills perceived by the participants prior to entering HEI it shows that clearly 67% felt their VLE skills were not appropriate, while this is a large percentage it is important to note that this is before any training had been given and it is off benefit to the HEI that 33% felt they had an appropriate knowledge of the VLE. (See figure 3)
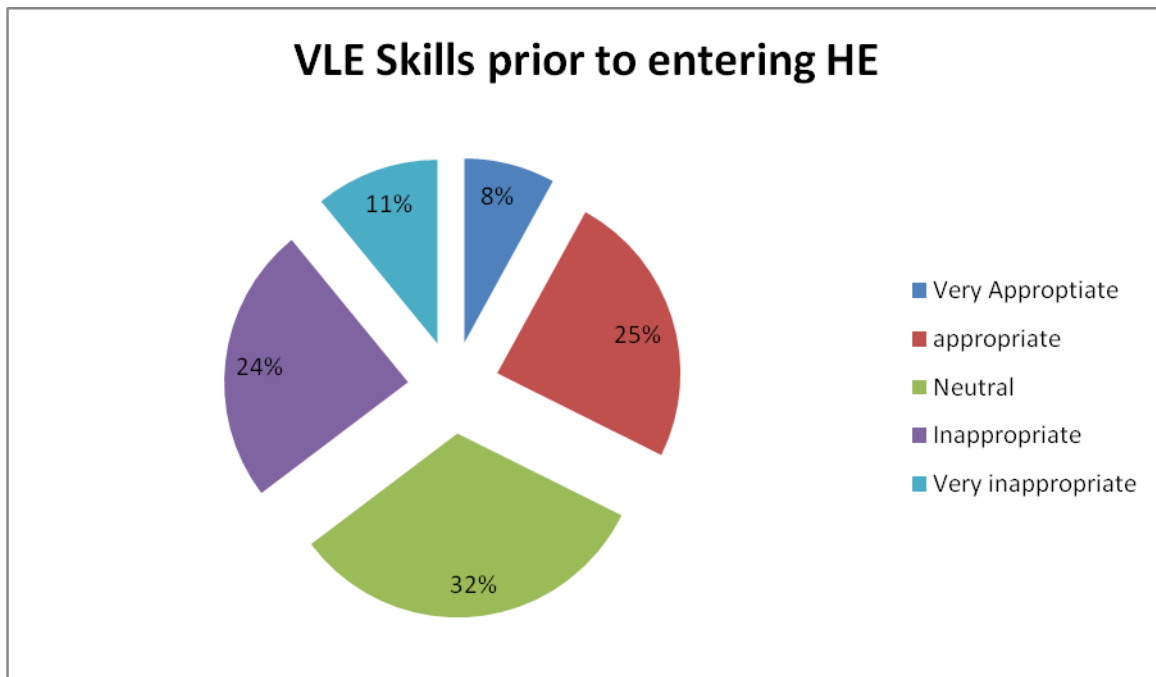
Figure 3 – VLE Skills prior to entering HE

The next step is to look at the views of the participants after being in HEI and being exposed to using the VLE within class and some in-class training. (Note no courses are delivered using the VLE as a sole teaching method within this HEI

however it is mainly use as an add on or a teaching aid). The results for the VLE skills after entering the HEI and being engaged in the courses shows that 74% of the participants feel their VLE skills are equal to or above appropriate while less than 7% feel they have inappropriate or lower skills. This again shows that the programme the HEI has in place is appropriate for the training of VLE.

The participants who feel they have inappropriate or lower VLE skills again could be due to the first year of their course or maybe part-time students who have not received full in class training yet. (See figure 4 for full results)

VLE Skills after entering HE

31% Very Approptiate
43% appropriate
19% Neutral
5% Inappropriate
2% Very inappropriate
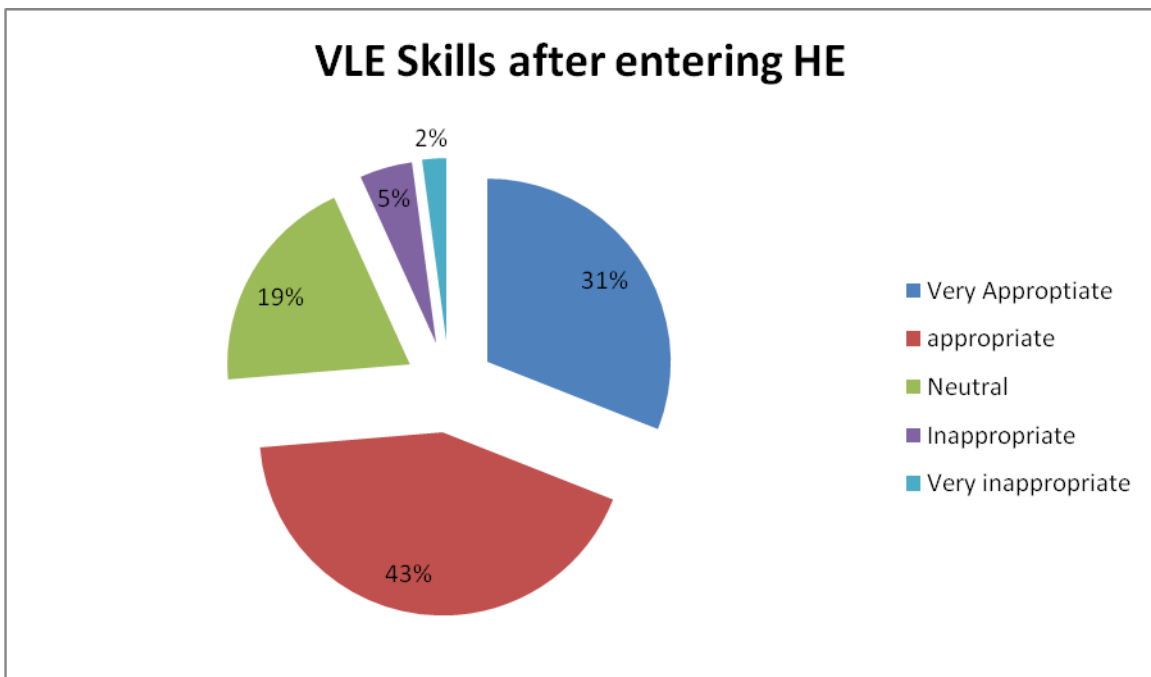
Figure 4 - VLE Skills after entering HE

The above findings answer Question five of the research objectives namely - What are the views of Irish Students towards training in the use of ICT and the VLE? From the findings it is clear that the students in this HEI are developing ICT

and VLE skills that are increasing their knowledge in the area as in both cases there was a decrease in the number who felt their skills were inappropriate to single figures in each case.

The results would suggest that there may be need for some individual sessions with the persons who feel their skills are inappropriate; however reasons for these student's low skills have been identified above.

