A Case Study of a Learning Management System in a New Zealand Secondary School

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Abstract

This project was a case study of the use of a learning management system (LMS) within a New Zealand secondary school. The interpretive study aimed to find out why the LMS was purchased, to examine the extent and patterns of its use within the school, and to identify factors that may be impeding or enabling its use. Data on user perceptions of the use of the LMS were gathered from students, teachers and administration staff through questionnaire, individual interviews and focus group interviews. User login data from LMS records were also used. The study findings indicate that KnowledgeNet is currently being used predominantly as a content management system rather than a genuine LMS. Usage of the system within the school is moderate to high, especially with student users, but students perceive they are not using the system adequately. The findings reveal a number of impediments to the effective use of the system within the school and make several recommendations as to how these issues might be addressed. The study also makes recommendations to address the shortage of research on LMS implementations in NZ to help guide schools in the choice and implementation of LMS.

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Next to my thesis supervisor, Mike, I thank you for the endless editing, feedback and weekend phone calls to keep me on track.

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CHAPTER 1
Introduction

The 'business' of education management is a major issue for governments and its citizens in countries the world over. As societies evolve, so too do the structures and influences which shape educational practices. Over the last two decades the New Zealand Ministry of Education (MOE) has directed schools to move towards a digital age with frameworks and strategies to produce students (and therefore citizens) who are 21st century ready and can achieve their full potential in this digital age (MOE, 2006). Having moved globally from the industrial age (which our current education system was built on), into a digital or knowledge based age requires, some say, "a paradigm shift in educational thinking" (Bolstad & Gilbert, 2008).

For schools in New Zealand, this directive has meant that they are required to provide current technologies and expert teaching staff in environments built for different practices. So far schools have been given the freedom to select technologies which would fit into their existing systems, but with little or no guidance (Selwyn, 2008). This has meant an increase in school technology purchases and teacher training in the use of new technology, but there appears to be a huge variance within and between schools in terms of 'change in teaching' or student learning outcomes (Bolstad & Gilbert, 2008; MOE, 2007; Selwyn, 2004; Ward, Parr & Robinson, 2004).

1.1 Current Technology

There is a long list of things which can be considered technology. Some used currently in classrooms today are: computers and software, printers, digital cameras, interactive whiteboards, projectors, digital microscopes, and the internet. While these are all important technologies, for the purposes of this study the only technology being researched is learning management systems (LMS). LMS in a school setting can be defined as "a software package to manage and deliver learning content and

resources to students, usually comprising a variety of applications amalgamated as an ‘integrated‘ package and used within an” online learning environment (OLE) (MOE, 2006, p.2). This refers to the complete range of applications available online. A LMS will often include discussion forums, file sharing, assignment management, lesson plans, curriculum management, and chat sites (Dalsgaard, 2006). Bailey (1993) has outlined the general features of a learning management system (LMS) used in education as:

- Instructional objectives are tied to individual lessons;
- Lessons are incorporated into the standardised curriculum;
- Coursewear extends several grade levels in a consistent manner;
- A management system collects the results of student performance; and
- Lessons are provided based on the individual student’s learning progress.

Many systems currently being used in schools, which claim to be LMS, do not match the above description. Usually they are learning content management systems (LCMS) which have a subset of the functionality a LMS has. Or alternatively, many schools are using a LMS, but are only using a fraction of its functionality, as a content management tool. While content management tools are very helpful, the ability to transform student learning is limited if not impossible. The implementation of a LMS is a very complex process.

1.2 Implementing Learning Management Systems (LMS) in schools.

When not done effectively, implementation of a LMS can cost schools considerable time and money. With the huge impact technology integration has on all people in a school, the process can often cause conflict between staff and management and result in a lack of motivation in students and teachers for ICT technology in general (Ward et al., 2004).

As the MOE has directed all schools to get 21st century enabled and students demand a certain level of 'real world' technology (McKenzie, Kirby and Mims, 1996), many schools feel pressure to implement a LMS, but have little guidance on which tool could provide the best results. Each school has individual requirements with different systems currently in place, so there is no 'one size fits all' solution (Mitchell, Clayton, Gower & Bright, 2005). In addition to the problems the schools are experiencing in deciding which tool to use, once a school has implemented a LMS, it would appear there has been little significant research conducted into the effect on students, teachers and schools (either positive or negative) of those systems after implementation (Marshall 2010; Tearle, 2004).

1.3 Background for Research

This research project has evolved out of a desire to understand what issues exist for teachers, students and administrators of New Zealand secondary schools, when implementing and using a LMS. By researching a school that has recently implemented and is currently using a LMS, this project aims to provide some insight into the factors which work well and those which limit LMS use in schools. The ultimate aim of this study is to try and identify a set of guidelines which may be used to assist schools in effective LMS selection and implementation in the future.

1.4 About the Researcher

The researcher is a practicing Science and Biology teacher in a South Auckland secondary school. She has a Biological Sciences undergraduate degree and Graduate Diploma in Teaching: Secondary, from The University of Waikato. The researcher also has a Post Graduate Diploma in Forensics from Auckland University. By combining 10 years commercial IT marketing experience in NZ and London, with a strong belief in education, the researcher is looking to combine these two disciplines into transforming student learning. The researcher aims for this research project to provide an insight for the case study school into the current usage levels and effectiveness of their LMS and inform her own use of the LMS installed in her school.

1.5 Research Aims

This research paper has been written for the teachers, administrators and students within a case study school. It has used information from one site and aims to:

1. Identify perceived impediments and enablers which influence the use of KnowledgeNet in the case study school.
2. Enable teachers and support staff to identify issues which may be impeding the successful use of KnowledgeNet within the school.
3. Provide guidelines for student learning management system implementation and use to the wider educational community.

From these aims the following set of research questions has been formulated.

1.6 Research Questions

The following research questions were devised to gain some insight into what is currently happening with KnowledgeNet at the case study school from the perceptions of its users. The findings from the case study school are presented in chapter 4.

The research questions are:

Question 1: What was the school's rationale for implementing KnowledgeNet and has the student learning management system fully met the requirements for which it was purchased? (4.1).

Question 2: What is the extent and pattern of use of KnowledgeNet within the school? (4.2) and

Question 3: What are the enablers and impediments to its use, as perceived by users, of KnowledgeNet? (4.3).

1.7 Overview of Thesis

Having introduced the research project in Chapter 1, Chapter 2 reviews the literature relevant to this study, beginning with an overview of learning management systems (LMS) and a review of current LMS research (2.2). Section 2.3 introduces KnowledgeNet (the case study LMS) and factors thought to affect technology implementation and use. Chapter 2 concludes with consideration of current IT implementation plans. Chapter 3 describes the research design and methods adopted in this project. The chapter covers the research paradigm and methodology of the project as well as a description of the project's context, participants, data gathering and analysis methods. Chapter 3 concludes with an overview of ethical considerations. Chapter 4 presents the study's findings organised under each of the research questions. These findings are analysed and discussed in Chapter 5. Chapter 5 also presents the conclusions drawn from the findings, discusses the study's limitations and makes recommendations for future research.

CHAPTER 2
Literature Review

2.0 Introduction

Chapter 2 reviews the literature that informs this study. The review begins in Section 2.1 by examining the nature of learning management systems (LMS) and introducing current LMS research (2.2). Section 2.3 looks at KnowledgeNet, the LMS installed at the case study school and considers the enablers and barriers influencing the use of LMS that are identified within the literature. This chapter concludes by considering proven implementation plans that could be used to introduce a LMS into a school or business.

2.1 What are Learning Management Systems (LMS)?

Technology is such a rapidly evolving area that it can be difficult to keep up with advances (Marshall, 2010). Daily, new releases of hardware and software are announced which are set to 'revolutionise' the world and change people's lives. In education, commercial technology is being integrated with promises of transforming learning, often without specific information on the effects of each of the technologies once implemented (Brown, 2004; Kortecamp & Croninger, 1996; Tearle, 2003). One such technology currently being implemented into schools are LMS.

LMS were originally commercial systems (Hall 2002; MOE, 2006; Paulsen, 2003) which have been introduced to the education realm with the unfulfilled promise of transforming learning (Dalsgaard, 2006; Lai and Pratt, 2007; Marshall, 2010; MOE, 2007; Pratt, 2008; Selwyn, 2004; Tearle, 2003; Ward & Parr, 2008). Hall (2002) states a learning management system should enable "the management, delivery and tracking of blended learning (i.e. online and traditional classrooms) for employees, stakeholders and customers" (Hall, 2002, para.2).

When selecting a LMS there are key features which need to be considered:

High availability: the system is required to suit many users simultaneously.

Scalability: the system needs to meet any future growth of the organisation, both in functionality and the addition of new users.

Usability: the system must be user friendly for all levels and suit individual learning paths.

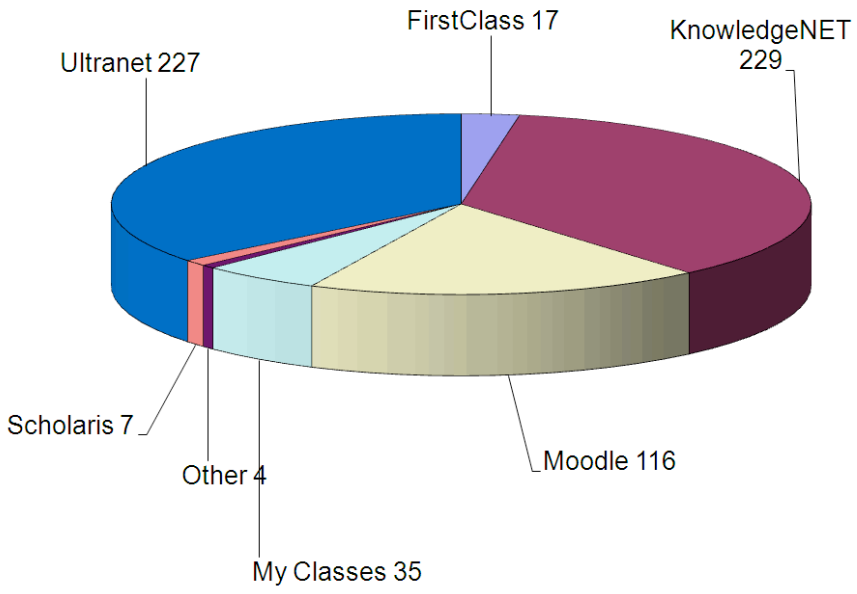
Interoperability: the system is required to support multiple connections and content sources for fully integrated learning.

Stability: the system needs to handle continuous activity over a 24 x 7 cycle.

Security: the system needs to selectively allow access to different users (adapted from Hall, 2002).

Careful evaluation of LMS prior to purchase is required as there are many systems available to choose from. As at January 2011 the New Zealand Ministry of Education (MOE) produced details on schools that are currently using a LMS. Figure 1 represents the 25% of New Zealand schools that are using a LMS (approximately 75% do not currently use one).

Figure 1: Number of schools using LMS according to the New Zealand Ministry of Education (Figure taken from MOE, 2011).

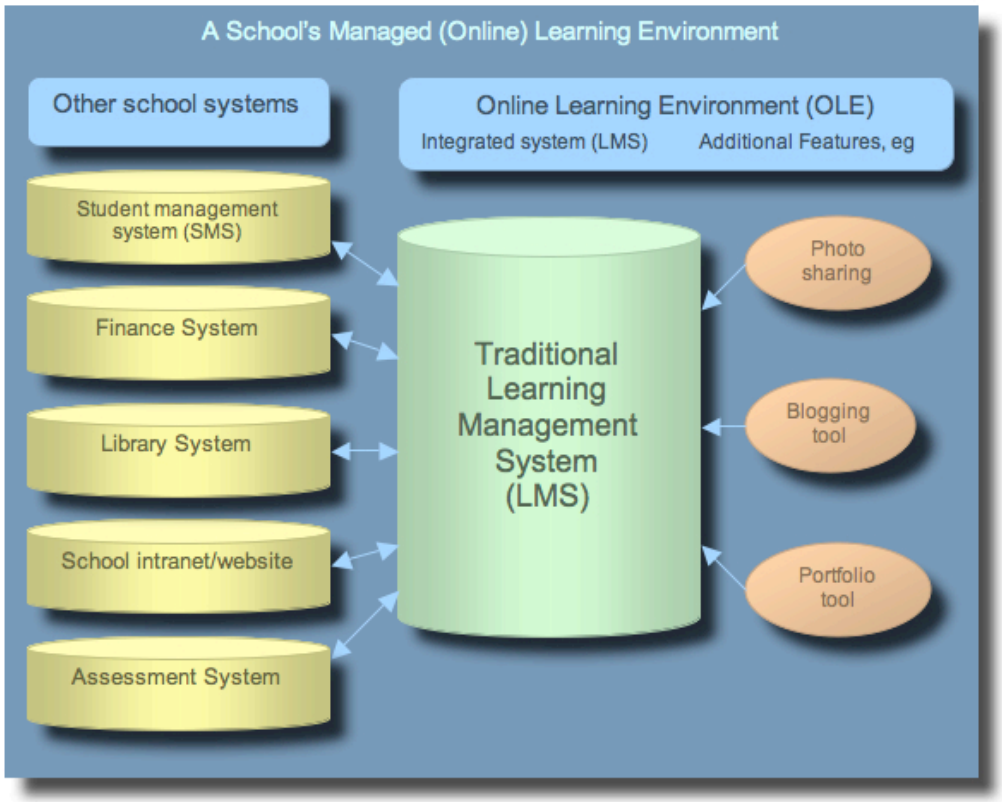


The LMS in use shown in Figure 1 are: UltraNet (227), First Class (17), KnowledgeNet (229), Moodle (116), My Classes (35), Scholaris (7), and Other (4) systems.

Each system has its own strengths and weaknesses along with specific implementation issues. A good LMS could enable a school to provide an individualised student learning experience electronically or enhance an existing program of study by including learning material, online courses, assessments, student evaluations, progress reports and results in 'real time' (Paulsen, 2003). Of the many LMS currently in schools in NZ, the top three are: KnowledgeNet, UltraNet and Moodle. Previously the MOE has allowed schools to freely choose their own LMS and apply for funding accordingly. In 2009, to ensure schools have the systems they need to be 21st century ready the MOE joined with three development partners. These partners are producing products which link all school electronic systems in a managed learning environment (MLE) (MOE, 2011).

Originally LMS were pitched as 'the tool' to transform learning, but it is now recognised that a mix of tools is the stronger more stable approach. This mix is known as an MLE. MLE in New Zealand are still maturing and the total development will be several years away (MOE, 2011). As shown in Figure 2 (p.9) an MLE or online learning environment (OLE) connects with all other systems within the schools network, with the LMS in a central position.

Figure 2: A schools managed learning environment (MLE) (Figure taken from MOE, 2008).



2.2 Current research on student learning management systems

The claims KnowledgeNet and other LMS solutions make about transforming learning are yet to be proven. Despite a large number of implementations over the last decade there is still limited research on the use of LMS in schools (Avgeriou, Papasalouros, Retalis, & Skordalakis, 2003) and unfulfilled claims they would transform student learning. There has been a call for further research into this area and standards to be produced (Brown 2004; MOE, 2007).

There has previously been complaint from schools that the MOE have not provided enough support around the implementation of LMS (Gainsford, 2009). The technology is advancing so rapidly it is hard for schools to keep up. The MOE have had multiple plans in place over the last decade to try and address technology used in education, and LMS and MLE are just two of many solutions that claim to have the ability to transform student learning experiences.

Schools were originally tasked with implementing student management systems (SMS) which could track student attendance and data. Many of these were implemented and then unable to be linked to the preferred LMS or MLE. Now there is a directive to get a LMS onboard and schools are worried that the same issues will arise with these systems - a lot of time, money and resources will get put into the system, but the outcomes will not be what is expected or promised (Gainsford, 2009). Now before the LMS have been fully implemented there is yet another new solution, MLE, which are said to be the real way learning will be transformed.

LMS implementations have not had great success in transforming learning. Watson and Watson (2007) introduce the argument that LMS are being mislabeled, so when their functionality and limitations are discussed, people are actually referring to different systems. A true LMS "manages the learning process as a whole" (Watson and Watson, 2007, p.30). In a knowledge age, such as the one society is in currently, a LMS can be used to access and direct individual learners. It enables the teachers and learners to see where they are at and what needs to happen to reach the next milestone. While most LMS have this functionality, many are not being used to their full capabilities. When stakeholders demand full functionality of LMS, this is when we will see enhanced learning occurring (Watson and Watson, 2007).

Paulsen (2003) conducted a research project on LMS in Europe and identified 52 commercial systems and 35 self-developed systems in use. The European leaders are: Tutor 2000, LUVIT, TopClass and Classfronter. Well known LMS available in the US are: WebCT, FirstClass, Lotus Learning Space, Desire2Learn, Hotchalk, Sharepoint LMS, ThinkingCap, SimplyDigi, and Joomla LMS. In New Zealand there are many LMS already implemented by schools and universities including: KnowledgeNet, Moodle, Scholaris, First Class, My Classes, Ultranet and custom built systems (MOE, 2011).

There has been rapid progress in LMS implementation over the last decade. The MOE is creating strategies and policies to try and improve ICT use in schools. The government also provides extra funding so equipment can be purchased, along with intensive training programs offered within and externally for teaching staff. It would appear two of the main influences identified in most research studies are being addressed – resources and institutions. However, current research still laments the lack of genuinely transformed learning resulting from the use of LMS (Marshall, 2010).

2.3 KnowledgeNet – The tool to transform student learning

Dataview is one of the preferred LMS development vendors partnered with the MOE. The arrangement began in 2009 to develop a system that enables schools to share resources and work seamlessly in the greater managed learning environment. Students are able to enjoy the new style of learning opportunities and retain a digital record of learning that can mature and move with them (Dataview, 2009). Dataview manages the LMS, KnowledgeNet. This is a commercial system which has targeted the school market and claims to be an "unparalleled New Zealand learning management service that facilitates the effective sharing of knowledge and communication between cluster schools, teachers, administrators, students, parents and caregivers, delivering a rich teaching and learning environment" (Dataview, 2010). "KnowledgeNet engages learners in the 21st century by using learning processes and tools in a collaborative and interactive online learning environment to enable lifelong learning" (Dataview, 2010).

KnowledgeNet is the most implemented LMS currently in New Zealand schools. Over 220 schools have the system in their technology offering today. Yet, there is little to no accessible research available on these implementations. Many authors have produced research on generic ICT integration issues in education and conclude there needs to be a general "paradigm shift in educational thinking" (Bolstad, Gilbert, Vaughan, Darr & Cooper, 2006; Bolstad & Gilbert, 2008; Ward et al., 2004) before we will

see a learning change from technology used in and outside classrooms. Whilst this research is for generic IT use, these findings can be transferred to the use of LMS technology as well. Tearle (2004) states any change within a school has to be managed by the whole school and is called a 'change management concept.' This introduces the theory that any change in a school or organisation affects the whole school, so should follow a general change management plan. There is a link between whole school culture and the ability of that school to make change (Tearle, 2004). This idea fits well with research from many ICT implementation projects that list whole school culture as being a major factor in implementation success or failure (Bolstad & Gilbert, 2008; Hammond, Crosson, Fragkouli, Ingram, Johnston-Wilder, Johnston-Wilder, Kingston, Pope & Wray, 2009; Jones 2008; Kong, 2009; Morton, 1996). Many authors specifically discuss the importance of principals getting behind the implementation (Mumtaz, 2000; Veen, 1993), while others talk about how the degree of fit between school ethics and ideals and the implementation process influences how successful that implementation will be (Brown, 2004; Pratt, 2008; Tearle, 2003).

