Investigating the influence of digital peer recommendations and social interaction on reading attitudes in primary schools with a custom-built tool.

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Declaration

I declare that the work described in this document is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university

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Abstract

To function fully in contemporary society an individual must have an appropriate reading level for their age. Though learning to read is a difficult process for many individuals, their learning must progress as expected by the educational system or there can be dire consequences for the individual and society as a whole as a result. Difficulties in learning to read can be connected to poor attitude towards reading. A learner may overcome their difficulties through hard work with a good attitude and become an expert, with a bad attitude towards reading the task is much more difficult. The reading attitude of the learner is shaped by a myriad of factors, amongst the most important being their early experiences around reading and the influences and recommendations of educators, parents and peers. Positive early experiences and influences are vital for the young learner and provide the learner with the foundations to build up their reading to the appropriate levels.

The aim of this research is to investigate the influence that digital peer recommendations and social interaction has on the reading attitudes of primary school learners. A tool was designed and built for this research to facilitate the learners in finding and recommending books to their peers in a safe environment. After careful consideration a mixed methods approach was adopted to enable the researcher to create a rich picture of the impact of the intervention on reader attitudes.

The data gathered and analysed in the course of this research suggests that the intervention had a positive impact on reader attitudes of the learners involved, particularly on learners who had the lowest reader attitudes in the class. The research recommends that additional studies and research be carried out in this area to investigate this phenomenon further as there is significant potential in the findings made.

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Chapter one: Introduction

1.1 Background and context

When humanity led a hunter-gatherer lifestyle there was a limited requirement for the dissemination of knowledge and information and what information was required was stored in human memory. The skills needed by members of a group would have been taught as a child was growing and there was little variation between the needs of different generations as technology changed slowly (Collins & Halverson, 2010, p. 22). Any traditions, historical knowledge or rules of a group were transmitted orally (Fitzhugh, Phillips, & Gjesfeld, 2011, p. 90) often using a specially trained and elite group, such as the druids of Celtic antiquity (Gaur, 1992, p. 14). As societies developed there was a need for the accurate storage and dissemination of a growing level of information which did not suit the oral model of transmission and storage. Societies across the world developed new methods to record information using symbols and glyphs that eventually developed into written language, which did not have the same limitations of storage as the human mind which could be fallible, was limited in ability to store information and would eventually die (Fischer, 2004, p. 33). Once writing was developed the hand-written information stored on the clay tablets, papyrus or vellum was able to be retrieved by anyone with the skills to decode the symbols. If an individual has taken the time and effort to learn how to decode text, theoretically, there was now no limit to the amount of information that they could consume other than death and even with death the information that they have is not lost but is stored for others to consume in the future (Gaur, 1992, p. 14). In the present day text is ubiquitous and reading is an essential skill for participation at work, education, leisure and for interaction with civil authority. The 'game of communications' dictates relationships of power, according to Foucault, and 'material documentation... exists, in every society' 'with which it is inextricably linked' (Foucault, 1970, p. 7; 1982, p. 787).Thus, reading has moved from being the domain of the privileged few to being an essential skill for the individual in modern society.

1.2 The research question

- How do peer recommendations and social interaction using an online tool influence reading attitudes in a primary school setting?
    - How does enabling young learners to exchange recommendations regarding books and reading material online affect their reading attitude?
    - How does social interaction in a safe online environment impact learner reading attitude?

1.3 Roadmap to chapters

This roadmap to chapters will serve as a brief synopsis of this dissertation and guide the reader through each chapter by signposting what is to be found in each section.

Chapter one contains the background and context to the research, posed the research question and finally provided this roadmap to chapters to facilitate an effective overview of the information contained within for the reader.

In Chapter two the literature is reviewed by the researcher. First examined are fluency and the learning processes required to enable a learner to reach the highest standard. Next the expected progress of a reader in the learning process will be examined along with the severe consequences of failure to progress as expected for the learner. The importance of positive early experiences and environments will be scrutinised along with the influence of educators, parents and peers on young learners and the benefits of online social interaction.

Chapter three provides an examination of the design processes involved in the creation of the digital artefact. The chapter consists of a brief introduction followed by an in-depth overview of the learning

intervention and a detailed examination of the user experience and the design of the developer side of the intervention that the user does not see.

Chapter four is the methodology chapter and describes in detail the process undertaken by the researcher to determine the correct methodology to use for this piece of research and the justification for the approach that was chosen. Also in this chapter is a description of the location and participants involved and details of the procedure used in administering the questionnaires and in making observations. The chapter closes with details of the ethical considerations involved with the research.

Chapter five gives a detailed account of the data analysis and the findings made. The data collection and analysis method is laid out and followed by an in depth look at each method of data collection and an examination of the data they provide.

Chapter six outlines the conclusions of the researcher following the research conducted and then signposts the limitations that are recognised in the research. Finally the researcher will give recommendations that arise from this research.

Chapter two: Literature review

2.1 Introduction

The purpose of this chapter is to serve as an evaluation and analysis of the current literature to investigate the significance of reading to an individual, identify the difficulties an individual may face and establish the serious consequences that failure to acquire this valuable skill can bring. The importance of learning to read when supports are in place will be discussed along with the expected progress of the learner and the appropriate time for intervention will be examined. The importance of positive early experiences, environments and role models will be evaluated and the additional benefits of online interaction will be espoused.

2.2 Fluency and the learning process

Reading is an extremely arduous process to master for many and can be particularly slow and agonising for the struggling novice (Paige, Rasinski, & Magpuri-Lavell, 2012, p. 67; Reynolds, Nicolson, & Hambly, 2003, p. 49). When an individual has mastery of the reading process, the mechanics take place automatically, without effort and the reader can focus entirely on the comprehension of the written piece (Seidenberg, 2005, p. 238). This high level reading is referred to in the literature as being an expert reader and can be seen as the aspiration of any individual learning to read. To become an expert reader a learner must develop reading fluency through the development of the ability to recognise words at a glance; word recognition automaticity. The level of word recognition automaticity necessary for fluency can only be attained through deep and wide reading (Gagne, 1985, p. 197; Paige et al., 2012, p. 72). This wide reading develops the skills necessary for fluency to develop to the point where the reader can perform the act without conscious thought or effort and they become an expert reader, ideally this should occur in adolescence (Wolf & Barzillai, 2009, p. 33). There

is no quick fix to this problem for a learner or the teacher or other educational professional and the learner must be given as many different reading strategies as possible, such as sounding out words phonetically or breaking them down, to enable them to achieve success and encourage them to continue reading until they master the process (Pomerantz & Pierce, 2013, p. 102). In teaching a learner to read, we must be aware that struggling learners may not have the same desire and drive to read as those without issues and we must seek to instil in them that innate desire to read by offering them stimulating material that interests and challenges them at the appropriate level (Lesesne, 1991, p. 61). Once the reader is self-driven to read more material, they will as a result improve their reading fluency and comprehension levels (Paige et al., 2012, p. 72) In this way we can give each learner the greatest opportunity of becoming an expert reader. Therefore we can say that reading is one of the most difficult skills a learner must learn and one that must be learned through hard work and determination on the part of the learner. This hard work must be aided through allowing them to read stimulating and interesting material to help them achieve fluency through wide and deep reading.

2.3 The expected progress of the learning process

As an individual progresses through an educational system expectations of ability are raised for every year that a learner completes. Teachers in primary school spend a large proportion of their working week in lessons focused on teaching skills and strategies to give a learner the ability to read (Baydar & Brooks-Gunn, 1993, p. 816; Spörer, Brunstein, & Kieschke, 2009, p. 272). Teachers in this setting are the real experts at teaching the mechanics of reading to a learner and employ many tried and tested systems in an attempt to aid the learner, such as Bruner's scaffolding techniques to aid the learner progressively less until they are able to compete the task unaided and Vygotsky's zone of proximal development with the teacher or more able peer in the role of expert (Bruner, 1978, p. 254; Vygotsky & Cole, 1978, p. 86). Primary school teachers spend a great deal of time focusing on the development

of strategies that a child can use when they come across a new word that they have never read before. Teachers use the sounding-out approach to develop the phonological awareness of a learner. Sounds are linked to letters, and groups of letters, and learners are shown how to break down words into their constituent phonological parts to develop their ability to independently consider and make educated attempts to decode even the most complicated words. This enables the learner to achieve success at reading independently and, indeed, some of the literature indicates that the phonological awareness level of the learner as a child is a predictor of the future literacy levels of that individual (Rieben & Perfetti, 2013, p. 8). A wide range of vocabulary is also introduced to the young learner to expose them to as many words as possible and enable them to read successfully and independently (Kennedy et al., 2012, pp. 124-127).

When a learner has progressed from primary to secondary-school they are no longer learning to read in the mainstream classroom but are expected to already have mastery of decoding reasonably complex material and instead comprehension and content forms the basis for the majority of learning (Edmonds et al., 2009, p. 262; Seidenberg, 2005, p. 238; Spörer et al., 2009, p. 272). If a learner reaches this stage without achieving the required level of literacy they will not be able to function fully in their new educational environment and they will suffer academically as a result. This problem will compound as time goes by and the struggling learner falls further behind their peers (Valleley & Shriver, 2003, p. 56).

When a learner leaves school it is expected that they will have the ability to read and to decode complex material from numerous sources to enable them to engage fully with the political, medical, educational and other functions of the modern world as well as to participate in the workforce of a modern economy (Baydar & Brooks-Gunn, 1993, p. 815; Reynolds et al., 2003, p. 49).

It is clear from the literature that society is geared in such a way that learners are expected to achieve the difficult skill of being able to read at a reasonably high level by the time they reach secondary school and at expert level by the time the reach adulthood.

2.4 The consequences of failing to progress as expected

In spite of the hard work of primary school teachers and the best efforts of specialist secondary teachers, there is still a considerable amount of learners who cannot read effectively and many adults who struggle through life without adequate skills. These struggles can have their root in a range of different circumstances; from specific learning difficulties, which can make the already arduous process of learning to read even more difficult, to a disruptive and unsupportive home environment or childhood trauma (Baydar & Brooks-Gunn, 1993, p. 815). Difficulties with reading can be shown in the literature to have a clear link to learners becoming disruptive, inattentive or hyperactive in a classroom environment (Hartas, 2012, p. 359). There is a consensus in the literature that failing to read at the appropriate level greatly increases the likelihood of an individual disengaging with the education system and dropping out of education entirely (Baydar & Brooks-Gunn, 1993, p. 815; Carbonaro & Gamoran, 2002, p. 802; Valleley & Shriver, 2003, p. 56). This negative association with education can also be consciously or subconsciously be transmitted to the child of the original sufferer, creating a cycle of problems that efforts must be made to break (Brooks, 2003, p. 287; Lesesne, 1991, p. 62). An individual with low levels of literacy faces a myriad of problems as they go through their lives including a negative impact on their employment prospects and future earning possibilities and damaging influences on their happiness and health (Carbonaro & Gamoran, 2002, p. 802; Reynolds et al., 2003, p. 49; Stableford & Mettger, 2007, p. 73; Valleley & Shriver, 2003, p. 56). Society as a whole also suffers when individuals fail to reach the expected levels of literacy as there are clear links between low levels of literacy and many of society's most intractable and controversial problems for example, unemployment and social welfare dependency (Baydar & Brooks-Gunn, 1993, pp. 815-816). Even more concerning is the fact that international and Irish studies have separately shown that the amount of the prison populations who have difficulties reading is excessively high and even higher amongst repeat offenders (M. Morgan & Kett, 2003, p. 35; Vacca, 2004, p. 301)

The stark consequences to an individual and society in general of an individual not having the expected reading levels are shocking and a line can be traced in the literature from a failure to be able to read to disruptive behaviour in school, social problems and potentially criminality.

2.5 Importance of providing positive early reader experiences and environments

It is widely acknowledged in the literature that the attitude of an individual towards reading and education broadly is largely shaped by their previous experience and the older a learner gets the more entrenched this attitude can become (Broeder & Stokmans, 2013, p. 93; Poyrazli et al., 2008, p. 547). While much of the focus of these studies has been on negative experiences leading to negative learning outcomes, it is essential that we remember that such experiences can also be positive and lead to positive learning outcomes. For a learner to reach their full potential they should be exposed to positive reading experiences in a supportive and meaningful environment to stimulate them from a young age (Katims & Pierce, 1995, p. 222; Seidenberg, 2005, p. 241; Walker & Greene, 2009, p. 464). A positive school experience can enable the learner to achieve a higher academic level and can influence the levels at which learners drop out of education entirely (Poyrazli et al., 2008, p. 548). The evidence suggests that the reading level progression rate of the average learner falls as they progress through the educational system and that it falls at an even more striking rate for the reader that is below average (Wilson & Lonigan, 2009, p. 116). As such, it is clear that the optimum time for an intervention to aid a learner to read is while a learner is a pupil in a primary school setting, surrounded by experts in the teaching of the mechanics of reading. Early interventions could also have a more positive impact as a learner would not have been exposed to many years of cumulative negative experiences. These experiences could leave a learner with an intractable negative attitude towards reading and could also lead to emotional difficulties if a learner is the constant recipient of negative reinforcement of their adequacy by their teacher (Finn, 1989, p. 119).

Early, positive experiences and environments are of vital importance to a young learner and can help shape attitudes towards reading and education in general. It is the duty of educators to provide them using every tool at their disposal.

2.6 Role models, influencers and recommendations: educators, parents and peers

A learner does not exist in isolation. They constantly interact with a range of different groups and individuals, such as teachers, parents and peers, who become role models of varying importance to them and shape their attitude to learning. This role modelling can be of a positive or negative nature to the young learners (Lesesne, 1991, p. 62). The role modelling can also be either implicit or explicit. Learner attitude can be strongly influenced by the implicit norm of parents, family and peers with the actions of these groups in providing positive modelling more important as their words. An example would be a parent who recommends to a child they should be reading every night whilst they themselves do not model such positive behaviour (Broeder & Stokmans, 2013, p. 93). Learner attitude and achievement can be positively influenced by explicit and active interest of parents in learner progress and development giving a learner an increased likelihood of educational attainment, with the developing role of fathers in what was traditionally seen as a maternal function becoming evident in the research (Borich & Tombari, 1997, p. 547; A. Morgan, Nutbrown, & Hannon, 2009, p. 181; Roberts, Jurgens, & Burchinal, 2005, p. 346). Peers in the classroom can also have an influence on a learner, though some research warns of the difficulty of measuring the influence empirically (Ammermueller & Pischke, 2009, p. 342). However, while acknowledging that previous research has come up with differing conclusions, EisenKopf states categorically that peers are very important as they induce higher motivation among learners and thus educational achievement (Eisenkopf, 2010, p. 370). In another study of undergraduate level students, learners themselves believed there was a positive impact on their own learning outcomes when they worked with high-quality peers and that

this was a complementary reciprocal relationship (Foster & Frijters, 2010, p. 262). It is clear from the literature, however, that recommendations from such peers are more likely to be acted on than recommendations from others and that this is linked to the critical motivational relationship that develops among a peer group, including online peer groups (Baker, Dreher, & Guthrie, 2000, p. 154; Harasim, 2000, p. 50).

People are social creatures at every age but the formative period of school attendance is a particularly important time and every effort must be made to ensure that the influences that they are under positively influence their learning.

2.7 Benefit of online social interaction

We have already noted the importance of offline social interaction in the classroom and the home in relation to role models and influences, it is also highly desirable to influence a learner online as increasingly students are interacting in that domain. Online interactions are not intended to replace offline interactions but rather to complement them and to provide additional support when needed and there is evidence to indicate a strong connection between usage of social networks and indicators of social capital (Ellison, Steinfield, & Lampe, 2007, p. 1165). Social capital refers to the accumulation of resources within a group or network which an individual can draw on when required. In the instance of this study, social capital refers to peer knowledge regarding age and reading level apprpriate books, the interests of others and who in the class they should recommend particular books to. Studies report that learners who interact with peers online have increased levels of motivation, learning and better outcomes take place (Harasim, 2000, p. 50; Richardson & Swan, 2003, p. 81). There are also issues raised by the literature such as the problem of communication anxiety faced by some learners as they learn to interact in a new way and the unrealistic expectations from policy makers and society in relation to the speed of change in our schools (Harasim, 2000, pp. 58-59). Perhaps a greater problem

is the limited amount of empirical research into the area of social learning online (Richardson & Swan, 2003, p. 81). Though the research may be relativly lacking in this area what exists is enough to allow us to see great benefits to allowing our learners to interact online.

2.8 Conclusions

Reading is a difficult skill to master but one which must be obtained or there are profound consequences for the individual concerned. Learning should take place at the appropriate time, which in the Irish context is in the primary school setting (Burns, 2012, p. 94). Due to the serious nature of the impacts that poor levels of reading have on an individual and society every aid possible should be given to the learner. Learners must have positive early experiences and positive role models to thrive and an online solution could provide a valuable complementary support. The online environment would provide a safe forum for learners to share books and material that interest them and help them to increase their intrinsic motivation, particularly important for weak learners. Peer recommendations and social interaction could prove to be a valuable support to learners who are struggling and encourage them to read more through tapping into and developing the social capital of the class online.

Chapter three: Design of intervention tool

3.1 Introduction

The preceding literature review highlights the many intricate factors involved in learning to read and the exceedingly laborious learning process involved for many learners, in particular the struggling novice (Paige et al., 2012, p. 67; Reynolds et al., 2003, p. 49). The review indicates that the ultimate goal in teaching an individual to read is for them to become expert readers who are self-motivated and can read without conscious thought or strain regarding the complex processes involved and can instead focus on the comprehension of the text that they are engaged with (Seidenberg, 2005, p. 238). To achieve this goal of becoming an expert reader, the literature suggests that educators should promote the development of word recognition automaticity and reading fluency through facilitating a learner to consume a wide range of reading material until such a time as the student has mastery of the processes involved (Paige et al., 2012, p. 72; Pomerantz & Pierce, 2013, p. 102). To facilitate a learner to read a wide range of material we can enable them to have easy access to material at the right level that stimulates and interests them through the use technology and the influence of peer recommendations (Lesesne, 1991, p. 61). It is clear from the literature that peer-influences and recommendations are powerful drivers in motivation, which in turn influences reading levels.

The literature review found it is expected in society that a learners reading level will progress at a certain rate as they navigate the educational system to adulthood and the optimum time for a learner to master the reading processes is before they reach secondary school, surrounded by the experts for teaching reading. (Valleley & Shriver, 2003, p. 55; Wilson & Lonigan, 2009, p. 115). The design of this intervention was influenced very strongly by this as it had to be designed with children of primary school age in mind as a result.

In this chapter the design of a tool will be outlined, which is guided by the literature and is intended to enable safe peer interaction among the class group. This interaction is to facilitate the recommendation of books at the appropriate level that will interest learners and increase the motivation of primary school children to read more widely and thus improve their likelihood of becoming expert readers. A general outline of the tool will be shown in the following section, followed with a more comprehensive examination of the technical construction and features of the artefact.

3.2 Overview of the learning intervention and design process

As the literature suggests that any intervention would be most appropriate at primary school level, this learning tool has been designed specifically for use by children. Research indicates that learner outcomes can be positively influenced by providing positive early experiences around the whole area of reading and offering the learners opportunities to act as positive role models for each other and to recommend books from their class library of the appropriate level that may interest an individual (Broeder & Stokmans, 2013, p. 93; Katims & Pierce, 1995, p. 222; Poyrazli et al., 2008, p. 547; Seidenberg, 2005, p. 241; Walker & Greene, 2009, p. 464). If a learner is given recommendations for books from trusted peers, research suggests that they are more likely to read the book and increase the volume of their reading overall and as a direct result of more widespread reading they are moving closer to the goal of becoming an expert reader (Eisenkopf, 2010, p. 370; Heathington, 1979, p. 710; Lowder, Choi, & Gordon, 2013, p. 745; Pomerantz & Pierce, 2013, p. 102; Sharon et al., 2007, p. 383; Wolf & Barzillai, 2009, p. 33). The design of this recommendation system is strongly linked to the ideas of social capital discussed in section 2.7 of this paper.

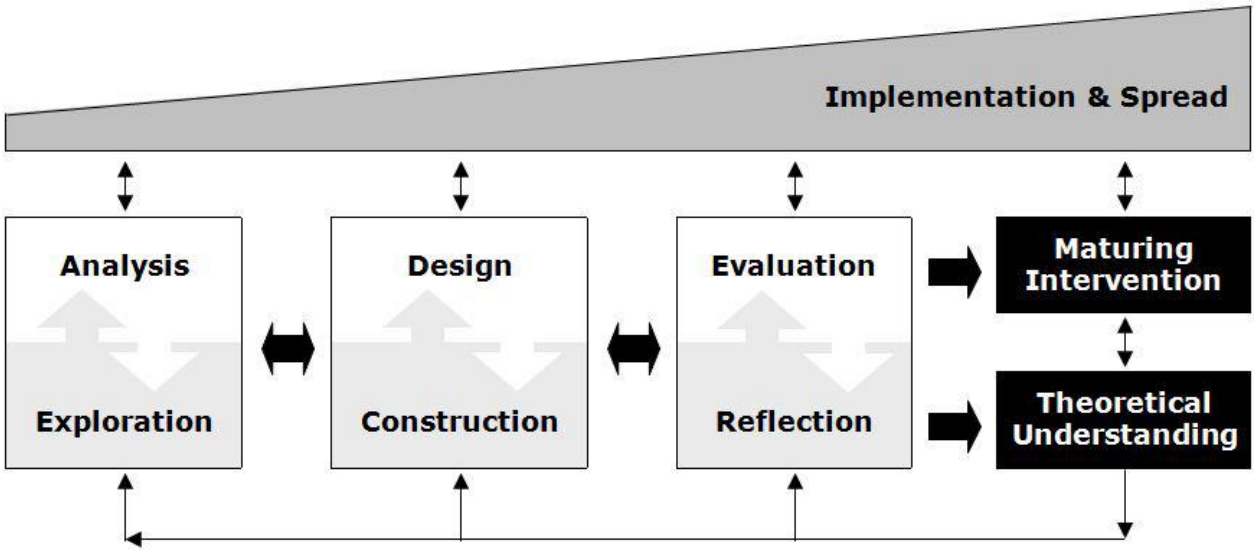
The learning tool that will be provided to the young learners will be an online social tool, where a closed group of learners can interact safely. Learners will give expert recommendations to each other and the benefits outlined above may be accrued. As learners will know what book they want to read

before going to the classroom library, valuable reading time will not be lost as the learner looks blindly at hundreds of books. Instead recommendations given on the learning tool will speed up the whole process and more time can be spent actually engaged in reading, again helping the learner towards the goal of becoming an expert reader (Katims & Pierce, 1995, p. 223; Lesesne, 1991, p. 63; Sharon et al., 2007, p. 383).

While there is some debate in the literature regarding the desirability of the omnipresence, and indeed omnipotence, of technology such as mobile phones in everyday life, young learners are likely to engage with technology regularly and those that do not should be encouraged to do so, when possible to ensure that they are able to function fully in the technology-fuelled and driven economy of the future (Kvavik & Caruso, 2005, p. 4; Lepp, Barkley, & Karpinski, 2014, p. 344; Prensky, 2007, p. 8). By placing the tool online in this instance we are not only encouraging use of technology in the classroom, but freeing up the learner to use that same technology at home or in the car on the way to school through the use of tablets or smartphones. Learners will have saved lists of books that they were recommended and added to their 'to read' list, they will no longer have to try and remember what their friends might have recommended to them some time in the past. They will be able to keep a record of what books they like and what books they have read, information that is also available to the classroom teacher who can use this information when purchasing books in the future or creating lesson plans. This information would also be helpful for parents to follow the progress of the child in conjunction with the classroom teacher which is again linked to increased achievement academically as it provides a wide supportive educational environment for a learner (A. Morgan et al., 2009, p. 181; Roberts et al., 2005, p. 346; Walker & Greene, 2009). By providing adequate opportunities to use and experience different types of technology in schools, the impact of the technology gap, that is described in the literature as potentially dividing the social classes as the richer members of society gain access to superior technology and connection speeds, is reduced (Biancarosa & Griffiths, 2012).