With respect to the individual it would be up to them to identify that their weakness with the academic in change of the course.

4.2.4. The expert's opinion on the ICT and VLE.

The expert in the area of ICT, the VLE and training for students reviewed the finding of the survey and gave an opinion based on their experience in the area.

The results above display the fact that the current training programme in the HEI is effective as the rate of participants who feel they had inadequate ICT and VLE skills had reduced once the students had been enrolled in the course, the expert felt that this would be the normal of most students in their opinion. Over the years of introducing students to the VLE they tried a number of different techniques including holding a separate training session which was not a success as only a few people turned up, the fact the separate training session was only attended by a small number of people this would correspond with the 2% who felt they had inadequate ICT skills and the 7% who felt they had inadequate VLE skills.

The expert then stated that they now conducted training for using the VLE at the beginning of a class and ensures that every member of the class logged in at least once and has never experienced any major problem other than technology glitches that have so far been easily overcome.

The expert also noted that there was a correlation between the number of students not using the VLE and those who did not attend classes, for further research it would be of interest to establish of these 7% for the VLE and the 2% for the ICT, how many have a high class attendance level as there may be a correlation between the class attendance and skills gained. (Note the findings of this project do not suggest this, it is merely an area of further research).

4.2.5. Do Students feel they need training?
Another important question to establish was if the students who participated in the research felt that they needed training for the use of ICT and the VLE.

Results from the survey show that over 80% of the population felt they would need more training on how to use the VLE, while the students feel their knowledge of the VLE is increasing from they enrol in HE the training on how to use the VLE is not enough.

However, it is felt by the expert review that the VLE use is more of a "doing" exercise whereby the students themselves need to practice using the system in their own time.

A suggestion to overcome this maybe to change the training at the start of a class (as noted by the expert) to a training class conducted in a computer lab where the students will get firsthand experience of using the VLE.

In answer to this Question the students do not feel they need training regarding their knowledge of the VLE but do need more on using the VLE but as noted it may require a different process than the current method.

The ICT training elements seem to be to the satisfaction of the student views as the VLE was the main area of focus for the training required. (See figure 5)
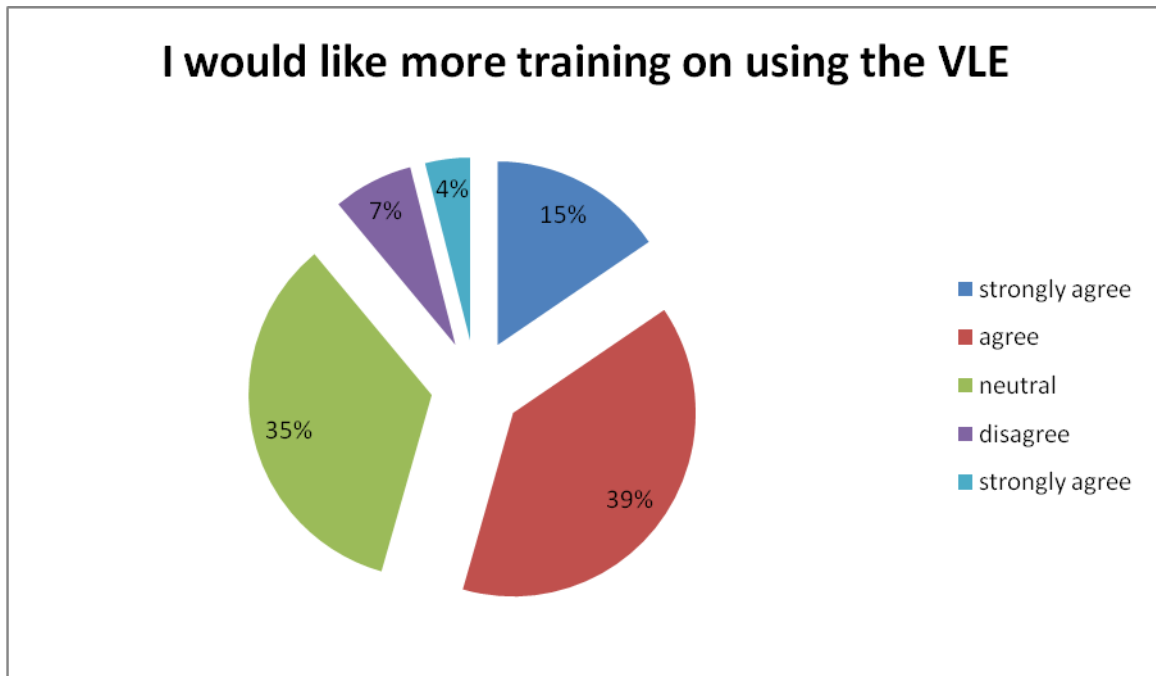
Figure 5 - I would like more training on using the VLE

4.2.6. What views do Irish students have regarding the use of ICT and the VLE?

The survey conducted also contained a number of questions for the purpose of establishing the student views toward the use if ICT and the VLE within the HEI and the classroom setting. These questions sought to answer question such as did they find using ICT boring? Was there time in classes to use ICT? All these had a positive result in that students felt the ICT and the VLE is needed within the HEI and more than half the population felt that ICT and the VLE is not boring, is not time consuming and made HEIs better places. Other elements were also establish such as the fact that just over 40% felt ICT should be used in all subject matters, while the rest disagreed. When this information was reviewed by the expert they felt it was what they would have expected and with regards to the use in all subjects there are some that would not lend to ICT use totally such as

accounting, giving an example of using ms word to answer an accounting question the expert found it was not appropriate and had to revert back to using the "chalk and board" method.

From the findings it can be established that student views are in favour of ICT and the VLE and that there is a benefit from the students using ICT. Students do not see the ICT and the VLE as a task that has to be done but as a new method of doing a task. (See figures 6 – 9 for a summary of some of the questions asked and the results obtained).

4.2.7. Other important information gained.

Within the survey there was an opportunity to gain an insight into the perceived value of ICT and the possibility of future use, students were asked if they believed they would be using ICT in their future careers, the results for this show that students did believe that they would be using ICT in their careers as almost 80% more than agreed and 18% were not convinced either way (see figure 10)

The survey also had an open ended question which was optional to fill out, while not everyone chose to fill it out those who did provided interesting information regard the use of the VLE within their HEI. The majority of responses were to highlight the fact that the students felt that the VLE was not used enough by the lecturers, while this maybe a fact there must be an understanding that it is up to each individual lecturer to decide if they are going to use the VLE or not. The expert review of these comments believed there were coming from the fact as stated that not all lectures use VLE.