2.4 Factors affecting general technology use

Hoffman (1996) identifies eight key areas that should be considered for any successful technological implementation:

1. Administrative Support; for technological implementation to be successful it needs to have strong support from school boards and administrators. Incentives and bringing on board the right staff to assist in the development of technological advances is an important part of the implementation success.
2. Staff Development and Technical Support: using technology can complicate teaching, by providing staff development programs and adequate technical support it enables teachers to gain the skills and knowledge needed to use technology in their teaching. Training is not done once, but repeatedly as part of regular professional

development in addition to time made available to teachers for independent practice.

3. Availability of Technology: ensure there is adequate technology available, of high quality which is accessible by all users.
4. Technology Use Plan: often a requirement of technology funding, a technology use plan is vital for effective technological implementation. A 3-5 year plan also ensures staff of the commitment of the school to the long term success of the implementation which is important to their acceptance of the system.
5. Technology Co-ordinator: often having a dedicated person to assist in training and co-ordinating new technology implementations leads to greater and more effective use of the technology.
6. Facilities and Maintenance: allowing for staff responsible for the installation and ongoing maintenance of technology is often overlooked in implementation plans, but essential in initial and ongoing success from implementations.
7. Assessment: the factors used to assess the success of the implementation can in turn influence its effectiveness. Often test scores are not the best measure of a successful technological implementation. Careful consideration of what will be measured as success needs to be decided.
8. Broad Participation: for an implementation to be successful a school needs all stakeholders invested in the project. It is not enough that one key management or teaching staff member is running the implementation, there needs to be a broad investment from all stakeholders for success to be seen.

These eight factors are essential for successful technology implementation as “together they promote the skills and knowledge, the environmental support, the incentives and motivation required to help teachers successfully integrate technology” (Hoffman, 1996, p.53), and LMS implementations are no different.

In her 2004 study, Tearle condenses the key areas of technology implementation into two categories: 1. Practical Factors (availability, time, training and support; and co-ordination and management) and 2. Attitude & Ethos (individual attitude and motivation; characteristics and ethos of organisation). Mumtaz (2000) has similar findings to Tearle, in her review of literature on the factors affecting teachers' use of ICT. She found three major factors which affect uptake of ICT: institution, resources and the teacher. Pratt (2008) has also given two main categories, the teachers themselves and their environment, with teachers having issues with skill, attitude and pedagogical belief.

Kortecamp and Croninger (1996) list mentor relationships and personal projects along with technical knowledge and keeping up with progress as key ICT integration factors. Hammond et al. (2009) list technical knowledge and infrastructure as being already adequately managed, but mentor relationships and personal projects as key factors still to be utilised (Hammond et al., 2009). Teachers have to believe that the technology adds something to their teaching or they will not use it. From recent research where strategies were put in place to encourage teacher uptake, it was found that ICT implementation could be very successful in transforming learning (Shein, 2008).

The individual teacher beliefs and values affecting the implementation of technology is a very important influence identified in many studies (Hammond et al., 2009; Jones, 2008; MOE, 2007; Pratt, 2008; Selwyn, 2008; Ward et al., 2004; Ward & Parr, 2008; Zhou & Xu, 2007). Mumtaz (2000) takes the teacher influence a step further to say, if all the other influences are found to be in place but the teacher is not on board the implementation will not be successful.

In reality there could be any number of individual lists of issues that affect technology implementation, depending on what areas the researchers choose to study or how they interpret their results. But it appears most of these issues fit into the same two or three categories that can be applied

to all LMS implementations. The things which will influence the implementation of technology are:

1. **Individual beliefs and values:** lack of motivation, lack of reward, low level ICT understanding, resistance to change.
2. **Resources:** non-functional equipment, not enough machines, lack of support, and
3. **Institution:** timetable, lack of time, insufficient funding, and curriculum constraints (McQueen, 2004).

Even with the current research on factors affecting technology implementations there is still limited evidence of transformed learning or changes to teaching practice occurring (Lai and Pratt, 2007). Ward and Parr (2008) list two possible reasons for the lack of progress as being 1) the policy is incorrect or 2) implementation is ineffective. The reality appears to be somewhere in the middle. Policy lists integration of technology into schools and transformation of learning as a result but there are no operational goals, just strategic ideals with no real picture of what the end result should be (Ward & Parr, 2008). It is the idea that if you provide 'IT', the results will happen. The reality is a little more complicated than this. Just having the technology does not mean teachers are able to integrate it successfully into their teaching. To integrate technology teachers need to develop transformative learning skills (Lai, 2008) and have comprehensive implementation plans in place.

2.5 IT Implementation Plans

For an implementation project to be successful the whole school needs to be involved in that implementation. There needs to be a comprehensive implementation plan, which includes all factors involved with the implementation process before, during, and after the implementation. While there appears to be limited specific LMS implementation plans published for general use, there are many general technological plans which could be adapted to work with LMS implementations.

One such plan is RIPPLES. This model has seven components: resources, infrastructure, people, policies, learning, evaluation, and support (Surrey, Grubb, Ensminger & Ouimette, 2009). While Surrey et al. (2009) believe implementation is a very individual process which requires a school to assess and implement accordingly, they believe RIPPLES can be used as the template from which these decisions are made. Another approach is the PESTER plan: planning and promotion; education; support; training; encouragement and recognition; and reward (Jones, 2008). This plan works best when departments implement one at a time so training resources are not worn too thin and staff have the support they require. Kong (2009) has a complete resource pack which is designed to assist the school in the entire implementation process, freely available online and Wang (2008) has evaluated 3 models currently in use for guiding ICT into teaching and learning: ASSURE (analyse learners, state objectives, select media and materials, utilise media and materials, require learner participation, evaluate and revise) ICARE (introduce, connect, apply, reflect, and extend) and the systematic planning model.

A promising plan currently in use in New Zealand, Japan, Australia and United Kingdom universities is the e-learning Maturity Model (eMM). This is a comprehensive five dimension plan which enables institutions to plan and evaluate their IT implementations. Marshall (2010) lists the five dimensions as:

1. Delivery
2. Planning
3. Definition
4. Management and
5. Optimisation

From systems currently in place it appears schools are able to get the implementation and delivery processes right, but fall down on evaluation, management and optimisation (Marshall, 2010). This appears to be supported by the low level of LMS research available, despite the many implementations done in schools in New Zealand. Evaluation has to date not been a high priority.

The thing all these implementation plans have in common is the requirement that there be a comprehensive plan with full staff and management buy-in in place prior to the implementation. The MOE provides some guidance to implementing new LMS in schools with planning documents on their website. These documents help schools analyse their requirements, but when it comes time to select a system there appears to be a shortage of research available for schools to use in their decision making process. The MOE has partnered with the three providers who produce UltraNet, KnowledgeNet, and Moodle respectively, the three most frequently used LMS in New Zealand schools. Any school wishing to purchase a LMS can do so through these providers and be assured the MOE will be directing, supporting and funding this process. If a school wishes to use another LMS that is fine, they can still apply to the MOE to access specifications, but will not get the funding (MOE, 2011).

2.6 Conclusion

While there appear to be many LMS in use and available, what seems to be missing for New Zealand schools is a comprehensive evaluation of the current models being used. This study aims to provide the case study school with an evaluation of their implementation of KnowledgeNet. This will help the school to look at what is working well and what could be changed or done differently for the next implementation phase to ensure full buy-in and use of their LMS.

The next chapter will look at the methodology behind this study and the methods used to gather the data needed to evaluate the school's use of KnowledgeNet.

CHAPTER 3
Methodology

3.0 Introduction

Before a researcher can conduct any sort of research there needs to be some investigation into the relevant methodology the researcher intends to use. In research the term methodology is often confused with the research methods used (Dillon & Wals, 2006). The methods used (which are discussed later in this section) refer to the actions carried out by the researcher when conducting the research. The methodology on the other hand, refers to the beliefs and theory behind the research design (Johnson & Onwuegbuzie, 2004). Chapter 3 introduces the research paradigm and methodology used in this research project. Section 3.2 discusses case study research methods, strengths and limitations. Next the researcher introduces both the study setting (3.3) and participants involved (3.4) along with the data collection (3.5) and analysis (3.6) methods. This chapter ends with an examination of the validity (3.7), reliability (3.8) and ethical requirements (3.9) for this research project.

3.1 Research Paradigm

Before a researcher can evaluate the ethical requirements or plan their research, a theoretical review must be considered. In designing their research in a particular context, a researcher is required to consider what type of research paradigm is best suited to their particular project and research questions. A paradigm is basically a viewpoint, ones beliefs about how “the world is constructed” (Pearse, 1983, p.158) and this frames and influences the researcher’s perspective and approach to the research.

Historically there have been two competing paradigms, quantitative and qualitative research (Johnson & Onwuegbuzie, 2004). Quantitative paradigms use ‘real’ data based on statistical results from large groups which are analysed using mathematical probabilities. Qualitative research

is opinion based and takes into account individual perceptions and viewpoints.

Recently there has been a push for research paradigms that combine methodology and use the strengths of both original research paradigms and limit any weaknesses (Johnson & Onwuegbuzie, 2004); this research paradigm is known as mixed method research. The methodology a researcher uses ultimately depends on their research intentions (Johnson & Onwuegbuzie, 2004) and a researcher's epistemology. Epistemology is the relationship between the researcher and the participants (Admiraal & Wubbels, 2005; Ponterotto, 2005).

3.1.1 Quantitative Paradigms

The researcher was originally drawn towards a quantitative paradigm. As a scientist, paradigms which use 'real data' that give 'real' results always appeared a more reliable method. However, there are known limitations to this process. Quantitative data requires unbiased detached data collection by the researcher and has no real room for individualised comments from the participants (Salomon, 1991). Data is generic and no individual ideas are considered. Also in quantitative research, often statistics are modelled to show what a researcher wants readers to see, rather than individual accounts told in the participants own words (Broke-Ute, 1996). As this research project aims to investigate individuals' perceptions, a quantitative methodology alone would not be able to gather information in enough depth to capture the perceptions of individuals.

3.1.2 Qualitative Paradigm

When looking at alternative paradigms which take into account the individual participant, qualitative research stood out as a strong contender; qualitative research considers individual respondents. Often qualitative methodology can be called an interpretive paradigm (Howe, 1992; Rist, 1977). Interpretive research focuses on individuals and aims to understand their perceptions of what is happening around them. Theory is generated by the information found from the research. Researchers

discover what 'reality' is as they investigate each individual situation. Interpretive research aims to discover the reality in one place at one time and compare it to other places and times (Cohen, Manion & Morrison, 2007). In qualitative paradigms a personal voice can be heard and more in-depth data can be considered and analysed, but it too has some limitations. It can be very time consuming to document individual responses (Johnson & Onwuegbuzie, 2004). There is often too much data collected for researchers to analyse and accurately categorise individual comments and when the researcher is categorising the answers there is potential for researcher bias to influence the research (Onwuegbuzie & Leech, 2007). Critics of interpretive research say the fact that different researchers can study the same subject and get different results is a weakness of the research model (Smith, 1992). However, this researcher believes, as long as the research is supported by clear guidelines and examples, the research is as valid as any other.

3.1.3 Mixed Methods paradigm

There has been much debate amongst researchers about which research paradigm is the most valid. Recent research has seen a number of educational researchers (Howe 1992; Johnson & Christensen 2004; Morgan, 1997; Onwuegbuzie & Leech, 2004) supporting the concept of mixing paradigms and using both quantitative and qualitative research methods – a mixed methods research paradigm. By joining the two research paradigms many believe it actually results in much more robust research findings (Johnson & Onwuegbuzie, 2004).

As neither individual paradigm seemed to fit exactly with this research project, a mixed methodology was chosen with a strong affiliation to interpretive research. One of the main arguments against mixed method research is the limitation created by in-depth research of this type. Researchers may only be able to research one location or a subset of the population, as mixed method research is much more time consuming and personalised than quantitative research (Onwuegbuzie & Johnson, 2006). Single paradigm researchers argue that the lack of transferability of such

research is a limitation and can weaken the research, making it less valuable than quantitative research done on a large scale (Teddlie & Tashakkori, 2009). While research from a single location could be considered less transferable than data from many locations, a single location research project like a case study is never conducted with the intention it will be transferable to all situations. Not every research project needs to be about the entire population. Changes on a site by site basis not only have value to that site, but are a worthy research basis for similar sites (Cohen et al., 2007).

3.2 Research Methodology

Whether a researcher is conducting a single site research project or multiple locations there still needs to be careful research methodology followed. Yin (2009) introduces five main types of research methodology: experiment, survey, archival analysis, history and case study. Cohen et al. (2007) talks about the six types of methodology being: survey experiment; ethnography; action research; testing and assessment; and case study.

As this research project involves the identification and interpretation of the perceptions of individuals, the research conducted in this project needed to be based on research practices which allow for individualism. This research is also conducted at one location, at one point in time, with the research questions mainly asking why and how. Based on this core information the methodology chosen for this project is a case study (Cohen et al., 2007; Yin, 2009).

Case study research can be defined as inquiry into in-depth real life situations without clear boundaries. The study should have multiple sources of evidence based on theoretical propositions which are triangulated to provide insights into that case (Yin, 2009). Case study research has both strengths and limitations. Cohen et al. (2007) identify weaknesses in case study research, where results may not be generalisable and are not easily open to cross checking. Results may be

selective, biased, personal and subjective and case study research is prone to problems of observer bias. These limitations are similar to those identified by Yin (2009) who lists concerns from traditional researchers about case study research such as a lack of rigor, or no systematic process that can provide for scientific generalisation, that it takes too long and the study results in too much data to review.

The strength of a case study is in its depth, validity, and reliability when combined with other research projects using similar guidelines (Yin, 2009). A case study is research which is 'real', and easy to understand by a wide audience. Case studies can also often uncover previously hidden information that can be used by other researchers at other locations (Cohen et al., 2007). A single researcher can conduct the study and results are not constrained by events or research design as in other study methodologies.

3.3 Study Setting

The case study site chosen by the researcher for this project was a large New Zealand secondary school. The school is a mixed gender, public school with students aged 13-18 years. The school is ranked as a high decile Auckland school, situated in a residential suburb. It has a multi-cultural student population, the majority of which come from local in-zone families. Around ten percent of the students are international full fee paying from overseas.

3.4 Participants

From this school the researcher selected three different sets of participants: students, teaching staff, and support staff (includes administrators and managers). Student participants were selected from documents containing data logs of how often users logged into the school's student learning management system (LMS), KnowledgeNet. Large lists of possible participants for each of three sub-groups (high, medium, and low users) were identified from the data and participants were randomly selected from each list. The sub-groups were selected

based on how often the potential respondent logged into the LMS for the first two terms of 2011. Any person who logged into KnowledgeNet less than 5 times a term was considered a low level user, anyone who logged in between 5 and 10 times was considered a medium level user and anyone who logged in more than 10 times was a high level user. Random selection of each participant was done by dividing the number of users in each sub-group by four and selecting five users from each quarter, to make a total of twenty participants in each sub-group. In total sixty users were selected to take part in the student questionnaire phase of the project.

The teaching and support staff were selected randomly by the IT manager according to who had free periods during the data collection times at the school.

The project asked participants for their perceptions of the school's LMS KnowledgeNet.

3.5 Data Gathering Methods

In order to collect individual perceptions of the LMS at the school, several data gathering methods were used. This study used four different data gathering methods described in the following sections.

3.5.1 Documents

Documents are defined for this research project as any printed or created material which exists and is not dependent on the case study being conducted (Taylor-Powell & Renner, 2003). Documents can include (but are not limited to) field notes, diaries, records, books, memos, emails, correspondence, letters, reports, photographs and directories (Cohen et al., 2007). There are benefits for using document data, it can be reviewed repeatedly, data is exact (Yin, 2009), can cover many lifetimes, and give information on people or things already gone (Cohen et al., 2007; Yin, 2009). It can also enable large samples to be reviewed (Cohen et al., 2007). Documents have some weaknesses: they can be difficult to

retrieve (Yin, 2009), may be biased or selective (Cohen et al., 2007; Yin, 2009), may be personal accounts rather than factual information, and documents may exist but be unavailable to the researcher (Cohen et al., 2007).

The first data collected for this research project were from data logs exported directly from KnowledgeNet. This data was used to calculate how often users logged into KnowledgeNet and also to assist with random participant selection (as described in Section 3.4). The data exported from KnowledgeNet is very accurate. It is raw data exported directly from a computer system of user records logged in the systems memory. This data has not been manipulated or amended in any way prior to the researcher receiving it. The data was easy to access once the IT manager had been shown by the KnowledgeNet administrators how to download the required data and was made readily available to the researcher.

3.5.2 Questionnaires

Once the participants had been selected from the documents downloaded from KnowledgeNet, the researcher used three additional data collection methods. In the first instance all participants were given a questionnaire to complete (see Appendix 1). A questionnaire is a pre-constructed form with questions the participant is asked to answer honestly and completely and does not require the researcher to be present (Hannon, 2007). A benefit of using a questionnaire is that, as they are completed anonymously, participants will usually answer honestly. A questionnaire is more economical than interviews, in terms of time and money (Cohen et al., 2007) and they are more convenient, as questionnaires can be completed at a time that suits the participants. Questionnaires do have some disadvantages: they often have a low percentage return rate, and the researcher is not able to address any questions the participant may have or ambiguity arising from the questionnaire (Hannon, 2007). Questionnaires may not match the literacy levels of participants and may not generate the correct information due to inadequacies in the design (Cohen et al., 2007).

3.5.3 Focus Groups

Secondly, selected participants were asked to be part of a series of focus groups. Due to time constraints, it was not possible to do interviews for all participants, so small focus groups were used to gather more in-depth data from the largest participant group (students). Focus groups are small selected groups invited to attend a discussion where an interviewer will introduce topics and the group will discuss and provide collective ideas (Kitzinger, 1995). There are benefits to using focus groups; they enable the researcher to gain insight into the views of a large group of participants, over a relatively short period of time. They may provide information not gained in questionnaires or interview situations, and they produce a large amount of data over a short period (Morgan, 1997). There are some issues to take into account when using focus groups. You cannot ensure all participants will feel comfortable sharing their individual opinions in group situations; it can sometimes be difficult to get generalised information from a focus group. With group discussions it is easier to get off topic, and often focus group data may not be completely reliable (Cohen et al., 2007). This however can be strengthened by triangulation of data gathering methods as discussed in section 3.7.