The design process used was inspired by work by McKenney & Reeves and a diagram of the process can be seen below in figure 3.1. This visualisation aided the design process by providing structure while at the same time being able to respond to continuous reflection and evaluation. The model is specifically designed for use in educational design and the interaction of the three main phases of the model provide the user with an iterative flexible design process (McKenney & Reeves, 2013, p. 77).

Figure 3.1 Model for education design



Source: McKenney & Reeves, 2013

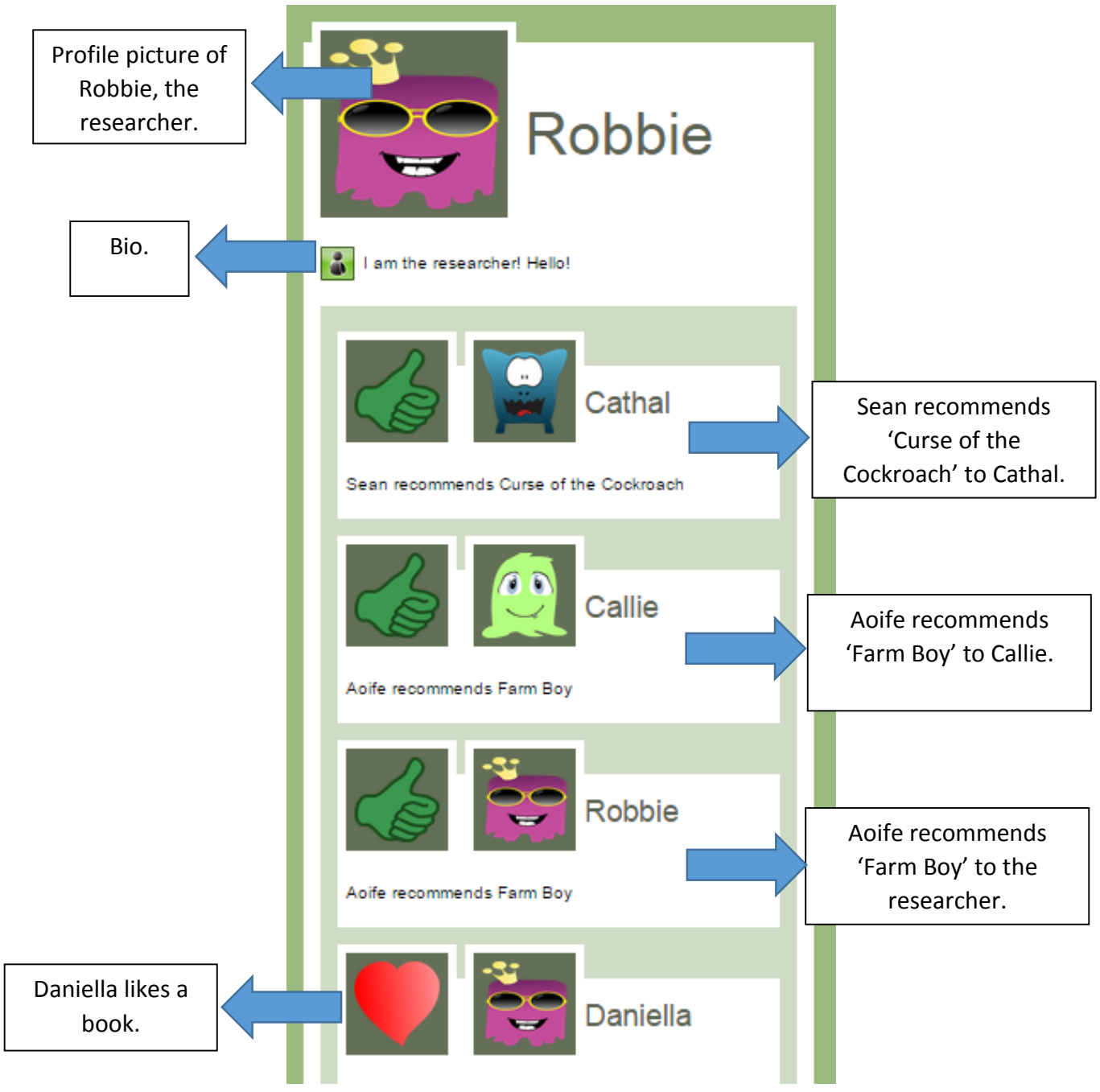
3.3 Design of the user experience

The rationale behind the intervention is that by fostering a positive early experience around reading for a learner through peer interaction and recommendation on a safe online platform, the literature suggests that it is possible to improve the speed and quality of the book selection process, increase the amount that they read and thereby increase the likelihood of the learner becoming an expert reader.

The literature review has expounded the many benefits of peer recommendations and interactions on learner motivation and their consequent influence on reading levels. As such the design of the intervention was developed to promote positive interactions among the learners and uses many of the design characteristics of popular social media websites, such as Facebook or Twitter.

The learners in Bunscoil Loreto each have access to an IPod Touch in the classroom and this is the rationale behind optimising the intervention for use on this particular system with large pictures and buttons for the user to press and minimal text on all pages, barring where the learner chooses to read an excerpt or description. It should be noted, however, that the intervention is also designed to be responsive for use on any platform, such as an android device or a web browser. This is so the learner can have the benefit of the system whenever they choose to engage with it.

Figure 3.2 User wall



The design elements such as a profile picture, bio and wall were purposefully used as a hook to create a sense of familiarity and desire in the user, who may have looked longingly over a shoulder at the social media of an older sibling, parent or guardian. This was also an effort to make the user interface as natural and intuitive as possible for the learner, see figure 3.2 above. Age restrictions for websites such as Facebook and Twitter are intended to deny children of primary school age access to these sites, the typical age restriction is 13 years of age. Though there are children who flout these rules, this should not be encouraged. In a recent study it was found that 26% of 9-10 year olds, rising to 49% of young people aged 11-12 had a profile on a social networking site and an average of 56% of these young people did not have their profile set to fully private (Livingstone, Haddon, Görzig, & Ólafsson, 2010, pp. 36-38). The intervention was designed to tap into this illicit demand and the 'intrinsic appeal' of an online place to communicate with friends (O'Neill, 2013, p. 22). The intention of this intervention is to create a safe online environment that is closed to those outside of the class group which is conducive to interaction among the class, to ensure that the maximum number of recommendations are given to learners and the social capital of the class is harnessed to the fullest extent.

There are clear issues with using the popular social media websites for primary school learners and the system has been developed to solve these issues and to provide the specific functionality required, such as the search facility, that the social media platforms do not make provision for. After deep reflection and discussion with peers it was decided that comment functionality was not appropriate for this system as this could potentially lead to cyberbullying or negative comments, which could impact on the positive early experience desired. The design of the intervention was driven by the findings in the literature review, see table 3.1 below.

Table 3.1 Design table

Literature review theme	Design principle	Implementation	Outcome
Importance of reader attitude	Reader attitude can have a major impact on a learners reading ability and thus on their academic achievement as a whole. To improve reader attitude learners should have quick access to books that they will enjoy.	Learners are provided with a facility to discover and share books that they enjoy in a social environment without negative commentary.	As the learners can easily find books that they enjoy, attitudes to reading may improve.
Positive early experiences	Learners should be exposed to positive reading experiences in a supportive and meaningful environment to stimulate them from a young age. Negative experiences can develop entrenched negative attitudes.	The TEE is designed to provide a positive experience and there is no scope for negativity. If a learner does not like a book they simply do not click on the heart or recommend it and there is no record of this shown to others.	Learners given a positive early experience and this may help to develop in them a positive attitude regarding reading.
Expectation of student progression	Students are expected by society to progress at a standard reading rate. Failure to do so has severe repercussions for the individual and society. The optimum time to learn the mechanics of reading is the primary school.	The intervention is designed for young learners and took place in a primary school setting: Bunsoil Loreto, Gorey, Co. Wexford.	Young learners may find the design appealing and may be encouraged to read more.
Peer influence	Peers can have an important influence on a learner's motivation and attitude.	Learners see what books their peers like and also peers recommend books to each other.	Positive influences may be given by peers to all learners, this may particularly aid a learner with poor role models in the home environment.

Peer recommendation	Peers recommendations can have a considerable influence on a learner.	Peers recommend books to each other, choosing which individual they believe will be interested in the book. This may encourage deeper reflection on the book and also on their knowledge of others in their peer group.	A learner receiving a recommendation for a book from a peer is more likely to read that book. This interaction may spill over into offline interactions and that the learners may discuss books together.
Constructivism	Learners construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences.	When a learner has finished reading a book they reflect on the content of the book and can decide to like the book and recommend it to a peer.	Those recommending a book may think critically about the book before they recommend it. Others will receive tailored recommendations that increases the likelihood of them finding a book they may enjoy and read.
Constructionism	Building knowledge occurs best through building things that are tangible and sharable.	Learners are given a blank canvass and build their own profiles and networks of recommendations between each other. They share recommendations and these are built into a bank of books that they want to read.	Learners may share which books they enjoy with the group and will recommend books to individuals based on their knowledge of the individual.

Once the design elements were identified it was logical to see if these needs could be met using a pre-existing technology, rather than create a bespoke tool for the intervention, see table 3.2. This examination of existing technology and subsequent rejection provide the rationale for the construction of a bespoke tool to drive the intervention.

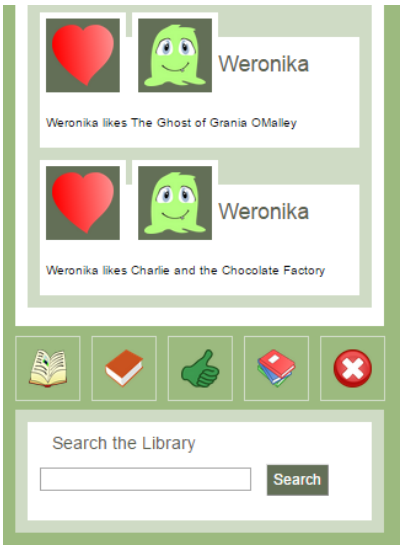
Table 3.2 Functionality of social media and bespoke tool

Literature review theme	Functionality required	Possible in Facebook/Twitter?	Possible in bespoke tool?
Importance of reader attitude	Search facility	Not possible. No search facility.	Possible. Full search functionality.
Positive early experiences for young learners	Closed, safe environment for young learners. Not possible to leave negative feedback/ comments.	Not possible. In the social media learners will be exposed to positive and negative experiences. The open nature of such websites may lead to unwelcome commentary or a distraction from the intervention at hand.	Possible. Fully enclosed, safe environment for learners. Positivity promoted.
Expectation of student progression	Specifically designed for young learners.	Not possible. Facebook and Twitter are designed primarily for adult users and children of primary school age are not allowed to open accounts. That some users surreptitiously open accounts at a younger age is not relevant to this study.	Possible. The intervention is specifically designed for young learners.
Peer influence	Peers influence each other through liking what they are reading	Possible. Peer influence would be possible on social media but difficult to monitor and measure.	Possible Peer influence would be facilitated and easy to monitor and measure.
Peer recommendation	A systematic method of recommending books and retrieval of past recommendations.	Possible. It is possible to recommend books on social media. A list of these recommendations are not available however and it can be quite frustrating to find old recommendations.	Possible. Recommendations would be made and saved in lists for easy recovery when wanted.

3.3.1 User functionality

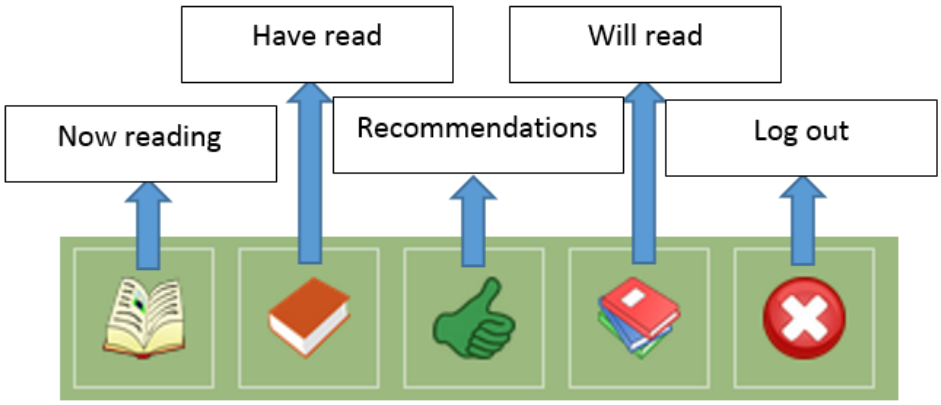
The toolbar and search facility of the intervention is at the bottom of every page for the user. A basic search facility was developed by the researcher during prior research and was developed further to drive the search functionality of this intervention (Doyle, 2014). Figure 3.3 shows this at the bottom of a user wall.

Figure 3.3 Toolbar at the bottom of wall



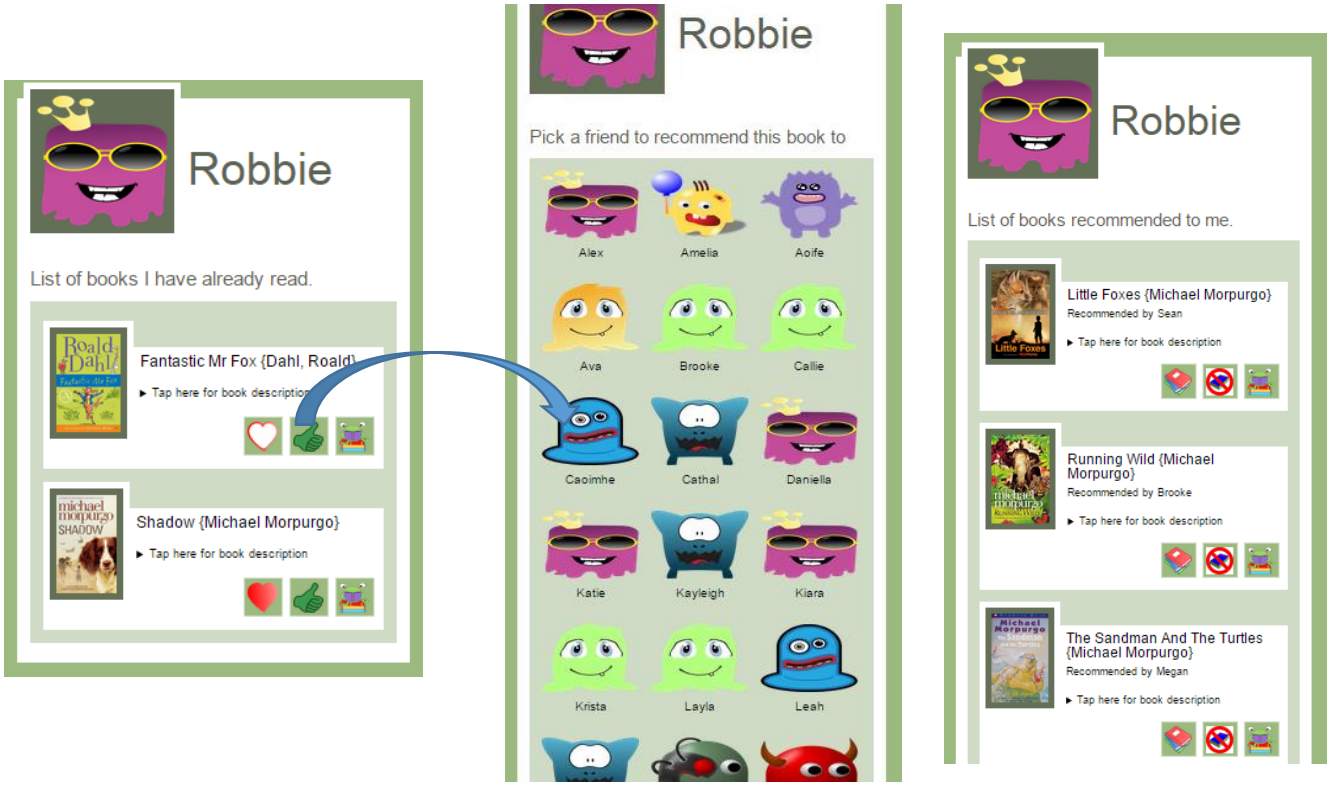
The toolbar is a simple graphical user interface which represents the functions behind the buttons. Figure 3.4 shows these functions, hovering over the button would also give the user this text prompt. The buttons are designed to be intuitive for the user to reduce the amount of learning required to use the system.

Figure 3.4 Toolbar functions



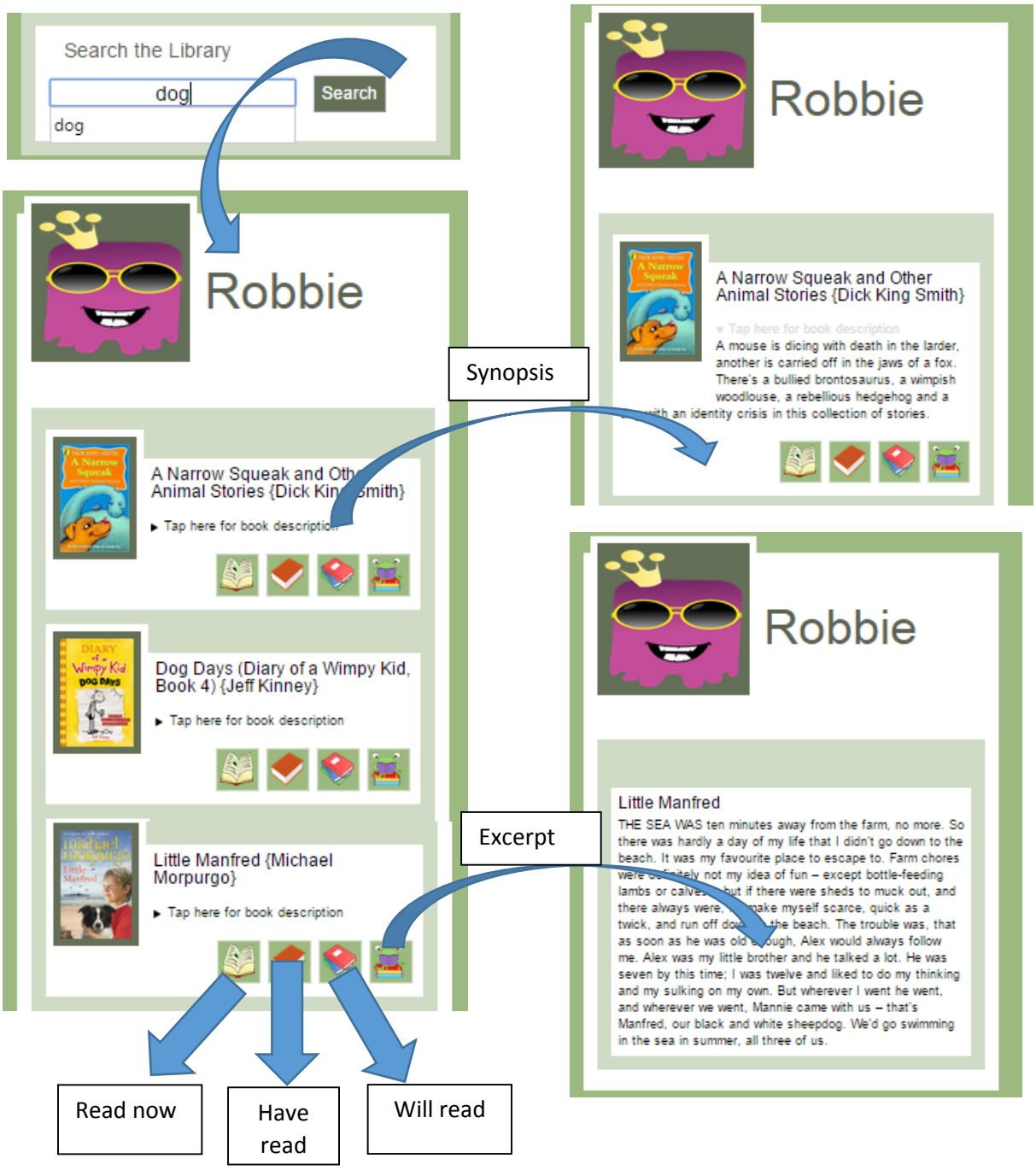
To make a recommendation or like a book a user must first have read the book and added it to their have read list, as in Fantastic Mr Fox in figure 3.5. When a user clicks on the recommend button a list of other users appears that may be recommended the book. This user will then carefully decide who to recommend the book to and select a member of their class. The user who received the recommendation will now have a post on their wall telling them about who recommended them the specific book and the book will also appear in the recommendation list of that user for simple retrieval when needed. In the recommended books list a user may choose read a book description or read an excerpt from the book. This saves vital time for a learner and reading an excerpt also shows the reader the level of the book which can then be rejected if it is too high or low. The literature review suggested that books that were too difficult or too easy for the learner had a negative impact on reader attitudes and this solution was created in response. The excerpts and descriptions are also available from search results for this purpose. A learner may then choose to accept a recommendation and add a book to their 'will read' list or reject a book, a choice which is not shared with the person who makes the initial recommendation.