Figures 6 – 9 showing information regarding using ICT and VLE within HEIs

I am pleased computers are used more in Education

- 40% strongly agree
- 43% agree
- 11% neutral
- 3% disagree
- 3% strongly agree
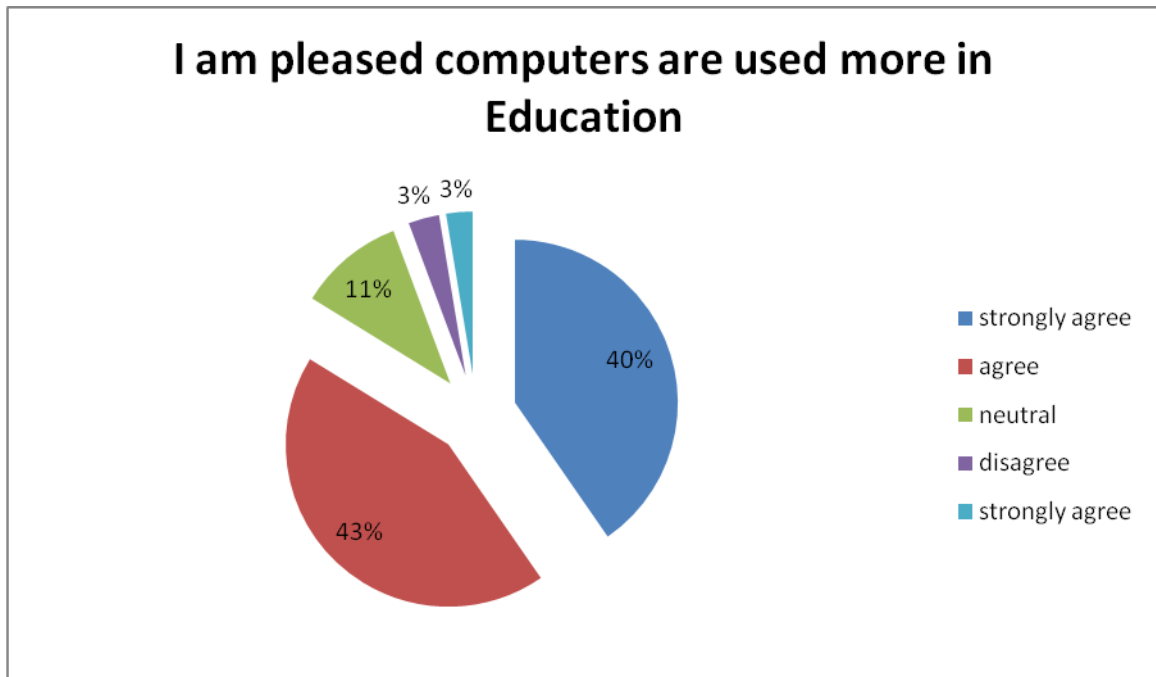
Figure 6 - I am pleased computers are used more in Education