Of the original sixty students who were issued with questionnaires, thirty were randomly selected to take part in one of four focus groups (each focus group met once and contained six to eight students). Of the four focus groups, one was for high users, one was for medium users and one was for low users. The fourth group was a mixed group of any user. The random selection was achieved by selecting every 3rd name on the group list. This student was selected if they had returned a signed consent form. Once the three specific user focus groups had been selected, all the remaining students who had already returned signed consent forms were grouped together for the last mixed focus group.

3.5.4 Focused Interviews

Thirdly, data was gathered using focused interviews. Of the original participants who completed questionnaires from teaching and support

staff, selected participants were invited to take part in one-on-one interviews. Interviews can be defined as “a two-person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information” (Cohen et al., 2007, p.351). Focused interviews contain pre-formatted questions which are asked in a short one off interview situation. Questions should be open yet focused enough to keep the interviewee to the topic but not constraining so as to guide the information obtained (Morgan, 1997). Some benefits of an interview are: they enable the researcher to identify actual perceptions of individual participants, they provide a real account of participant experiences, and information is freely given and can be recorded for accurate analysis at a later date (Morgan, 1997). Questions can be explained and participant questions answered by the researcher during interviews.

There are quite a few different interview types (Cohen et al., 2007) depending on how structural the questions are prior to and during the interview. A researcher can control the interview to different degrees. A researcher needs to be aware of weaknesses of some interview types (Cohen et al., 2007). Interviews, in general can take a very long time, involve lots of data collection, collation and analysis. Interviews can have researcher or participant bias due to the way questions are asked and leading of participants (Morgan, 1997). Participants may not feel comfortable telling the truth to a researcher so information may be limited. Also, due to time constraints, a limited number of participants can be reached in interviews (Cohen et al., 2007).

3.6 Data Analysis

Once the data has been collected and recorded in an appropriate way, the data is then analysed. There is a mix of both **numerical** and **word data** analysed in this study. This research project used quantitative data (numerical) analysis in the first instance to identify the level of LMS use of each participant. This was done using basic statistics, with actual values exported from the KnowledgeNet computer system. A spreadsheet was exported from the system with user log data. This data was used to show

how often users logged into KnowledgeNet over a two term period. The data was also used to sort participants into three user groups (high, medium and low users) outlined in Section 3.4.

Secondly, with the questionnaires, focus groups and interview data, the researcher identified key ideas and trends coming through from all data collected and coded ideas into themes which were sorted independently using a two step process**.** Each point made was highlighted and summarised. The summarised data was collated until a coding framework was developed. Data which used ranking scale questions were entered into a spreadsheet to provide basic statistical values and visual displays of data. Ranking scale questions are questions where the participant is given a list of options and they have to rank the list based on preference (Tearle, 2003). This data analysis method is known as Typology (Shrivastava,1983).

All the data was processed solely by the researcher, peer checked by the supervisor and at least one critical friend.

3.7 Validity

When a researcher processes the data collected in an interpretive study, there is some question as to the validity of the data. Validity can be defined in different ways depending on the type of research conducted. Quantitative researchers define validity by asking the question, “am I truly recording what I intended to record rather than something else?”(Tashakkori & Teddlie, 1998, pg. 80). One of the perceived weaknesses of qualitative research is a lack of validity. However, qualitative researchers have dealt with validity in slightly different ways. In general, qualitative research defines validity as ‘is the account given a true and accurate account as told by the participants’ (Onwuegbuzie & Johnson, 2006). Qualitative research is based on real world experiences and has ways to ensure validity just like quantitative research does, a simple comparison of the two validity terms is shown in Table 1 (p.28).

Table 1: Matching quantitative validity to qualitative validity traits (adapted from Onwuegbuzie & Johnson, 2006).	
Qualitative trait	**Quantitative Trait**
Credibility	Internal validity
Transferability	External validity
Dependability	Reliability
Confirmability	Objectivity

Generally validity can be replaced by the term trustworthiness in qualitative research. Qualitative research can have improved validity by carrying out member checking, triangulation, thick descriptions, peer reviews and external audits (Creswell and Miller, 2000). In this study the researcher has chosen to use triangulation and member checking to strengthen the validity.

Triangulation can be achieved in various ways, such as using multiple groups of participants, theories, methods or using different researchers. By using triangulation a researcher is attempting to validate the data generated by using multiple or different sources of information to form theories or groups to support the data found (Creswell and Miller, 2000). In this research project, validity has been strengthened by triangulation of participants and method. Using three different groups and doing both questionnaires and more in-depth focus group and interview processing, the researcher has attempted to validate the findings. In addition to triangulation, this research project has also used member checking of transcripts to ensure accurate participant accounts have been documented, further strengthening the research validity (Cohen et al., 2007). Another way of ensuring validity is to make sure correct well-documented research processes are followed so other researchers can repeat the research at alternative sites. This also shows the researcher has reliability; everything proposed was actioned and documented for the reader to see.

3.8 Reliability

"The goal of reliability is to minimize the errors and biases in a study" (Yin, 2009, p.45). To ensure the research has a high level of reliability, all processes are documented, checked and carefully monitored. Researchers ensure they conduct themselves and the research process with the utmost integrity and transparency (Aubrey, 2000). By checking results with participants, fully disclosing any bias, and retaining original research data gathered, a researcher can strengthen their reliability significantly.

In this research project the researcher has strengthened reliability by fully documenting the process prior to the research being carried out. Ethical consent was applied for and obtained through a recognised governing body. Research questionnaires and recordings have been stored securely and transcripts sighted and approved by interview participants. These all combine to make the research practice more reliable.

3.9 Ethical research practice

In order to make sure researchers are conducting themselves with integrity, there are governing bodies which are responsible for ensuring a researcher has adequately planned for a fair and safe research process. Depending on who is conducting the research and for what purpose will determine who the governing body is (Hedges, 2001). This research project has had ethical approval from The University of Waikato. A comprehensive ethical proposal was completed and approved prior to any data collection (see Appendix 2). In this research project, ethical principles were regarded at every step of the process. Ethics considers moral questions and principles, outlining guidelines for behaviour seen as reputable (Aubrey, 2000; Hedges, 2001). The ethical principles followed in this research project are described in the following sections.

3.9.1 Informed consent and anonymity

Informed consent principles guide the researcher to ensure the participants are always aware of their rights and requirements in a way

they can understand. At all times the participant is fully informed of what will happen in each stage of the research process (Hedges, 2001). Anonymity refers to keeping the participant's identity unknown, so no repercussions occur. This study has practiced informed consent and anonymity at each stage of the research process. In the planning stages of this research project the school was approached and asked to consent to their site being used for this study (see Appendix 3). Once school permission had been given participants were invited to participate by being given an information letter (see Appendix 4) and consent form (see Appendix 5) which was voluntary to complete. The letter clearly stated the respondent's right to not take part in this research project. The student consent form required parental consent in addition to student consent. Students were only given a questionnaire once parental consent had been returned.

Teaching and support staff were given the information letter, consent form and questionnaire together. When given study information all participants were requested not to discuss the contents with anyone (other than parents for student participants) to retain their anonymity.

The questionnaires collected were anonymous. Selected participants were presented with a named envelope which contained the questionnaire and an unmarked envelope for questionnaire return. Original named envelopes were destroyed by participants prior to the questionnaire being returned to maintain anonymity. All participants signed consent forms and all completed questionnaires were returned via a sealed ballot box in the house leader's office that was only ever accessed by the researcher's school contact.

3.9.2 Confidentiality

Sealed ballot boxes were used to ensure the participants remained anonymous throughout this research project. This ensures the confidentiality of the participant, which is an important ethical requirement (Cohen et al., 2007). The participant needs to feel confident the

information they provide will be treated respectfully and have no negative repercussions for them.

If the researcher had the need to mention an individual comment in this project the participant was given a respondent number. No person other than the researcher and supervisor was ever aware of individual participant details throughout the entire research process. The original recordings and questionnaires have been kept locked away by the researcher and will be destroyed once the thesis is published and graded.

3.9.3 Free from harm or deception

By locking away the original research data, and using respondent numbers if required, this ensures the participant has anonymity. This is important so the participant trusts the research project will not cause any undue stress in their lives. Also ensuring there was no deception in intention or data collected by the researcher ensures the participant feels comfortable sharing relevant data truthfully.

This research project caused no harm to participants in any way. At all times participants were advised of their right to withdraw from the project. The researcher did withhold some information during the process of participant pre-selection. Participant pre-selection was based on individual usage data taken directly from the LMS. The purpose of withholding this information was to prevent any bias in the participant responses based on their perceptions of how often they used KnowledgeNet. The information withheld in no way harmed any of the participants, but was necessary to keep the research unbiased and so as to not affect responses (Aubrey, 2000). For the intents and purposes of this research the participants were assured the research participant selection process was entirely random.

3.9.4 No Coercion

Another ethical requirement for research projects is that the participants are not given an incentive to complete the study, or if they are, the incentive is clearly described and explained. This ensures the reliability

and validity of the research project (Hedges, 2001). There were no incentives or compulsion for participation in this study. There are no monetary incentives for participants to take part. This research was totally voluntary for all participants' right up until this paper was written and research results collated.

3.9.5 Respect

Whilst all participants are voluntarily taking part in the research project, there is still a need for respect between researcher and participant. Respect is one of the most important ethical considerations in research (Aubrey, 2000). All participants should be shown the utmost respect during each stage of the research process. During this research project all individuals were consulted at each stage of the research and continually asked if they were happy with progress and results were accurately portraying their views. Each interview transcript was typed up and a copy authorised by the participant to ensure it was a true and accurate portrayal of their interview, or changed if requested.

The next chapter presents the findings from the research project questionnaire, focus group and interview process.

CHAPTER 4
Results and Findings

4.0 Introduction

This chapter presents the project's findings from data collected at the case study school. These results will be presented to help answer each of the original research questions introduced in Chapter 1.

Question 1: What was the school's rationale for implementing KnowledgeNet and has the student learning management system fully met the requirements for which it was purchased? (Section 4.1).

Question 2: What is the extent and pattern of use of KnowledgeNet within the case study school? (Section 4.2) and

Question 3: What are the enablers and impediments, as perceived by users of KnowledgeNet? (Section 4.3).

4.1 Rationale for implementing KnowledgeNet in the school.

Research Question 1: What was the school's rationale for implementing KnowledgeNet and has the student learning management system fully met the requirements it was purchased for?

Why was KnowledgeNet implemented?

Of the six staff interviewed at the school, when questioned whether they knew why the system was implemented, five staff could give a reasonable answer which related to their co-workers response and only one staff member said they had no idea.

Of the five staff who gave a valid reason for KnowledgeNet's implementation, there were two respondents who thought the system was introduced for document storage or sharing, two respondents who thought the system was as a "communication link between home and school so students could log on from home" (R1) and one respondent who thought it

was to “keep the documents secure so that only students and staff could access” them and “keep material off the public website” (R2).

KnowledgeNet has enabled documents to be stored in a central repository which could be shared between recipients anywhere in the world. Generally all three reasons given by users of KnowledgeNet could be combined under the one category; storage and access. The documents were loaded onto the public website originally, so students could access course work from home, but by putting them on the website they were available to the general public, as well as the students, which was not what the school wanted. KnowledgeNet has resolved this insecurity issue, as well as provide a portal between school and home for the students and staff of the school.

Has KnowledgeNet met the implementation requirements for which it was purchased?

Staff

While the reasons why KnowledgeNet was implemented were relatively easy to determine and the majority of the participants agreed on the reasoning, the second part of the research question is a little harder to answer.

The system was implemented and does have the functionality to share documents between home and school, removing the need for documents to be loaded onto the public website. So the capability is there, but whether it has ‘fully’ met the requirements is yet to be seen.

When asked whether they were satisfied with the way KnowledgeNet was being used in their school, the majority of the staff respondents have answered yes. Of the six staff who responded to this question; two answered yes it has met the needs of the school, two answered yes but added comments to their response which said; 1. “In Science yes, I don’t know what the other subjects are doing“ (R3) and 2. “Some teachers are” (using the system) “and others are not” (R1).

One respondent stated “there’s a lot of stuff on KnowledgeNet and students use it extensively – hardly any students have no access to computers, so it is an essential tool” (R2).

Only one respondent was not content with the way KnowledgeNet was currently being used. When asked if they were satisfied with the way KnowledgeNet is currently being used in their school, they answered “no” (R6). When further asked if they felt the staff use it to its fullest capabilities the response was, “no, definitely not” (R6).

Five of the six questioned respondents were happy with how KnowledgeNet is currently being used, although two of those did mention that not all teachers were using the system to its fullest capabilities. So while most were happy with the way KnowledgeNet is used presently - there is always room for improvement. A few of the staff felt some subject areas were perhaps using it better than others.

Students

This view was supported by student focus groups where two main areas of the school have been highlighted as using KnowledgeNet extensively. As shown in Figure 3 (p.36) the comments from students during focus sessions highlighted that two main subject areas in the school (Science and Mathematics), were using KnowledgeNet much more than any of the other areas.

It is clear from the comments made in Figure 3 (p.36) that students are being exposed to KnowledgeNet in selected subject areas, but the system is yet to be fully utilised by the whole school. This leads on to the next research question which looks at the extent to which KnowledgeNet is being used in the school and the pattern of its use.

Figure 3: Do students think KnowledgeNet is being used well in the school.	
Only used in selected subjects; particularly Science and Math.	"Science is all ordered neatly" (R1) "Only our Science teacher uses the site and Math as well" (R4) First time introduced to KnowledgeNet "In Science during class" (R3) "It's mentioned lots in Physics we have assignments on it all the time and the same for Math, in English nothing gets mentioned" (R7) "We only use it for revision and only really Math and Science. I've never been told to go on for English or Social Studies" (R8) "I think the only time I can kind of remember that my teacher ever said anything was like in Math" (R2)

4.2 Extent of KnowledgeNet use at the case study school.

Research Question 2: What is the extent and pattern of use of KnowledgeNet within the case study school?

How often it is used.

To get the portion of users who log into KnowledgeNet and use it in the first two terms of the year, data was exported directly from the KnowledgeNet system supplied by the case study school. This data needed to be sorted and analysed based on the research criteria. In addition to this, respondents were asked how often they thought they used the system. There are some variations in the data obtained.

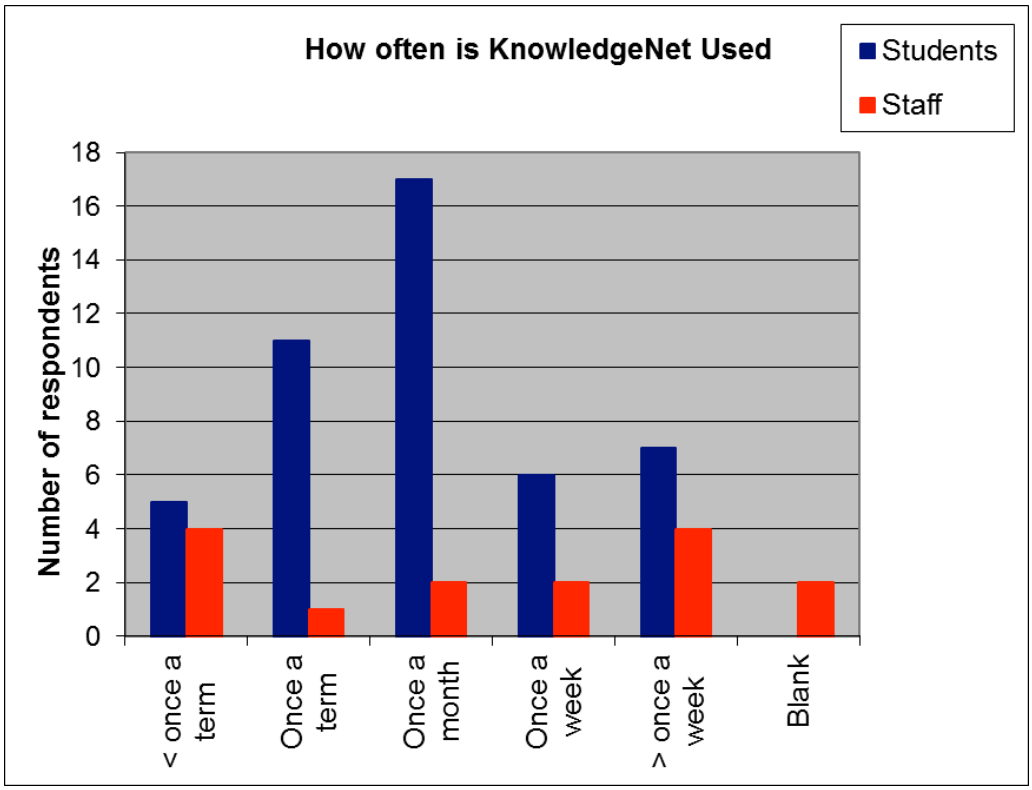
From Table 2, it is clear there appears to be a high portion of users logging into the system frequently. For student users according to the data logs, over 50% of registered users logged into the system in excess of 20 times this year. For the staff users, over 30% of registered users logged into the system in excess of 20 times this year.

Table 2: Frequency of log-ins by users of KnowledgeNet at the school.

Number of Log ins Term 1 & 2	Accumulative Percentages (students)	Accumulative Percentages (staff)
User logs in over 100	4%	5%
User logs in over 80	6%	8%
User logs in over 60	11%	11%
User logs in over 40	3%	21%
User logs in over 20	50%	30%
User logs in over 10	73%	54%

There is variance between staff and student results.
Students appear to be higher users of the system generally, over 73% of students logged in over 10 times in terms one & two whereas only 54% of staff did. However, at the higher end of the scale, the usage values are almost identical in students and staff; 4% of student users logged into the system in excess of 100 times this year, 6% logged into the system in excess of 80 times this year and 11% logged into the system in excess of 60 times this year. Compared to staff users which had 5% of users logged into the system in excess of 100 times this year, 8% logged into the system in excess of 80 times this year and 11% logged into the system in excess of 60 times this year. These values show that the high users (frequent users) are in similar proportions in both student and staff groups.

Figure 4: How often Respondents think they use KnowledgeNet.



The perceived usage results do not seem to match up with the 'real' data log results obtained from KnowledgeNet. When asked how often they used the system, (as shown in Figure 4 above) over 50% of the users reported logging in once a month or less. Either the user profile in the questionnaires cannot be considered representative of the full users of the system, or user perceptions are off, and the students actually log in more often than they think. As the questionnaire sample is a small subset of the full user group (45 respondents compared to over 2200 school users), and the usage log data are actual system records, the data logs are considered the more reliable data source for this project. These logs show actual student usage is quite high.