Figure 3.5 Recommendation Process



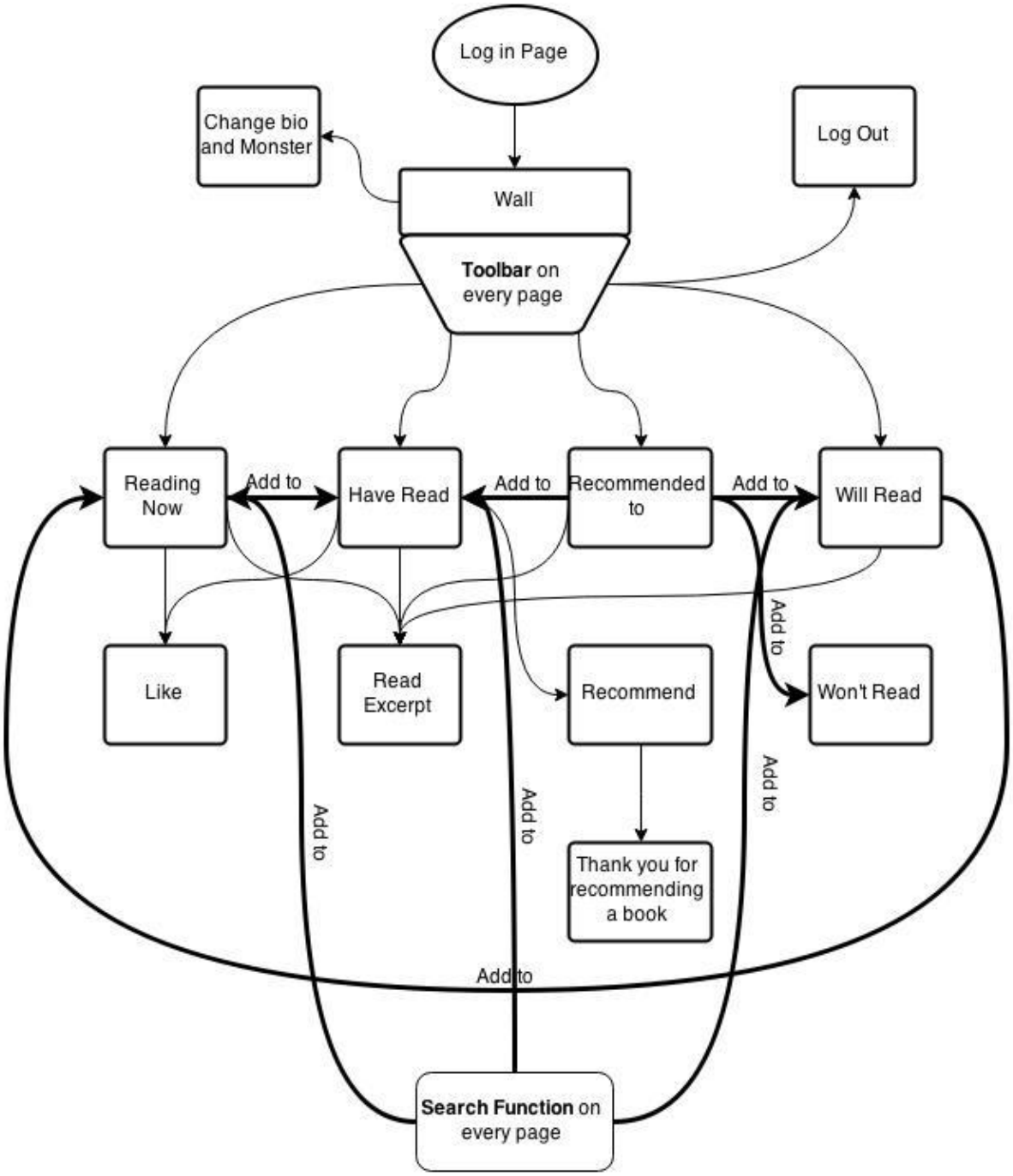
To assist the reader in understanding the intervention fully, the process and functionality of the book search is illustrated in figure 3.6 below using a demonstration search for the word ‘dog’. On any page type ‘dog’ into the search function and you will be shown books that have dogs in their content. A learner can get a brief synopsis of the book by tapping under the name for a book description or they can read an excerpt from the book

Figure 3.6 Search facility



An overview of the design of the learner experience is given in figure 3.7 below.

Figure 3.7 Design overview

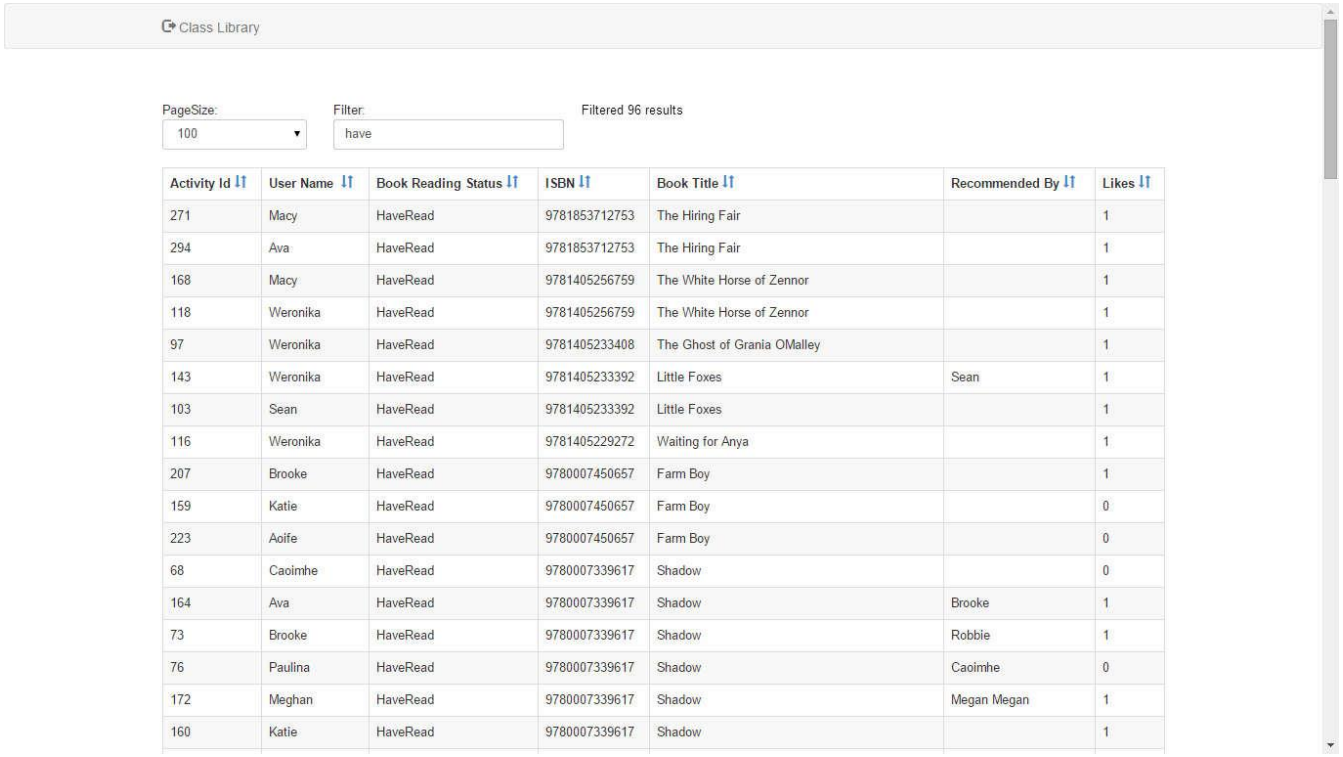


3.3.2 Classroom teacher functionality

The system is also designed to be user-friendly for the classroom teacher and to be responsive to the needs that may arise over the course of a school year. Teachers may add, edit or remove books and students as the need arises.

The main benefit for the teacher is in the searchable database which is created through the actions of the learners. Each like, recommendation or book status change is logged and searchable, giving the teacher access to detailed information as to which books are popular or unpopular among the class and the book status of each individual. This can tell the teacher which books an individual has read, wants to read in the future and which books they have rejected. In the example illustrated in figure 3.8 below the search is for books that the students have read. This shows that since the initial introduction of the intervention ninety-six books have been marked as having been read by the students.

Figure 3.8 Teacher searchable admin page example



Activity Id	User Name	Book Reading Status	ISBN	Book Title	Recommended By	Likes
271	Macy	HaveRead	9781853712753	The Hiring Fair		1
294	Ava	HaveRead	9781853712753	The Hiring Fair		1
168	Macy	HaveRead	9781405256759	The White Horse of Zennor		1
118	Weronika	HaveRead	9781405256759	The White Horse of Zennor		1
97	Weronika	HaveRead	9781405233408	The Ghost of Grania OMalley		1
143	Weronika	HaveRead	9781405233392	Little Foxes	Sean	1
103	Sean	HaveRead	9781405233392	Little Foxes		1
116	Weronika	HaveRead	9781405229272	Waiting for Anya		1
207	Brooke	HaveRead	9780007450657	Farm Boy		1
159	Katie	HaveRead	9780007450657	Farm Boy		0
223	Aoife	HaveRead	9780007450657	Farm Boy		0
68	Caoimhe	HaveRead	9780007339617	Shadow		0
164	Ava	HaveRead	9780007339617	Shadow	Brooke	1
73	Brooke	HaveRead	9780007339617	Shadow	Robbie	1
76	Paulina	HaveRead	9780007339617	Shadow	Caoimhe	0
172	Meghan	HaveRead	9780007339617	Shadow	Megan Megan	1
160	Katie	HaveRead	9780007339617	Shadow		1

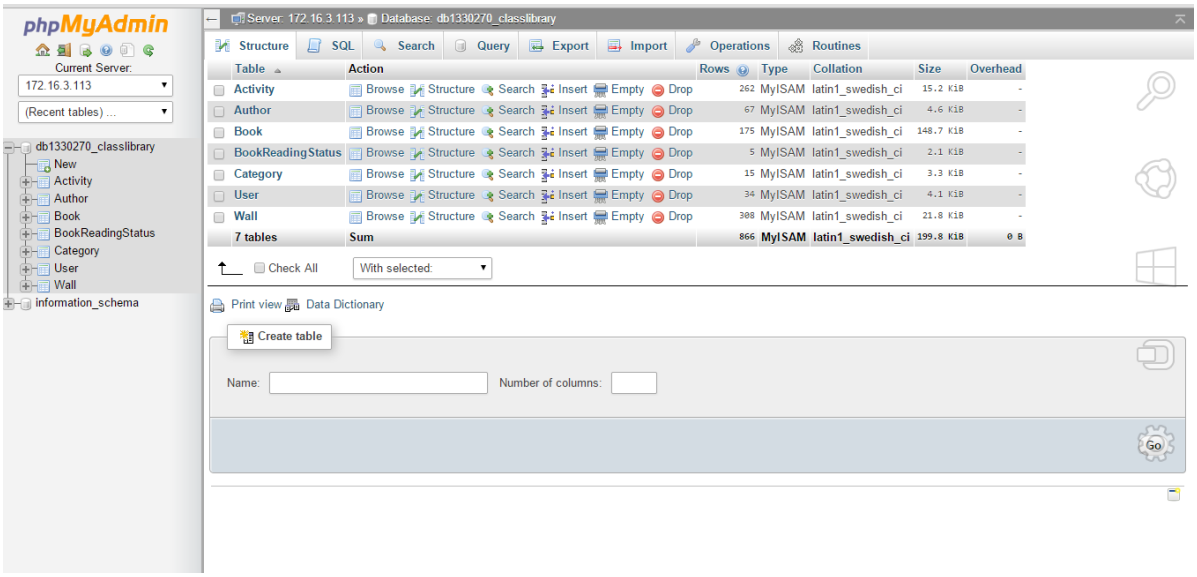
3.4 Developer design of the artefact

The design of the server side of the intervention can be split into two parts, the database structure and retrieving data for the user.

3.4.1 Database structure

The user experience is backed by a set of seven tables in a database on the server side of the intervention, see figure 3.9. A great deal of thought went into the construction of these tables to ensure that there was no duplication of data and that the intervention ran as smoothly as possible.

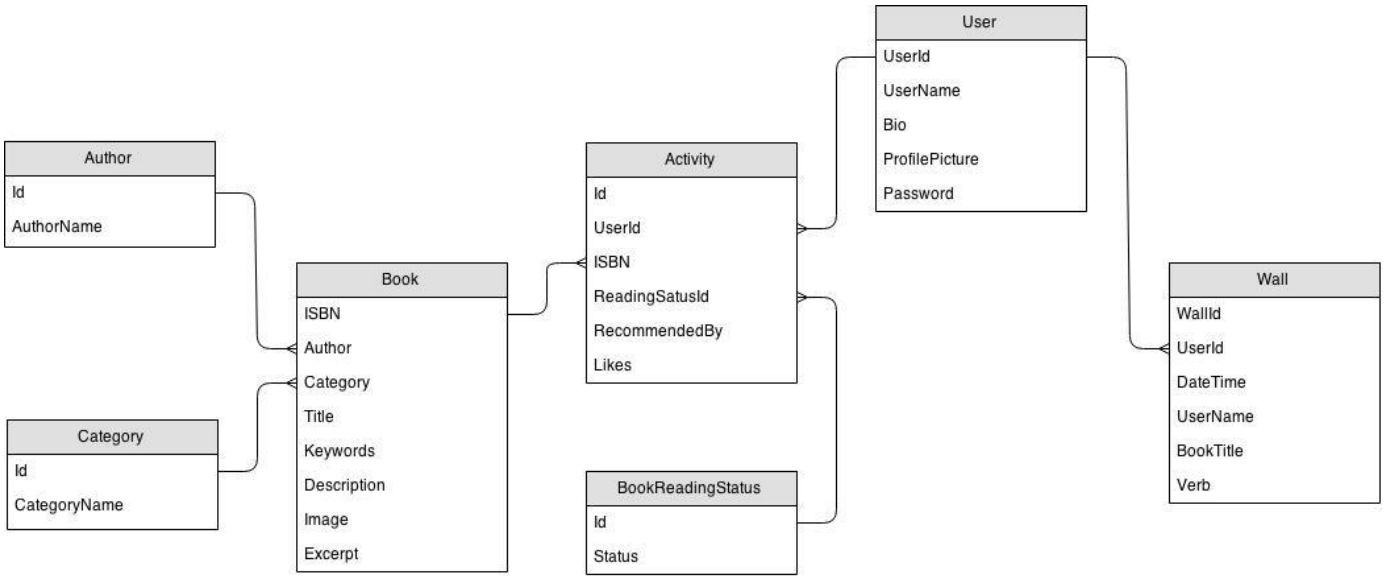
Figure 3.9 Overall database overview



Three tables were used for the search facility of the intervention, named Author, Book and Category. This enabled the user to search for any book in their class library using all or part of an author's name, a book's name and the category of book it belongs. Additionally the user could search for any term included in the excerpt from the book or in the description of the book, meaning that if a user searched for 'dog' they would be given all of the books that interested them and not merely those with dog in the title.

The remaining four tables are used to display the user data and activity. These are Activity, BookReadingStatus, User and Wall. Once a user logs in using the correct details as found in the User table they are presented with their wall which shows their individually tailored data, including books that they were recommended and books their friends liked. This information is stored in the Wall table. Any action that a learner takes in the intervention, such as liking a book, recommending a book or marking a book as read is logged in the Activity table. Such actions have an effect on other tables such as the BookReadingStatus table, which determines where the book will show up on the learner profile. A book that is selected can be in five different states to state that the book has been read in the past, is currently being read, was recommended to them, is a book they want to read in the future or one that they do not want to read. The status of the book will determine where the book will be displayed, or in the case of a book that the learner does not want to read, whether it is removed from their profile. Books that have been marked as 'won't read' by a learner can be seen only by the researcher but could potentially be of use for a teacher in a future system. A full database schematic is provided below in figure 3.10 to clearly illustrate the relationship between the tables in the database.

Figure 3.10 Database schematic



3.4.2 Presenting the data for the end user

Once the database had been carefully constructed, the information that the database contained had to be displayed as designed for the user. To achieve this a combination of HTML 5, PHP script and SQL queries were used to generate the requested pages using the user information supplied. Cascading style sheets were used to ensure a consistent visual aesthetic was maintained. A sample of files using the HTML 5, PHP and SQL scripting language is available in Appendix T and the cascading style sheet is available in appendix U.

Chapter four: Methodology

4.1 Introduction

At the beginning of this chapter the research questions that provide the framework for this thesis will be reiterated for the reader. The methodological approach adopted will then be outlined along with the reasoning behind the choice of this particular method and justification for the rejection of alternative possibilities. A detailed description of the participants of the study and the location of my intervention will be provided to afford the reader with a context to place the study within. A comprehensive description of the process of administering the pre-intervention reading attitude questionnaires will then be given, along with details of how the questionnaires of non-participants were handled by the researcher. The following sections will furnish an in-depth look at the initial introduction of the intervention to the classroom and the implementation of the tool in a primary classroom setting and researcher observations regarding this process. The penultimate sections will consider the second visit to the classroom of the researcher and the post-intervention questionnaire and the final section will discuss the ethical considerations raised by the intervention.

4.2 Research question

The purpose of the research is to investigate how peer recommendations and social interaction using an online tool influence reading attitudes in a primary school setting. To investigate how enabling young learners to interact in a safe environment online to exchange recommendations regarding books and reading material affects their reading attitude. Finally, to determine how social interaction in an online environment impacts learner reading attitude.

4.3 Methodological approach adopted

This section of the chapter will go into great detail on the decision making process regarding the methodological approach to the research.

4.3.1 Range of approaches to research

A range of methodologies are available to the researcher depending on the requirements of each piece of research. These methodologies include experimentation, surveys, archival analysis, histories and case studies. The methodological approach adopted for the research is a case study. This approach was adopted after careful examination of the options available to the researcher and the nature of the research being undertaken, see table 4.1.

Table 4.1 Relevant situations for different research strategies

Relevant Situations for Different Research Strategies			
Strategy	**Form of Research Question**	**Requires Control of Behavioural Events?**	**Focuses on contemporary**
Experiment	How, why?	Yes	Yes
Survey	Who, what, when, how many, how much?	No	Yes
Archival analysis	Who, what, where, how many, how much?	No	Yes/No
History	How, why	No	No
Case Study	How, why?	No	Yes

Modified from source:(Yin, 2003, p. 5)

4.3.2 Why a case study?

Yin is a strong advocate for the use of a case study. He believes that a case study allows researchers to investigate events that involve people and their complex social interactions (Yin, 2003, p. 2). Creswell also believes that there is great merit in conducting a case study and describes the approach as one where the researcher 'explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (Creswell, 2012, p. 97). The literature also suggests many difficulties involved with case studies, including defining what a case study is. Indeed, research has uncovered at least twenty-five different definitions of what a case study is in a single paper, which is suggesting yet another definition as a solution to this problem (VanWynsberghe & Khan, 2008, p. 2). This research will adopt the approach defined by Yin and Creswell, while acknowledging that there is a range of other opinions in the literature.

4.3.3 An exploratory case study

Once a case study was chosen as the type of study, different types of case studies were examined to determine which type of case study would be the most appropriate for the research concerned. Yin believes the variety of different case studies can be distilled into three primary categories and can be described as an exploratory case study, a descriptive case study or an explanatory case study (Yin, 2003, p. 3). A descriptive case study can be used to describe phenomena within a dataset and to trace, over sometimes considerable amounts of time, sequences of interpersonal events and can be both time-consuming and expensive. An explanatory case study looks at data in great detail in an attempt to explain, or elucidate, the phenomena that are evident in a data set. Again an explanatory case study can be both time-consuming and expensive. An exploratory case study is a less time-consuming and

expensive method of conducting a case study. It is suited to smaller scale data collection and analysis and can be used as a pilot case study 'to develop pertinent hypotheses and propositions for further inquiry' (Yin, 2003, p. 6). As a result of this evaluation of differing case study strategies, it is clear that the most suitable type of case study that could be used is an exploratory case study.

4.3.4 Justification for mixed methods

Mixed methods were chosen for use with this exploratory case study. This means that the researcher will collect analyse and interpret both quantitative and qualitative data, based on the research questions, and will be able to gain the benefit of both approaches to triangulate and corroborate data (Stake, Denzin, & Lincoln, 2005, p. 271). There is debate in the literature regarding mixed methods. Some consider the method to be so developed that it represents a third methodological paradigm, with the first and second being quantitative and qualitative (Venkatesh, Brown, & Bala, 2013, p. 22). Others argue that we should strive towards 'methodological pluralism' and reject any distinction between quantitative and qualitative, instead focus on mixed-methodological approaches (Onwuegbuzie & Leech, 2005, p. 272). Creswell sees the constructive debate and controversy surrounding mixed methods as a 'healthy development' and believes that it pushes researchers towards 'a greater openness to new ideas' (Creswell, 2002, p. 539). On balance, the researcher believes that the range of methods will add strength and rigour to the research being conducted as it will provide insights into the data that way otherwise have escaped attention and offer alternative theoretical perspectives for analysis (Venkatesh et al., 2013). It must be acknowledged that as a small intervention with time restrictions and other limitations the insights the research provides may not prove to be reliable and that they should be regarded as indications for further research where reliable insights may be found.

4.3.5 Mixed methods elements

The mixed methods which have been adopted for this case study consist of numerous elements. Before and after the intervention the learners will be given a rigorously tested questionnaire, which has been used extensively across hundreds of schools and tens of thousands of students in a significant study in the United States, see appendix F (Kear & McKenna, 1990, p. 627). This questionnaire has been developed explicitly to test the attitude of young readers and is, therefore, a perfect tool for use in this research and adds rigour and fortitude to the findings that may be obtained from its use. The questionnaire can be used to measure academic reading, which is reading related to schoolwork and recreational reading, which is reading a learner will pursue for fun in their own time, or can be read as a combined total of the two. An example of an academic reading question from the questionnaire is; 'How do you feel when a teacher ask you questions about what you read?', which relates specifically to the classroom. A recreational reading question relates to reading outside the class, such as; 'How do you feel about reading for fun at home?', see appendix F for all twenty questions. Learners are not informed as to this possible distinction in the questions they are asked. The quantitative data gathered in the pre-intervention questionnaire will be compared to the data generated in the post-intervention questionnaire, which asks the same questions, giving us a before and after of the young learners attitude. Quantitative data will also be gathered from researcher and classroom teacher observations as well as learner feedback, the researcher's reflective journal and analysis of the learner's online interactions. Qualitative data will also be gathered from the website statistics available.

4.4 Location and participants

The intervention took place at Bunscoil Loreto, a mixed primary school in the heart of Gorey, Co. Wexford, in the south east of the Republic of Ireland. Though established in the mid-19th century, the

school has been recently upgraded and boasts wide corridors, modern large classrooms and is bright and welcoming throughout, see figure 4.1. The classroom teacher that is facilitating the intervention, Lucinda Doyle, teaches 3rd class boys and girls from a range of economic and ethnic backgrounds. Bunscoil Loreto is an inclusive school that caters for children of all abilities and as such there is a mixed range of abilities present in the classroom of Ms Doyle.

Figure 4.1 Bunscoil Loreto, a modern primary school.

4.5 Pre-intervention formalities and questionnaire

In the week preceding the intervention, the learners were provided with information sheets and consent forms to bring home and return to the classroom teacher for both themselves and their parents or guardians, see appendices A and B. Consent for the intervention had previously been sought and obtained from the school Board of Management and the classroom teacher.

Upon arrival at the classroom, after a brief introduction of the researcher to the learners, the pre-intervention questionnaire was distributed among the learners, see appendix F. All students were given time to complete the survey during class, but none were required to answer questions if they

did not choose to as elucidated in the previously distributed information sheets. After the allotted time period elapsed the questionnaires were gathered and stored safely in the briefcase of the researcher. The questionnaires of the non-participating students were removed from those collected and destroyed as soon as time permitted and no data was gathered from them. Information was gathered from the participating student questionnaires and collated for later analysis and examination.

4.6 Introducing and implementing the intervention in the classroom

With the questionnaire safely gathered and stored the researcher presented the recommendation system to the learners using the projector that is attached to the ceiling of the classroom. The process of logging on, searching for and recommending a book was demonstrated to the learners and the functionality of the technology enhanced experience was described. Each of the learners were then presented with an IPod Touch for use with the technology enhanced experience and were given the address and their login details. Learners were given only one instruction to get them started with the tool. They were instructed to think about one book that they had read in the past and enjoyed and then to think about a friend that might like to read this book. Learners were then free to use the tool any way they chose. The tool was designed according to the principles outlined in the literature review to accrue the benefits of a constructivist approach with learners using experimentation, discovery and their prior experience to construct their own knowledge and thereby gain ownership of what they created. As such, the learners were each independently creating content and networks of recommendations between each other.

The learning experience took place at the very end of the school day and as the students were working independently, they were each undertaking a different process when the bell to end the school day rang. This situation was purposefully engineered to build user anticipation for the next time that they

would be able to use the tool. Learners were encouraged to bring their login details home, to access the recommendation system from there and to show their parents the process. The rationale behind this procedure was the clear link in the literature between the level of active interest of parents or guardians in the development and day to day progress of a child and their educational attainment in the longer term (Broeder & Stokmans, 2013, p. 93; A. Morgan et al., 2009, p. 168).

4.7 Post-intervention questionnaire

The technology enhanced experience took place over the course of a month. During this period the learners were free to use the technology as much or as little as they pleased at home. They were also given some class time to use the facility to search for books that they wanted to read, to see what books had been recommended to them and to recommend books to others.