I find using computers enjoyable

- 32% strongly agree
- 46% agree
- 16% neutral
- 5% disagree
- 1% strongly agree
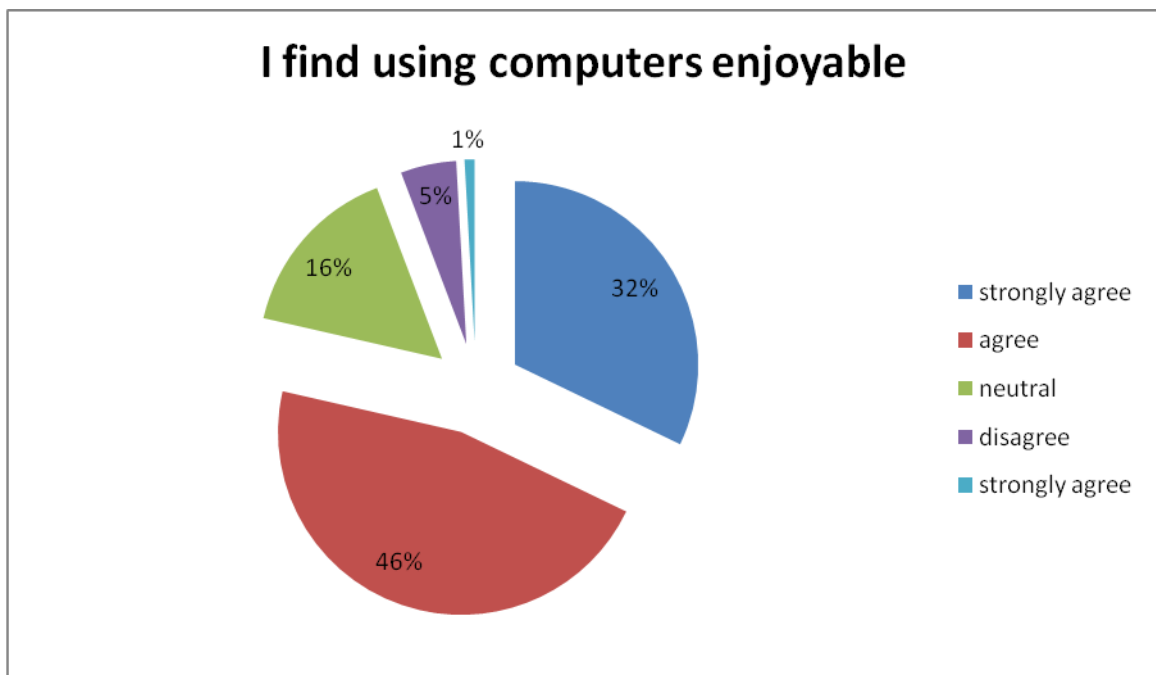
Figure 7 - I find using computers enjoyable
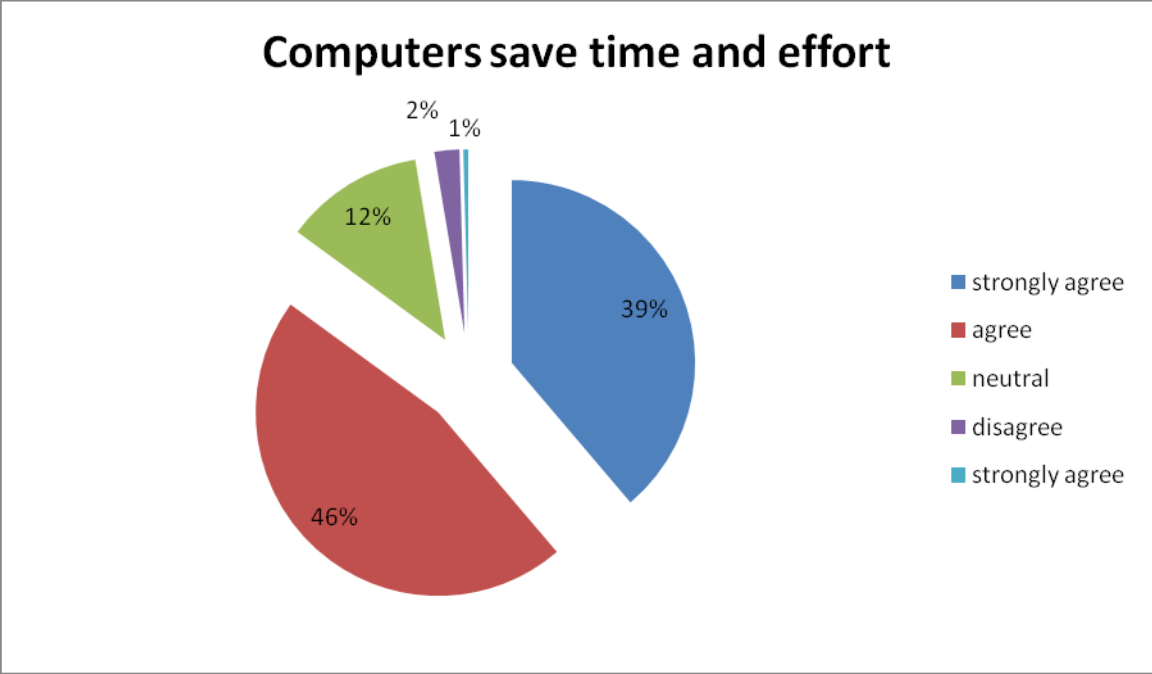
Figures 8 - Computers save time and effort
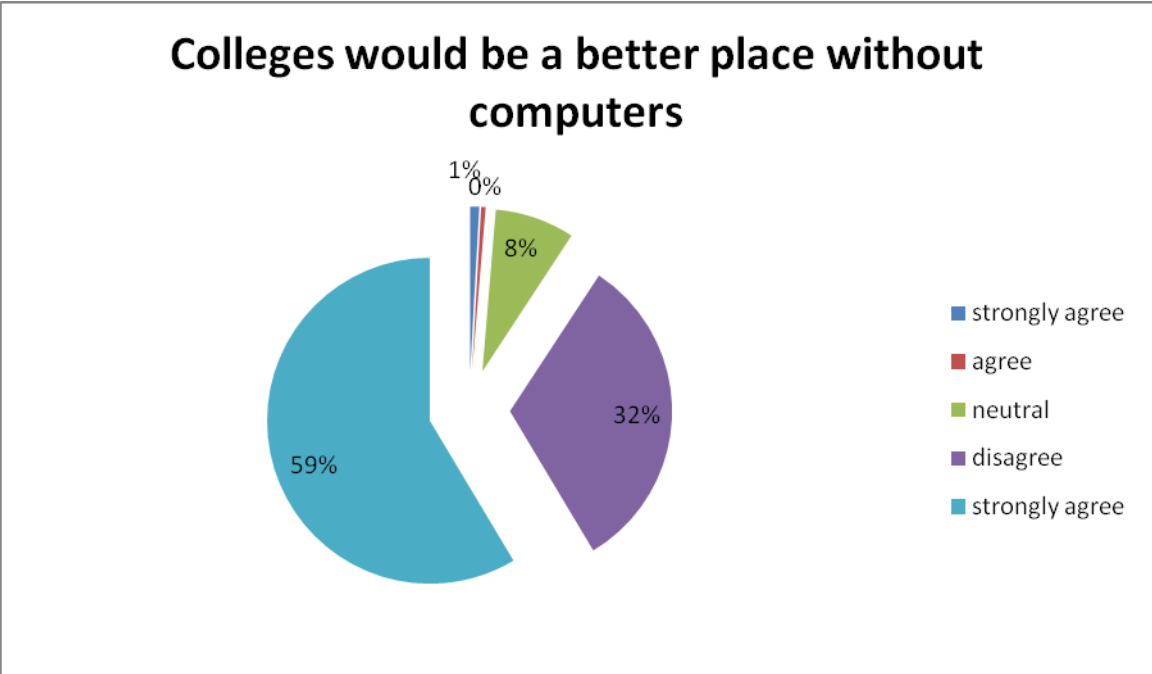
Figure 9 – HE would be better without ICT

4.3.   Conclusion

In Conclusion this chapter highlights the findings of the survey which has been supported by the expert review of the result. It would seem from the results that there is sufficient training for both the knowledge of ICT and VLE but student would need more hands on experience of using the VLE so a more practical training method may be required to provide the most appropriate level of training. Students also feel that the VLE is not being used enough as many lectures have not adapted to use the VLE within their delivery method.

Chapter 5 - Discussion

5.1. Reflection and interpretation of findings

This chapter will examine the findings from the primary research under the four main headings set out in the aims/objectives in chapter one.

5.1.1. ICT

The information gathered from both the experts review and the survey would suggest that the ICT training and awareness within the HEI are at an appropriate level which is supported by the evidence that students feel their ICT skill have increased from the enrolment in HE. The minority of 1 – 2% that felt their skills were not appropriate could be first year or part time students who had not experienced the full ICT training given by the HEI. Based on the findings it could be assumed that the training provided for using ICT is at an appropriate level and that there is no need for review of the current training policy. These findings also are a direct comparison with the finding of Dixon (2008) who discovered a similar breakdown of percentages.

5.1.2. The VLE

In order to best understand the findings for the VLE it needs to be split into two elements: knowledge of VLE and a practical element. The results have shown that the knowledge or familiarity with the VLE is at an expectable level for most students but the practical usage element would need more training. The review with the expert uncovered that training given within this HEI was mostly at the beginning of class as a display made by the lecture. The expert also stated that the VLE practical element was a matter of practice.

The research suggests that there is need for more practical experience of VLE for the students; a suggestion could be that HEIs change their training policies to include a session in an IT lab for training on the VLE so that the students get practical experience of using the VLE and they will then be able to practice on their own until they feel confident.

5.1.3. Training Costs

The Research also shows that student feel they will use ICT in their future career, linking this back to the literature review and the primary research of Dugan (2002) suggest training costs are ignored by HEI management and questions if there is a cost benefit, as student views would illustrate the future use of ICT this training would have a cost benefit, the HEI output product is a trained student but if that student had appropriate ICT skills then it would suggest a better output of higher demand.

ICT and VLE training is provided in this HEI by mean of class delivery which would be a cost effective method of delivery, even the usage of the IT lab to gain practical knowledge would not be of major cost, possibly an opportunity cost to another class but it would only be for one session.

The fact that student views point towards usage in the future careers would also establish the fact the ICT has a future and expenditure in this area would yield a benefit.

5.1.4. Student views towards ICT and the VLE

Another fundamental aim of this research process was to establish the view of the Irish students towards ICT and the VLE. In the previous chapter there were examples of the questions asked such as; do you enjoy using computers (ICT)?