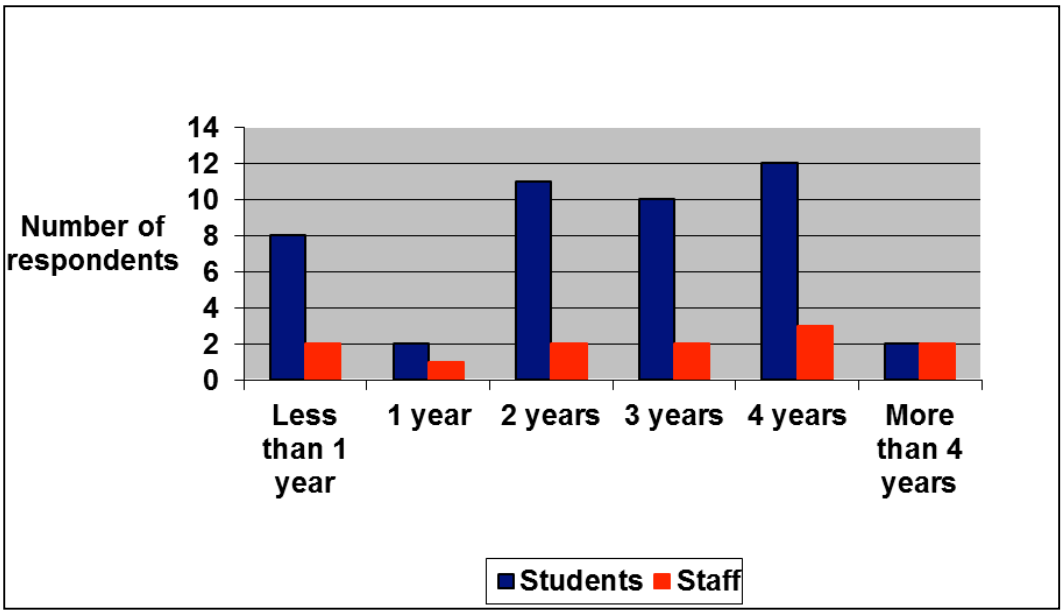
There are variances between the student and staff responses in perceptions of how often they use KnowledgeNet. The majority of students stated they use KnowledgeNet once a month or less, so from their perception they are not really using the system that much. From staff usage data, there appears to be a pattern shown with two separate groups. The largest two staff user groups are at opposite ends of the

usage scale. It would appear from Figure 4 (p.38) that staff either use KnowledgeNet frequently (more than once a week), and these would be your confident users (possibly Science and Mathematics), then there is the same number of staff who use it infrequently (less than once a term), these being the limited users.

Length of use

In addition to a high frequency of use shown in the usage data logs it would appear that the users have been exposed to KnowledgeNet for, long enough to enable them to know what the system does and give fair feedback on its usefulness. As shown in Figure 5, over 50% of student users have been exposed to KnowledgeNet for at least 3 years, with the highest individual frequency being 4 years.

Figure 5: How long the user has been exposed to KnowledgeNet.



Staff users seem to have a greater spread in their duration of use, with similar numbers having used the system across the range from less than 1 year through to more than 4 years. This may also account for the variance seen in Figure 4 (p.38). Those that have not been exposed to KnowledgeNet for as long may use it less than those who are more familiar with it. Other reasons as to why some users are possibly using KnowledgeNet more than other users, is discussed in section 4.3;

perceived enablers and impediments to the use of KnowledgeNet from the perspectives of the users.

Table 3: Things users think KnowledgeNet should be used for.

Item	Staff	Students	Totals
Revision (past papers/ old tests)	7	17	24
Sharing documents	3	1	4
Parent access (attendance, grades)	1		1
Course information	2	10	12
Current work (homework/ notes / assignments)	7	28	35
Alternate for those who cannot attend school	1		1
Extension material	1	9	10
Educational games / animations	1	3	4
Communication/chat site	4	12	16
Blank/Don't know	2	2	4
Results (student only)		1	1
Access to school work from home (student only)		1	1
Website links (student only)		3	3

Things users would like to see KnowledgeNet used for are shown in Table 3. Table 3 shows the staff and student choices on things they think KnowledgeNet should be used for. These include items KnowledgeNet is currently being used for and also things users would like to see KnowledgeNet used for in the future.

As shown in Table 3 (p.40) the top three things all respondents think KnowledgeNet should be used for are the same from both student and staff users. Firstly they think it should be used for current course work (homework, notes, and assignments). Secondly all users think it should be used for revision work (past papers/ old exams) and thirdly both user groups think KnowledgeNet should be used for communication or have a chat site. The first two items listed are actually something a content management tool would offer, the last item is something which a learning management system could offer. All three are things KnowledgeNet can do easily. After the top three item selections, staff user numbers get a little small to make a clear differentiation of the data choices.

Differences in perceptions between high users and low users of KnowledgeNet

To distinguish respondent patterns of use the researcher has made comparisons between the high user and low user groups to see if there are any differences in the usage pattern. From the methodology chapter (p.23) above high users were defined as those who logged into KnowledgeNet more than 10 times a term for the first two terms of 2011 and low users are considered those who log in less than 5 times a term for the first two terms of 2011. From the questionnaires received from prospective respondents there are thirteen high users and sixteen low users who have participated in the study. In addition to questionnaire data, some data presented is from dedicated focus groups. There was one high user focus group and one low user focus group. Their data has also been referred to in the following section.

No Difference

In general from all the data gathered, there did not appear to be many significant differences in information obtained from low users of KnowledgeNet when compared with high users. The researcher has highlighted some areas where low users and high users show little to no difference, followed by some areas where there is enough variance that it may account for the different patterns of use in the two groups.

Table 4: Duration of Use of KnowledgeNet (high and low users).		
Duration of Use	**Low Users**	**High Users**
1 year or less	3	1
2-3 years	7	6
4 years or more	5	6
Blank	1	

Table 4 shows similar results for both low and high users in the length of time they have been using the system. The values are close enough that we can assume the low users and high users have been exposed to KnowledgeNet for around the same duration. Therefore this is not considered a reason for the difference in their usage frequency.

Table 5: Perceptions of ease of use of KnowledgeNet (high users and low users).		
Easy to use	**Low**	**High**
Yes	13	11
No	3	2

When asked if they thought the system was easy to use there were similar responses given from both high and low users. As shown in Table 5 above the majority of both high and low users think KnowledgeNet is easy to use. So this is not considered a reason there are differences in usage patterns for high and low users.

Table 6: Were users shown how to use KnowledgeNet (low user and high user).		
Shown how to use it	**Low**	**High**
Yes	10	9
No	6	4

When asked if they had been shown how to use KnowledgeNet, the majority of the users (both high and low) said yes they had been shown how to use it. As shown in Table 6 (p.42) there is no significant difference between high and low user perception on whether they were shown how to use KnowledgeNet or not. This is not considered a reason for the differences in usage frequency between high and low users.

Table 7: Top three items users perceive might make them use KnowledgeNet more. L=low user, H= high user.

Item	1st L	1st H	2nd L	2nd H	3rd L	3rd H
More time to use IT in school	3	0	3	0	0	1
Teachers talk about KnowledgeNet more	1	0	0	0	2	0
IT available for use in my own time	0	0	2	0	1	0
Have a chat site	3	1	1	1	1	0
More training	0	0	1	0	0	1
Assignments posted on KnowledgeNet	1	2	0	2	3	2
More things to use on KnowledgeNet	2	1	1	1	4	4
Work more on KnowledgeNet in class	0	0	2	0	0	0
Extra teaching material to read in my own time	1	3	3	4	0	0
Other – listed individually	2	0	0	0	0	0

Differences

There were some variances seen from the data collected between high users and low users worth mentioning and these are shown above.
As seen in Table 7 when asked what things could make them want to use KnowledgeNet more there were some differences in the items users selected.

If you compare Table 7 between low user and high user preferences for things which might make them want to use KnowledgeNet more, there is

not enough variance within the groups to use single categories as the respondent results would need to be significantly higher to achieve this. However if you pool the 1st, 2nd and 3rd choices from the users together for both high users and low users then there are differences which begin to emerge.

Table 8: Top three Items users perceive might make them use KnowledgeNet more. (Data is collated for top 3 choices).		
Item	**Low user**	**High User**
More time to use IT in school	6	1
Teachers talk about KnowledgeNet more	3	0
IT available for use in my own time	3	0
Have a chat site	5	2
More training	1	1
Assignments posted on KnowledgeNet	4	6
More things to use on KnowledgeNet	7	6
Work more on KnowledgeNet in class	2	0
Extra teaching material to read in my own time	4	7

As you can see from Table 8 when the top three choices are collated there are differences in the items selected by high and low users, for things they perceive would make them want to use KnowledgeNet more.

Low users top three combined choices

1st choice More things to use on KnowledgeNet

2nd choice More time to use IT in school

3rd choice Chat site added

High users top 3 combined choices

1st Extra teaching material to read in my own time

2nd = Assignments posted on KnowledgeNet

= More things to use on KnowledgeNet

There were also differences in the responses given by high and low users from the questions which ask about how the teacher's opinion or use of KnowledgeNet affects others.

Table 9: How many teachers talk about KnowledgeNet in class (low users and high users).

	Low User	High User
Some	11	12
None	5	1
All	0	0

From Table 9 there is a difference in opinions of high user and low user. The majority of high users (92%) thought 'some' teachers talk about KnowledgeNet, and only one respondent (8%) thought 'none' of their teachers talked about KnowledgeNet in class. Whereas low users mostly thought (69%) 'some' of their teachers talk about KnowledgeNet in class. But there was also a significant number (31%) who thought 'none' of their teachers talked about KnowledgeNet in class. This could be considered a reason for a difference in their usage frequency which will be discussed in Chapter 5 as a limitation to use.

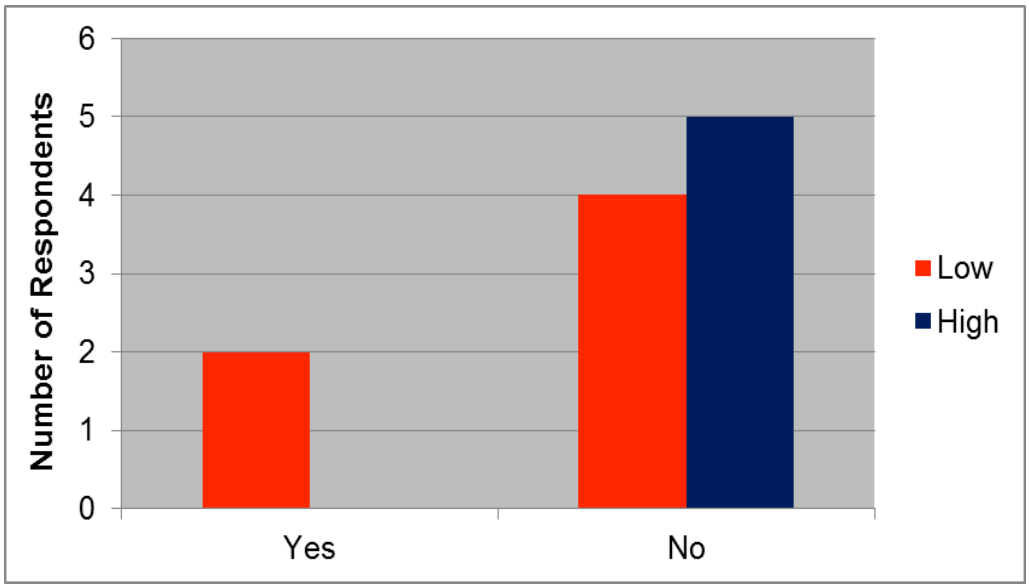
Table 10: Does how the teacher feels about KnowledgeNet affect user opinion of the program (low user and high user).

Response	Low	High
Yes	5	6
No	11	6

From the data shown in Table 10 (p.45), high users are evenly distributed. 50% think 'Yes' - the teachers opinion of KnowledgeNet will in turn affect their own opinion and 50% answered 'No' - how their teacher feels about KnowledgeNet has no bearing on their own opinion. For the low users a much higher proportion (69%) answered 'No' - how their teacher feels about KnowledgeNet has no bearing on their own opinion with a lower portion (31%) answering 'Yes' - they think the teachers opinion of KnowledgeNet will in turn affect their own opinion. This can also be considered a factor in the usage frequency differences between low and high users which will be discussed in chapter 5.

There were also some variances seen between high and low users opinions when asked if they thought KnowledgeNet could transform student learning. As Figure 6 shows there are quite different opinions from students depending on whether they were high users or low users of KnowledgeNet, when it came to the question of if they thought KnowledgeNet can transform student learning. This data is taken from student focus groups. At the end of the session students were asked if used to its full capabilities could KnowledgeNet transform student learning.

Figure 6: Users perception of whether KnowledgeNet can transform learning.



All of the high user respondents answered ‘No’ KnowledgeNet could not possibly transform learning; it could make learning more efficient but would not actually transform it. In comparison 33% of low user respondents thought that there was a chance KnowledgeNet could transform their learning. Not in the current way it was being used in the case study school, but if it was being used to its full capabilities.

Of note here is two participants in the low user group have used KnowledgeNet before at their intermediate school. They felt the way it was used at their previous school was much better than it is currently being used in the case study school. This might account for the differences in perceptions of being able to transform learning. As shown in Figure 7 (p.49), both high and low users have different opinions as to how the system is currently used and could be further used in their school.

High users did not really discuss in detail what KnowledgeNet does or could do, there answers indicated they were happy with its current use as a content management tool, but it also indicates they may not know what functionality KnowledgeNet actually has outside its current use. Generally high users would like a chat facility added, along with external website and video links.

High users would like KnowledgeNet to be used as a hard drive for storage of school documents they could access from home rather than bringing in USB drives to download documents or getting them emailed to them (which is the current practice with many of their teachers).

Low users on the other hand, had quite a bit to say about the functionality currently being used or which could be used from KnowledgeNet. There are two experienced users in this group, who have had extensive use of KnowledgeNet at another school, so are more aware of the functionality of KnowledgeNet on the whole. Low users talk about the ability to have chat tutorials and interactions between teachers and students. Also have your own pages which can be amended and added to. These pages can be

seen by relevant teachers and commented on. There were some similar findings between high and low users in how they thought KnowledgeNet could be better used. Both users thought training was required – high users thought teachers required more training, whereas low users thought both teacher and student users could do with further training. Low users thought better organisation of material and more frequent reference to KnowledgeNet and use was needed.

High users thought the links needed updating and more regular use. High users also thought the user interface was dated and should be adaptable by the user with more colours and picture upload available. These high user ideas are largely cosmetic which could also indicate a lack of knowledge on what functionality KnowledgeNet actually has.

The next section will look at research question 3, which talks about the enablers and impediments to the use of KnowledgeNet.

Figure 7: Ways students think KnowledgeNet can be used or improved (R= individual student respondent).

Idea	Low User ideas	High User ideas
Things you can do on KnowledgeNet, including things not being done in your school now?	"Teachers put extra notes on it and could run chat tutorials" (R1) "Have your own page and click through to other pages, there's really not much to it" (R2) "Interaction between teachers and students" (R3) "You can have your own page which logs all you've done and add links and stuff" (R4) At our other school we used it for homework where teacher made comments on individuals pages (R5)	"Could have a chat site on there" (R1) "Links to external websites, file storage facility, lots of exemplars" (R2) "Chat site, video links" (R3)
Ways KnowledgeNet could be improved.	Exemplars and marking criteria would be good. Teachers could put extra notes there and use it more (R1) Train users and teachers on it properly (R2) Regularly post homework on it so we had to use it, teachers not currently using it (R3) Better organized resources, they are there but could be better organized (R4) "At my previous school we used it heaps but here it is not referred to much" (R5)	"Teachers trained properly how to use it." (R3) "I don't like how my teachers cannot upload files" (R2) Needs to be more modern. Should be able to individualise it (R1) File links all updated and working so when you go onto a page it has working links. (R4) I would enable students to create their own pages, change colours and add pictures. Also add chat functionality (R5)

4.3 Perceived enablers and impediments for users of KnowledgeNet.

Research Question 3: What are the enablers and impediments, as perceived by users, of KnowledgeNet?

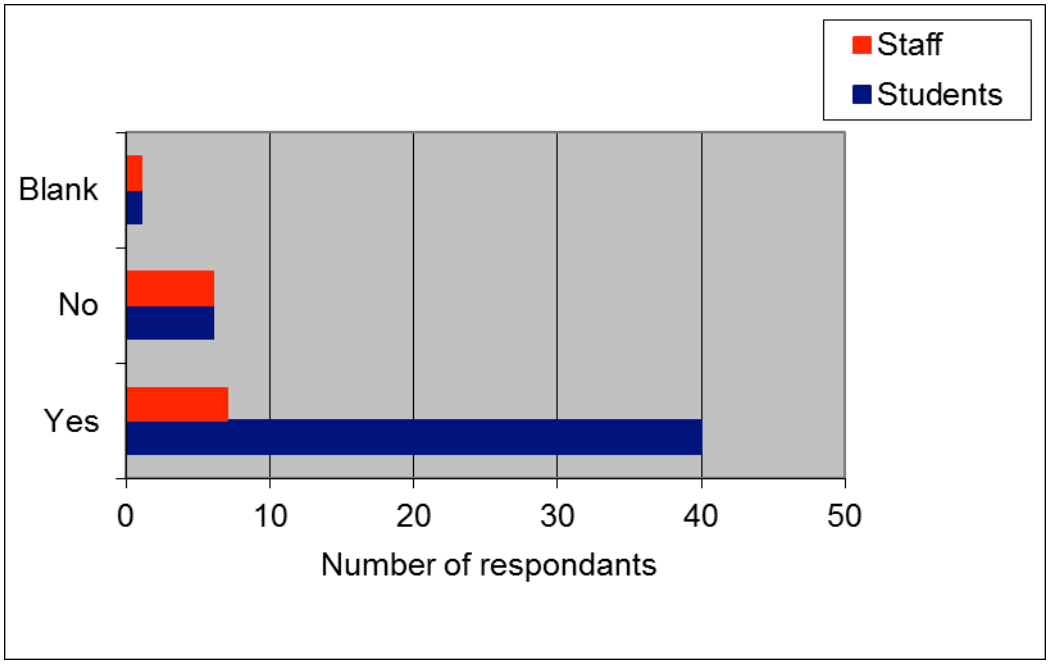
In order to answer the question as to what enablers and impediments exist for the users of KnowledgeNet at the school, the researcher has used questionnaire, interview and focus group responses.

Enablers

In the first instance data obtained from the questionnaires was analysed to see whether users think that KnowledgeNet is easy to use. From Figure 8 you can see a very high proportion of total users say yes KnowledgeNet is easy to use (77%).

However, there are different perceptions on 'ease of use' from the perspective of students and staff. So for this question the data has been analysed individually for the student and staff user groups.