After this period the researcher visited the classroom again to administer the post-intervention questionnaire. The questionnaire was distributed among the learners in the same classroom situation as the pre-intervention questionnaire. All students were given time to complete the survey during class, but did not have to answer any questions that they did not want to and no pressure was applied. After the allocated time period, the questionnaires were collected and placed in the briefcase of the researcher. The questionnaires of the non-participating students were removed and destroyed as soon as possible and no data was used from them. Information was gathered from the participating student questionnaires and collated for later analysis, examination and comparison with the pre-intervention questionnaire.

4.8 Classroom teacher observations

The classroom teacher made observations throughout the entire period of the intervention, from the first visit made by the researcher until the second visit and the administration of the final ERA questionnaire. These notes were made available to the researcher and the observations paragraph in chapter five was read by the classroom teacher to ensure that her observations were properly represented, adding to the rigour of the research.

The classroom teacher also made observations of the learners during lunch and other more social occasions to determine offline friendships for comparison with online interactions.

4.9 Researcher classroom observations

The researcher took brief notes and made observations during preliminary questionnaire, the introduction of the technology and its use on the first day or the intervention and during the administration of the second questionnaire five weeks later. Immediately after both sessions with the learners, the researcher expanded upon these notes and noted items that could not be written during the intervention due to time pressures. This was done immediately afterwards to ensure that the memories were still fresh in the mind of the researcher.

4.10 Ethical considerations

The learners who participated in this study were all children under the age of eighteen so the consent of parents or guardians, as well as the learners themselves, was required before any intervention was able to take place, see Appendices A and B. As the intervention took place in a primary school, the permission of the school Board of Management and the classroom teacher was also required, see

Appendices C and D. All of the individuals and groups above received detailed and age appropriate information sheets along with their consent forms and only learners with completed consent forms would have data gathered and used in this study.

Legislation that is relevant to this study includes the Data Protection Act 1988 and the Data Protection (Amendment) Act 2003 (Comission, 2014), and the Department of Education Child Protection Procedures for Primary and Post-Primary Schools (Education, 2011).

4.11 Summary

After a careful examination of the methodological approaches open to the researcher to answer the research question posed, a mixed methods exploratory case study was chosen. The location of the study is to be Bunscoil Loreto primary school in Gorey, Co. Wexford, where the participants are members of Ms Doyle's 3rd class. Questionnaires are administered pre and post-intervention to measure the reading attitude of the class and observations made by the researcher and teacher. As the participants are under the age of eighteen, there are certain ethical considerations which must be observed, such as contacting parents for consent. Full details of the applicable ethical considerations may be found in section 4.10.

Chapter five: Data analysis and findings

5.1 Data collection and analysis method

As this was a mixed methods case study, a variety of sources of data were used to gather different types of data. To this effect, pre and post intervention questionnaires, class teacher and researcher observations, learner feedback, learner interaction online, website statistics and excerpts from the researcher's reflective journal will be used to gather data. This data will then be triangulated in an effort to elucidate the impact of the technology on the attitude of the learner.

The pre and post intervention questionnaires were both identical questionnaires based on the rigorously tested Elementary Reading Attitude survey (ERA) which was widely used in large-scale American studies. To analyse the data from these questionnaires it was first necessary to enter the data into an individual ERA scoring sheet for each learner, see Appendix G. In an effort to gain an overall picture of the attitude of the entire class both before and after the intervention the data gathered in the pre and post intervention questionnaires was collated into Appendices H and I. The ERA questionnaire can be broken down into two sections to measure attitudes towards both recreational and academic reading. In Appendices J and K the changes in recreational and academic reading are shown. Finally in Appendix L, the total attitude changes as measured by the ERA questionnaire are presented to facilitate the comparison of individuals and give a broad overview of the class as a whole.

Observations were made by the classroom teacher throughout the course of the intervention, reflected on and presented to the researcher upon the conclusion of the research along with learner feedback. Similarly the researcher was engaged in observation and gathering of feedback while in the classroom, but more importantly, was engaged in continuous reflection on the processes and the research as a whole. Website statistics and learner interaction online were automatically gathered

and will be analysed using tools provided by the hosting company of the website and by other free software obtained online and described in detail in the forthcoming chapter.

5.2 Researcher observations and reflections

For the intervention the researcher travelled to Bunscoil Loreto, Gorey, Co. Wexford. The school, much like the town it resides in, has been expanded and modernised in recent years and cuts a striking image on the landscape, as can be seen in figure 4.1 in the previous chapter. The modern school's wide corridors and large, bright classrooms were a perfect location for the research. Before the research began the researcher was delighted with how open both the Board of Management and the classroom teacher, Cindy Doyle, were to the use of technology and to experimentation with new approaches.

When the researcher arrived for the initial session the learners had already been made aware of the intervention through the information sheets that had been tailored for their consumption, see appendix A. The learners were seated in grouped tables in the large, bright classroom and the atmosphere was conducive to learning, each learner being attentive and alert. The questionnaire was distributed among the learners efficiently using a system whereby a learner from each table would come and collect enough for their table and then distribute them to their peers. Once each of the learners had a questionnaire the researcher pointed to the happiest Garfield character and asked the students what emotion he was feeling. The researcher then followed the same process with the really unhappy Garfield and elicited the two other levels of emotion between them. The students were encouraged to answer the questions as honestly as they could and were reminded that this was not a test and they could not answer any questions wrong. The students were then able to complete the questionnaire without any further intervention.

When the questionnaire was completed it was gathered and stored. The researcher then introduced the intervention to the learners using the classroom projector. The processes of logging on, searching

for and recommending a book was demonstrated to the learners and the functionality of the technology enhanced experience was described. The learners were then each presented with an IPod Touch and were given the address and their login details. Learners had one instruction to get them started with the tool. They were instructed to think about one book that they had already read and enjoyed and to recommend this book to a friend that they think might like to read it. This was in an effort to make them familiar with the system. Learners were then encouraged to use the tool any way they chose. Small problems arose for some students during the log in process, such as an incorrectly spelled log in name, but these problems were immediately rectifiable by the researcher and overall the log in process was a smooth one.

While the student were using the system they were free to interact with the researcher and to give feedback on the intervention. The learners were excited by the tool and the researcher did not experience any negative commentary, bar during the log in process where the learners believed that the system was not working. One interesting comment was from a girl who said she loved the fact that no text comments were possible as this would 'stop cyber bullies'. This was very interesting for the researcher as this was the reason that text comments were not built into the system, a decision which was deeply reflected upon, and the rationale for the decision was in no way explained to the learners. This provided the researcher with justification for his decision. Other comments from the learners focused on the design of the intervention, which the learners enjoyed due to the intuitive layout and the colourful monsters.

When the bell went at the end of the school day learners were audibly disappointed. They were then told to bring their login details home and they could log in from there. At this point the researcher overheard some learners say that they were going to show their parents their wall when they got home. Again this was interesting for the researcher as the rationale behind allowing the students to use the system from home was the clear link in the literature between the level of active interest of

parents or guardians in the development and day to day progress of a child and their educational attainment in the longer term (Broeder & Stokmans, 2013, p. 93; A. Morgan et al., 2009, p. 168).

5.3 Classroom teacher observations

The classroom teacher had many interesting observations on the use of the system by her students and on the value the system had to her as a teacher. An email from the teacher with her observations may be found in Appendix O.

On a practical level the teacher found the system of great benefit to transition from ICT time to Literacy time and to manage when learners were browsing the library for books. As the class is short on space there is a limit of two or three children who can physically browse for books at the same time which is time consuming and challenging to manage. The teacher found the system removed the problem of class management and the entire class could search for books simultaneously, which saved a great deal of class time and led to an increase in time to read for learners. The teacher observed that it was also beneficial that the learners could browse the library from home she said, 'which they loved doing'.

The teacher believed from her observation that the system instilled a 'bit of healthy competition in them'. Learners were eager to recommend books to others and had to read the book before they were able to. The teacher also overheard one learner thank another for her recommendation and asking questions as to what the book was about. The teacher sees her class as a friendly and inclusive group and encourages this atmosphere through switching seats on a regular basis. While the learners are happy to work with anyone in the classroom, in the yard at break they tend to stick to friendship groups. The teacher was curious as which category the system would fall into and was happy to see that it 'crossed their traditional friendship boundaries and extended to anyone they thought would enjoy the book – and also be able for the book'.

5.4 Implementing Elementary Reading Attitude questionnaire

The Elementary Reading Attitude questionnaire provides the user with figures that would be meaningless without being put in the appropriate context. Fortunately the researchers that are responsible for the initial construction and trialling of the questionnaire have provided other researchers with the key for unlocking the power of their beneficial tool. The questionnaire is designed in a Likert scale, where the attitudinal questions are carefully combined to create a composite scale and the answers should not be analysed individually (Boone & Boone, 2012). In this case, a reading attitude score of 50 is to be considered to be the midpoint on the scale and is thus an attitude of indifference. The attitude of the reader is progressively more positive as the score tends towards 80 and more negative as the score tends towards zero from the attitudinal midpoint of 50. It is important to bear this information in mind as one examines the data gathered as upon a more cursory examination one may assume, quite naturally, that the point of indifference would be at a score of 40 on a scale from 0-80 and thus may unwittingly exaggerate the positive attitude of a reader or, conversely, underestimate the negative attitude of the reader (Kear & McKenna, 1990, p. 636).

5.5 Analysis of pre-intervention questionnaire

The observational information provided by the classroom teacher, regarding reader attitude, suggested that there would be a range of attitudes. The observations also noted that while there is likely to be a wide range of attitudes, the overall attitude of the learners would be positive. In an effort to garner as clear a picture as possible of the reader attitudes and consider the data systematically, the data was first analysed in detail regarding academic and recreational reading in Appendices P and Q (Tables 5.1-5.4 and 5.7-5.10 and Figures 5.1-5.2 and 5.4-5.5), and then amalgamated to provide a global view below.

5.5.1 Pre-intervention overall reading score analysis

The following analysis will provide an overall view of the reading attitude of the class before the intervention. Both recreational and academic reading scores will be combined and analysed to draw inferences from the data. This data will later be compared to the post-intervention questionnaire.

Table 5.5 Individual student overall pre-intervention reading scores

Students	**Pre-Intervention**
	Full scale raw score (Recreational + Academic)
1.	**54**
2.	**77**
3.	**68**
4.	**73**
5.	**46**
6.	**70**
7.	**72**
8.	**65**
9.	**76**
10.	**63**
11.	**69**
12.	**76**
13.	**55**
14.	**56**
15.	**55**
16	**65**
	1040

Table 5.5 shows the overall positive attitude of the class towards reading as a whole. A total score of 1040 from a maximum of 1600 was achieved, which is above the score of 800 that would have

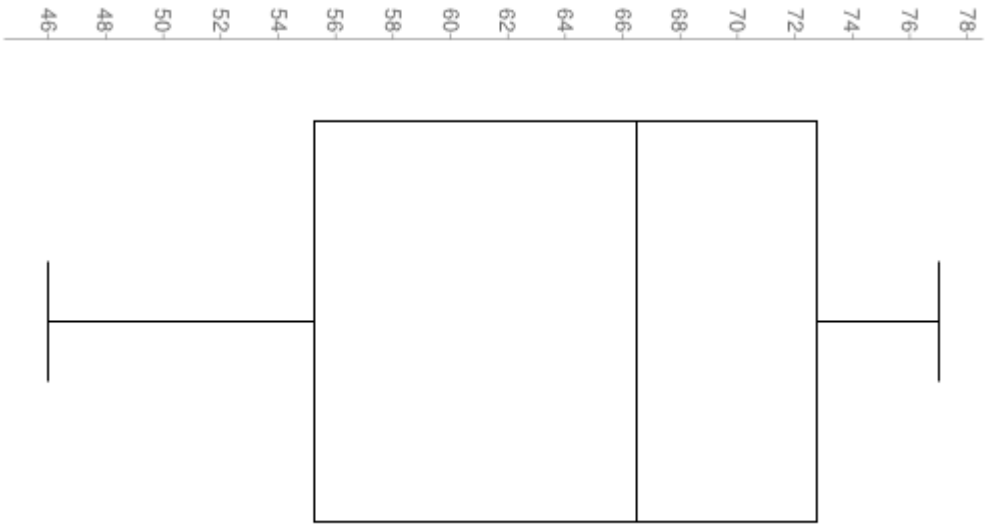
represented apathy. There was a range of 31, with the highest scoring individual on 77 and the lowest scoring individual a score of 46. There is only one learner with a negative total reading attitude, this score was only four points under the apathy threshold of 50 and is, as such, a low level of a negative attitude but still noteworthy. There are a number of other learners who scored only slightly above the threshold of apathy, whose positivity towards reading is not strong and who could be considered generally apathetic before the intervention.

Table: 5.6 Analysis of overall pre-intervention academic reading scores

	Overall Pre-Intervention
Total score of 16 learners	1040
Highest value	77
Low	46
Range	31
Interquartile range	17.5
First quartile	55.25
Third quartile	72.75
Sample variance	87.733
Mean	65
Median	66.5
Mode	55, 65, 76
Sample standard deviation	9.367

The mean reader attitude of the total score of the learners was 65. The median was 66.5 and the modes were 55, 65 and 76. This indicates that the general attitude to reading was positive overall before the intervention took place, though we must remain cautious of reading too much in such a small sample. The sample variance of 87.733333333 and sample standard deviation of 9.3666073545 show a close spread of the data, see table 5.6. For a clear graphical representation of this data a box and whisker plot has been constructed, figure 5.3 below.

Figure 5.3 Student pre-intervention overall reading scores box and whisker plot



5.6 Post-intervention questionnaire analysis

Analysis of the post-intervention questionnaire will follow the same pattern as the pre-intervention questionnaire, with recreational and academic reading being analysed independently in Appendices R and S before the totals are then considered here.

5.6.1 Post-intervention overall reading score analysis

The following analysis will provide an overall view of the reading attitude of the class prior to the intervention taking place. Both recreational and academic reading scores will be combined and analysed in an effort to draw inferences from the data. This data will later be compared to the pre-intervention questionnaire.

Table 5.11 Individual student overall post-intervention reading scores

Students	**Post-Intervention**
	Full scale raw score (Recreational + Academic)
1.	**56**
2.	**78**
3.	**76**
4.	**74**
5.	**52**
6.	**74**
7.	**71**
8.	**66**
9.	**74**
10.	**61**
11.	**74**
12.	**77**
13.	**67**
14.	**58**
15.	**72**
16	**70**
	1100

Table 5.11 shows the overall positive attitude of the class towards reading as a whole. A total score of 1100 from a maximum of 1600 was achieved, which is considerably higher than the score of 800 that would have represented apathy. There was a range of 26, with the highest scoring individual learner on 78 while the lowest scoring attained a score of 52. There were no learners with a negative total reading attitude as all learners were above the apathy threshold of 50. There was only one learner who scored only slightly above the threshold of apathy, whose positivity towards academic reading was not strong after the intervention. In the comparison of the pre and post-intervention questionnaires to come, it will be interesting to see what changes this learner experienced, if any.

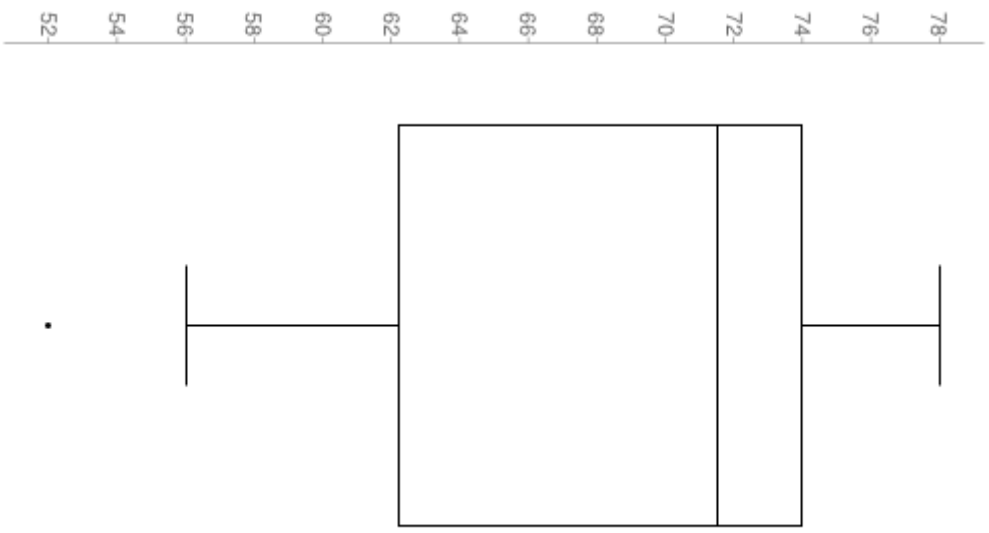
Table: 5.12 Analysis of Overall post-intervention reading scores

	Overall Post-Intervention
Total score of 16 learners	1100
Highest value	78
Low	52
Range	26
Interquartile range	11.75
First quartile	62.25
Third quartile	74
Sample variance	64.2
Mean	68.75
Median	71.5
Mode	74
Sample standard deviation	8.01249

The mean reader attitude of the total score of the learners was high on the scale at 68.75, given that the maximum achievable score is 80. The median was 71.5 and the mode was 74, again this indicates

to us that the general attitude to reading was very positive after the intervention took place, though we must remain cautious of reading too much in such a small sample. The sample variance of 64.2 and sample standard deviation of 8.01249 show a close spread of the data, see table 5.12. For a visual representation of this data a box and whisker plot has been constructed, figure 5.6 below. The box and whisker plot clearly shows the high levels achieved by bulk of the learners and the outlier that will need more attention to improve their attitude.

Figure 5.6 Student post-intervention overall reading scores box and whisker plot



5.7 Questionnaire comparison

The questionnaire comparison will examine the recreational, academic and total reading attitudes in that order. This comparison will show us clearly where changes have occurred, if any.

5.7.1 Recreational reading questionnaire comparison

To read widely and deeply in order to achieve the level of expert reader a learner must enjoy reading during their free time for pleasure and not just during school hours. As such, recreational reading attitudes are a very important source of information for the researcher. There was a significant increase of 25 in the overall class score from 533 to 558 points, an increase of 4.69%. Figure 5.7 below, clearly shows the changes, if any, of each individual learner in their recreational reading score. Pre-intervention scores are in blue and post-intervention scores are in red. Nine of the learners gained in score, the smallest gain being 1, the largest 8 and the mean 3.44 points gained. Four learners had no change, though, perhaps significantly, each of these learners had a score of over 35 points and a very strong positive attitude to recreational reading prior to the intervention. There were also three learners who decreased in score, with a mean drop of 2. See appendix J for further detail of individual recreational reading changes.

Figure 5.7 Recreational reading questionnaire comparison

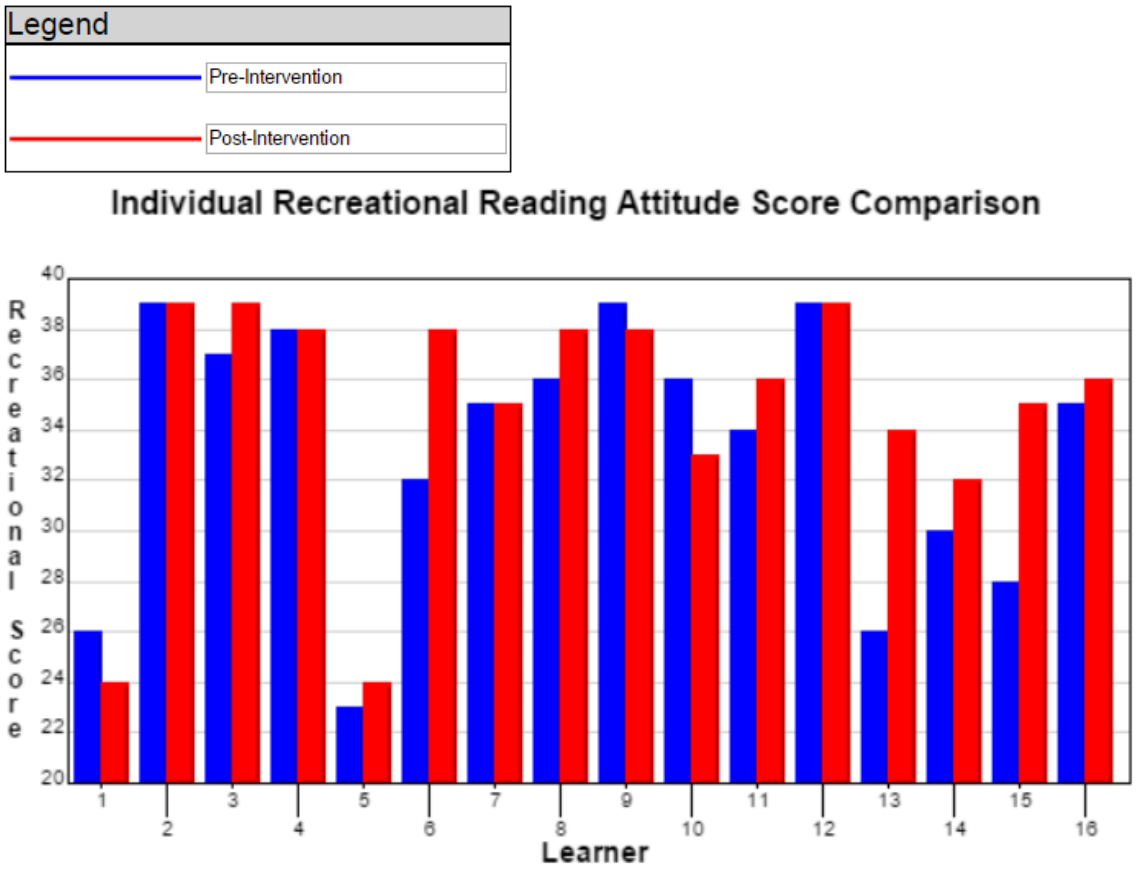


Table 5.13 shows the significant changes that took place between the two recreational reading questionnaires. The data shows that the increases in score led to a raising of both the mean and the median score. The dropping of the mode from 39 to 38 can be explained by the increase in numbers of learners achieving a score of 38 while the number of learners on 39 remained static, though one of the individuals who was 39 pre-intervention dropped to 38 post-intervention, see appendix J. The data also reflects the tighter clustering of scores with a narrowing of the range between the highest and lowest score and a decrease in the interquartile range and variance indicating this. The pushing up of the first and third quartile show the upward trend in this clustering of data and it could be significant that the largest push has been among those who occupied the lowest quartile.

Table: 5.13 Analysis of recreational reading score changes

	Pre-Intervention	**Post-Intervention**	**Change**
Total score of 16 learners	533	558	+ 25
Highest value	39	39	None
Low	23	24	+ 1
Range	16	15	- 1
Interquartile range	9.25	4.75	-4.5
First quartile	28.5	33.25	+4.75
Third quartile	37.75	38	+0.25
Sample variance	27.1625	22.7833333	-4.3792
Mean	33.3125	34.875	+1.5625
Median	35	36	+1
Mode	39	38	-1
Sample standard deviation	5.21176553579	4.773189	-0.4386

5.7.2 Academic reading questionnaire comparison

Academic reading attitudes are an indication of how the learner views reading during the school day, academic reading attitude is important for any learner who wishes to achieve their potential in an educational environment. There was an even greater increase of academic reading attitude levels than recreational levels, increasing 35 in the overall class score from 507 to 542 points, a significant increase of 6.9%. Figure 5.8, below, illustrates the differences, if any, of each individual learner in their academic reading score. Eleven of the learners gained in score, the smallest gain being 1, the largest 10 and the mean 3.64 points gained. Only one learner had no change, this learner retained a score just above the point of apathy. There were four learners who decreased in score, with a mean drop of a slight 1.25. See appendix k for further detail of individual academic reading changes.