The purpose of these questions was to establish the student views, after analysing the results to these questions it was understood that most students were in favour of ICT and the VLE, and there was a time saving benefit for using the ICT and the VLE. These findings highlighted that ICT and the VLE are of importance to students and that student's value ICT and the VLE mainly for convenience. However, in some case traditional practices maybe required along with the ICT and the VLE.

5.2.   Areas of improvement

Allen and Seaman (2007) conducted research over a number of years through different HEIs to give a balanced view of the VLE usage and to establish if there had been any change over the period. This extensive research would also benefit the findings of this research paper, while it could be argued that this is a representation of the population results may vary depending on the location of the students and the focus of the HEI on ICT and the VLE.

A number of surveys conducted over a period of time across all the HEIs across Ireland would give better feedback on the view of Irish Students.

Another area for improvement on the findings would be an on-spot detailed feedback with a sample of the population who conducted the survey to establish how they felt the problem areas could be overcome this however, was not possible with this research process as the participants were totally anonymous.

5.3. Conclusion

In conclusion to this chapter the main points or findings of the research are:

1. Irish Students in the northwest of Ireland feel that their ICT skills are adequate and there is no need for HEIs to provide more training.

2. Irish Students in the northwest of Ireland also feel their VLE knowledge is sufficient but would require more practical training, The review by the expert felt this would have been expected and the lack of practical experience was mainly due to the fact that students need to practice the VLE in order to gain practical skills.

3. Training costs for the training conducted by the HEIs tends to be in class training which is cost effective and no matter about the cost it is worthwhile as the results show that the majority of students feel they will be using ICT in their future careers so therefore there is a cost benefit.

4. Students value the use of ICT and the VLE within HE and the majority believe that there is a time saving element linked to the usage of ICT and VLE and that there is an enjoyment element is the usage.

These main points highlight the finding and answer the questions aimed to be answered through this research process. Other information has also been gathered which establishes the future of ICT in that student view about using ICT in their work place highlighted the fact that they would be used with only a small majority stating they would not use ICT in their future careers.

Chapter 6 - Conclusion

6.1. Review of your research project

In review of this research process it has been a learning curve both for the area of ICT and for the researcher conducting the project. This research process has caused the researcher to study the area of ICT and form a better understanding of the area and the need for training within HE. The data findings also highlight that Irish Students in the North-west of Ireland do value ICT within their learning process and the majority enjoy using the various ICT elements which they feel are beneficial to aid learning.

The secondary research shows that there is a lack of information regarding how students view ICT but most findings are from the HEI, or academics point of view.

While there are limitation to this research paper it has achieved the aims set out at the beginning of the process, these aims will set scope for future research with the possibility of using this model in a different HEI to compare results.

This project indentify and satisfies a gap in the secondary research, there is little information collected to provide student views on the matters of ICT and the VLE and this has been identified as a gap which has been partly satisfied by this research project as there has been limitations to this process.

6.2. Answers to the research questions

The research questions to be address by this research process have been created from the identification of the gap in the research. This gap was explored and a focus area was established which created five research questions. These

research questions are identified in chapter one. The literature review has answered the first four questions which was established from the existing research already done in the area of ICT and the VLE and cover questions in relation to the evolution of ICT and the actions of the HEIs, while the last two questions based on a lack of existing research have been answer from the results of the survey conducted for this research process (the answers to Questions 1-4 are outlined in chapter 2 and Question 5-6 in chapter 4 and 5).

All the Questions aimed to be answered through this process have been. A summary of the questions and the answers are:

1. How has ICT and the VLE developed to support the work of higher education? – ICT and the VLE have changed class delivery methods as some HEI have even move to providing courses solely using the VLE. Biggs (1999) identified the initial gap between ICT and traditional teaching methods and Jamison (2004) expanded upon this gap as time changed more of the ICT was included and less of the traditional method. Coen (2003) identified three ways in which ICT impacted the HEI showing that the support was more than just for class delivery.

2. What challenges are encountered by HEIs who support the provision of ICT and VLE? – the main challenges seem to be in relation to the myths that are believed about ICT as outlined by Allen and Seaman (2007), once these myths are provided to be untrue the HEI support ICT and the VLE have only got budget elements to consider. The myths are mostly in relation to online course been of poor quality and beliefs around this.

3. What impact has the proliferation of ICT and VLE had on students? - The changes/proliferation of ICT and VLE are an important element as companies are regularly issuing updates for software in order to increase their revenue. These updates require more training for the Students and staff in how to use the new software and this is the major impact. Stensaker *et al.* (2007) identifies that there is a delay due to the training element which causes the HEI to have an ICT lag.

4. What views do Irish students have regarding the use of ICT and the VLE? – Irish students in the north-west of Ireland feel that ICT and the VLE are important to their HE experience and also in their future.

5. What are the views of Irish Students towards training in the use of ICT and the VLE? –Irish students in the north-west of Ireland feel that their ICT skill are appropriate so there is no need for extra training but the VLE practical element training may need to be reviewed to include a lab session.

6.3. Limitations

The main limitation to this research project was with regards to the access to HEIs in the northwest of Ireland, the first aim was to do a contrast between a pubic and a private HEI but due to access restrictions this was not possible.

In Chapter three it is outlined that there is two public HEIs in the northwest of Ireland but again access was restricted to the second HEI.

Other limitations arose within the scope of the research project in relation to the timing nature. If there had been more time it may have been possible to gain access into other HEIs in Ireland in order to compare a contrast between the

different areas and culture difference (while within Ireland the result would have been expected to be of a similar nature).

Collecting the data also proved to have limitations as the expected response rate of 10% or three hundred surveys was not achieved, the response rate was 8% however, this may have been due to two main elements:

1. Gaining Ethics Permission - The process of gaining ethic permission from the HE been studied at took time so it was late March before the survey was launched which was close to the end of term when students are pressurised to complete projects and study for exam.

2. Dropout rate – there is no possibility of ensuring all the three thousand students in the population were still active in their studies at the time of the survey so the population may not have been three thousand.

6.4. Recommendations

6.4.1. Recommendation for better research

With the knowledge that has been gained from conducting this research project recommendations can be put forward in order to gain findings of greater quality.

Suggestions such as access to a greater number of HEIs for collecting the data would ensure a balance view of all Irish students, and collecting over a number of years would provide findings of greater quality.

For any future research involving students as the population an early release time of the survey should be more beneficial to the response rate as time would need to be selected when students are not trying to meet deadlines.

6.4.2. Recommendations from the results

Chapters four and five have highlight the results and give suggestion for HEI with regards to training for the use of ICT and VLE. The results show recommendations for the HEI to consider.

The results show that:

1. HEIs in the north-west of Ireland provide sufficient training for using ICT as the majority of the population felt their ICT skills were appropriate, this would recommend that HEIs should continue with their current training programme.