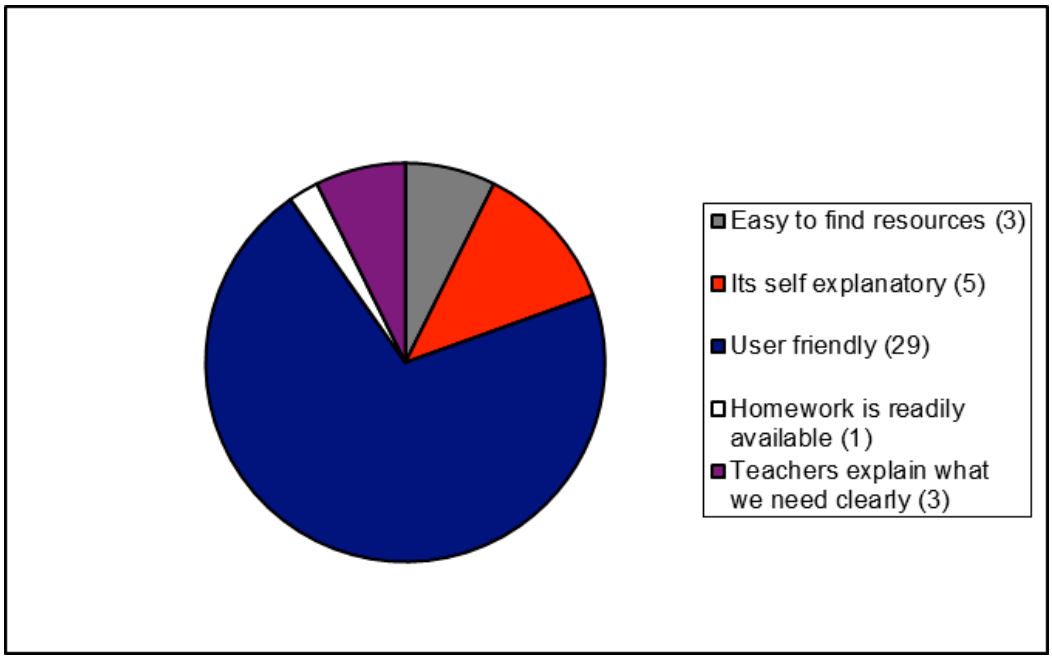
Figure 8: Graph showing if users think KnowledgeNet is easy to use.



Students

An overwhelming 87% of students thought that KnowledgeNet was easy to use. The main reason they gave for KnowledgeNet ease of use was that it was 'user friendly'. As Figure 9 shows the other reasons users gave for ease of use were: it is easy to find resources there, it is very self-explanatory when using it, it's really good for homework, and lastly, the teachers explain fully what we need to do.

Figure 9: Why students find KnowledgeNet easy to use.



This can be considered an enabler for students, as ease of use is crucial for effective LMS implementation and ongoing use. There were some students who thought KnowledgeNet can be difficult to use (13%). Of the 13% of students who think KnowledgeNet can be difficult to use, the main reason given was - it's just not user friendly (67%) or it is confusing (33%).

Staff

In contrast, only 54% of staff thought KnowledgeNet was easy to use. The staff reasons for thinking KnowledgeNet is easy to use are shown in Figure 10 (p.52).

Figure 10: Reasons why staff think KnowledgeNet is easy to use (S= individual staff respondent).	
KnowledgeNet is easy to use.	"Menus easy to work around" (S1) "Well set out and easy to navigate from subject to subject" (S3) "Once you get use to it, it's easy to use. Was a little confusing at first" (S4)

Of the 46% of staff who think KnowledgeNet can be difficult to use, the main reasons given were, its just not user friendly (33%) and it can be confusing (33%). Other reasons taken from questionnaire responses are: no time to investigate and learn new system and forgotten password (responses shown in Figure 11).

Figure 11: Reasons why staff think KnowledgeNet is not easy to use (S= individual staff respondent).	
KnowledgeNet is not easy to use.	"New version and not yet had time to explore it" (S6) "Not very intuitive" (S2) "Easy enough for students to log in but not so easy to create pages and upload material" (S4) "Not user friendly " (S7) "Training sessions go beyond my understanding" (S11) "Forgotten password" (S12)

So ease of use appears to be an enabler for the student users and possibly a barrier for some of the staff from questionnaire responses

alone. However, when adding focus group and interview data, ability to use the system is possibly a barrier to use for both groups. This will be discussed further below.

Another enabler for staff users would appear to be availability of help and who to go to for help when needed. The staff interviewed could not be more complimentary about the IT Managers support, availability and help when issues with KnowledgeNet arose. Staff have been offered multiple training sessions, had pages uploaded when requested and had main subject pages designed and set up for them, to ease their transition into the new system. A second administrator was assigned to help with editing, uploading and password changes. Staff recognises and appreciates this support, which can be shown in the comments recorded in Figure 12 taken from interviews with staff.

So for staff where and who to go to for help appears to be an enabler, as this support enables users to get to know the system with support and assistance as and when they need it.

Figure 12: Staff opinion on the help available with KnowledgeNet (S = individual staff respondent).

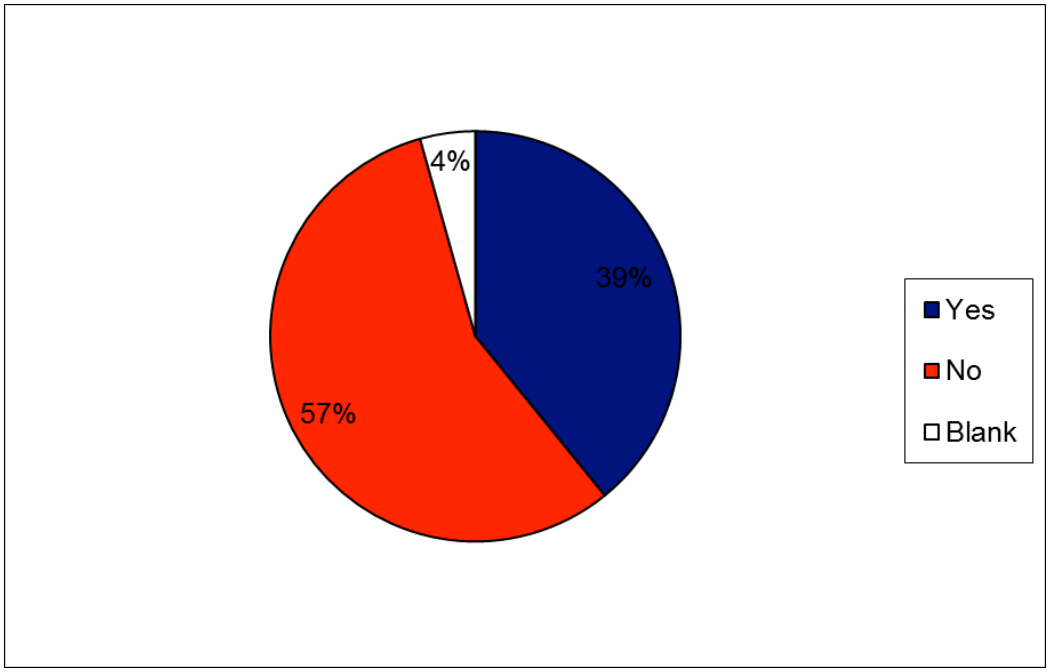
IT manager and administrator very approachable and always there when needed.	"Always there if you have a question" (S5) "She is very approachable and I can ask her for anything I may not know how to do" (S1) "IT staff always there for staff if they're stuck or need help" (S2) "At least two KnowledgeNet experts available all the time, open door policy" (S3)

Impediments to Use

Unfortunately student user perception of who and where to go for help was not as positive as the staff users. The next question from the questionnaire which we can look at is 'how the system was shown to the user'. When asked if they had ever been shown how to use KnowledgeNet by a staff member at the school, over 30% of student users answered 'No'. In addition to this, when asked the two additional questions; if they were able to get help or do you know who to go to for help, nearly 20% of users answered 'No' to both questions. This would appear to be a perceived barrier for students: users do not know where to go or who to call, if they need help.

As over 30% of the students felt they did not get shown how to use KnowledgeNet it was not surprising when asked if they thought how their teacher felt about KnowledgeNet affected their own opinion, over 39% of student users said yes they did think it affected them.

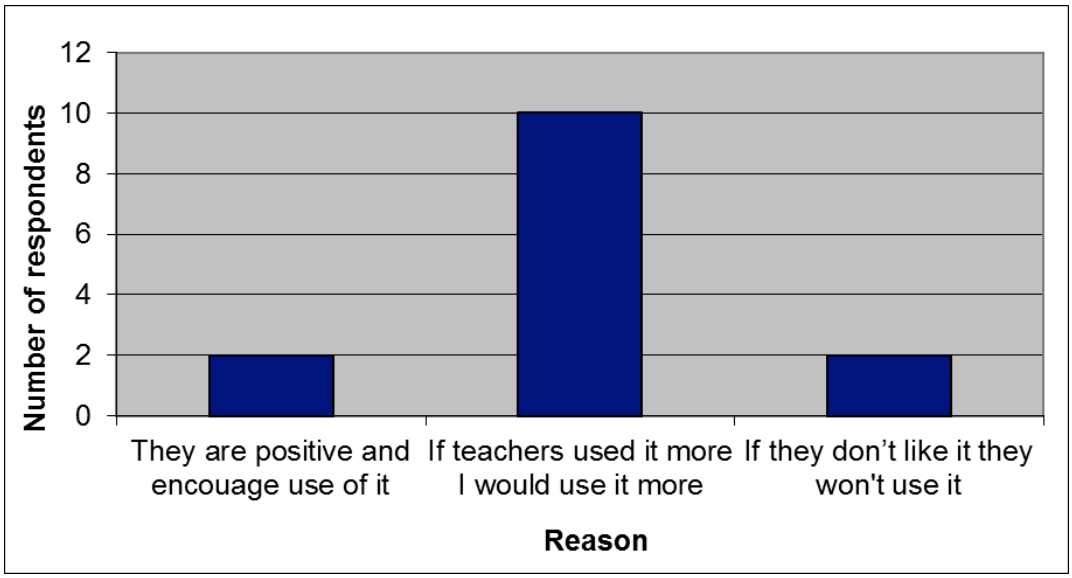
Figure 13: Does how a teacher feels about KnowledgeNet affect student opinion of the system.



Students

As shown in Figure 13 (p.54), 39% is a large portion of users. These users gave reasons as to why they thought their teacher's opinion of KnowledgeNet, in turn affected their own opinions. The reasons they gave can be seen in Figure 14. By far, the main reason users thought it made a difference to their opinions, if their teachers thought highly of KnowledgeNet, was because if teachers used it more then the student would want to use it more. The other two reasons given were: if they don't like it they won't use it and if they were positive about KnowledgeNet, it could encourage the further use of it.

Figure 14: Reasons why student users thought, how their teacher feels about KnowledgeNet affects their own opinions.



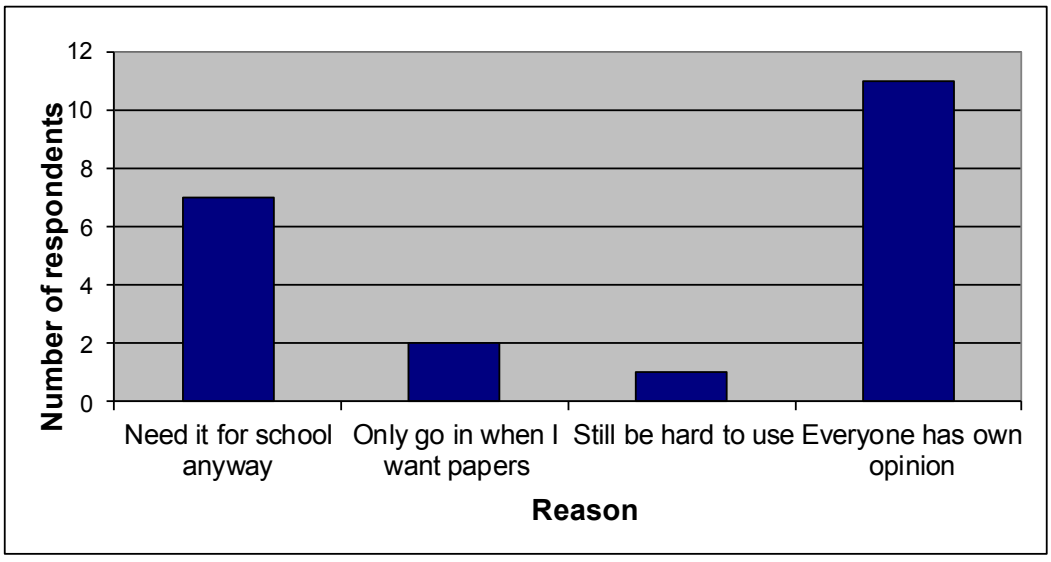
In addition to the questionnaire data, from student focus groups (Figure 15, p.56) a reason given for low levels of KnowledgeNet use were around teachers not using it enough themselves, not knowing how to use it properly and not encouraging the use of it.

Figure 15: Examples of comments made by students drawn from focus groups about possible barriers to using KnowledgeNet.	
Teachers not using it. (R=individual student respondent).	"Not enough material up there...teachers aren't really actively using it" (R1) "Put more resources up there" (R2) "Teachers don't change stuff very often" (R3) "If updated more recently, it would be more useful" (R4) "We get emailed out notes directly from our teacher, rather than going on KnowledgeNet" (R5) "Teacher asks us to bring flash drives and he just puts heaps of stuff on there" (R6) "More regular updates from teachers would make them want to use it" (R7)
Teachers not knowing how to use it properly.	"Teachers don't know about it themselves" (R5) "Train teachers how to use it" (R2)
Teachers do not encourage use of KnowledgeNet.	"Teachers don't talk about it" (R3) "The teachers never refer to it" (R2) "You wouldn't need to go on it, if the teachers didn't need you to go on it" (R1) "No, it hasn't really been mentioned" (R8) "The teachers should encourage us to use it more" (R6)

On the other hand there were many users who thought how their teacher viewed KnowledgeNet was not important to them. Their reasons are shown in Figure 16.

Of the 57% who thought what someone else thinks has no bearing on their choices, the overwhelming majority thought everyone was an individual and had their own opinions (50%), so they would not be influenced by another user at all. The other reasons given were the system was still hard to use, I only go on when I want to access papers, and second largest majority (33%); I would need it for school anyway, so what my teacher thinks is irrelevant.

Figure 16: Reasons why student users thought, how their teacher feels about KnowledgeNet does not affect their own opinion.



Because there are over one in three users (39%) who think that their teacher has an influence on their use of KnowledgeNet, this is considered another perceived barrier: Teachers opinion or lack of use of the system could affect student usage levels.

Staff

The staff were also asked if how they felt about computers affects their opinion of KnowledgeNet. Over 78% said yes they thought it did.

Table 11: Staff user perception on whether their opinion of computers affects their opinion of KnowledgeNet.	
Opinion	**Percentage**
Yes	78%
No	22%

Table 11 shows the majority of staff perceive that their opinion of IT affects their opinion of KnowledgeNet. There were three varying reasons given as to why their opinion of IT in general affects their opinion of KnowledgeNet. Some staff supported KnowledgeNet use as technology was enjoyed so they thought KnowledgeNet would be useful. Some staff thought KnowledgeNet would not be enjoyed because they did not like technology in general. The last group could not believe KnowledgeNet was so hard to use when they found technology in general easy to use. The individual staff comments are shown in Figure 17 (p.59).

Figure 17: Does staff opinion of IT in turn affect their opinion of KnowledgeNet (S= individual staff respondent).	
KnowledgeNet liked/used because of prior technology feelings.	"Some features are difficult to use, but if you like computers you will work through it" (S1) "General attitude affects how much time and effort I am willing to put in" (S2)
KnowledgeNet not liked because of prior technology opinions.	"People who don't like computers don't like KnowledgeNet and use that as an excuse" (S3) "Frustration when they don't work as expected" (S4)
Disbelief that KnowledgeNet was so difficult to use, as generally the user liked technology.	"As I am proficient with computers it frustrates me KnowledgeNet is not easier to use" (S3) "I find it easier to get the kids to access L drive, they find it easier to access and I find it easier to manage" (S2) "I do not mind using technology" (S6) "I am reasonably competent in computer use" (S5)

A fourth question which can highlight perceived barriers to use can be analysed from the question "what would make you use the system more?" When asked to rank the things the school could do to make a user want to use the system more students came up with the results in Table 12 (p.60).

The top three categories in this table had very similar results:

1. More time to use computers (7),
2. A chat site on KnowledgeNet (6) and
3. Assignments posted on KnowledgeNet (6).

Table 12: Student perceptions on things their school could do to make users want to use KnowledgeNet more.										
Thing that makes you want to use KnowledgeNet more	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**	**9th**	**10th**
More time to use IT in school	7	3	1	1	1	1	5	3	3	1
Teachers talk about KnowledgeNet more	0	0	1	3	3	4	5	2	8	0
IT available for use in my own time	0	2	2	2	4	3	5	4	4	0
Have a chat site	6	2	4	4	2	2	0	2	3	1
More training	0	0	1	5	4	4	3	7	1	1
Assignments posted on KnowledgeNet	6	5	3	6	3	0	0	0	2	1
More things to use on KnowledgeNet	2	3	9	2	3	2	1	2	2	0
Work more on KnowledgeNet in class	0	3	2	2	4	3	7	3	2	0
Extra teaching material to read in my own time	3	7	3	1	1	7	0	3	1	0
Other – listed individually	2	1	0	0	1	0	0	0	0	21

Even when combining the top three choices together (Table 13, p.61) and ranking the 'top three things you would like your school to do so you would use KnowledgeNet more' gave very similar findings.

However, the top 3 items selected could really be grouped in the same category: the desire for additional material loaded onto KnowledgeNet or teachers uploading more content to keep students using it.

1st equal =Assignments posted on KnowledgeNet (14)
=More things to use on KnowledgeNet (14)
3rd Extra teaching material to read in my own time (13)

This once again highlights the idea that teachers are not using KnowledgeNet enough, a barrier already mentioned (p.57).

Table 13 – Top three things the school could do to make students use KnowledgeNet more.				
Thing that makes you want to use KnowledgeNet more	**1st**	**2nd**	**3rd**	**Total**
More time to use IT in school	7	3	1	11
Teachers talk about KnowledgeNet more	0	0	1	1
IT available for use in my own time	0	2	2	4
Have a chat site	6	2	4	12
More training	0	0	1	1
Assignments posted on KnowledgeNet	6	5	3	14
More things to use on KnowledgeNet	2	3	9	14
Work more on KnowledgeNet in class	0	3	2	5
Extra teaching material to read in my own time	3	7	3	13
Other - listed individually	2	1	0	3

Students feel there is no incentive for them to go onto the system and so they do not. Either, material is not loaded up frequently enough, teachers are not consistent within and between subjects in loading material onto the site, or material is old and out of date. This was a theme brought up repeatedly in the focus group discussions as barriers to KnowledgeNet use, as shown in Figure 18 (p.62).

Figure 18: Things students perceive as barriers and enablers when using KnowledgeNet (R= individual student respondent).	
Things students perceive as barriers to frequent use.	"I don't really use it as there is nothing on it I need" (R1) "There's not enough material up there" (R2) "There's nothing that makes you go on to it"…"I would if they update it more" (R3) The material is "old and not from my teacher" (R4) "Lots of stuff on there is outdated and teachers don't change stuff very often." (R5) "There are links for specific classes but if you are not in that class you cannot access it" (R6)
Things students perceive as enablers if done right.	"We'd use it a bit more if we had to do stuff on it" (R2) "More resources to use, put all the resources in class up there too" (R1) "Teachers should encourage us to use it, put more up there" (R7)

Students were quite clear on the fact that material was there, but it was old, out of date or not accessible to them. Yes they could access old exam papers, which they do, but this was only a couple of times a year and they could source these elsewhere if they really wanted too. Another possible barrier to use is: nothing to go on and look at as teachers are not using it regularly.