Figure 5.8 Academic reading questionnaire comparison line graph

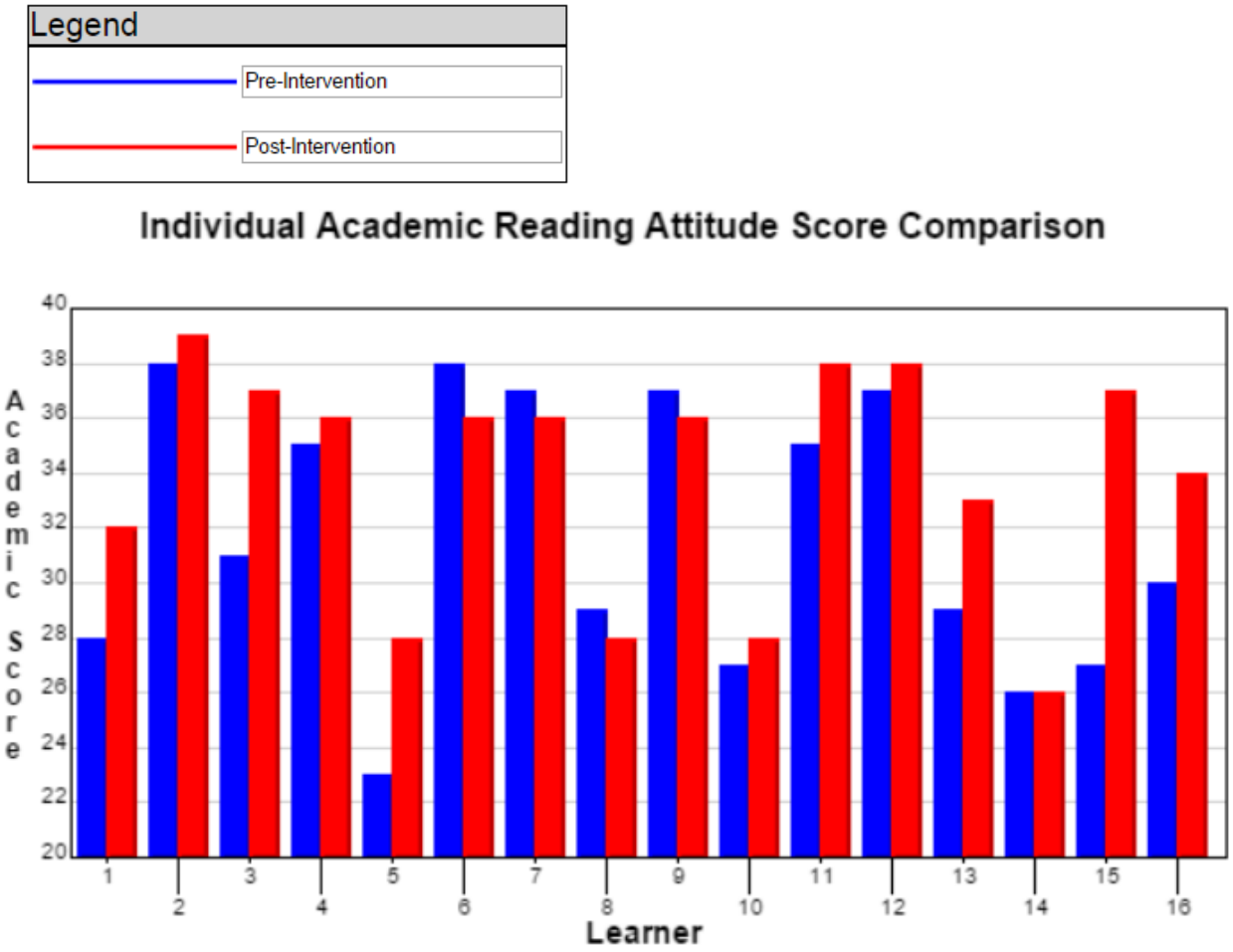


Table 5.14 shows the changes between the two academic reading questionnaires. The data shows that the increases in score led to a substantial raising of both the mean and the median score. The mode lost one point from 37 to 36, the change seems to have occurred when learners dropped slightly in their scores, see appendix K for individual academic attitude score changes. The narrowing of the range between the highest and lowest score and a decrease in the interquartile range and variance are again an indication of the clustering of data and the pushing up of the first quartile suggests an upward trend in the data score with the largest push among those who occupied the lowest quartile.

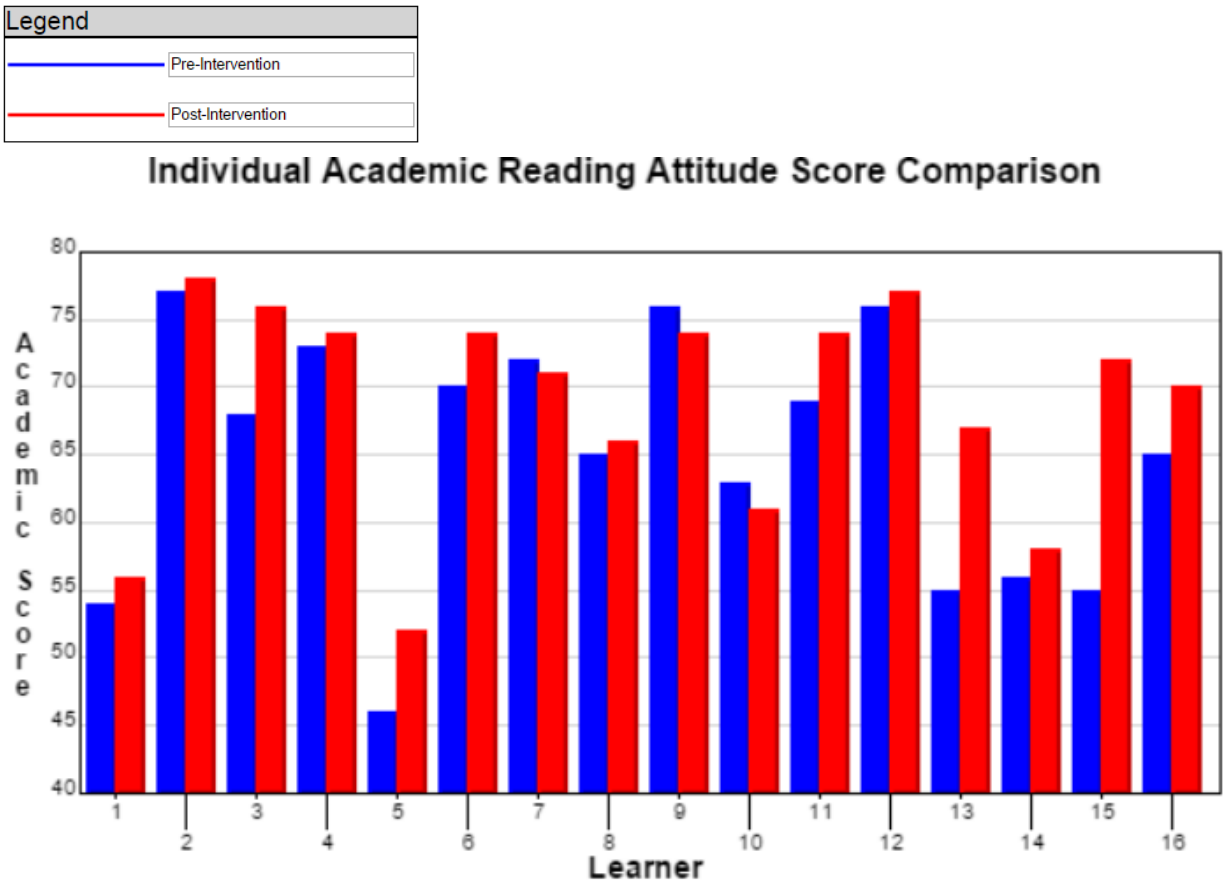
Table: 5.14 Analysis of Academic reading score changes

	Pre-Intervention	**Post-Intervention**	**Change**
Total score of 16 learners	507	542	+ 35
Highest value	38	39	+1
Low	23	26	+ 3
Range	15	13	- 2
Interquartile range	9.75	8	- 1.75
First quartile	27.25	29	+1.75
Third quartile	37	37	No Change
Sample variance	24.6292	17.85	-6.7792
Mean	31.6875	33.875	+ 2.1875
Median	30.5	36	+5.5
Mode	37	36	-1
Sample standard deviation	4.9628	4.2249	-0.7379

5.7.2 Total reading questionnaire comparison

The total reading attitudes are an indication of the learner's attitude to both recreational and academic reading combined. Using the total reading attitude measure it will be possible to speculate on the impact of the intervention and which learners had the greatest change. As the sample size is small and this is an exploratory case study, areas that show potential for further study will be identified. There was a large increase of total reading attitude levels, increasing 60 in the overall class score from 1040 to 1100 points, a noteworthy increase of 5.77%. Figure 5.9, below, displays the individual learner total reading scores. All of the learners saw change. Eleven of the learners gained in score, from 1 to a massive 17 with a mean of 5 points gained. While there were three learners who decreased in score, with a mean drop of 1.67, each of these learners maintained a very positive attitude to reading and the drops were very slight in proportion to their overall score. See appendix L for further detail of total reading changes for each individual.

Figure 5.9 Total reading questionnaire comparison line graph



Learner 5, who was the only learner to have a negative attitude before the intervention, improved significantly and the total score indicates a learner who is now positively disposed to reading in general, though not by a significant enough amount that an educator would see them as being out of danger yet. More intervention would be necessary to ensure that Learner 5 continues to improve their reading attitude and does not slip into apathy, or worse, a negative attitude towards reading.

Table: 5.15 Analysis of reading score changes for the lowest quarter of the group

Learner	Pre-Intervention	Post-Intervention	Change
	Full scale raw score (Recreational + Academic)	Full scale raw score (Recreational + Academic)	
1.	**54**	**56**	**+2**
5.	**46**	**52**	**+6**
13.	**55**	**67**	**+12**
15.	**55**	**72**	**+17**
Totals:	**210**	**247**	**+37**

After examining the individual success of Learner 5, let us consider the other low scoring individuals prior to the intervention. The lowest quarter of the group all increased in reading attitudes, some more significantly than others, see table 5.15. The lowest quartile of the group achieved a combined increase of 37 over the course of the intervention. This is hugely significant as this increase accounts for a massive 56.92% of all increases and 61.67% of total changes including reductions. More research is required to investigate these increases for the weaker learners. It should be noted, however, that increases were not limited the lowest scoring group, the top scoring individual prior to the intervention also saw gains.

It is also to be noted that academic reading attitude gained more than recreational reading attitude and closed the gap between the two. This was a surprise as the majority of the books that were contained in the system were more suited to recreational reading.

Table 5.16 shows the changes between the two total reading attitude scores. The data shows that the increases in score led to a raising of both the mean and the median score. The mode went from being an indicator of the spread of the data to a single very high score of 74, see appendix L for individual overall attitude score changes. The narrowing of the range between the highest and lowest score and a significant decrease in the interquartile range and variance are again an indication of the clustering of data and the pushing up of the first quartile shows the upward trend previously examined, among the lowest quartile.

Table: 5.16 Analysis of Overall reading score changes

	Pre-Intervention	**Post-Intervention**	**Change**
Total score of 16 learners	1040	1100	+ 60
Highest value	77	78	+1
Low	46	52	+ 6
Range	31	26	- 5
Interquartile range	17.5	11.75	- 5.75
First quartile	55.25	62.25	+ 7
Third quartile	72.75	74	+ 1.25
Sample variance	87.7333	64.2	- 23.5333
Mean	65	68.75	+ 3.75
Median	66.5	71.5	+5
Mode	55, 65, 76	74	+19, +9, -2
Sample standard deviation	9.3666	8.0125	- 1.3541

5.8 Website statistics

Statistics were gathered automatically by Advanced Web Statistics, the analytical software provided by the company used to host the intervention, Blacknight Solutions. Those statistics will be analysed and inferences drawn from the data.

5.8.1 Monthly statistics

Figure 5.10 shows the monthly visitor statistics for January, February and March 2015. The intervention was introduced on the 27th of January and the statistics were gathered until the administration of the post-intervention questionnaire on the 2nd of March.

Figure 5.10 Monthly visitor statistics

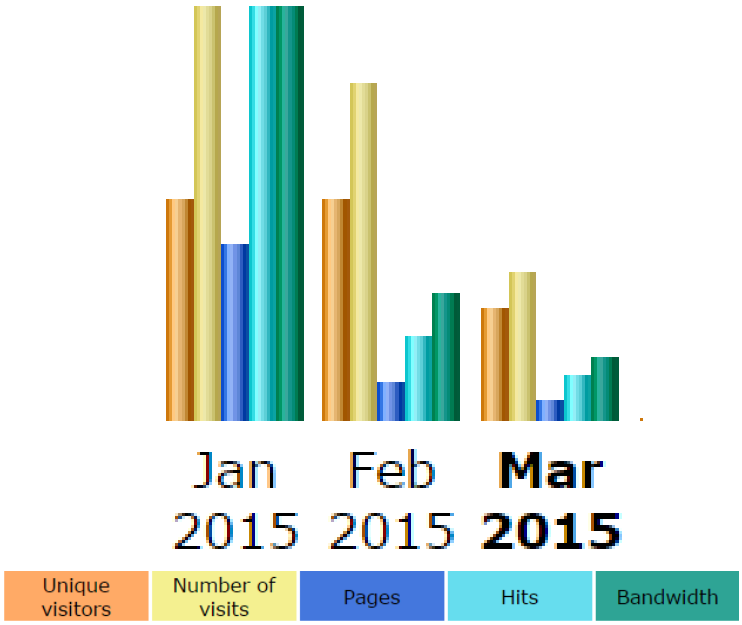
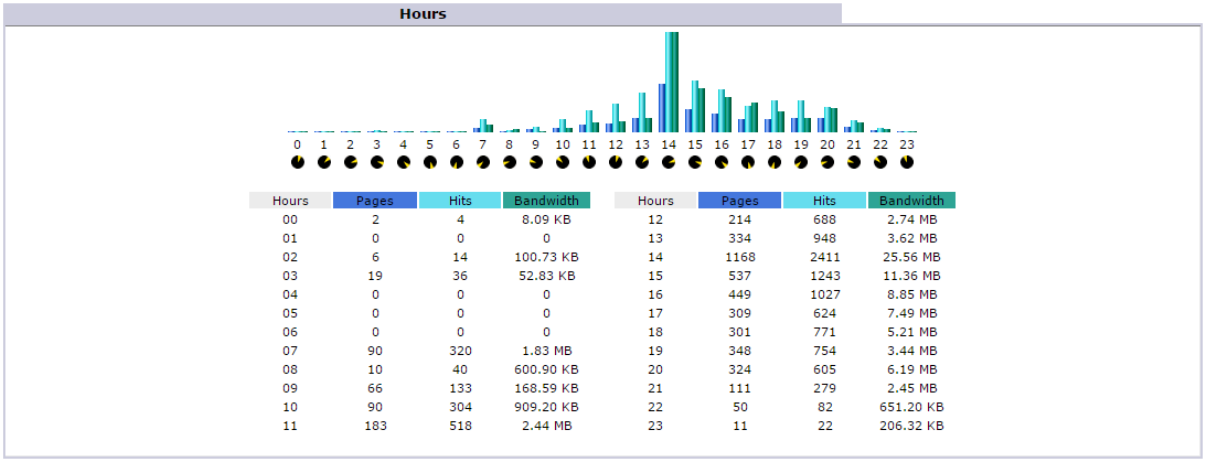


Figure 5.10 shows the number of unique visitors holds steady between January and February, with a drop in unique visitors in March. The initial excitement of the intervention may have waned as the weeks went by but there was still considerable usage across the five weeks of the intervention. See appendix M for a breakdown of figures by month.

5.8.2 Change in hourly of usage

Perhaps one of the most interesting discoveries that came from the analysis of the website statistics was the changing time of the day that the intervention was used. In January the intervention was primarily used between two and three o'clock, which was the time that the initial intervention took place. There is growing usage from early morning until two and then slowly dropping amounts of usage until 8 in the evening, see figure 5.11.

Figure 5.11 Hourly visitor statistics for January

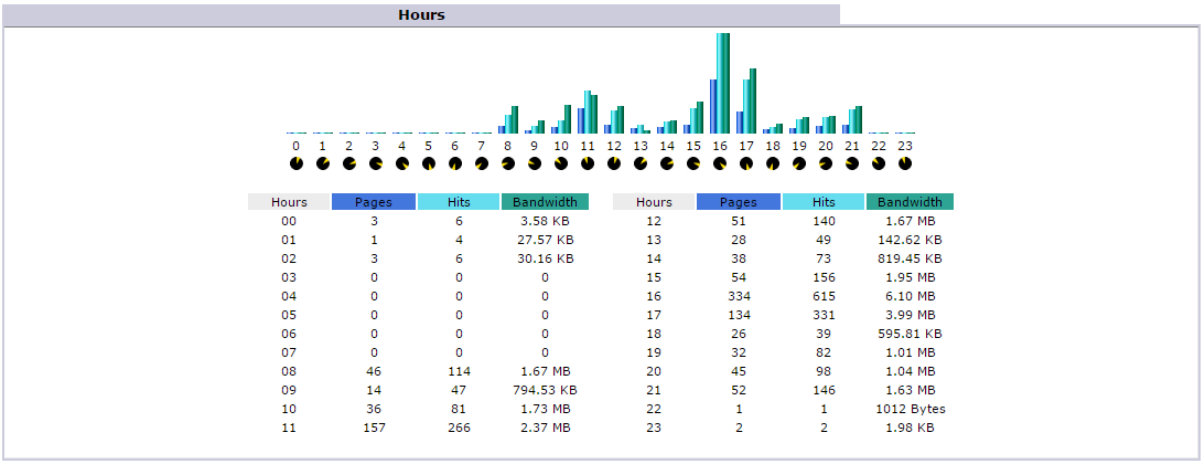


Hours	Pages	Hits	Bandwidth	Hours	Pages	Hits	Bandwidth
00	2	4	8.09 KB	12	214	688	2.74 MB
01	0	0	0	13	334	948	3.62 MB
02	6	14	100.73 KB	14	1168	2411	25.56 MB
03	19	36	52.83 KB	15	537	1243	11.36 MB
04	0	0	0	16	449	1027	8.85 MB
05	0	0	0	17	309	624	7.49 MB
06	0	0	0	18	301	771	5.21 MB
07	90	320	1.83 MB	19	348	754	3.44 MB
08	10	40	600.90 KB	20	324	605	6.19 MB
09	66	133	168.59 KB	21	111	279	2.45 MB
10	90	304	909.20 KB	22	50	82	651.20 KB
11	183	518	2.44 MB	23	11	22	206.32 KB

In February's hourly visitor statistics we can notice four clear spikes in the data, see figure 5.12. Deducing from the times that these spikes took place it is possible to infer four patterns of usage for the intervention during this month. The first spike, between eight and nine in the morning suggests a pattern of usage before the school day started, perhaps in the family car or school bus on the way to school. The second pattern of usage would be usage during the school day and spikes at eleven, which would have been anticipated. The third period of usage is in the early evening, building from when school is finished at three, peaking sharply between four and five and continuing until six in the evening. This pattern of usage is very encouraging and shows that some learners continued to use the intervention, even after the school day had finished and they had arrived home. Perhaps the intervention was not seen merely as something that they 'had to do' for school, but rather as

something the ‘wanted to do’ for fun and to keep in touch with peers. The final spike in the data is at nine in the evening, suggesting perhaps that some of the learners would log on to the site before they went to bed to check on their days interactions.

Figure 5.12 Hourly visitor statistics for February



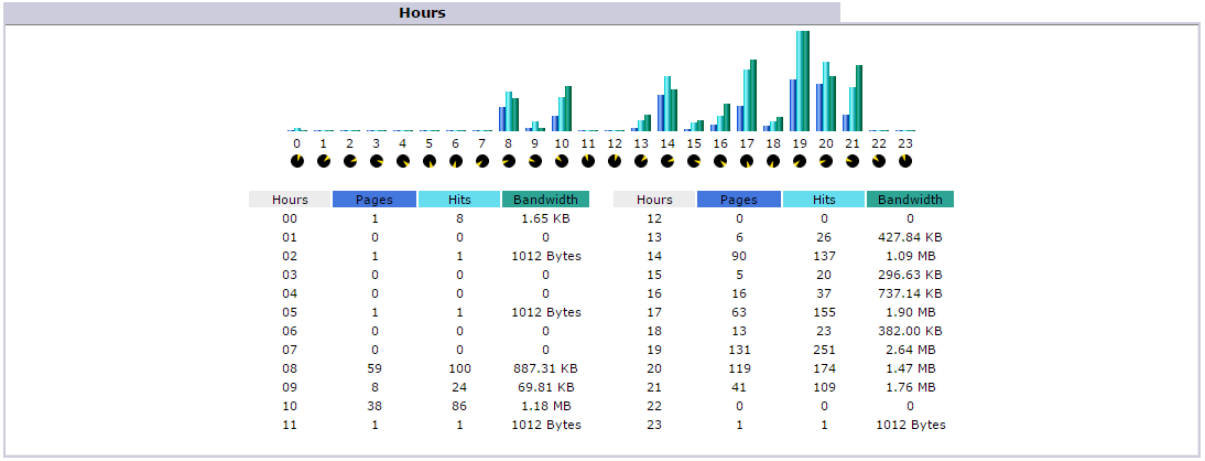
Hours

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Hours	Pages	Hits	Bandwidth	Hours	Pages	Hits	Bandwidth
00	3	6	3.58 KB	12	51	140	1.67 MB
01	1	4	27.57 KB	13	28	49	142.62 KB
02	3	6	30.16 KB	14	38	73	819.45 KB
03	0	0	0	15	54	156	1.95 MB
04	0	0	0	16	334	615	6.10 MB
05	0	0	0	17	134	331	3.99 MB
06	0	0	0	18	26	39	595.81 KB
07	0	0	0	19	32	82	1.01 MB
08	46	114	1.67 MB	20	45	98	1.04 MB
09	14	47	794.53 KB	21	52	146	1.63 MB
10	36	81	1.73 MB	22	1	1	1012 Bytes
11	157	266	2.37 MB	23	2	2	1.98 KB

In March the pattern of usage outside of school hours is even more sharply pronounced, with early morning and evening becoming more important, see figure 5.13. The primary usage of the intervention has now shifted from usage within the school to usage outside of school hours, mostly in the evening. This was an unexpected finding as though the intervention was designed for use outside of the classroom as well as within, it was expected that the majority of usage would be in the classroom environment.