2. The VLE training provided by HEIs is sufficient to provide students with a knowledge of the VLE but lacks a practical element, the review by the expert suggests this practical element requires individual practice to gain the required skill, however one could conclude that a recommendation for students to be given a practical lab session in the VLE would aid the learning process, even one session would give student a practical experience of using the VLE.

3. The final recommendation from the data collected would suggest that ICT and the VLE are essential learning aids and over half the population stated they would use ICT in their future career which shows a recommendation for HEI management not to ignore ICT training as it is essential.

6.5. Scope for further research

This research process only conducts the primary research within one HEI in the north west of Ireland; this study could be conducted in any other HEI to create a comparison, or all the HEIs to be surveyed within the one project.

The cost of training – An investigation into the cost of training as there is a major lack of quality research into the area of costing, the secondary suggest that there is little evidence of how much training cost for ICT within a HEI are because the costs are mostly factored per student and not itemised.

Research could also be conducted to see what method of training HEIs offer for both staff and students; this would also show the most suitable methods of training.

6.6. Conclusion

This research process represents an essential element of personal development for the researcher and has proved to be a beneficial learning process. The findings from the data give recommendations for the management of HEIs. The literature review sets the background to the area and the existing material of relevance to the aims of the research.

This research project has identified gaps in the existing secondary research and has highlighted areas for further study and there also have been areas of further study identified from the collection of data process.

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Appendix

Appendix 1 – Survey Cover Email

TO: All LYIT Students

FROM: William Whyte <L00065551@lyit.ie>

SUBJECT: ICT and VLE Survey

Hello

my name is William Whyte and I am a 5th year student in the LyIT.

As part of my masters course I have been conducting research into the view of

Irish students towards Information and Communication technology in colleges

including the Virtual Learning Environment such as blackboard.

The survey will take around 5 minutes and all the questions are multi choice, if

you could spare the 5 minutes to fill it in I would be very grateful.

http://kwiksurveys.com?u=williamwhyte

This survey is anonymous, nobody will know if you fill it in or not. At any stage

you can opt out.

Thanks for your time

William

Appendix 2 – Survey

ICT and Higher Education: A student's perspective

A survey to gather the views of Irish Students toward Information & Communication Technology (ICT) an the Virtual Learning Environment (VLE)

1.   Are you

  ○ Male   ○ Female

2.   What age are you?

  ○ 17 - 21   ○ 22 - 25   ○ 26 - 30   ○ 31 - 40   ○ 40+

3.   What area are you studying?

  ○ Business   ○ Computing

  ○ Science   ○ Medicine/Nursing

  ○ Engineering   ○ Other

4.   What year are you in?

  ○ 1st year   ○ 2nd   ○ 3rd year   ○ 4th year   ○ 5th year   ○ Other

5.   Is your course

  ○ Part time

  ○ Full time

6.   How would you rate your ICT skills prior to starting college?

○   Very Appropriate

○   Appropriate

○   Neutral

○   Inappropriate

○   Very Inappropriate

ICT = Information & Communication Technology,

7.   How would you rate your ability to use the VLE prior to starting college?

○   Very Appropriate

○   Appropriate

○   Neutral

○   Inappropriate

○   Very Inappropriate

VLE = Virtual Learning Environment such as Blackboard

8.   How would you rate your ICT skills at this current point of your studies?

○   Very Appropriate

○   Appropriate

○   Neutral

○   Inappropriate

○   Very Inappropriate

9.   How would you rate your ability to use the VLE at this current point of your studies?

○   Very Appropriate

○   Appropriate

○   Neutral

○   Inappropriate

○   Very Inappropriate

Please rate the following Questions on the scales provided

10.   I find using computers difficult

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

11.   I am pleased computers are used more in Education

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

12.   I find using computers enjoyable

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

13.   Computers save time and effort

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

14.   Colleges would be a better place without computers

○   Strongly   ○   Agree   ○   Neutral   ○   Disagree   ○   Strongly
Agree   Disagree

15.   Students should use computer in all subject matters

○   Strongly   ○   Agree   ○   Neutral   ○   Disagree   ○   Strongly
Agree   Disagree

16.   I feel the VLE is extremely useful

○   Strongly   ○   Agree   ○   Neutral   ○   Disagree   ○   Strongly
Agree   Disagree

17.   I would like more training on using the VLE within my college

○   Strongly   ○   Agree   ○   Neutral   ○   Disagree   ○   Strongly
Agree   Disagree

18.   I feel more class materials could be delivered using computers

○   Strongly   ○   Agree   ○   Neutral   ○   Disagree   ○   Strongly
Agree   Disagree

19.   Computers are fast and efficient means of getting information

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

20.   Computers can enhance students' learning

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

21.   Computer technology can improve education

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

22.   Teaching with computers offers a real benefit over traditional methods

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

23.   Computer technology cannot improve the quality of learning

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

24.   Class time is too limited for computer use

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

25.   Computer use within my course suits my learning preferences and my level of computer knowledge

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

26.   After I complete my college studies I will continue to use ICT in my workplace

○ Strongly   ○ Agree   ○ Neutral   ○ Disagree   ○ Strongly
Agree   Disagree

Thank you for your Time

Thank you for completing this survey. The data you provided will help give an insight to the attitude of students towards ICT and the VLE
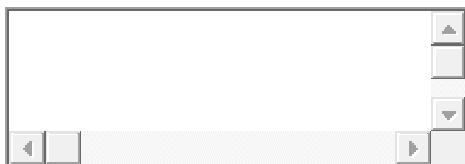
If you have any comments please write them below

If you have any questions of concerns please contact me on l00065551@lyit.ie

Regards & Thanks
William Whyte

Some Questions in this survey have been adapted from the survey conducted by Dr. Ali Akbar Shaikhi Fini (2008) and Albirini, A. (2006)

Any other comments

Appendix 3 – The Survey Results

Results for survey

238

Total Responses Received:

ICT and Higher Education: A student's perspective

Question 1*
Are you

Male	102	= 42.86%
Female	136	= 57.14%
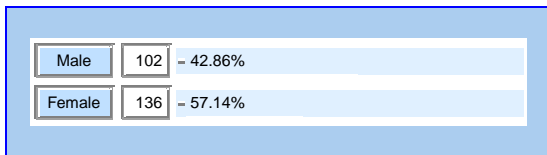
Question 2*
What age are you?

17 - 21	93	= 39.08%
22 - 25	60	= 25.21%
26 - 30	32	= 13.45%
31 - 40	32	= 13.45%
40+	21	= 8.82%
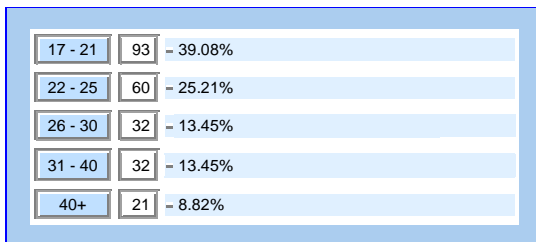
Question 3*
What area are you studying?