This perception that students have of teachers not valuing or using the system can also be shown in the question which asked 'how many of the teachers talk about KnowledgeNet'.

Table 14: How many teachers talk about KnowledgeNet in class.	
All	1
Some	38
None	7

In Table 14, it shows that only one student had all teachers talking about KnowledgeNet in class, seven had none of their teachers talking about KnowledgeNet and 38 had some of the teachers doing so. This also supports the barrier introduced above: teachers lack of use could in turn affect student usage.

In addition to student ideas on barriers to use, staff were also questioned about what would make them use KnowledgeNet more often. These highlighted enablers and barriers to use from staff perspectives, as to why these teachers were maybe not discussing the system with their students.

As the numbers of staff questioned are quite low there is not really enough variation from the data to get a definitive picture of the key things staff would like to see. By comparing the top three things staff think would make them use KnowledgeNet more (as shown in Table 15, p.64), it is clear staff feel they need more support before they will start using KnowledgeNet more.

Results for top 3 things which would encourage staff use were:

1st = Groups to discuss ideas & create shared resources (7)

2nd = More training on KnowledgeNet (6)

3rd = More time to prepare KnowledgeNet material (5)

= Management directive to use KnowledgeNet more (5)

Table 15: Things that staff perceived would make them want to use KnowledgeNet more.				
Item	**1st**	**2nd**	**3rd**	**Totals**
Groups to discuss and create shared resources	2	0	5	7
More KnowledgeNet training	2	2	2	6
Own computer for use at home	2	0	1	3
Other	2	0	0	2
More time to prepare KnowledgeNet material	2	3	0	5
More general IT training	0	3	0	3
More computers available for class teaching	0	1	1	2
Management directive to use KnowledgeNet more	3	1	1	5

These results have identified another two possible barriers to staff use of KnowledgeNet:

1. Requirement for more training on the system, perhaps in a buddy or group based setting rather than one-on-one or full staff setting, and
2. Additional time to create resources and learn the system

In addition to time and training two interesting requirements were highlighted by staff as things which would encourage use (from Table 15).

1. There was a strong interest in forming working groups to discuss and collaborate on resources and
2. There was a speculation that if management directed people to use the system this would result in greater use overall.

Two items which scored very low in priorities for teachers as an encouragement to further use of KnowledgeNet as shown in Table 15 were access to their own computer to practice using KnowledgeNet and access to more computers for class work. For teachers individual access to computers is not a problem, as they had “laptops for all teachers”

introduced around the same time as KnowledgeNet so this could be considered an enabler: teachers have adequate access to individual laptops. With the item access to more computers for class work, there were almost equal results for teachers who wanted more access and those who thought access was not a problem. As shown in Table 16, some of the staff thought more access to computers would be beneficial.

Table 16: Perceptions of staff on available access to KnowledgeNet.

Access	**Number of responses**
No problem accessing KnowledgeNet	7
Require more access	8
Don't know	1

Of those that indicated more access to computers would be beneficial, three wanted to see computers in each class for everyday use**.** Therefore a minor barrier to use for the case study school could be: everyday access to computers at school during class time.

However, from the perceptions of ease of use from staff and students, just providing the computers may not increase the level of use. Findings indicate that despite 77% of all users saying KnowledgeNet was easy to use (Figure 8, p.50) some users indicate there are user issues with KnowledgeNet. These issues came up in some of the staff interviews, and student focus groups. Figure 19 (p.66) shows examples of some comments made by staff in interviews on how easy to use KnowledgeNet is.

Figure 19: Comments made by staff on whether KnowledgeNet is easy to use (S=individual staff respondent).	
Staff find KnowledgeNet difficult to use.	"It does not seem user friendly – too complicated" (S1) "I find it a bit tricky, for me it's not very self-explanatory" (S3)
Some other user issues identified.	"I don't know what to do but it gets done" (S4) "I have no trouble using it but it can be difficult for the students" (S2)

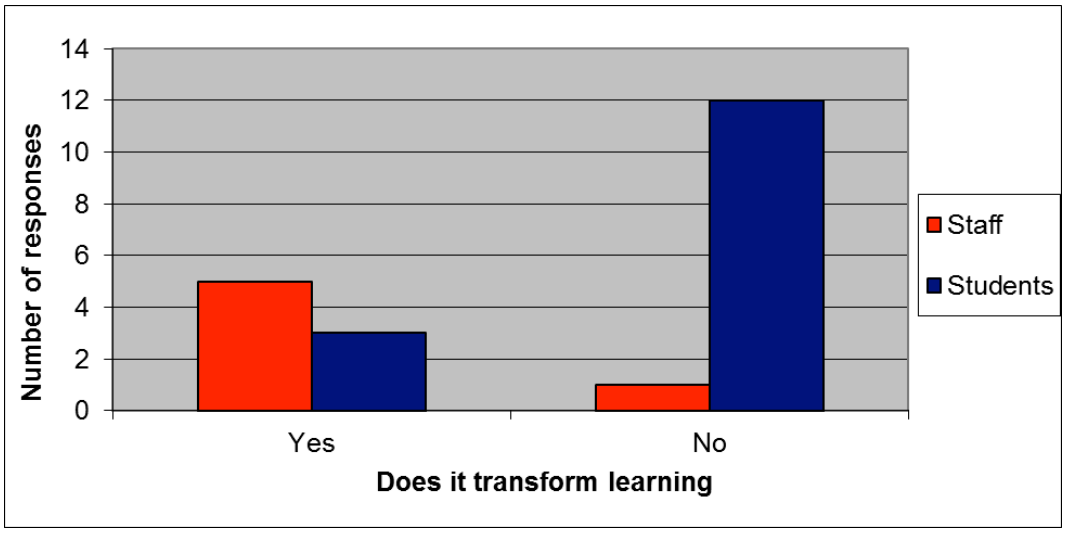
Figure 20 shows examples of some comments made by students in focus groups on how easy to use KnowledgeNet is. While the majority of individual participants the researcher spoke to said they were comfortable using KnowledgeNet, promotion of the system's features and training were identified as possible barriers required to be overcome for wider use of the system by other students.

Figure 20: Comments made by students on whether KnowledgeNet is easy to use (R= individual student respondent).	
Student perception: More training is required.	"We haven't fully been taught how to use it" (R1) "Some people who haven't used it at another school, wouldn't know how to use it" (R2) "Maybe if we were taught how to use it properly" (R3) "I would promote it so everyone knew what it could do" (R4)

These results add 'student training' to that of staff as a possible barrier to use. In addition to training, students felt 'promotion of the features of KnowledgeNet' to all users was required.

Another perceived barrier which resulted from staff interviews and focus groups was whether the user thinks KnowledgeNet can transform student learning.

Figure 21: Does the user think KnowledgeNet can transform learning.



From Figure 21 more respondents think that KnowledgeNet is not the tool to transform learning (13) compared to those who think it could (8). There is variance between staff and student responses. Only 20% of students think KnowledgeNet has the ability to transform learning, compared to 83% of staff who hold the same belief. This may stem from a difference in understanding about what functionality KnowledgeNet has between students and teachers, but this study did not test this theory.

The majority of these users are students who do not think KnowledgeNet can transform their learning, especially the way it was currently being used. Individual comments are shown in Figure 22 (p.68). This concept can be considered a barrier: perceptions of individual affect overall use of the system.

Figure 22: Student focus group thoughts on whether KnowledgeNet has the potential to enhance learning (R= individual student respondent).	
Yes it does have the potential, but not currently as it is being used.	"Yes – could be used more if everyone had access in every class" (R1) "yes – if access was consistent in classes" (R2)
No it does not have the potential.	"No – it's still school" (R4) "No – won't go that far" (R5) "No – still be able to learn without it" (R6)

4.4 Conclusions

Table 17 (P.69) shows a summarised list of the enablers and barriers of KnowledgeNet at the case study school as identified in Chapter 4. These enablers and barriers have come from all the findings presented in this study.

Having presented the findings of the project in Chapter four, the next Chapter will discuss the issues that emerge from these findings.

Table 17: Summary list of possible barriers and enablers to the use of KnowledgeNet.	
Enablers	**Barriers**
Ease of use.	Students do not know where or who to go to for help
Staff have good assistance when needed.	Users require more training (both students and staff)
Staff access to personal computers.	Staff would like more time to learn, upload and create on KnowledgeNet
	Require more promotion of site as some do not know what it can do
	Individual affects use of others - teachers opinions or lack of use can affect student use - Material not uploaded regularly can affect regular student use - Prior opinions of technology can influence use of KnowledgeNet
	Faulty links on system deter users from regularly logging onto system
	More access to computers in teaching classrooms

CHAPTER 5
Discussion and Conclusions

The "majority of teachers think that ICT can improve learning outcomes but they think that ICT has little or no impact on their methodology"

(Balanskat et al., 2007, p.8.)

5.0 Introduction

This chapter discusses the project's findings and presents the conclusions drawn. The chapter begins by discussing the reasons KnowledgeNet was implemented in the case study school and whether it has fulfilled this purpose (5.1). In Section 5.2, findings related to frequency and patterns of usage within the school are discussed and Section 5.3 considers the identified enablers and impediments to the use of KnowledgeNet. Section 5.4 discusses the limitations of the study, and this is followed by a summary of the main conclusions drawn from the study's findings. Chapter 5 concludes with recommendations for further research in this area.

5.1 An effective implementation

The research project found KnowledgeNet was implemented to act as a secure portal to enable the storage and access of documents for students and staff between school and home. KnowledgeNet has successfully achieved this directive. However, this shows KnowledgeNet being used as a content management system (LCMS) rather than a student learning management system (LMS).

Although KnowledgeNet advertises that it can transform learning experiences (Dataview, 2010), in that it allows for individual learning programs and communication between schools and communities, this is not how KnowledgeNet is currently being used in the case study school. While KnowledgeNet may have the functionality to transform learning, in reality achieving this transformation is no simple task. There are many schools using LMS, but most, like the case study school, are using them

more as LCMS (Watson and Watson, 2007). Many schools are using a fraction of the functionality of the LMS they have purchased, which in turn means they are not seeing the promised transformation of learning. This is in line with international research that has found, "studies looking at the use of LMS do not give a positive picture in terms of their pedagogical use" (Balanskat et al., 2007, p.38). It is not until schools start to use the individualised learning programs achievable in LMS like KnowledgeNet that transformed learning is likely to occur.

The implementation of a LMS is an endeavour which takes time and will have different outcomes at different sites (Marshall, 2010). This is dependent on the ethos of the school and its staff. One of the main factors found to influence the success of an IT implementation is how the school has gone about introducing the system and if it has the buy-in of all the staff (Hoffman, 1996). Findings from this study show that some areas of the school are using KnowledgeNet extensively in their daily practice while other areas were not using it at all. This is in line with other LMS research reviewed in Chapter 2 which indicates that, unless there is approval and buy-in from all the users within the school, individual beliefs will have a significant influence on whether the system is used or not (Mumtaz, 2000).

5.2 Usage frequency and patterns of use

While the case study school did not have full buy-in from all the users, it would appear from usage data that KnowledgeNet has been accepted by a large portion of the school. The second research question looked at how often KnowledgeNet was actually being used and at patterns of usage. There were some variations found between data downloaded directly from KnowledgeNet and user perceptions gathered from questionnaires, focus groups and interviews. Whether this variation was because the participants selected are not representative of the whole user population at the case study school is not known at this stage, and is further discussed as a limitation of this research project in Section 5.4.

5.2.1 Frequency of use

From data in the KnowledgeNet logs there are high numbers of students and staff logging into KnowledgeNet on a regular basis. Student users logged in more than staff in general, but quite interesting was the fact that at the high end of the usage data, for users who logged in over 60 times a term, the student and staff ratios were almost identical. These findings are supported by current research data which suggest teachers who want to use KnowledgeNet and are encouraged by leaders and peers in their subject areas will use a LMS frequently, whereas those who are not interested or encouraged will struggle to use it at all (Balanskat et al., 2007). The users at the high end are those individuals who believe in the value of the system and encourage its use accordingly.

Questionnaire data results varied from user logs exported from KnowledgeNet. Student users thought they did not use the system very often. Staff users showed a varied pattern, with two different types of staff user emerging; those who use KnowledgeNet frequently and those who use it sparingly. This data supports the focus group data which had students complaining about the lack of use of KnowledgeNet by most of their teachers. The only subject areas which the students perceived to use KnowledgeNet frequently were Mathematics and Science.

5.2.2 Duration of use

Length of use of KnowledgeNet was also researched to see if the duration the user had been exposed to KnowledgeNet reflected on their ability to use the system. Student exposure to KnowledgeNet was generally quite high. Staff users showed more individual variation than the student group. Staff exposure was spread across the entire usage spectrum. It is unknown if this is representative of the entire staff user group. The staff invited to participate in this study were a small number of the total staff on site (around 10% of total population present at the study site). The different exposure durations to KnowledgeNet could account for why some staff showed more frequent use than others, but there is not enough information to make a definitive finding from the present study.

The users of KnowledgeNet at the school have been exposed to the program for several years. The majority of them have been using KnowledgeNet for over 3 years, many with over 4 years use. This is enough time to ascertain how they feel about the system and resolve any user issues. This shows a mature user base which should be starting to make effective use of the system. Balanskat et al. (2007) has made reference to the pivotal point of the implementation process where initially there appears to be little going on in the form of change and then the pivotal change occurs and there is a leap in progress once all users have passed a certain point. It would appear that the case study school could be nearing this pivotal point. They have a high number of registered users who appear to be using the system regularly, but as yet little change in learning outcomes has been seen.

5.2.3 What users think KnowledgeNet should be used for

Another area looked at within usage patterns was what users thought KnowledgeNet should be used for. The findings from this question showed a strong affiliation to KnowledgeNet being used as a learning content management system (LCMS). Both staff and students had similar views and indicated that KnowledgeNet was commonly used for managing content and they would like it used more regularly for this. Other KnowledgeNet facilities such as the chat/communication facility is yet to be set up, but is something users would like to see introduced.

5.2.4 Differences in high and low user perceptions

The last area examined for patterns of use was the presence of differences between high users and low users which might account for the variations in usage frequency. There were no significant differences found in how long the users had been using KnowledgeNet or the perceptions of how easy to use the system was. Neither were there real differences between high and low users in whether they were shown how to use the system or not. It was only when the researcher started to investigate perceptions of individuals on the topics of 1) what would influence the respondent to use the system more or 2) what affect other users may have

over another individual's KnowledgeNet use, that some variance started to emerge between user groups.

The first difference seen from the high user and low user comparison was in what things the users perceived would make them want to use KnowledgeNet more. Low users appeared to be more socially driven in their selections. They wanted to use KnowledgeNet more during class time, have lots more interactive activities loaded onto the system and maybe add a chat site to KnowledgeNet. High users were more interested in enhancing their current use of the system by adding more material to revise, assignments posted on the site, and more activities to do on KnowledgeNet. This could highlight a difference in user profiles of the high user and low user group, but there is not enough information on the users to ascertain the cause of the differences.

The second difference in the high user and low user comparison was whether the user thought their teachers talked about KnowledgeNet in class. A large portion of high users thought 'some' of their teachers talked about KnowledgeNet (and from the results recorded it could be assumed those teachers are in Mathematics and Science) whereas low users also had high numbers who thought 'some' teachers talked about KnowledgeNet but they also had 1/3 of users who thought none of their teachers talked about KnowledgeNet. This could indicate a significant barrier to use for these students. If their teachers are not encouraging the use of the system it follows the students will probably not use it either. There is a strong indication that where the teacher is not talking about or using KnowledgeNet, the students are not using KnowledgeNet.

The next difference in user frequency was whether the user thought how their teacher felt about KnowledgeNet could in turn affect their own opinion of the system. High users had fairly even opinions with half thinking that how their teacher feels about KnowledgeNet does affect their own opinions, and the other half thinking it does not. Low users show quite a different result. 2/3 of low users think that what their teacher thinks has no

effect on their use or opinion of the system. This shows naivety, where the user is perhaps unaware of the influence others actually have over how often they will use KnowledgeNet. The reality of the matter is the teacher can have quite a strong effect on whether the user has to use KnowledgeNet as part of their learning experience. It would appear these low users have yet to be influenced by their teachers (who are possibly not using KnowledgeNet as often as they could), so the student is unaware how influential their teacher could be in the usage requirements of this system.

A final area which showed variance between high user and low user perception was whether KnowledgeNet could transform a student's learning experience. High users did not believe that KnowledgeNet had the ability to transform their learning experience, while some low use users thought maybe it could if used differently. Of note here is the presence of two low use students who had used KnowledgeNet at their intermediate school. These users were much more aware of the functionality of KnowledgeNet than other low users in the group and had quite a clear idea of the ways in which KnowledgeNet could assist in their learning. These two users were disappointed KnowledgeNet was not used as often at the case study school as it had been in their previous school.

What is clear from staff interviews and focus groups is that teachers and students have very busy lives. When a new system is implemented like KnowledgeNet you are not going to get full buy-in from all users immediately. What can be hoped is that over time the majority of the users will see the benefits of the system and eventually more and more users will take advantage of these benefits and use the system (Balanskat et al., 2007). This process can take many years and requires evaluation of the systems currently in use. What is difficult to manage is that there are many individuals involved in the implementation process and each user has prior conceptions and abilities. This prior knowledge can cause difficulties for the implementation process of such a large undertaking.

5.3 Perceived enablers and impediments of a LMS

The third question researched in this study investigated perceived enablers or impediments from a user perspective when using a LMS. Table 17 (p.69) highlighted all the enablers and impediments found during this study.

5.3.1 Perceived enablers

Firstly we will look at the enablers: easy to use system, staff help readily available, and teachers have adequate access to computers for planning and personal use. Having good access to help when needed and to personal computers gives staff the best basis from which to build effective usage levels on KnowledgeNet. By making sure staff have adequate support, but without the pressure of strict directives from management, enables the staff to use KnowledgeNet on their own terms. The case study school is allowing the staff to choose if they use the system or not. Some studies dispute this method and state management influence is required for successful implementations (Hoffman, 1996).

However, some teachers are actively using the system (Mathematics and Science) and some are not using KnowledgeNet at all, so lack of management directive has not impeded these high users. Some staff expressed, during interview, their satisfaction that there was no hard directive, so they generally appear happy with the current lack of management direction. Some staff did rank management direction as a way for more frequent use of KnowledgeNet, but generally staff wanted frr choice over their use of the system.

Ease of use assists all users, however, there was some question as to how easy to use the system actually is. Some staff users state the student interface is relatively straight forward, but setting up pages and uploading material can be difficult, this is why the case study school has opted to provide such extensive technical support to ensure lack of ability does not stop their staff from using the system. This works for some users, but has

had an opposite effect on others, who feel less capable of using the system so they don't.