Figure 5.13 Hourly visitor statistics for March



Hours

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Hours	Pages	Hits	Bandwidth	Hours	Pages	Hits	Bandwidth
00	1	8	1.65 KB	12	0	0	0
01	0	0	0	13	6	26	427.84 KB
02	1	1	1012 Bytes	14	90	137	1.09 MB
03	0	0	0	15	5	20	296.63 KB
04	0	0	0	16	16	37	737.14 KB
05	1	1	1012 Bytes	17	63	155	1.90 MB
06	0	0	0	18	13	23	382.00 KB
07	0	0	0	19	131	251	2.64 MB
08	59	100	887.31 KB	20	119	174	1.47 MB
09	8	24	69.81 KB	21	41	109	1.76 MB
10	38	86	1.18 MB	22	0	0	0
11	1	1	1012 Bytes	23	1	1	1012 Bytes

5.9 Learner relationship analysis

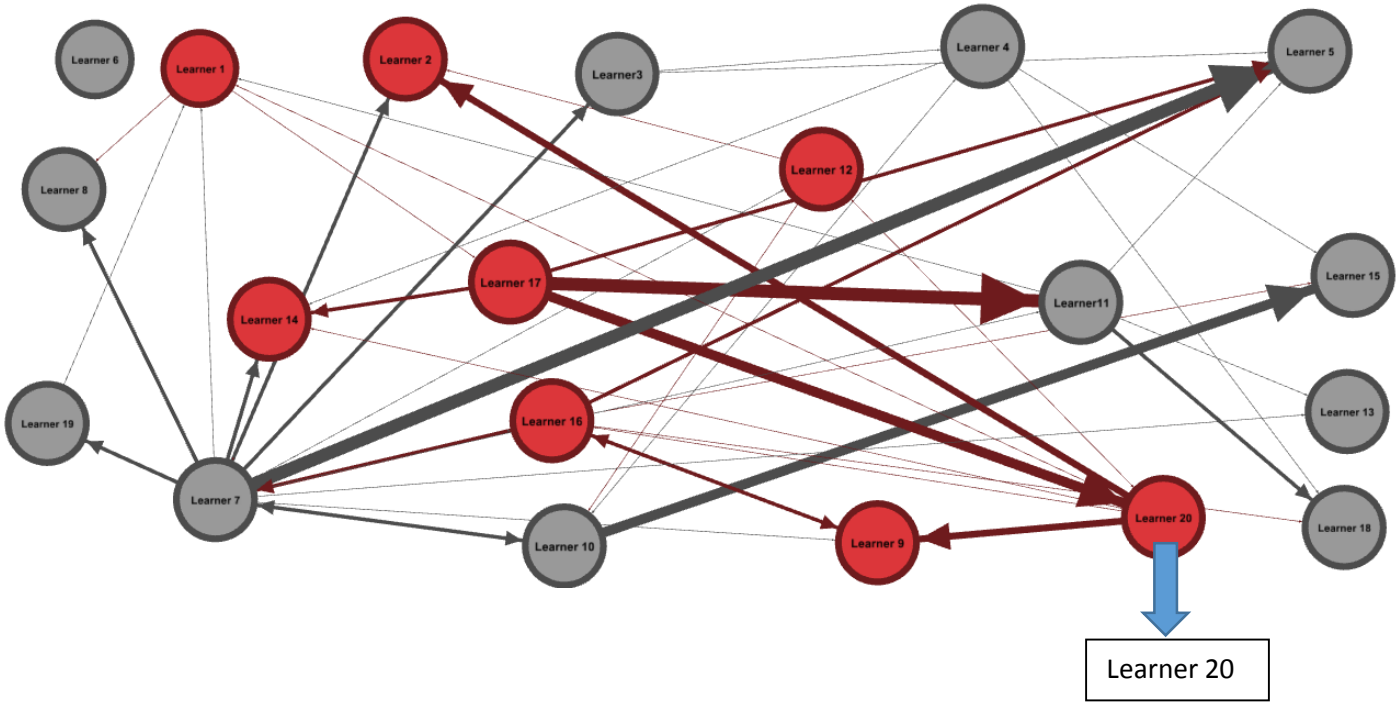
In this section the relationships that have been developed online using the system will be analysed and compared to the offline relationships that have been observed by the classroom teacher, see appendix M. The online relationships involve the recommendations recorded between the learners. There are a number of data visualisation tools that could be used to analyse this data, such as SocNetV and UCINET, which are available for a range of different prices online. After due consideration of cost and functionality required, the data will be analysed using Gephi data visualisation software. Gephi is open source and describes itself as 'an interactive visualisation and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs' (Gephi, 2008-2015). Gephi visualisations can be used to assist the researcher in finding interesting elements within the data and in understanding the structure of the network and has been used in the past to successfully guide domain experts through the complex exploration of larger networks than the network analysed by the researcher (Bastian, Heymann, & Jacomy, 2009, p. 361). The Gephi diagrams that follow show the same class network and highlight individual networks in red.

The offline relationships noted by the classroom teacher in appendix M have a number of interesting features. The instruction given to the teacher when she was constructing the list was to include a maximum of three of the learner's closest friends in the data. As it happens, though there is one stand-out student who is deemed a 'social animal', there are only four of the twenty learners being analysed that have three friends included, seven with two and six with one best friend. Two students had just joined the class and they had yet to settle to a discernible friendship pattern. A user from each of these five groups will be analysed in an effort to give a broad overview of the class's relationships as a whole that inferences may be drawn from and future research possibilities examined.

5.9.1 The 'social animal'

Learner 20 was described by the classroom teacher as a 'social animal', who was friends with many individuals in the classroom. This individual is a natural communicator in person and this flair for interpersonal interaction transferred into the online environment. Learner 20 could be described as one of the main hubs for the network and interacted frequently and directly with seven other learners during the course of the intervention, see figure 5.14 below.

Figure 5.14 Online interactions of learner 20, the 'social animal'.

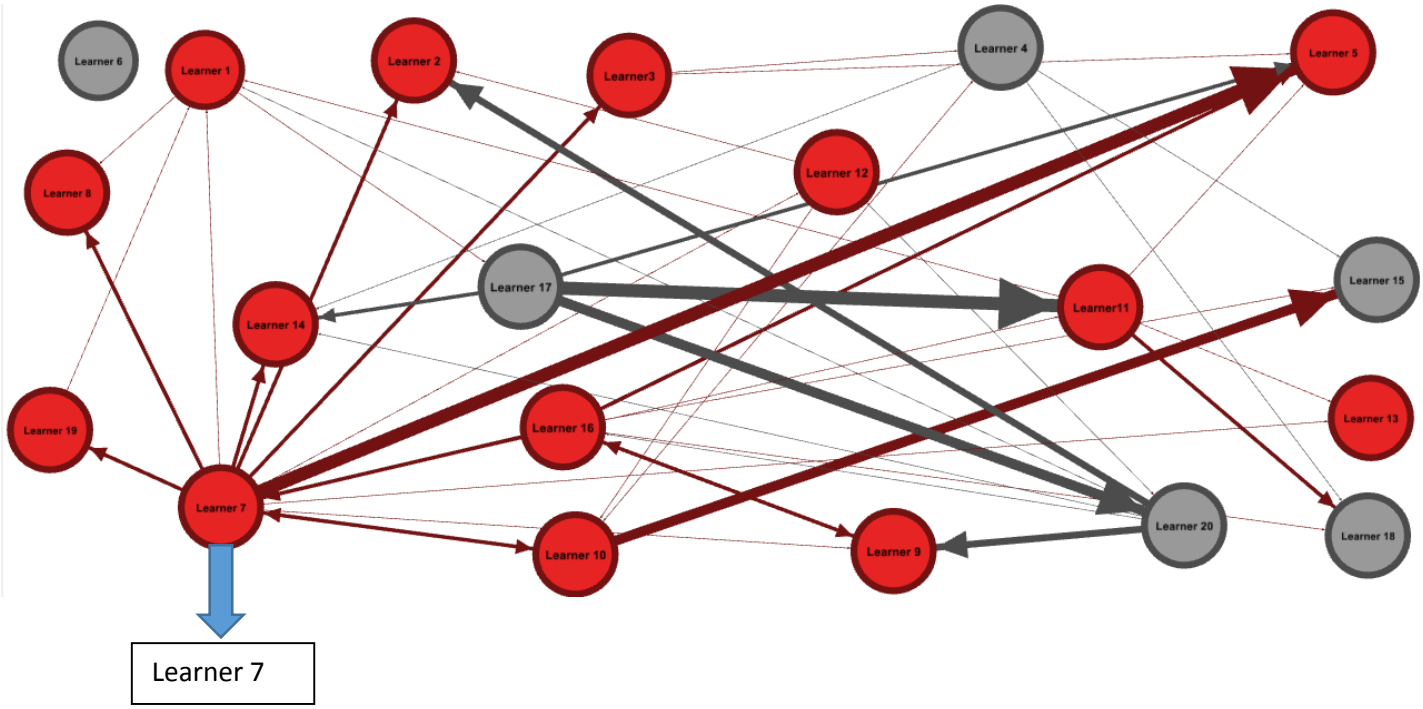


5.9.2 A learner with one close offline relationship

Learner 7 was observed to have one close relationship in the classroom by the classroom teacher. There was a great deal of interaction between learner 7 and this offline friend, learner 5. What is interesting is the massive amount of online interaction that this learner took part in with others. Indeed, learner 7 had the most online interpersonal contact of any individual in the class and was the primary hub for the class, interacting with thirteen members of the group and creating a large

network of friends. Figure 5.15 illustrates clearly the level of interaction that learner 7 was involved in and the importance of the learner to the group dynamic.

Figure 5.15 Learner 7, network of friends.



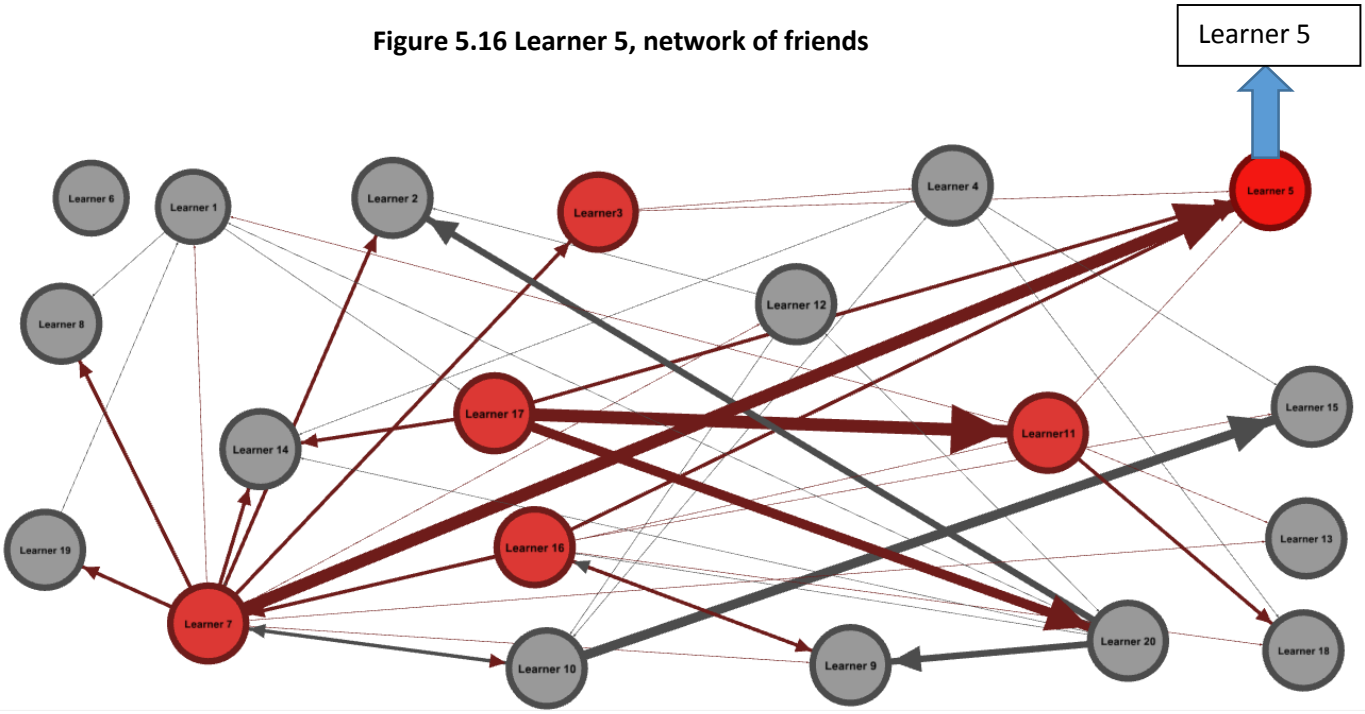
5.9.3 A learner with two close offline relationships

Learner 5 was the only learner that had a negative reader attitude prior to the intervention. As we have seen, the learner improved and had a positive attitude to learning after the intervention. As such, the online interactions of this learner are of particular interest to see if there is a correlation between the improved attitude and the online interaction of learner.

Learner 5 was a learner for whom the teacher noted two close friendships in the classroom, learner 7 and learner 3. In an online environment learner 5 interacted with these two friends and with three others, see figure 5.16 below. This online interaction is again greater than the offline interaction that

was observed by the classroom teacher. While this data appears promising, it should be remembered that as this is a small sample, inferences drawn are indicators to potential areas for further study.

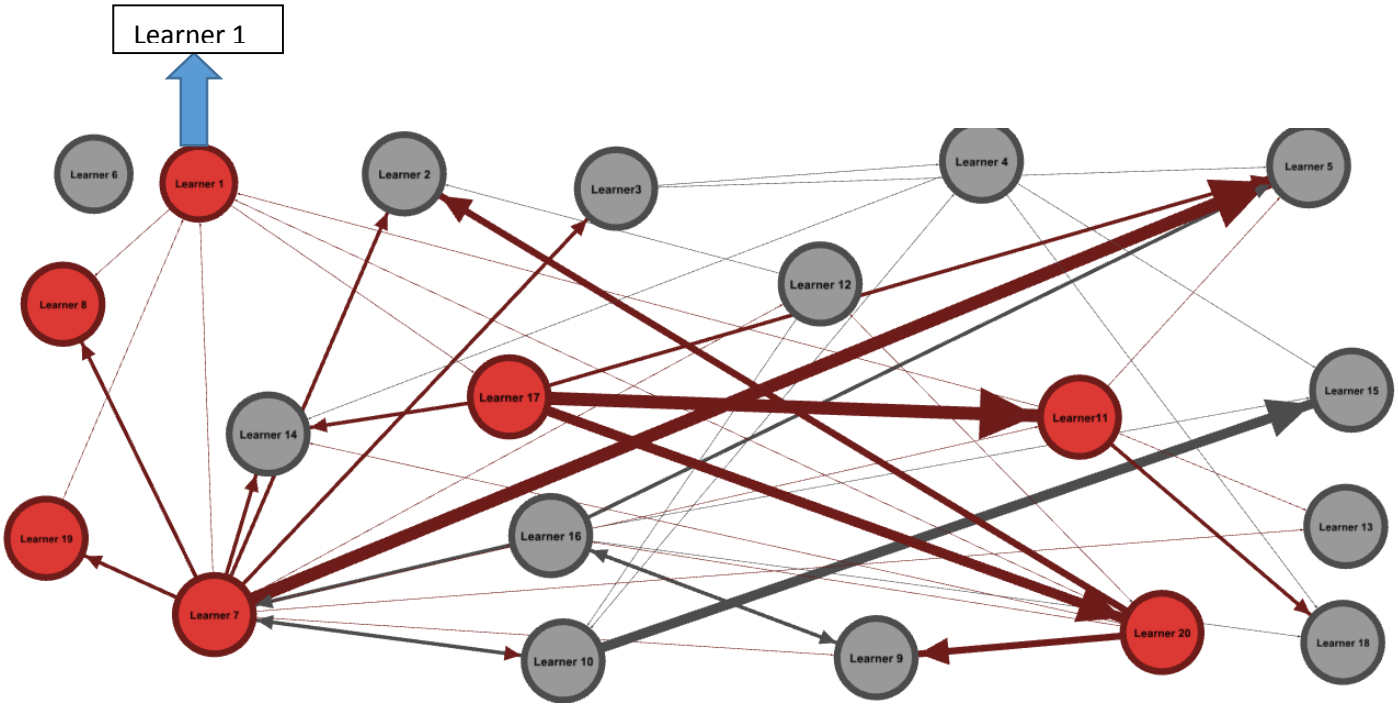
Figure 5.16 Learner 5, network of friends



5.9.4 A learner with three close offline relationships

Learner 1 was determined to have three close offline relationships by the classroom teacher with learner 19, learner 12 and learner 20. Analysis of the online interactions of learner 1 shows that the learner interacted with two of the three offline friends and with four other learners. Learner 1 interacted with the two main hubs of the online network, which massively increases the social capital available to the learner in the online environment. This can be seen visually in figure 5.17 on the following page.

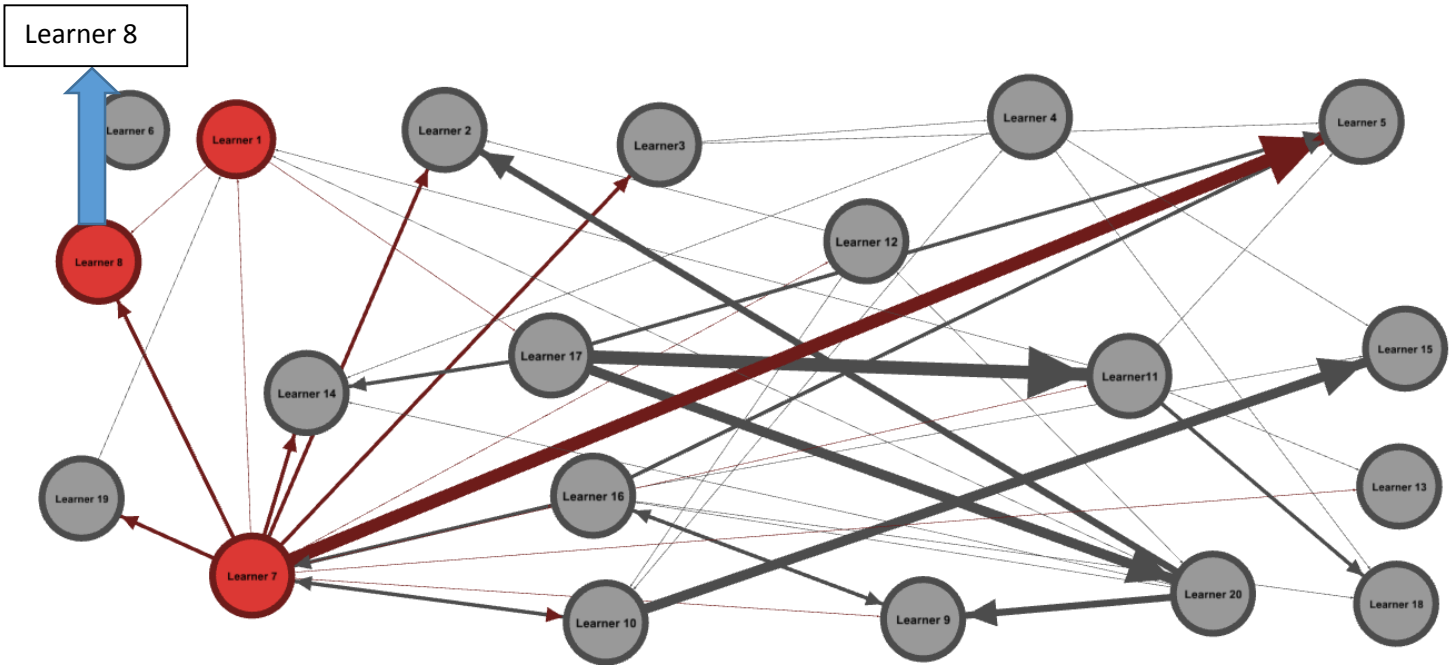
Figure 5.17 Learner 1, network of friends



5.9.5 The new student

There were two new students in the group who had not settled enough to have close friends that could be discerned by the classroom teacher, learner 6 and learner 8. Learner 6 had no interactions that were usable in this study due to the forms not being returned and can be seen as anomalous to the data. Learner 8, however, registered data that can be analysed and interacted with learner 8 and the primary hub of the class, learner 7. Through learner 7 the new student can access the knowledge of most of the class and benefit from the social capital of the group.

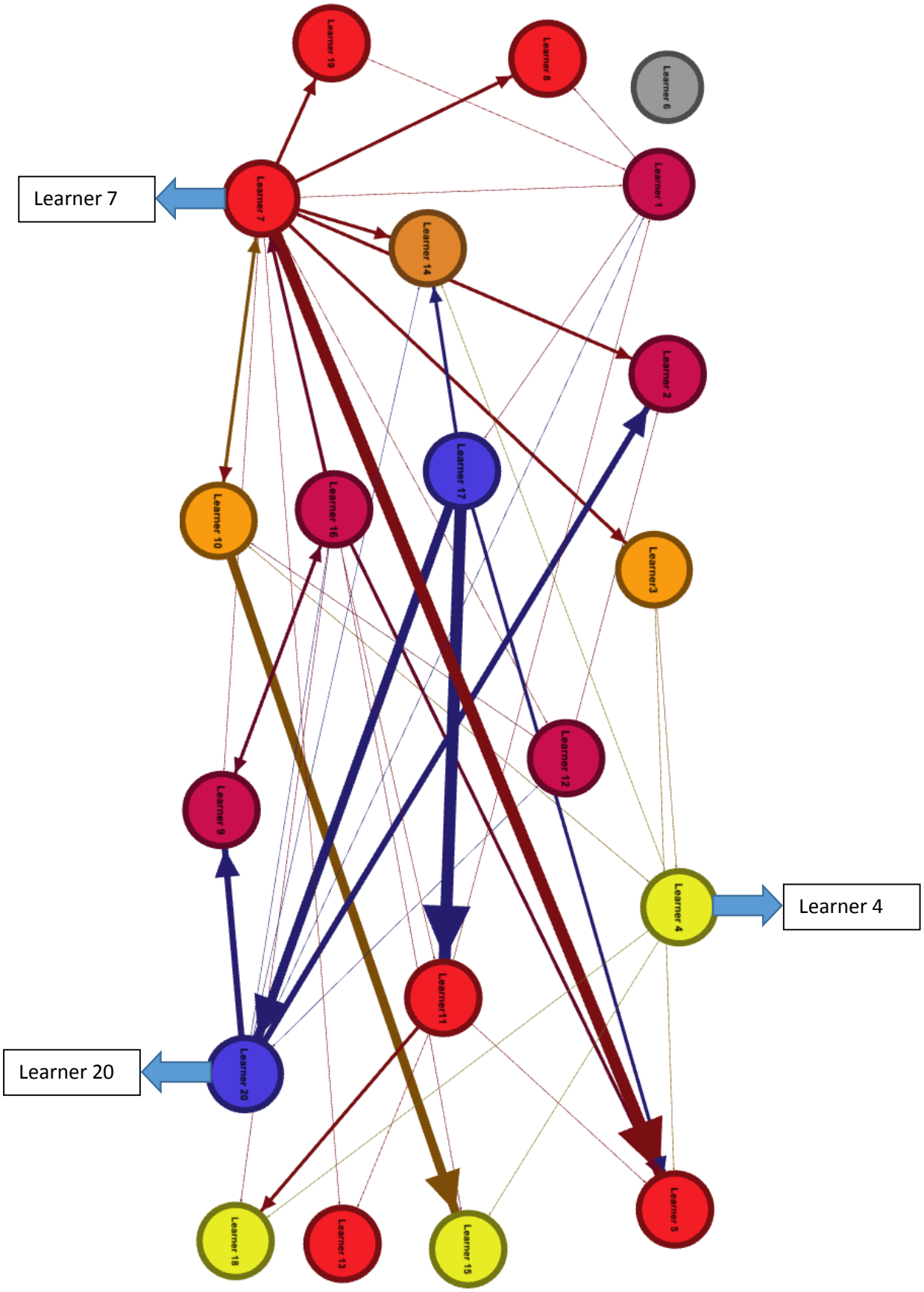
Figure 5.18 Learner 8, network of friends



5.9.6 Class wide interaction

Examining the class as a whole unit there is a considerable amount of interaction taking place among the group, with the exception of learner 6 as explained above. Just three individuals can link the entire class group and this is achievable using a number of different individuals. In figure 5.19, on the following page, we clearly see this interaction visually. Learner 7 is red, learner 20 is blue and learner 4 is yellow. The various shades of each colour on learners illustrates the level of interaction with each of these three individuals.