Business	98	= 41.18%
Computing	45	= 18.91%
Science	19	= 7.98%
Medicine/Nursing	14	= 5.88%
Engineering	20	= 8.40%
Other	42	= 17.65%
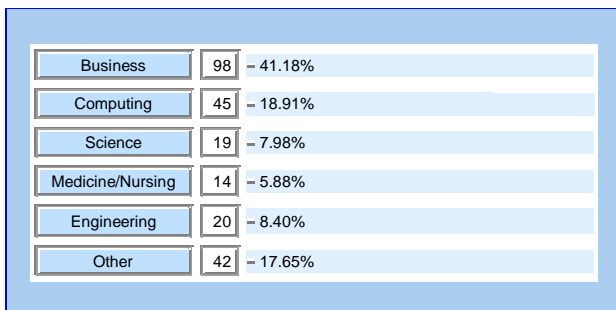
* Marks a compulsory Question

Question 4*
What year are you in?

1st year	57	– 23.95%
2nd year	54	– 22.69%
3rd year	61	– 25.63%
4th year	26	– 10.92%
5th year	36	– 15.13%
Other	4	– 1.68%

Question 5
Is your course

Part time	11	– 4.64%
Full time	226	– 95.36%

Question 6*
How would you rate your ICT skills prior to starting college?

Very Appropriate	38	– 15.97%
Appropriate	97	– 40.76%
Neutral	86	– 36.13%
Inappropriate	15	– 6.30%
Very Inappropriate	2	– 0.84%

Question 7*
How would you rate your ability to use the VLE prior to starting college?

Very Appropriate	19	– 7.98%
Appropriate	58	– 24.37%
Neutral	77	– 32.35%
Inappropriate	58	– 24.37%
Very Inappropriate	26	– 10.92%

* Marks a compulsory Question

Question 8*
How would you rate your ICT skills at this current point of your studies?

Very Appropriate	90	– 37.82%
Appropriate	116	– 48.74%
Neutral	28	– 11.76%
Inappropriate	3	– 1.26%
Very Inappropriate	1	– 0.42%

Question 9*
How would you rate your ability to use the VLE at this current point of your studies?

Very Appropriate	73	– 30.67%
Appropriate	103	– 43.28%
Neutral	46	– 19.33%
Inappropriate	11	– 4.62%
Very Inappropriate	5	– 2.10%

Question 10
I find using computers difficult

Strongly Agree	4	– 1.75%
Agree	8	– 3.51%
Neutral	24	– 10.53%
Disagree	88	– 38.60%
Strongly Disagree	104	– 45.61%

Question 11
I am pleased computers are used more in Education

Strongly Agree	92	– 40.35%
Agree	99	– 43.42%
Neutral	24	– 10.53%
Disagree	7	– 3.07%
Strongly Disagree	6	– 2.63%

Question 12
I find using computers enjoyable

Strongly Agree	72	– 32.14%
Agree	104	– 46.43%
Neutral	35	– 15.63%
Disagree	11	– 4.91%
Strongly Disagree	2	– 0.89%

Question 13
Computers save time and effort

Strongly Agree	88	– 38.77%
Agree	105	– 46.26%
Neutral	28	– 12.33%
Disagree	5	– 2.20%
Strongly Disagree	1	– 0.44%

Question 14
Colleges would be a better place without computers

Strongly Agree	2	– 0.88%
Agree	1	– 0.44%
Neutral	18	– 7.93%
Disagree	73	– 32.16%
Strongly Disagree	133	– 58.59%

Question 15
Students should use computer in all subject matters

Strongly Agree	24	– 10.62%
Agree	77	– 34.07%
Neutral	67	– 29.65%
Disagree	51	– 22.57%
Strongly Disagree	7	– 3.10%

Question 16
I feel the VLE is extremely useful

Strongly Agree	35	– 15.56%
Agree	105	– 46.67%
Neutral	67	– 29.78%
Disagree	13	– 5.78%
Strongly Disagree	5	2.22%

Question 17
I would like more training on using the VLE within my college

Strongly Agree	35	– 15.49%
Agree	88	– 38.94%
Neutral	78	– 34.51%
Disagree	16	– 7.08%
Strongly Disagree	9	– 3.98%

Question 18
I feel more class materials could be delivered using computers

Strongly Agree	25	– 10.96%
Agree	103	– 45.18%
Neutral	67	– 29.39%
Disagree	32	– 14.04%
Strongly Disagree	1	– 0.44%

Question 19
Computers are fast and efficient means of getting information

Strongly Agree	98	– 42.98%
Agree	114	– 50.00%
Neutral	9	– 3.95%
Disagree	7	– 3.07%
Strongly Disagree	0	0.00%

Question 20
Computers can enhance students' learning

Strongly Agree	68	– 29.96%
Agree	134	– 59.03%
Neutral	22	– 9.69%
Disagree	3	– 1.32%
Strongly Disagree	0	0.00%

Question 21
Computer technology can improve education

Strongly Agree	66	– 28.95%
Agree	128	– 56.14%
Neutral	26	– 11.40%
Disagree	8	– 3.51%
Strongly Disagree	0	0.00%

Question 22
Teaching with computers offers a real benefit over traditional methods

Strongly Agree	33	– 14.60%
Agree	101	– 44.69%
Neutral	69	– 30.53%
Disagree	22	– 9.73%
Strongly Disagree	1	– 0.44%

Question 23
Computer technology cannot improve the quality of learning

Strongly Agree	10	– 4.42%
Agree	28	– 12.39%
Neutral	51	– 22.57%
Disagree	99	– 43.81%
Strongly Disagree	38	– 16.81%

Question 24
Class time is too limited for computer use

Strongly Agree	9	– 4.00%
Agree	43	– 19.11%
Neutral	66	– 29.33%
Disagree	91	– 40.44%
Strongly Disagree	16	– 7.11%

Question 25
Computer use within my course suits my learning preferences and my level of computer knowledge

Strongly Agree	40	= 17.70%
Agree	123	= 54.42%
Neutral	49	= 21.68%
Disagree	11	= 4.87%
Strongly Disagree	3	= 1.33%
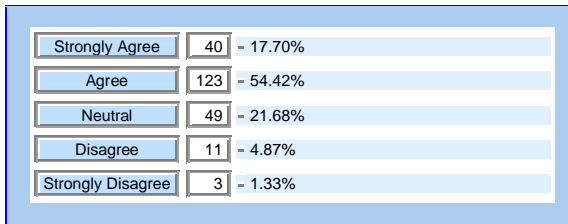
Question 26
After I complete my college studies I will continue to use ICT in my workplace