5.3.2 Perceived impediments

There are a much higher number of perceived impediments to the use of KnowledgeNet from the case study school. The impediments are:

1. Some students may not know where or who to go to for help with the system.
2. All users require regular training on the system.
3. Staff require more time to learn, upload and create resources for KnowledgeNet.
4. The case study school could promote the functionality of KnowledgeNet so all users know what it is capable of doing.
5. Individual user patterns affect others (teachers' opinion and lack of use affect students, prior opinions of technology can affect opinion of KnowledgeNet, and material needs to be uploaded more regularly).
6. Faulty links on pages within the system discourage further use.
7. More access to computers is required in teaching classrooms.

These barriers to use can be put into two of the three categories of issues which affect all technology implementations that were introduced in the literature review in Chapter 2 (p.15).

1. Individual beliefs and values
2. Resources (McQueen, 2004).

5.3.2.1 Individual beliefs and values

Under this category can be placed the first five perceived barriers. The majority of barriers to use fall under the category of individuals' beliefs and values. This is in line with the research introduced in the literature review which reported that individual beliefs and values affect implementation of technology (Hammond et al, 2009; Jones, 2008; MOE, 2007; Pratt, 2008; Selwyn, 2008, Ward et al., 2004; Ward & Parr, 2008; Zhou & Xu, 2007), and it would seem this LMS implementation is no different.

In order for teachers to encourage the use of technology there needs to be additional incentive and value perceived by them in doing so (Hammond et al, 2009; Jones, 2008; McQueen, 2004; MOE, 2007; Mumtaz, 2000; Pratt, 2008; Selwyn, 2008, Ward et al., 2004; Ward & Parr, 2008; Zhou & Xu, 2007). Teachers need to be motivated themselves in order to motivate others (Balanskat et al., 2007). There needs to be incentives, professional development and the promotion of lifelong learning carried out by management for effective change to occur. It would appear from the comments made, that the school has not had extensive management directive to use KnowledgeNet. This is one of the important implementation issues raised in many studies, i.e. when management is not directing the process implementation can have problems (Balanskat et al., 2007; Mumtaz, 2000).

The complaint of not enough access to computers and not enough time to create resources are common ones in IT implementation research. The reality is teaching is a busy job, with many calls on available time. Teachers need to prioritise what is important to them, and those that complain of a lack of time do not prioritise LMS as important. Those that used the system more often did not complain about lack of time, while those that did not use the system found time an issue. This is a common theme seen in research on technology and LMS implementations, those teachers that believed in the value of the system found the time to use it while those that did not, found the excuse not to (McQueen, 2004; Tearle, 2004). Once teachers have embraced the technology, the issues with teachers not using the system, not encouraging student use and not knowing how to use the system soon become non-issues.

Being unable to use the system is a barrier that people may not actually be aware of if they have not been introduced to it effectively. When someone knows part of a system well, they perceive that they can use this system, when in fact they are actually only using the portion of the system they are comfortable with. The researcher would argue that if a system has never been properly introduced to a user, they are less likely to know

the details, usefulness and therefore full functionality of that system. Therefore the researcher agrees with users that suggest promotion of KnowledgeNet is needed.

The requirement for training can be a complex one. With users at different levels having different requirements it can be challenging to arrange adequate training for them all. Rather than tackle learning a new system, some teachers are using alternate methods to distribute material to students (email, flash drives, other drives and printed material). Others are happy to use the system, but use material uploaded by IT experts. There are few users who are regularly uploading content to the KnowledgeNet system for use by students. This role has been diverted to the KnowledgeNet administrator and manager, who are trying to ease their users into the system in the least invasive way possible. For some, usually hands on users, this has left the feeling of not being able to use the system adequately, so they don't. While for others this works really well and they refer to it regularly in their lessons as an added tool in their teaching repertoire.

Many of the users who choose not to use the system state they are happy with their current methods that they work, so why change. Technology is a rapidly evolving reality that has already changed the way things are done. Advances have been numerous, but there are still more to be introduced. As Tearle's (2004) research on change management has shown, those more open to change are better adapted to new experiences and will find themselves in a stronger position than those who continue to ignore the changes and always do what they have always done.

In addition to the barriers discussed above, staff identified two things they think would influence better use of KnowledgeNet, a) a staff buddy system or focus groups to allow for knowledge sharing and b) management directive to use the system (Table 15, page 64). These ideas are supported by recent research such as Balanskat et al. (2007) who report that peer associated learning experiences can help implementation

extensively. By having teachers actively involved with KnowledgeNet it allows them to have some ownership over the system and they are more likely to use it. In addition to this, by creating sub-user groups the training issue mentioned above of lots of different areas needing a variety of different kinds of support becomes more manageable as smaller peer groups can effectively manage more specific requirements.

5.3.2.2 Resources

The two remaining barriers to use fall under the resources category. Faulty links to pages which do not exist that remain unattended to and requests for more access to computers during class time are resource issues. Within the case study school, computer rooms were available for use but bookings could be challenging. Some users thought KnowledgeNet was for use at home, so computers at school were not essential. KnowledgeNet is a very versatile tool which is not intended to be used just by the students at home, but as with any other behaviour we wish to teach students, needs to be regularly modelled by teachers, parents and management. If enough people model the use of the system, it soon becomes common place and usage frequency would soon increase. To do this staff and students need to be regularly using KnowledgeNet in class.

With the laptops for teachers initiative from the New Zealand Ministry of Education (MOE, 2010), teachers can have their own computers but this does not remove the access problem for students in class. High users did not complain of access problems as they were all happy they had adequate access at home, if not at school. However, the low users did bring up the issue of not enough class time on computers and the belief that if they had access to computers in every class, KnowledgeNet would be used much more extensively. Having computers in classrooms is possibly a pre-determined eventuality. This is the way schools are moving, so access may not be a problem for long.

Faulty links are merely a communication issue. If staff were having regular focus group meetings or resource creation sessions, faulty links would soon be updated.

5.4 Limitations of the study

5.4.1 Small sample size

This study was carried out at one site, at one point in time and as such does not claim to include the opinions of all users of KnowledgeNet at the school. Due to time and funding constraints, it was not possible to do a complete school review of all the staff and students using KnowledgeNet. The relatively low numbers of respondents compared to the size of the school limits the extent to which these findings can be generalised, but they do provide insight into the perceptions of a cross section of the school population.

Although using data logs to pre-select participants have helped to reduce bias towards selecting a particular type of user, there is still the possibility, due to the relatively low sample size, that respondents were not representative of the school population. It is also not known from the data logs what each user is doing when they log into KnowledgeNet, how long they stay logged in or what areas they visit. This information would be helpful in gaining deeper insight into how the LMS is being used.

5.4.2 Access to participants

Although the researcher was an independent observer within the case study school and this provided a degree of objectivity for the study, being an outsider to the school may have made some participants, particularly staff, less comfortable with discussing their experiences and problems. However, the advantages of the researcher's independence from the case study school was considered to outweigh the potential ethical problems, such as possible researcher bias and undue influence on participants (Cohen et al., 2007), of conducting the research within the school where the researcher is employed.

5.5 Conclusions

The case study school implemented a learning management system (LMS) with the intention it would enable them to remove sensitive documents from their public website and make them accessible to students and staff from home. To this end, KnowledgeNet has served the purpose for which it was purchased. Studies the world over have claimed that LMS use is not transforming learning but, as with this case study school, many schools that have implemented a LMS are actually using them as learning content management systems (LCMS) (Watson and Watson, 2007) rather than genuine learning management systems (LMS). However, the fact that the school implemented a LMS means they are in a position to use the full features of their LMS in the future.

As the school develops their system, additional functionality can be turned on. In order to ensure their users will gain the full benefit of this system, and begin to see a greater impact on learning, the school will need to address the barriers to effective use of KnowledgeNet that users have identified in this study. To overcome the identified barriers, the school could consider the following actions:

- Promote the system to staff and students so everyone is aware of the functionality of the system, and who they can go to for help
- Provide regular training sessions, both full group and peer run sessions for both staff and students. Also have collaborative groups which create data and support each other.
- Provide incentives for teachers to use and promote the system with students, as how they present and use the system does have an effect on whether the students will use it.
- Secure additional non-contact time for staff to learn the system, develop resources and make sure current resources are adequately linked.
- Ensure management directives and incentives are created to encourage staff to use the system, as without their full buy-in the system will not be accepted into daily practice.

- Create a chat site/communication portal through which teacher-student and student-student communication can occur.

Once these barriers are addressed, there should be more extensive use of KnowledgeNet, and slowly individual learning paths can be created so students can start to see real transformation of their learning.

There are issues with the limited use of LMS technology (what we do not have are definitive solutions). The New Zealand Ministry of Education (MOE) has spent the last decade building solutions for schools to enable them to become 21st century ready. But despite claims of transformed and individualised learning opportunities, what has been seen is individual schools' struggling to implement new technologies with little or no assistance. What is missing is extensive evaluation of the systems already implemented and documented research accessible to schools on those implementations.

5.6 Recommendations for further research

There is a clear need for the development of a comprehensive implementation guide for schools on LMS. Before this can be done, there is a need for more research at school sites which have successfully (and unsuccessfully) implemented learning management systems, particularly in schools that currently use the three preferred LMS the MOE has selected as technology partners: Ultranet, KnowledgeNet and Moodle. This research should be carried out so a comparison can be made of the strengths and weaknesses of each system. In addition, information about the type of site each system is best implemented into would be helpful. Only then will schools have enough information on which to base informed selection of a new LMS.

Research into the degree to which a LMS can, or does, transform learning is also needed. While some teachers are convinced of the benefits of using LMS, others remain sceptical. Classroom based research on the impact of LMS on student learning needs to be accessible to schools so

that teachers can make effective professional decisions about their use of LMS.

Because the implementation of student learning management systems is so new, there are going to be many decisions to make and issues to resolve. However, with more collaboration and sharing between schools, more research done on systems currently in use, and effective guidance from the New Zealand Ministry of Education, New Zealand schools will be able to make better decisions about how best to implement learning management systems that meet the learning needs of their students.

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Appendices

Appendix 1 – Questionnaires

Student Questionnaire - Your perceptions and experiences using a student learning management system (KnowledgeNet) in school.

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Purpose of Questionnaire
This questionnaire is solely for the purposes of a research thesis paper, for a Waikato University Masters Degree. Your individual responses will remain anonymous and you can choose not to participate. Your responses will be used to understand student ideas on the use of KnowledgeNet (a student learning management system) in your school.

Questions
1. Are you Male / Female *(please circle one)*

2. What Year level are you? Year 9 / Year 10 / Year 11/ Year 12 / Year 13 *(please circle one)*

3. Have you ever used a computer program called KnowledgeNet at school? Yes / No *(please circle one*). If you answered no go to Question 7, if yes continue with Question 4.

4. How often do you use KnowledgeNet?
Less than once a term / once a term / once a month / once a week / more than once a week *(please circle one)*

5. How long have you been using KnowledgeNet?
Less than 1 year / 1 year / 2 years / 3 years / 4 years / More than 4 years *(please circle one)*

6. Do you think this system is easy to use? Yes / No *(please circle one)*
Why/Why not?

_____

_____

7. Have you ever been shown how to use KnowledgeNet by a staff member at school? Yes / No *(please circle one)*

8. Are you able to get help (if needed) when you are using KnowledgeNet at school? Yes / No *(please circle one)*

9. Do you know who could help you to use KnowledgeNet if you needed help? Yes / No *(please circle one)*

10. Please list possible people who could help you if you needed help with KnowledgeNet?

_____
_____

11. How many of your teachers talk in class about using KnowledgeNet?
All / Some / None *(please circle one)*

12. In your opinion do any of your teachers enjoy using KnowledgeNet?
Yes / No / Don't know *(please circle one).* If you answered Yes or No, why do you think this?

_____

13. Do you think how your teachers feel about using KnowledgeNet affects your opinion of the program?
Yes / No *(please circle one)*
Why/ Why not?

_____
_____

14. Please rank the following things your school could do to make you want to use KnowledgeNet or technology more.
1 = Most likely to make me use KnowledgeNet more, 10 = least likely to make me use KnowledgeNet more.

	More time to use computers during school		Assignments posted on KnowledgeNet
	Teachers talk about KnowledgeNet more		More things to use on KnowledgeNet
	Computer available for use in my own time		Working on KnowledgeNet while in class
	Chat site on KnowledgeNet so I can discuss course work with other students		Extra teaching material available to read in my own time and working examples available
	More training on how to use KnowledgeNet		Other? List here:

15. What things do you think KnowledgeNet should be used for?

_____
_____

16. What other software programs or websites do you use on a regular basis at school and at home?

_____
_____

17. Do you enjoy using computers? Yes / No *(please circle one)*
Why/ why not?

_____

Thank you for your time

Support Staff Questionnaire - Your perceptions and experiences in using a student learning management system (KnowledgeNet) in school.

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Purpose of Questionnaire
This questionnaire is solely for the purposes of a research thesis paper, for a Waikato University Masters Degree. Your individual responses will remain anonymous and you can choose not to participate. Your responses will be used to investigate the use of KnowledgeNet (a student learning management system) in your school.

Questions

1. Are you Male / Female *(please circle one)*

2. What is your role within the school?

_____

_____

3. Have you ever used a computer program called KnowledgeNet at school? Yes / No *(please circle one*). If you answered no go to Question 7, if yes continue with Question 4.

4. How often do you use KnowledgeNet?
Less than once a term / once a term / once a month / once a week / more than once a week (*please circle one)*

5. How long have you been using KnowledgeNet?
Less than 1 year / 1 year / 2 years / 3 years / 4 years / More than 4 years *(please circle one)*

6. Do you think KnowledgeNet is easy to use? Yes / No *(please circle one)*
Why/Why not?

_____

7. Have you received any training on how to use KnowledgeNet? Yes / No *(please circle one)*

8. Do you know who could help you to use KnowledgeNet if you needed help? Yes / No *(please circle one)*

9. Please list possible people who could help you if you needed help with KnowledgeNet?

_____

_____

10. Do you enjoy using Computers? Yes / No *(please circle one)*
Why/Why not?

_____
_____
_____

11. Do you think how you feel about using computers affects your opinion of KnowledgeNet?
Yes / No *(please circle one)*
Why/ Why not?

_____
_____

12. Please rank the following things your school could do to make you want to use KnowledgeNet or technology more.
1 = Most likely to make me use KnowledgeNet more, 7 = least likely to make me use KnowledgeNet more.

	Groups/network to discuss KnowledgeNet and prepare resources jointly		More time made available to prepare KnowledgeNet material
	More training on how to use KnowledgeNet		More general computer training
	Computer available for use in my own time		Management directive to use KnowledgeNet more
	Other? List here:		

13. What things do you think KnowledgeNet should be used for?

_____
_____
_____

14. What other software programs or websites do you use on a regular basis at school and at home?

_____
_____
_____

Thank you for your time ☺

Teaching Staff Questionnaire - Your perceptions and experiences in using a student learning management system (KnowledgeNet) in school.

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Purpose of Questionnaire
This questionnaire is solely for the purposes of a research thesis paper, for a Waikato University Masters Degree. Your individual responses will remain anonymous and you can choose not to participate. Your responses will be used to investigate the use of KnowledgeNet (a student learning management system) in your school.

Questions
1. Are you Male / Female *(please circle one)*

2. What subjects do you teach?

_____
_____
_____

3. Have you ever used a computer program called KnowledgeNet at school? Yes / No *(please circle one*). If you answered no go to Question 7, if yes continue with Question 4.

4. How often do you use KnowledgeNet?
Less than once a term / once a term / once a month / once a week / more than once a week *(please circle one)*

5. How long have you been using KnowledgeNet?
Less than 1 year / 1 year / 2 years / 3 years / 4 years / More than 4 years *(please circle one)*

6. Do you think KnowledgeNet is easy to use? Yes / No *(please circle one)*
Why/Why not?

_____
_____

7. Have you ever received any training at school on how to use KnowledgeNet? Yes / No *(please circle one)*

8. Do you know who could help you to use KnowledgeNet if you needed help? Yes / No *(please circle one)*

9. Please list possible people who could help you if you needed help with KnowledgeNet?

_____

10. Do you enjoy using Computers? Yes / No *(please circle one)*
Why/ why not?

_____
_____

11. Do you think how you feel about using computers affects your opinion of KnowledgeNet?
Yes / No *(please circle one)*.
Why/ why not?

_____
_____

12. Do you talk to students about using KnowledgeNet in class? Yes / No *(please circle one)*

13. What things could you use KnowledgeNet for in your classroom?

_____
_____

14. What things could you use KnowledgeNet for outside your classroom?

_____
_____

15. Please rank the following things your school could do to make you want to use KnowledgeNet or technology more.
1 = Most likely to make me use KnowledgeNet more, 8 = least likely to make me use KnowledgeNet more.

	Groups/network to discuss KnowledgeNet and prepare resources jointly		More out of class time to prepare individual KnowledgeNet material
	More training on how to use KnowledgeNet		More general computer training
	Computer available for use in my own time		More computers available for classroom use
	Other? List here:		Management directive to use KnowledgeNet more

16. What things do you think KnowledgeNet should be used for?

_____
_____

17. What other software programs or websites do you use on a regular basis at school and at home?

_____
_____

Thank you for your time ☺

Appendix 2 – Ethics approval application

Application for Approval
Outline of Research or Related Activity

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

1. Identify the project

1.1 Project Title

Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

1.2 Supervisor's name and contact information (if relevant)

Mike Forret
Faculty of Education
Waikato University

1.3 Anticipated date to begin data collection

August 2010

1.4 Does your application involve issues of health or disability with human participants? If so, please refer to the guidelines as to whether your application needs to be submitted to the Northern Y Regional Ethics Committee.

There are no perceived issues of health or disability which should arise from this study.

2. Describe the research or related activity

2.1 Briefly outline what the project is about including your goals and anticipated benefits. Include links with a research programme, if relevant.

This research project aims to gain perspectives from staff and students on the use of a student learning management system (SLMS) used at School A. The intention is to use the perceptions of staff and students along with current research on SLMS usage to identify the enablers and barriers to successfully using the system and thereby make recommendations on effective implementation and use of SLMS's in secondary schools.

2.2 Briefly outline your methods.

This research study has two parts. In the first instance questionnaires will be given to:

A) 60 students, pre-selected from usage data in three groups. 20 high users, 20 medium users and 20 low users of the computer system KnowledgeNet. (High users are considered greater than 7 times a term, medium users are considered between 3 and 7 times and low users are considered less than 3 times a term)

B) 10 teachers randomly chosen to complete a questionnaire and,

C) 6 support staff randomly chosen to complete a questionnaire.

The students selected in group A above will not be identified to anyone other than the researcher and supervisor/s on the basis of their use category. The participants will also be unaware of pre-selection criteria based on usage, for their intents and purposes this is

an entirely random questionnaire selection. Each questionnaire should take no longer than 15 minutes to complete.

Secondly, from these questionnaires six random focus groups (each with five students) will be set up for Group A, five teachers from Group B and three support staff from Group C will have one-on-one interviews. Interviews and focus groups will be conducted to gain further insight into the perceptions of each group on the use of the computer system KnowledgeNet used at School A. Focus groups and interviews should take no longer than 1 hour each to complete and selection of all participants is entirely random and participation voluntary. Participants will be informed due to time constraints of the researcher, the focus group numbers and interviews are limited in numbers, and only those randomly selected can take part to ensure fairness to all participants.