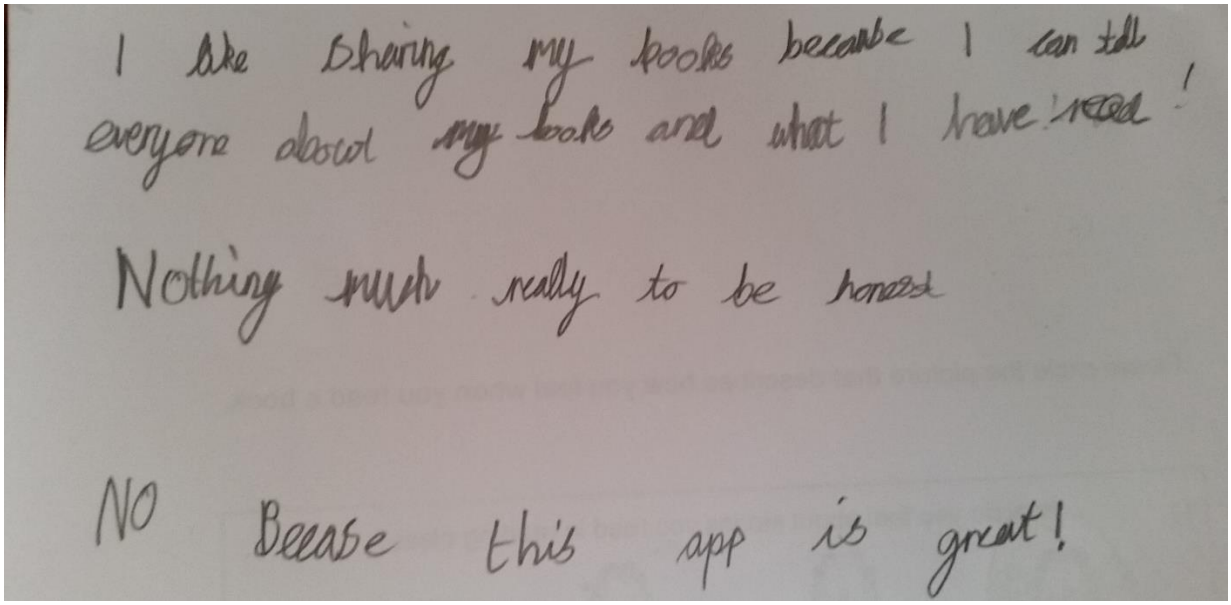
Figure 5.19 Class wide interaction illustrated.



5.10 Learner Feedback

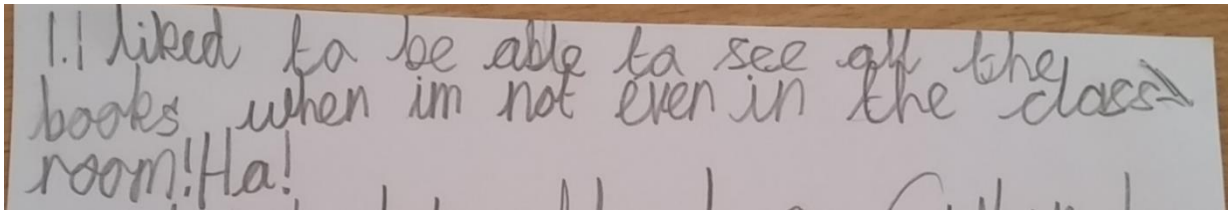
Learners were asked to write one thing they liked, one thing they didn't like and if there is anything they would change as feedback for the researcher. The written learner feedback for the intervention was overwhelmingly positive with all of the learners saying that they enjoyed using the system and many of the learners said that there was nothing they did not like. See figure 5.20 below.

Figure 5.20 Positive learner feedback.



The most common positive piece of feedback was that the learners loved to recommend books to their friends and to tell them what they were reading. Other learners were happy that you could search the library, and showed that they enjoyed to use the facility outside of the class.

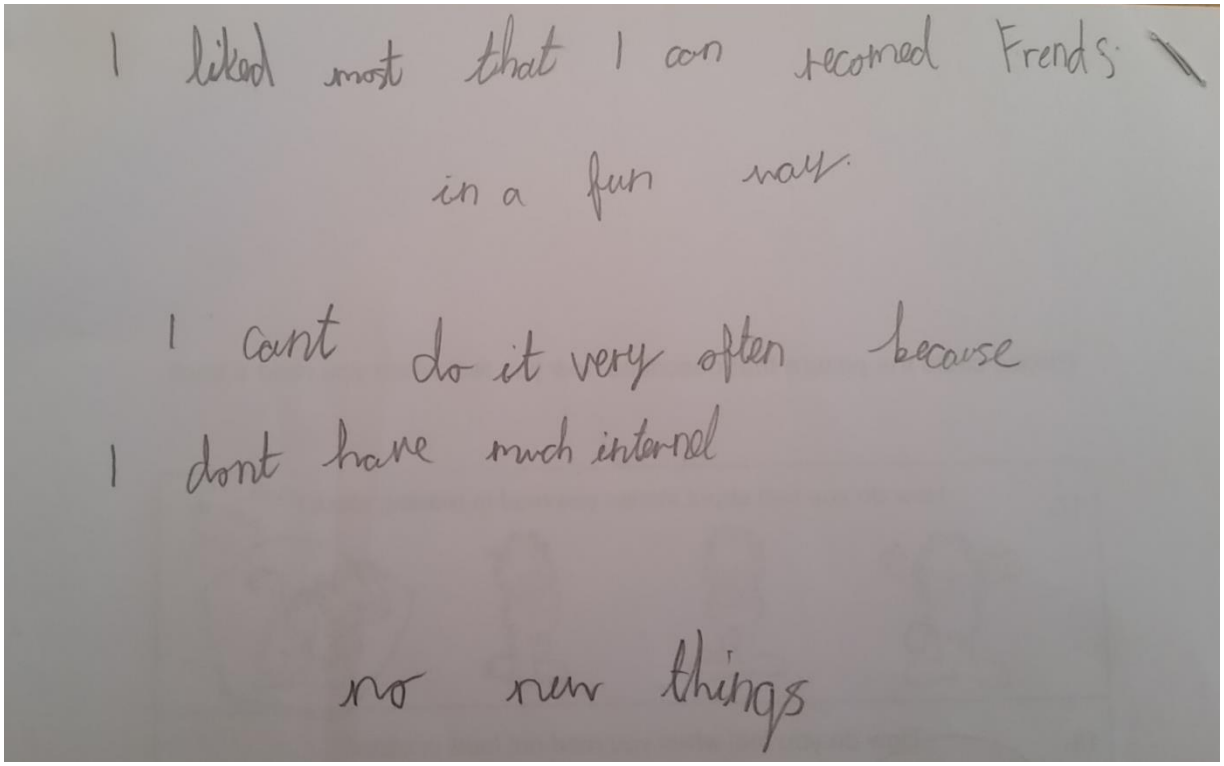
Figure 5.21 Feedback regarding out of class usage of the system.



By far the most common answer to the question, 'what did you not like?' was that there was nothing they did not like, which may be an indication that the design elements of the intervention were

successful. This question also indicated the importance of class time for using the intervention as it highlighted the lack of internet at home for some users, see figure 5.22. Whether this lack of access to the internet was down to limitations of usage due to household rules or a lack of infrastructure in the home is unknown and for the purposes of the recommendations of the researcher it is irrelevant.

Figure 5.22 Feedback regarding lack of internet.



Most of the learners had no suggestions for the intervention, the most common specific request was a request for more monster avatars to choose from. Other suggestions included a private recommendation facility and the ability to put your face up instead of a monster. These were options considered and rejected by the researcher at the design stage.

Chapter six: Conclusions, limitations and recommendations

6.1 Introduction

The rationale behind the mixed methods exploratory case study which was chosen for the research is carefully analysed in chapter four. The choice has an impact on the conclusions, limitations and recommendations that are made in this chapter.

As a result of the small scale nature of this exploratory case study and the fact that it could only take place over a period of only five weeks, there are limitations to the inferences we can draw from the data gathered. All conclusions drawn from this study show be seen through prism of these limitations and the recommendations should be understood as pointers towards areas that show potential for further study and research.

6.2 Conclusions

The data gathered from the mixed methods used in the course of the study allows the researcher to corroborate the findings and complement each other to create more rigorous hypothesises as to what may be occurring. The mixed methods of both quantitative and qualitative data collection were chosen precisely for this reason, to triangulate the data, garnering the benefits of each approach to create a rich picture of the impact of the intervention on reader attitudes (Denscombe, 2010, p. 346; Jick, 1979, p. 602). The validity of the research is aided by member checks with the classroom teacher and the triangulation of data through different methods and analysis through multiple theoretical lenses (Marshall & Rossman, 2010, p. 40).

Reading attitudes may be subject to fluctuation depending on the disposition of the individual at a particular moment in time. A comprehensive examination of the data gathered using the Elementary

Reading Attitude questionnaire suggests that there has been an improvement in the overall reading attitude in the class during the course of the intervention. Surprisingly for the researcher there was a greater increase in the levels of academic reading than there was in recreational reading, given that the majority of the books within the system would be considered recreational reading. The academic reading attitude of the class was considerably lower than the recreational reading attitude before the intervention and this gap was significantly narrowed afterwards.

The reading attitudes of the four learners with lowest reading attitude scores before the intervention were the most significantly improved afterwards, accounting for over 60% of the total gains of the group. An examination of the online interactions of the lowest scoring two learners shows significant usage of the system and a wider social network than observations by the classroom teacher indicate. These gains are incredibly significant as the learners with the lowest reading attitudes are the learners who the literature indicate are most likely to fall behind and suffer the terrible consequences of not being able to read at the anticipated level and, as such, are the primary focus of the intervention.

The learner feedback also indicates positivity towards the intervention by these learners and indicates a level of use both in the school and in a home environment. This evidence of home usage is correlated by the analysis of the website statistics for the intervention. The times of usage of the intervention were noticeably shifted from being used primarily during the school day to being used in the evenings when the learner is at home, with all the attendant benefits of parental involvement in the educational progress of the learner (A. Morgan et al., 2009, p. 168).

Perhaps the most powerful argument for the efficacy of the system is that it is still being used by students and the teacher in the classroom. At times educational research can become overly theoretical, with little scope for application in the everyday classroom. This piece of research, however, is an ever growing fixture of a classroom, driven by the learners and providing real-time data to the teacher regarding the reading of the learners in her charge. Over the course of the intervention the learners exchanged recommendations and interacted in a structured, safe environment online

and measurements at the end of this period showed that there was an improvement in the attitude of the learners, in particular for the weaker learners.

In answer to the research questions in section 1.2, the congruence of findings from multiple sources indicate that peer recommendations and social interaction using the intervention provided a beneficial influence on reading attitudes among primary school learners. If we provide a safe, positive environment for young learners to interact and recommend books to each other online it is possible to have a positive impact on reader attitude. To investigate this phenomenon in greater depth, further research will be required in this area due to the limitations of this research, as discussed below.

6.3 Limitations

Perhaps the principal limitation of this study was one that was recognised from the outset and one that the research methodology has been designed around, a limitation of time. Whilst the literature recognises that the process of learning to read is a difficult on that spans over many years, this research was limited in timescale and the intervention itself took place over a five week period. Reading attitudes are similarly shaped over extended periods of time and while excitement around reading and improved attitudes can be generated with a new intervention, longer term effects or trends cannot be examined, though hypotheses can be made and inferences drawn. This study is designed to test the waters for further studies and to see where there may be potential for a longitudinal study that could examine the long-term impacts of the intervention.

Another limitation of the research was the number of participants that took part. To draw any firm conclusions from the data gathered a larger sample size would be required. The research recognised this limitation and decided that the type of case study most suitable would be an exploratory case study, which is suitable for small-scale research. The limitation still exists, however, and must be acknowledged by the researcher.

As the research involved only one class and had no control group to act as a reference point, it must be acknowledged that it is impossible to determine exactly what influenced the positive improvement in the learner's attitudinal scores. Though there were no other literacy interventions running concurrently with the research, there may have been other influences at play that are unknown to the researcher. In an ideal research situation a control group would have been used as a base line but due to the limitations of time and scale that applied to this research, a control group was not possible and this limitation must be acknowledged.

Learner offline relationships were gathered from classroom teacher observations and though the best efforts of the teacher cannot be denied, the fickle nature of the friendships of young learners means that a complete and perfect list of learner offline relationships is impossible. The offline relationships are thus, a snapshot of a particular moment in time and may not represent the relationships over the course of the five weeks of the research. This is a limitation that must be acknowledged.

Another possible limitation for the research is the 'Hawthorne effect', which must be mentioned as another possible explanation for attitude changes observed in the research. This states that individuals who are subject to social investigation may modify their behaviour as a result of being investigated, rather than due to the merits of any particular intervention that the researcher may apply (McCarney et al., 2007, p. 31; Wickström & Bendix, 2000, p. 363).

6.4 Recommendations for further study and development

This study provides a tantalising glimpse of the benefits that may be possible through allowing young learners to interact and recommend books online. This research indicates that improvements in reader attitude is positively impacted by the intervention, particularly among learners with weaker attitudes where intervention is so vital. Further study is required to add more weight to the findings

as there are limitations to the research such as; time constraints, small number of participants leading to a small sample size, lack of sample group and difficulty in determining offline relationships.

Even with the limitations described, the evidence gathered from multiple sources and examined so thoroughly gives the researcher full confidence that further research in this area could greatly benefit learners struggling with the difficult process of reading by increasing their reader attitude level.

As the intervention is still in use in the classroom there is an opportunity to gather longer term data and feedback from the learners and teacher in an effort to further develop the intervention in the future. The researcher believes that this study shows the benefits of the intervention for the learner and teacher. Further investigation would be necessary to discover if this intervention could developed into a viable commercial concern.

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Appendices

Appendix A: Child information sheet

Child Information Sheet

Project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

What is happening?

Teachers are always learning, just like you! What we want to learn about is how to make our lessons better and how to make sure that children are learning as much as they can.

In this study we want to discover if you like to be told by your fiends what books that they think you will love online. You will be shown what books are recommended to you by all of your friends and you will be able to recommend books to your friends too!

What will happen?

If you choose to take part in this study, you will be given a questionnaire before you use the new online tool. You will then use the new tool to recommend books you think that your friends will like and to discover what books that your friends think you would like to read. At the end of the study you will answer another questionnaire. You will be asked about your feelings around reading.

There are no right or wrong answers for you to give so don't worry, we only want to know only what you think and feel about things. In fact you do not have to answer if you do not want to. This will all be done in school time.

If you take part, any information that you give will be used in the research, stored at Trinity College and all names will be removed so no one will know who said what. This is so you can tell us what you really think and don't have to worry about anything! But if the researchers find out about any illegal activities during the study they will have to tell the authorities.

Do my parents/guardians know about this project?

Your parents/guardians will also be given a letter explaining what the project is about. You should talk to them about this before you make your decision, especially if you are worried about anything.

Do I have to do the project?

You don't have to take part in the project if you decide that you don't want to. You can also choose to take part now and change your mind later and none of the information you gave will be used in the research, just tell your teacher, parents or your principal that you no longer want to take part.

Declaration of Conflict of Interest

I would like to let you know that the person doing the research is the brother of your teacher, Ms Doyle.

Project

Understanding and investigating the influence of computer-aided learner choice on reading levels and attitudes in a primary school setting.

Child Consent Form

I _____ agree to take part in this research project.

I have read, or had read to me, information about the project and know how information will be collected and stored. I understand that I can choose not to take part in the research at any time. Also, I know that my parents will be also given a consent form in order for me to take part in this study.

Data Protection: I agree to Trinity College, University of Dublin storing and using my information from this project.

Date: _____

Full Name: _____

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

Signature of Project Leader (TCD): _____

Date: _____

Full Name: _____

Please note: For any further questions please contact Robert Doyle at doyler12@tcd.ie

Appendix B: Parent/guardian information sheet

Parent/Guardian Information Sheet

Project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

Dear Parent/Guardian,

I am currently studying towards a M.Sc. in Technology and Learning at Trinity College Dublin. As part of this process I must complete a research project and investigate an educational problem or intervention. I have chosen to perform a study to investigate the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website. The aim of the study is to investigate whether peer recommendations made online have an impact on reader engagement and at. The study will also investigate the influence of online social interaction among young learners in a safe, structured and monitored environment.

To achieve this it will be necessary to carefully design and construct a framework within which the social interactions will take place. It is proposed to construct a website which will enable the learners to interact in a private and safe manner under the supervision of their classroom teacher and the researcher. A searchable database containing all of the books in the classroom library will be used by students to search for books that interest them and as a tool to store any reviews made by their peers. A system will be developed to flag any new recommendations made by their peers and each learner will be given a page of their own to receive recommendations from their peers directly.

Learners will have the ability to find a book about a topic they are interested in by computer, tablet or smartphone and to recommend that book to their peers when they are finished reading it if they enjoyed it. They will be able to tell individual friends about the book if they think it will interest them, promoting reading among their peer-group.

Studies suggest that there is a strong influence among peers at primary school level and that this influence can have both a positive or negative impact on reader attitude and engagement with reading. This study is an attempt to harness this powerful peer influence and positively

impact on reader attitude and engagement, which is a driver of achievement in literacy. Studies also indicate that by far the most effective reading interventions take place when the learner is young and in a primary school setting or equivalent.

I wish to invite your child, along with their classmates, to take part in the research project, supervised by Asst. Professor Richard Millwood and conducted by Robert Doyle in the presence of their teacher Cindy Doyle. If the situation arises where a child, parent or guardian does not grant, or withdraws consent, the child will use the time for free reading and no data will be gathered in relation to your child.

Before the intervention begins, your child will be asked to complete a questionnaire to discover their attitudes towards reading.
Observations of learner activity will take place during online learner actions and reading.
After the intervention, learners will a complete a questionnaire to discover their attitudes to reading after to the intervention to investigate if any change has taken place.
All questionnaires and other information gathered will be made anonymous and stored in accordance with the Data Protection Acts 1998 and 2003. In the extremely unlikely event that illicit activity is reported, the school's child protection policy will be followed and I will be obliged to notify the relevant authorities.
The school Board of Management has been contacted and granted consent for this project, however, information regarding your child can only be gathered and used with your permission.
The consent of your child will also be required for them to participate in this project.
Participation is completely voluntary and you may withdraw your child at any time during the process and any information gathered until that point will be deleted or destroyed.

Declaration of Conflict of Interest
Please be advised that this research is being conducted by the brother of the classroom teacher Cindy Doyle.

If you have any questions before, during or after the project, please do not hesitate to contact Robert Doyle at: doyler12@tcd.ie.

Parent/Guardian Consent and Declaration Form

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

I _____ (name of parent/guardian) consent to _____ (name of child) taking part in this research project.

I have read and understood the information letter regarding the proposed intervention and activities that my child will participate in, the data that will be gathered and how I may contact the research team.

I understand that participation is voluntary and that I can withdraw my child from this research at any time and any information gathered up to that point will be deleted or destroyed. I am also aware that my child's consent will also be requested in order for them to be able to participate in this study.

Data Protection: I agree to Trinity College, University of Dublin storing of any personal data relating to my child which may result from this project. I agree to the processing of such data for any purposes connected with the research project as outlined to me.

Signature of parent/guardian:_____ Date: _____

Full name of parent/guardian: _____

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

Signature of project leader (TCD): _____ Date: _____

Full name: _____

If you have any questions before, during or after the project, please do not hesitate to contact Robert Doyle at: doyler12@tcd.ie.

Appendix C: Teacher information sheet

Teacher Information Sheet

To Cindy Doyle,

Project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

Purpose

The purpose of my research is:

- to investigate whether electronic peer recommendations impact on reader engagement and attitude towards reading.
- to investigate the influence of online social interaction among young learners in a primary school setting

Re: Proposal Research

I am currently studying towards a M.Sc. in Technology and Learning at Trinity College Dublin. As part of this process I must complete a research project and investigate an educational problem or intervention. I have chosen to perform a study to investigate the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website. The aim of the study is to investigate whether peer recommendations made online have an impact on reader engagement and at. The study will also investigate the influence of online social interaction among young learners in a safe, structured and monitored environment.

To achieve this it will be necessary to carefully design and construct a framework within which the social interactions will take place. It is proposed to construct a website which will enable the learners to interact in a private and safe manner under the supervision of their classroom teacher and the researcher. A searchable database containing all of the books in the classroom library will be used by students to search for books that interest them and as a tool to store any reviews made by their peers. A system will be developed to flag any new recommendations

made by their peers and each learner will be given a page of their own to receive recommendations from their peers directly.

Before the intervention begins, the levels of reading will be analysed through the use of teacher records for the month prior to the intervention.

Learners will complete a questionnaire to discover their attitudes towards reading.

Observations of learner activity will take place while learners are using the system and while they are reading.

Learners will be shown a demonstration of how to use the website to search for books and make recommendations.

Learners will then be given time to search for books, collect them from the classroom library and to read the books that they have chosen.

Learners can write reviews of the books they have read, or make recommendations to peers from computers in the school itself or from devices they may have at home such as tablets, phones or laptops.

Learners will a complete a questionnaire to discover their attitudes to reading after the intervention to investigate if any change has taken place.

All questionnaires and other information gathered will be made anonymous and stored in accordance with the Data Protection Acts 1998 and 2003. In the extremely unlikely event that illicit activity is reported, the school's child protection policy will be followed and I will be obliged to notify the relevant authorities.

I require your permission for the research to take place in your classroom at Bunscoil Loreto, Gorey. If granted, participants will be asked for their individual consent and parents or guardians and the board of management will also be required to give consent to the research. Participation is completely voluntary and the school, teacher or individuals may withdraw fully at any time and any information gathered until that point will be deleted or destroyed. If the situation arises where a child, parent or guardian does not grant, or withdraws consent, the child will use the time for free reading and no data will be gathered in relation to that child.

If you have any questions before, during or after the project, please do not hesitate to contact Robert Doyle at: doyler12@tcd.ie or 0861062445.

Project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

Teacher Consent and Declaration Form

I have been provided with and understand an information sheet which outlines the activities that the students of my class will take part in, how data will be collected and stored and how I can contact the researcher.

I agree to participate in the research and understands that I may withdraw my class from the project at any time should I wish to do so for any reason and without penalty.

Teacher signature: _____

Full Name: _____

Date: _____

Name of school: _____

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

Signature of project leader (TCD): _____ Date: _____

Full Name: _____

Please note: For any further questions please contact Robert Doyle at: doyler12@tcd.ie or 0861062445.

Appendix D: Board of management information sheet

Board of Management Information Sheet

To the Chairperson of the Board of Management,

Project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

Purpose

The purpose of my research is:

- to investigate whether electronic peer recommendations impact on reader engagement and attitude towards reading.
- to investigate the influence of online social interaction among young learners in a primary school setting

Re: Proposal Research

I am currently studying towards a M.Sc. in Technology and Learning at Trinity College Dublin. As part of this process I must complete a research project and investigate an educational problem or intervention. I have chosen to perform a study to investigate the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website. The aim of the study is to investigate whether peer recommendations made online have an impact on reader engagement and at. The study will also investigate the influence of online social interaction among young learners in a safe, structured and monitored environment.