Strongly Agree	69	= 30.40%
Agree	109	= 48.02%
Neutral	40	= 17.62%
Disagree	6	= 2.64%
Strongly Disagree	3	= 1.32%
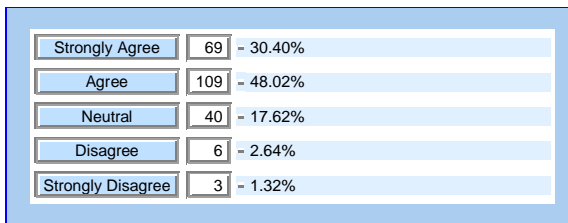
Question 27
Any other comments

Text Answers (15)

I feel that the WEB CT isn't used enough by the lecturers- it's hard for students who drive to college to get access to information on the public folder so I think that the lecturers should provide the same amount of information on WEB CT as on the public folder.

in the business course we use too many vle's with conflicting java settings which makes using them very frustrating and confusing for passwords - we use -- web ct, blackboard, ninehub, etc as well as course material being delivered in class and via email.

Training should be given at the start of 1st and 2nd yr. blackboard is ideal if you want to access info from home, but more lecturers should use it. saves the cost and time of travelling to letterkenny to access the public folders!

There is great potential for ICT to be integrated into classes, but it completely depends on the module being taught and the time of each lecture, it should not be used just for the sake of it, but where it gives value or saves time and resources, or enhances learning.

I am a design student, so I dont think your questions were applicable to my

course; our course structure is different as is our use of computers to other theory based subjects.
It would be great if the lyit could stop handing out useless notes which are written too small to read and use the power point on the computer to convey notes. These power points could then be safed onto a pen drive and taken home to be studied - this would be much more environmental friendly
I think a combination of both the old and new methods are required. Things like accountancy i found very difficult to learn when lecturers used spread sheets on the projector, those sorts of subjects are better being taught the old fashioned way.
Traditional learing methods still offer some advantages/disadvantages over digital content. In order to help retain information i believe it is necessary to write it down. A book can be taken anywhere, computers rely on power. VLE assumes a home computer and access to the Internet. This may introduce an added cost to students on a small budget.
I have never used or even heard of a VLE, or have never heard anyone else speaking of one.
being a graphics student i feel I should know computers that much better than most as we use a lot of programmes that do take specialised knowledge to use them efficiently, but to a degree I know I don't have all the skills to use computers to the best they can be used for
Lectures should update the blackboard. This will be handy for students who are absent from college due to the illness.
computers are useful for education but some subjects are probably better taught without them and a maths lecture of mine use blackboard to put up questions/quizzes for people to do, these were helpful but only if you already knew how to do the question, if you didn't or couldn't see where you went wrong it wasn't that much help
As a Creative Digital Media student, computers are essential to my education. I find it difficult at times to get a computer as there is high demand for them!
the lectures within the LyIT should be made to use VLE eg blackboard or moodle not a mix of both and I don't understand why the LyIT should pay for blackboard when moodle is free

Appendix 4 – Experts Review

The experts review and comments on the Survey Results.

Question Asked: Given the data collected and your expertise in the area of ICT and the VLE could you please give comment.

Answer Returned:
The first year I used WebCT it was in a large 1st year law class (80+) students. I showed them the system briefly in class, and then had 4 labs booked for 1 hour demonstration sessions. I also drew up a detailed instruction booklet. The labs were hard to get, and I had 4 hours of extra teaching. About 3-4 students turned up to each of the first 2 sessions, 1 student got an individual demonstration of the system in the 3rd one, and nobody came to the 4th. Maybe I advertised or approached it all wrong, but it seemed a big waste of time. Anyway, throughout the year most of the students seemed to be using the system. There were complaints over access problems at times, but that mostly seemed to be related to internet explorer. After that I gave up on the lab class method, and moved to using the VLE more in front of classes and asking if there were problems. Very few students would complain about not being able to use it at all, there were some complaints about being thrown out of the system, or blank pages opening etc. I always keep an eye on student usage to see that the system is accessible - most students access it at some stage. Very rarely do you get no usage by students, except sometimes students who are very infrequent attendees. I've seen little/no evidence of students using webct to access notes and then not coming to classes. Typically students who don't attend, don't use webct either. I now use Blackboard (as it's now called), in all my modules, but usage is very sporadic by staff across the college. I've never seen stats on usage, but based on word of mouth, it's very possible that students on some courses do not encounter it at all. However, most of my usage, though not all, is limited to uploading notes. I do use the discussion boards on the Academic Writing module. Despite the fact that there is extensive usage of blackboard and a range of its functions on the AW module, I've never run exclusive training classes and

never had any significant problems with student usage. Over the years I've come to the conclusion that in the vast majority of cases students are more computer literate than I am. So, often the exclusive training classes are a waste of my time and theirs. The in-class demos and asking if anyone is having problems mostly seems to work. However, if the college where to move to exclusive use of blackboard (no public folders), then it would be worth running classes a few times a year for those who are interested/need them. I would predict that most students would work it out themselves, and the few with weaker ICT skills on entry could get the support they need.

Your questionnaire results do not surprise me, and gives very strong opinions overall. Firstly there is the very strong indication through a lot of questions that ICT and the VLE are popular. That would be my perception from usage. The odd student asks about the public folder and why I don't use it, but that is rare. Some complain that blackboard has glitches and annoying habits, but I always explain how much more powerful a tool it is over the public folder, and I recommend using a browser other than explorer. Three years ago when I first started suggesting mozilla firefox students were largely unaware of it, now a large percentage of the class have heard of it or are using it. I have rarely encountered resistance to ICT or VLE. However, and this may help explain question 15, I had one very negative experience of ICT. I was teaching 2nd yr Financial Accounting, and had the 'bright' idea of trying to use the projector, and a word document. I typed a solution which appeared on the screen. I thought it might be easier to read than my writing. But it proved very problematic, it was too difficult to see the whole solution and I was moving the screen up and down to different parts of the solution as I explained. It lasted through one question demonstration and I went back to writing on the big board. I still haven't come up with a better way of doing computational examples than old fashioned chalk and talk. I have no doubt myself that ICT and VLE have lots of uses, but they don't beat all methods in all subjects.

As to training, in some ways the results also show that quite a few students don't feel they need training. It would be interesting to see how many of those who want training are 1st years, and how many may be mature students who have not come from school or a strong ICT background. Also, there may well be students in that category of wanting more training who have had little or no exposure to the VLE. However, there is no doubt that training would give more individual advice on computer spec needed, broadband, software requirements and browser, and dealing with downloading problems. I think these things are more problematic than learning to use the site once you get access.