2.3 Describe plans to give participants information about the goals of the research or related activity.

There will be an information letter which accompanies consent forms outlining the intention and reach of the research. This letter will also clearly state the respondent's right to not take part and to confidentiality at all times.

2.4 Identify the expected outputs of this research or related activity (e.g., reports, publications, presentations).

This research will be published as a Masters Thesis for accreditation purposes. The findings of this project may also be published in academic journals and/or presented at academic/educational conferences or seminars.

2.5 Identify who is likely to see or hear reports or presentations arising from this research or related activity.

As this research project is only for accreditation purposes the people most likely to see the report are; the Waikato University review board, any supervisors and critical contacts of the researcher. In addition any and all participants and associated contacts of School A will have free access to this research paper. This thesis is required to be printed and held by the university and access to the report will be available to Waikato University library users. Thesis findings may be published in academic journals and presented at academic/educational conferences or seminars. A copy of the thesis will also be made available to the school involved to use as a review document for their SLMS.

2.6 Identify the physical location(s) for the research or related activity, the group or community to which your potential participants belong, and any private data or documents you will seek to access. Describe how you have access to the site, participants and data/documents. Identify how you obtain(ed) permission from relevant authorities/gatekeepers if appropriate and any conditions associated with access.

This research will take place in School A. A vacant classroom will be accessed for focus groups and students will have individual desks and private space to complete original questionnaires during quiet individual form time. The only documents which will be reviewed for the purposes of this study will be numerical log data from the computer system under review (KnowledgeNet). This log data will be used to identify the original 60 students who will be asked to participate in the study. The details of this log data will only be known to the researcher and supervisor/s for selection purposes and then the original information destroyed.

An initial expression of intent to review KnowledgeNet perceptions and usage at School A has been made and provisional verbal approval has been given from the information manager at the school. Formal approval is yet to be given but will be sought from the School Principal and Information Manager before proceeding with the study.

3. Obtain participants' informed consent without coercion

3.1 Describe how you will select participants (e.g.special criteria or characteristics) and how many will be involved.

This study has three different sets of participants:
Set 1- Student participants will be selected based on quantitative log usage data obtained from the student learning management system. It is the researcher's intention to selectively identify users in three separate groups to provide as broad a base as possible in this research case study population.
Group 1 – 20 high users of the system – those who log in more than 7 times a term in the first two terms.
Group 2 – 20 moderate users – those that log in between 3-7 times in the first two terms and
Group 3 – 20 low users – those that log in less than 3 times over the first two school terms.
Of these 60 students, 30 will be randomly selected to take part in one of six focus groups (each focus group meets once and contains five students).

Set 2 - Ten teacher participants will be selected randomly based on availability of teachers at the time of data collection as long as selected teachers have used the KnowledgeNet computer system at least once during each school term. Of these ten participants, five will be randomly interviewed one-on-one.

Set 3 - Six support staff will be selected randomly based on availability of staff at the time of data collection, as long as selected staff have used the KnowledgeNet computer system at least once during each school term. From the six original staff questioned, three will be randomly interviewed one-on-one.

If insufficient questionnaires are returned for the student focus groups the researcher will access the next name from each group 1, 2 and 3 above from the log usage data sheet and issue these three participants with a consent form and information sheet. The researcher will continue selecting three participants from the list until 60 or more questionnaires are completed. The researcher will collect all completed questionnaires and only once required numbers have been met will interviews and focus groups commence.

This school has been selected as the researcher completed teaching practicum at this school in 2009 so has had a prior introduction to staff, the Student Learning Management System (SLMS) and some students. An initial interview with the Information Manager has ensured there is the possibility of research being done in this school but official permission for this research project and specific permission for the usage log data access from the School principal and Information Manager will be sought prior to any participants being approached. There has been no contact with this school in a teaching capacity by the researcher for the past 12 months. Any access for the study to the students and staff will be given to the researcher through the school board, management and relevant staff.

3.2 State clearly whether this is an application under section 10 of the Ethical Conduct in Human Research and Related Activities Regulations: Large Random Sample Surveys.

Not applicable to my knowledge.

3.3 Describe how you will invite them to participate.

Participants will be invited to participate by being given an information letter and consent form which will be voluntary to complete. The student consent form requires parental consent in addition to student consent. Students will only be given a questionnaire once parental consent has been returned. Teaching and support staff will be given the

information letter, consent form and questionnaire together. When given study information all participants will be requested to not discuss contents with anyone (other than parents for student participants) to retain their anonymity.

The questionnaires collected will be anonymous. Selected participants will be presented with a named envelope which contains the questionnaire and an unmarked envelope for questionnaire return. Original named envelopes will be destroyed by participants prior to the questionnaire being returned to maintain anonymity. All participants signed consent forms and all completed questionnaires will be returned via a sealed ballot box in the house leaders office which will only be accessed by the researcher.

From the completed questionnaires randomly selected students will be invited to attend a focus group to discuss their views further. In addition to the student focus groups, randomly selected teaching and support staff will be invited to attend one-on-one interviews as well.

3.4 Show how you provide prospective participants with all information relevant to their decision to participate. Attach your participant information sheet, cover letter, or introduction script. See document on informed consent for recommended content. Information should include, but is not limited to:

- what you will ask them to do;
- how to refuse to answer any particular question, or withdraw any information they have provided at any time before completion of data collection;
- how and when to ask any further questions about the study or get more information.
- the form in which the findings will be disseminated and how participants can access a summary of the findings from the study when it is concluded.

See attached participant information sheets, consent forms and sample questionnaires.

3.5 Describe how you get their consent. (Attach a consent form if you use one).

Participants are provided with a consent form and questionnaire. Student consent forms also require parental consent to be given. All returned questionnaire forms with signed consents will be considered acceptable responses. The Informed consent form(s) are attached.

3.6 Explain incentives and/or compulsion for participants to be involved in this study, including monetary payment, prizes, goods, services, or favours, either directly or indirectly.

There are no incentives or compulsion evident for participation in this study other than the time away from class to possibly be selected as a random focus group participant. There are no monetary incentives for participants to take part.

4. Minimise deception

If your research or related activity involves deception – this includes incomplete information to participants -- explain the rationale. Describe how and when you will provide full information or reveal the complete truth about the research or related activity including reasons for the deception.

By not informing student participants of the pre-selection process where 60 students are being selected from log usage data of the KnowledgeNet system the researcher recognises this may be perceived as deceptive. However, to ensure there is a wide spread range of participants surveyed and being unable to survey the entire population (due to cost and time constraints) this pre-selection process is the fairest and least biased way to pre-select a cross section of the population from which we are studying. This deception in no way negatively affects the participant's questionnaire responses nor them personally in any way.

5. Respect privacy and confidentiality

5.1 Explain how any publications and/or reports will have the participants' consent.

The consent form signed by parents prior to participants completing the questionnaire and returned completed questionnaires cover the participant and parental consent for the research report. In addition, all one-on-one interview transcripts will be presented in written form for participants to confirm accuracy prior to their use in the study.

5.2 Explain how you will protect participants' identities (or why you will not).

The participation of all participants will be entirely confidential with no individual names mentioned in the report. Individuals in the report will be referred to only by a reference code or by a pseudonym. The researcher intends to download the log usage data report from the KnowledgeNet computer system herself, once shown how the system works and given sufficient user access. Form teachers will know who has been invited to attend from named envelopes provided but not who has actually chosen to participate as these envelopes are anonymous and posted into a sealed box. All consent forms will be handled personally by the researcher. Once the required number of questionnaires has been collected the researcher will destroy the original and only copy of the usage log data containing individual names.

5.3 Describe who will have access to the information/data collected from participants. Explain how you will protect or secure confidential information.

The only people who will have access to information from participants will be the researcher and her supervisor/s. Digital data, such as audio recording files and other digital files, will be stored on the researcher's computer for five years and protected by password only access, after which it will be deleted. Paper-based data, such as questionnaires and interview transcripts, will be securely stored in the researcher's home office in a locked desk for five years before being destroyed.

6. Minimise harm to participants

6.1 Where participants risk change from participating in this research or related activity compared to their daily lives, identify that risk and explain how your procedures minimize the consequences.

There is no apparent immediate or long term risk associated with this study.

6.2 Describe any way you are associated with participants that might influence the ethical appropriateness of you conducting this research or related activity – either favourably (e.g., same language or culture) or unfavourably (e.g., dependent relationships such as employer/employee, supervisor/worker, lecturer/student). As appropriate, describe the steps you will take to protect the participants.

I have no relationship with the participants of this study that will affect the ethical appropriateness of this study. My first and only language is English so there may be some concerns for students with English as a second language, however as the case study school is an English teaching and speaking school this particular limitation should not provide a cultural ethical issue in this instance. As the study is a perceptions based qualitative project, there is room for individuality to be expressed eliminating any ethical/cultural issues which may otherwise arise.

6.3 Describe any possible conflicts of interest and explain how you will protect participants' interests and maintain your objectivity.

As the researcher is not teaching at this school, and has no personal relationship with anyone currently at this school there are no apparent conflicts of interest in this study.

7. Exercise social and cultural sensitivity

7.1 Identify any areas in your research or related activity that are potentially sensitive, especially from participants' perspectives. Explain what you do to ensure your research or related activity procedures are sensitive (unlikely to be insensitive). Demonstrate familiarity with the culture as appropriate.

At this stage I do not perceive any social or cultural issues that will arise from this research, however if it arises that there are concerns at any stage of the research, the researcher will seek advice from peers and cultural advisors on the best process to follow for each situation that arises.

7.2 If the participants as a group differ from the researcher in ways relevant to the research or related activity, describe your procedures to ensure the research or related activity is culturally safe and non offensive for the participants.

I do not foresee any ethical or cultural issues between the researcher's beliefs and that of participants from this study.

Research Project Information Sheet

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Project Title
Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

About the Researcher
My name is Nicole Stevens, I am currently enrolled in a Masters Degree at the University of Waikato. This research study is a required element of completing that qualification. I have a graduate diploma in teaching: secondary, and have spent over 7 years working in information technology focused companies. It is this combination of teaching and technological experience which has prompted this particular research topic.

What is this research project about?
This study aims to understand the effectiveness of a student learning management system (SLMS) in a single secondary school. I am interested in participant perceptions of an SLMS used in your school (KnowledgeNet). I will use questionnaires, student focus groups and staff interviews to collect perceptions of participants in the use of an SLMS in your school. By combining the findings from this study and other relevant published studies my aim is to produce a set of guidelines which other schools may be able to follow to implement and use an SLMS effectively. The research will also provide the case study school with valuable user perceptions on your SLMS.

What I need access to and how long will it take?
Prior to approaching any participants I will need access to KnowledgeNet Computer System to download a usage log report. In order to effectively survey as wide a range of participants as possible, I would like to print a report and isolate three sets of users based on their log in frequencies (high, medium and low users). From this data I intend to survey 60 students, 10 teachers and 6 support staff through paper questionnaires which will take individuals no more than 15 minutes of their time. I will provide sealed boxes in House Leaders offices for questionnaires to be returned. In addition to the questionnaires I would like to do six follow-up student focus groups (each group containing 5 students) and one-on-one interviews with 8 staff to get in-depth perceptions on KnowledgeNet. Each focus group and staff interview will be no more than 1 hour duration.

What will happen to the information collected?
The information collected will be used to write a research report for the credit of a specific paper. It is possible that articles and presentations may be the outcome of the research. However, only myself and my supervisor/s will be privy to the notes, documents, recordings and the initial paper written. Afterwards, notes and documents will be destroyed and recordings erased. No participants will be named in the publication/s and every effort will be made to disguise their identity. The case study school will be given a bound copy of the research for their records.

Declaration to participants
You have the right to decline to be involved in this study.

If you take part in the study, you have the right to:

- Refuse to answer any particular question and to withdraw from the study before **September 2011,** prior to analysis commencing on the data.
- Ask any further questions about the study that occurs to you during your participation.
- Be given access to a summary of findings from the study when it is concluded.

Who's responsible?
If you have any questions or concerns about the project, either now or in the future, please feel free to contact either:

The Researcher (first instance)	The Supervisor	The Dean (In unresolved issues)
Nicole Stevens *Phone:* *e-mail:*	*Dr. Mike Forret* *Waikato Faculty of Education* *Phone:*	Dr. Alister Jones *Waikato Faculty of Education* *Phone:*

Appendix 3 – Study consent form

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

Consent Form for Research Project

I have read the **Research Project Information Sheet** for this study and have had the details of the study explained to me. Any questions about the study have been answered to my satisfaction, and I understand that further questions may be asked at any time.

I agree to participate in this study and to the use of student log usage data being used in this study under the conditions set out in the **Research Project Information Sheet.**

Case Study school Principal	**Case study school Information Manager**
Signed: _____	Signed: _____
Name: _____	Name: _____
Date: _____	Date: _____

Researcher's name and contact information:

The Researcher
Nicole Stevens
Phone:
e-mail:

The Supervisor
Dr. Mike Forret
Faculty of Education
Waikato University

Appendix 4 – Participant Information Sheets

Participant Information Sheet – Students

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Project Title
Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

About the Researcher
My name is Nicole Stevens, I am currently enrolled in a Masters Degree at the University of Waikato. This research study is a required element of completing that qualification. I have a graduate diploma in teaching: secondary and have spent over 7 years working in information technology focused companies. It is this combination of teaching and technological experience which has prompted this particular research topic.

What is this research project about?
This study aims to understand the effectiveness of a student learning management system (SLMS) in a single secondary school. I am interested in participant perceptions of an SLMS used in your school (KnowledgeNet). I will use questionnaires, student focus groups and staff interviews to collect perceptions of participants in the use of an SLMS in your school. By combining the findings from this study and other relevant published studies I aim to produce a set of guidelines which other schools may be able to follow to implement and use an SLMS effectively.

What will you have to do and how long will it take?
This project has two parts. In the first part you will need to complete a survey questionnaire. This should take no longer than 15 minutes and completed questionnaires need to be returned to your house leader's office. From these initial questionnaires randomly selected students will be invited to join one of six small focus groups (each containing five participants) to discuss KnowledgeNet. This single focus group session should take no longer than 60 minutes. Focus groups may be recorded. There is a consent form attached which you will need to take home and get your parents to sign to give permission for you to be involved in this study, you will also need to sign the form.

What will happen to the information collected?
The information collected in this study will be used by me to write a research report for the credit of a specific paper. It is possible that articles and presentations may be the outcome of the research. Only myself and my supervisor/s will have access to the notes, documents, recordings and the initial paper written. Afterwards, notes and documents will be destroyed and recordings erased. No participants will be named in the publication/s and every effort will be made to disguise their identity.

Declaration to participants
You have the right to decline to take part in this study.

If you take part in the study, you have the right to:

- Refuse to answer any particular question and to withdraw from the study before **September 2011,** prior to analysis commencing on the data.
- Ask any further questions about the study that occurs to you during your participation.
- Be given access to a summary of findings from the study when it is concluded.

Who's responsible?
If you have any questions or concerns about the project, either now or in the future, please feel free to contact either:

Participant Information Sheet – Staff

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Project Title
Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

About the Researcher
My name is Nicole Stevens, I am currently enrolled in a Masters Degree at the University of Waikato. This research study is a required element of completing that qualification. I have a graduate diploma in teaching: secondary and have spent over 7 years working in information technology focused companies. It is this combination of teaching and technological experience which has prompted this particular research topic.

What is this research project about?
This study aims to understand the effectiveness of a student learning management system (SLMS) in a single secondary school. I am interested in participant perceptions of an SLMS used in your school (KnowledgeNet). I will use questionnaires, student focus groups and staff interviews to collect perceptions of participants in the use of an SLMS in your school. By combining the findings from this study and other relevant published studies my aim is to produce a set of guidelines which other schools may be able to follow to implement and use an SLMS effectively.

What will you have to do and how long will it take?
This project has two phases. In the first instance you will need to complete a survey questionnaire. This should take no longer than 15 minutes and completed questionnaires need to be returned to your house leader's office. From these initial questionnaires randomly selected staff will be invited to attend a one-on-one interview session with me to discuss KnowledgeNet. This session should take no longer than 60 minutes. Interviews may be recorded.

What will happen to the information collected?
The information collected will be used to write a research report for the credit of a specific paper. It is possible that articles and presentations may be the outcome of the research. Only myself and my supervisor/s will be privy to the notes, documents, recordings and the initial paper written. Afterwards, notes and documents will be destroyed and recordings erased. No participants will be named in the publication/s and every effort will be made to disguise their identity.

Declaration to participants
You have the right to decline to be involved in this study.

If you take part in the study, you have the right to:

- Refuse to answer any particular question and to withdraw from the study before **September 2011,** prior to analysis commencing on the data.
- Ask any further questions about the study that occurs to you during your participation.
- Be given access to a summary of findings from the study when it is concluded.

Who's responsible?
If you have any questions or concerns about the project, either now or in the future, please feel free to contact either:

Appendix 5 – Consent Forms (Students and Staff)

Consent Form for Participants – Students

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

Consent Form for Participants

I have read the **Participant Information Sheet** for this study and have had the details of the study explained to me. Any questions about the study have been answered to my satisfaction, and I understand that further questions may be asked at any time.

I also understand that I am/ my child is free to withdraw from the study **before September 2011,** or to decline to answer any particular questions in the study. I understand any information provided up until the researcher has commenced analysis on the data can be withdrawn. I/My child agree(s) to provide information to the researcher under the conditions of confidentiality set out on the **Participant Information Sheet**.

I agree to participate in this study under the conditions set out in the **Participant Information Sheet.**	I give permission for my child to participate under the conditions set out in the **Participant Information Sheet.**
	Parent/Guardian
Signed: _____	Signed: _____
Name: _____	Name: _____
Date: _____	Date: _____

Additional Consent as Required

I agree / do not agree to my responses to be tape recorded.

Student signed: _____

Name: _____

Date: _____

Researcher's Name and contact information:

The researcher
Nicole Stevens
Phone:
e-mail:

The Supervisor
Dr. Mike Forret
Faculty of Education
Waikato University

Consent Form for Participants – Staff

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Barriers and enablers in the implementation of a student learning management system in a New Zealand secondary school.

Consent Form for Participants

I have read the **Participant Information Sheet** for this study and have had the details of the study explained to me. Any questions about the study have been answered to my satisfaction, and I understand that further questions may be asked at any time.

I also understand that I am free to withdraw from the study **before September 2011,** or to decline to answer any particular questions in the study. I understand any information I provide can be withdrawn up until the researcher has commenced analysis on the data. I agree to provide information to the researcher under the conditions of confidentiality set out on the **Participant Information Sheet**.

I agree to participate in this study under the conditions set out in the **Participant Information Sheet**

Signed: _____

Name: _____

Date: _____

Additional Consent as Required

I agree / do not agree to my responses to be tape recorded.

Signed: _____

Name: _____

Date: _____

Researcher's name and contact information:

The Researcher
Nicole Stevens
Phone:
e-mail:

The Supervisor
Dr. Mike Forret
Faculty of Education
Waikato University