To achieve this it will be necessary to carefully design and construct a framework within which the social interactions will take place. It is proposed to construct a website which will enable the learners to interact in a private and safe manner under the supervision of their classroom teacher and the researcher. A searchable database containing all of the books in the classroom library will be used by students to search for books that interest them and as a tool to store any

reviews made by their peers. A system will be developed to flag any new recommendations made by their peers and each learner will be given a page of their own to receive recommendations from their peers directly.
Learners will have the ability to find a book about a topic they are interested in by computer, tablet or smartphone and to recommend that book to their peers when they are finished reading it if they enjoyed it. They will be able to tell individual friends about the book if they think it will interest them, promoting reading among their peer-group.

Studies suggest that there is a strong influence among peers at primary school level and that this influence can have both a positive or negative impact on reader attitude and engagement with reading. This study is an attempt to harness this powerful peer influence and positively impact on reader attitude and engagement, which is a driver of achievement in literacy. Studies also indicate that by far the most effective reading interventions take place when the learner is young and in a primary school setting or equivalent.

Before the intervention begins, the levels of reading will be analysed through the use of teacher records for the month prior to the intervention.
Learners will complete a questionnaire to discover their attitudes towards reading.
Observations of learner activity will take place while learners are using the system and while they are reading.
Learners will be shown a demonstration of how to use the website to search for books and make recommendations.
Learners will then be given time to search for books, collect them from the classroom library and to read the books that they have chosen.
Learners can write reviews of the books they have read, or make recommendations to peers from computers in the school itself or from devices they may have at home such as tablets, phones or laptops.
Learners will a complete a questionnaire to discover their attitudes to reading after the intervention to investigate if any change has taken place.
All questionnaires and other information gathered will be made anonymous and stored in accordance with the Data Protection Acts 1998 and 2003. In the extremely unlikely event that illicit activity is reported, the school's child protection policy will be followed and I will be obliged to notify the relevant authorities.

If the situation arises where a child, parent or guardian does not grant, or withdraws consent, the child will use the time for free reading and no data will be gathered in relation to that child.

The permission of the board for the research to take place in the 3rd class of Cindy Doyle in Bunscoil Loreto, Gorey is requested. If granted by the board, participants will be asked for their individual consent and parents or guardians will also be required to give consent to the research. Participation is completely voluntary and the school or individuals may withdraw fully at any time and any information gathered until that point will be deleted or destroyed.

Declaration of Conflict of Interest

Please be advised that this research is being conducted by the brother of the classroom teacher Cindy Doyle.

If you have any questions before, during or after the project, please do not hesitate to contact Robert Doyle at: doyler12@tcd.ie or 0861062445.

Title of project

Understanding and investigating the influence of peer recommendations and social interaction on reading levels in a primary school setting through the use of a social website.

Board of Management Consent and Declaration Form

The board has been provided with and understands an information sheet which outlines the activities that the students of Cindy Doyle's 3rd class will take part in, how data will be collected and stored and how it can contact the researcher.

The board agrees to participate in the research and understands that it may withdraw the school from the project at any time should it wish to do so for any reason and without penalty.

Signature of chair of Board of Management: _____

Date: _____

Full Name: _____

Name of school: _____

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

Signature of project leader (TCD): _____

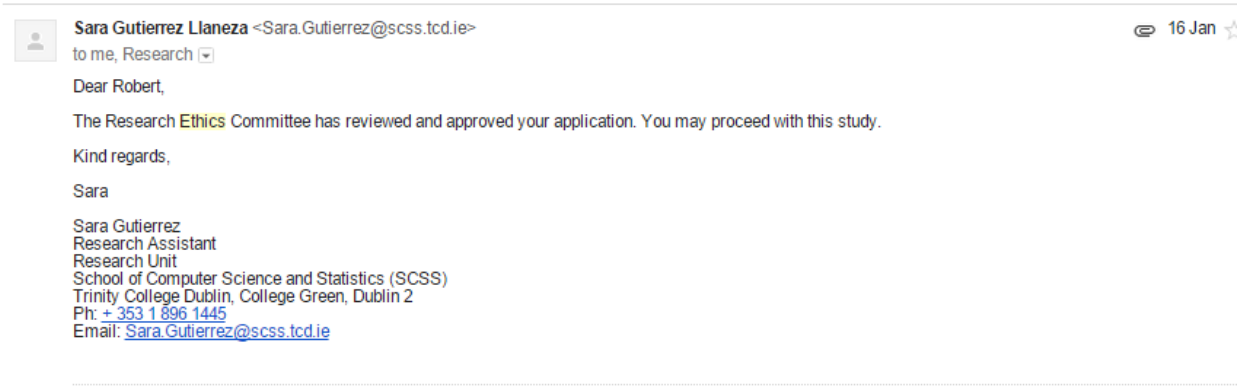
Date: _____

Full Name: _____

Please note: For any further questions please contact Robert Doyle at: doyler12@tcd.ie or 0861062445.

Appendix E: Screenshot of ethical approval

Screenshot of approval from the Research Ethics Committee.



Sara Gutierrez Llaneza <Sara.Gutierrez@scss.tcd.ie> 16 Jan
to me, Research

Dear Robert,

The Research Ethics Committee has reviewed and approved your application. You may proceed with this study.

Kind regards,

Sara

Sara Gutierrez
Research Assistant
Research Unit
School of Computer Science and Statistics (SCSS)
Trinity College Dublin, College Green, Dublin 2
Ph: + 353 1 896 1445
Email: Sara.Gutierrez@scss.tcd.ie

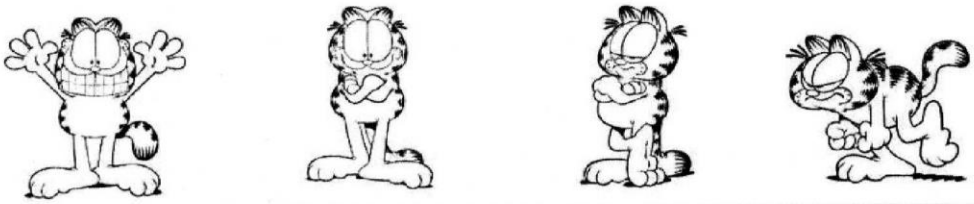
Appendix F: Elementary reading attitude survey

Elementary Reading Attitude Survey

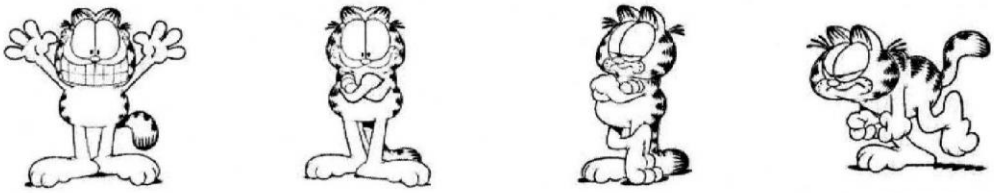
School_____ Grade_____ Name_____

Please circle the picture that describes how you feel when you read a book.

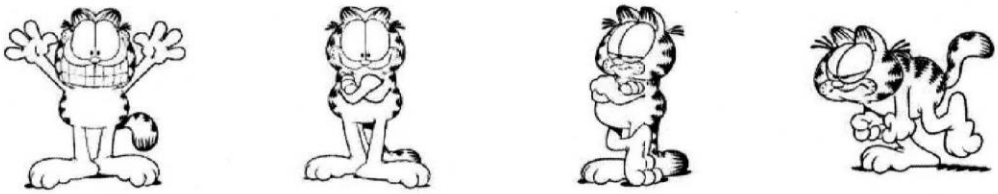
1. How do you feel when you read a book on a rainy Saturday?



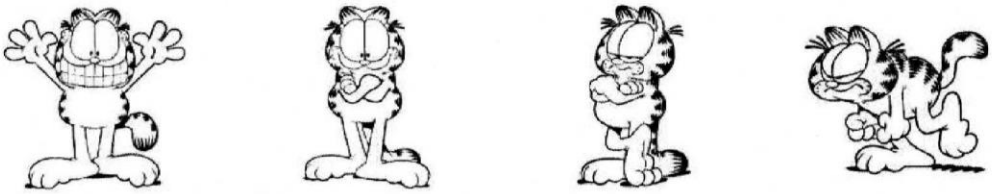
2. How do you feel when you read a book in school during free time?



3. How do you feel about reading for fun at home?



4. How do you feel about getting a book for a present?



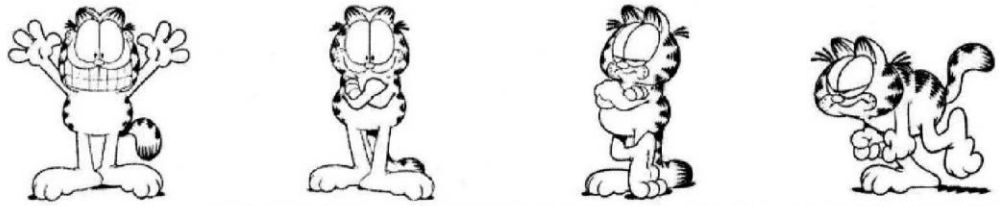
Page 1

Survey designed by Dennis J. Kear, Wichita State University

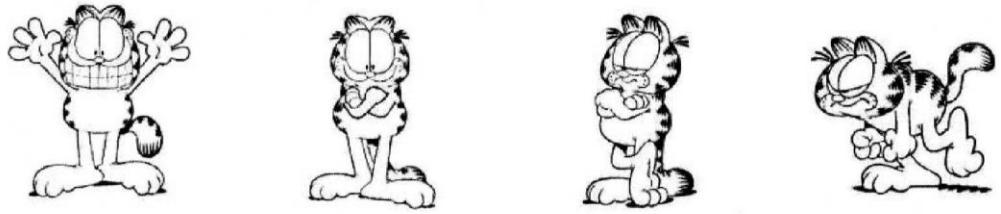
Each question is optional. Feel free to omit a response to any question: however I would be grateful if all questions are responded to.

Please circle the picture that describes how you feel when you read a book.

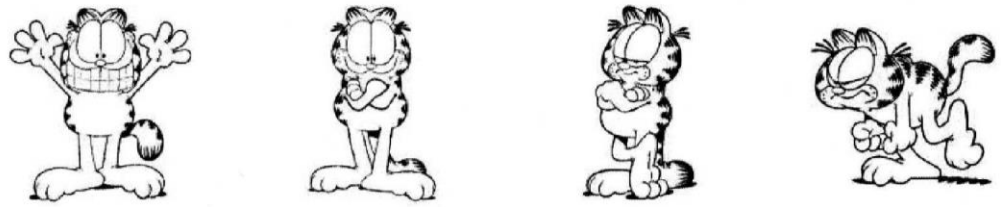
5. How do you feel about spendng free time reading a book?



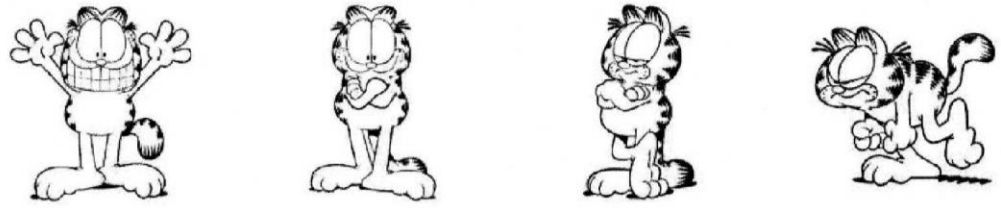
6. How do you feel about starting a new book?



7. How do you feel about reading during summer vacation?



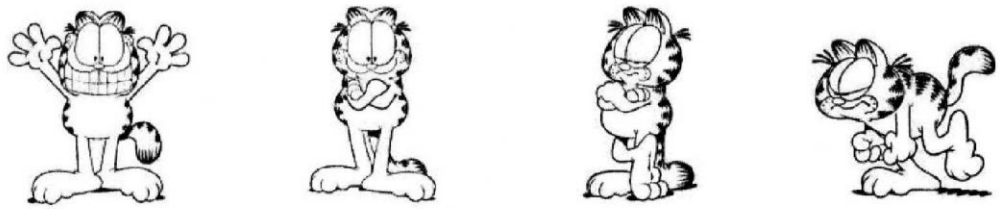
8. How do you feel about reading instead of playing?



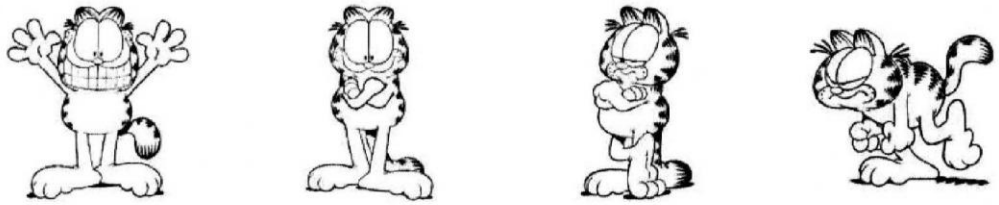
Each question is optional. Feel free to omit a response to any question: however I would be grateful if all questions are responded to.

Please circle the picture that describes how you feel when you read a book.

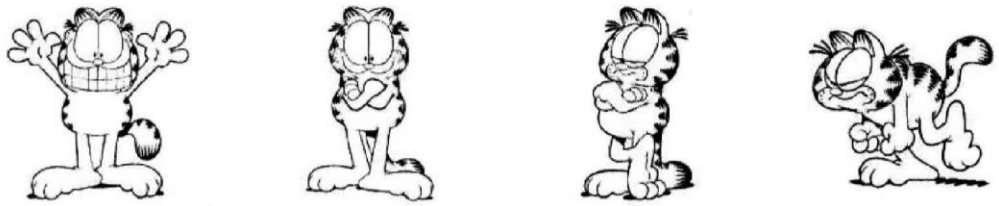
9. How do you feel about going to a bookstore?



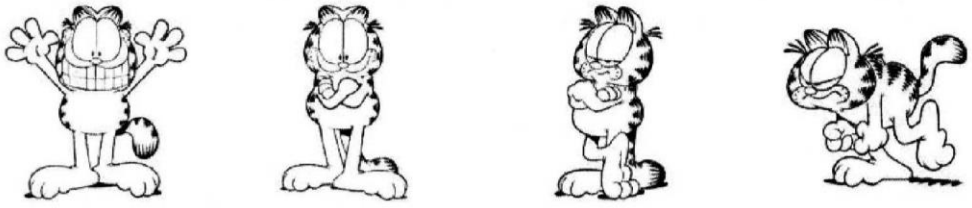
10. How do you feel about reading different kinds of books?



11. How do you feel when a teacher asks you questions about what you read?



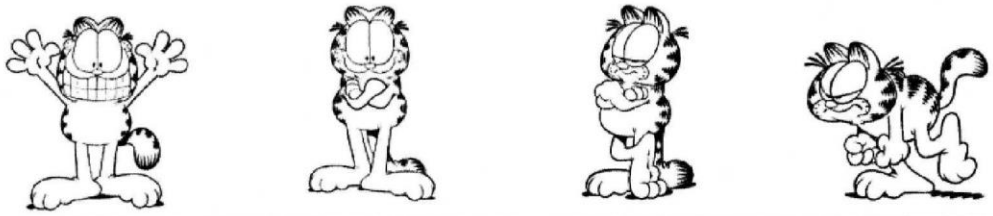
12. How do you feel about reading workbook pages and worksheets?



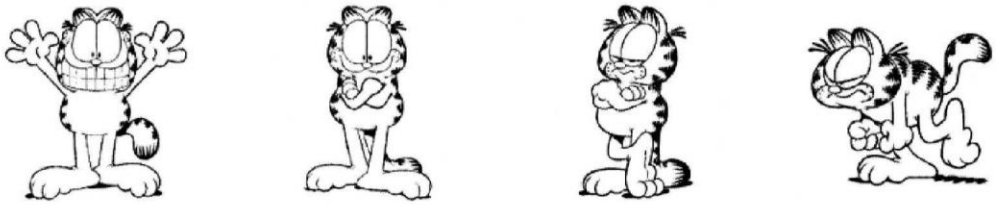
Each question is optional. Feel free to omit a response to any question: however I would be grateful if all questions are responded to.

Please circle the picture that describes how you feel when you read a book.

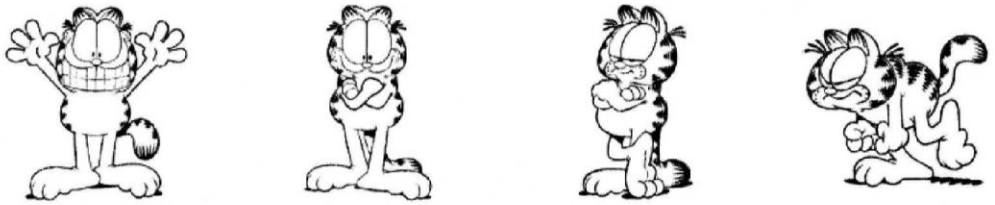
13. How do you feel about reading in school?



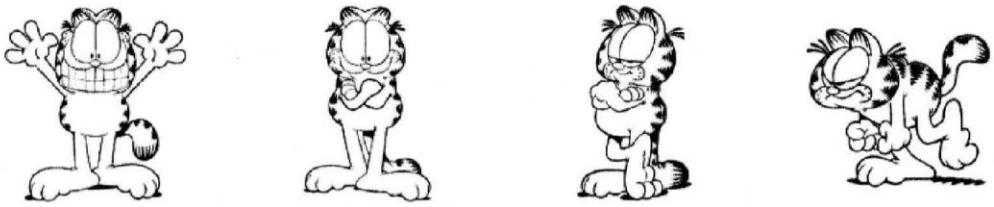
14. How do you feel about reading your school books?



15. How do you feel about learning from a book?



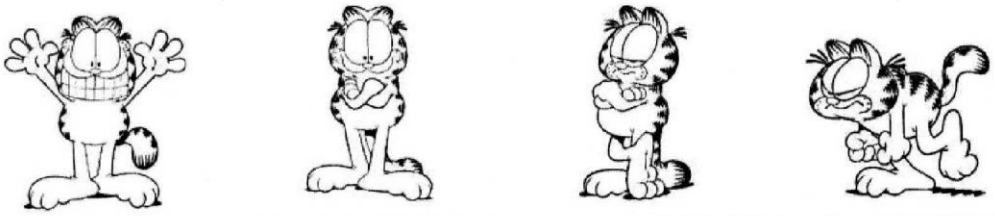
16. How do you feel when it's time for reading in class?



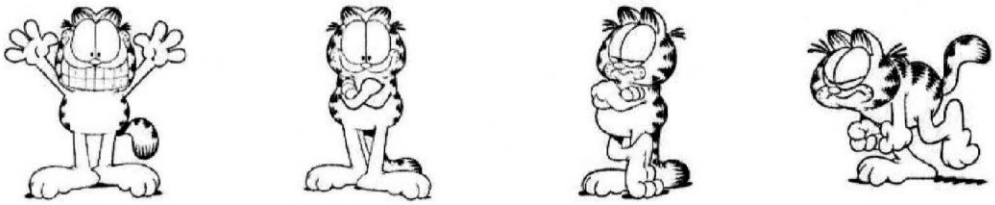
Each question is optional. Feel free to omit a response to any question: however I would be grateful if all questions are responded to.

Please circle the picture that describes how you feel when you read a book.

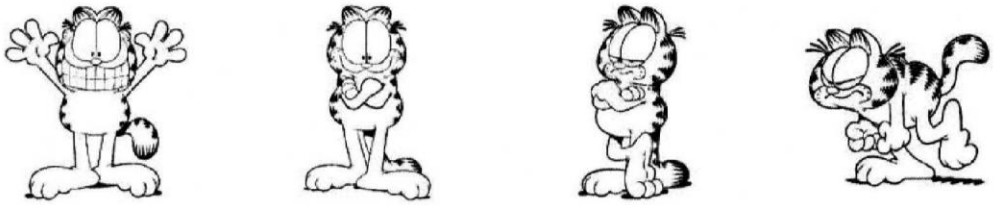
17. How do you feel about stories you read in reading class?



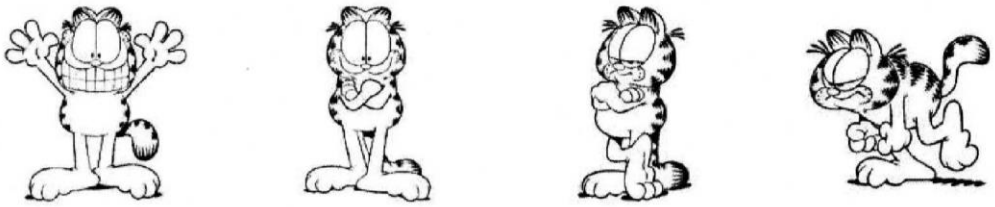
18. How do you feel when you read out loud in class?



19. How do you feel about using a dictionary?



20. How do you feel about taking a reading test?



Each question is optional. Feel free to omit a response to any question: however I would be grateful if all questions are responded to.

Appendix G: Elementary reading attitude scoring sheets

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 1

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	2	3	-	+1
2.	2	2	2.	1	4	-	+3
3.	2	2	3.	3	2	-	-1
4.	3	1	4.	4	4	-2	-
5.	3	3	5.	4	4	-	-
6.	4	4	6.	3	2	-	-1
7.	1	1	7.	2	4	-	+2
8.	1	1	8.	4	4	-	-
9.	3	3	9.	2	2	-	-
10.	4	4	10.	3	3	-	-
Raw Score:	26	24	Raw Score:	28	32	-2	+4

Full scale raw score — Pre intervention (Recreational + Academic): 54
Full scale raw score — Post intervention (Recreational + Academic): 56

Percentile ranks:
Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 2

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	4	4	-	
2.	4	4	2.	4	3	-	-1
3.	4	4	3.	4	4	-	-
4.	4	4	4.	4	4	-	-
5.	4	4	5.	4	4	-	-
6.	4	4	6.	4	4	-	-
7.	4	4	7.	4	4	-	
8.	3	3	8.	3	4	-	+1
9.	4	4	9.	4	4	-	-
10.	4	4	10.	3	4	-	+1
Raw Score:	39	39	Raw Score:	38	39	-	+1

Full scale raw score Pre intervention (Recreational + Academic): 77
Full scale raw score Post intervention (Recreational + Academic): 78

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 3

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	4	4	-	-
2.	4	4	2.	4	4	-	-
3.	4	4	3.	4	4	-	-
4.	2	4	4.	4	4	+2	-
5.	4	4	5.	4	4	-	-
6.	4	4	6.	4	4	-	-
7.	4	4	7.	2	4	-	+2
8.	4	4	8.	1	3	-	+2
9.	4	4	9.	2	3	-	+1
10.	4	4	10.	2	3	-	+1
Raw Score:	37	39	Raw Score:	31	37	+2	+6

Full scale raw score Pre intervention (Recreational + Academic): 68
Full scale raw score Post intervention (Recreational + Academic): 76

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 4

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	3	3	-	-
2.	4	4	2.	3	3	-	-
3.	4	4	3.	4	4	-	-
4.	4	4	4.	3	4	-	+1
5.	4	4	5.	3	4	-	+1
6.	3	3	6.	4	4	-	-
7.	4	3	7.	4	4	-1	-
8.	4	4	8.	4	4	-	-
9.	4	4	9.	3	3	-	-
10.	3	4	10.	4	3	+1	-1
Raw Score:	38	38	Raw Score:	35	36	-	+1

Full scale raw score Pre intervention (Recreational + Academic): 73
Full scale raw score Post intervention (Recreational + Academic): 74

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 5

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	1	3	1.	1	2	+2	+1
2.	3	4	2.	3	4	+1	+1
3.	2	1	3.	2	3	-1	+1
4.	3	3	4.	2	3	-	+1
5.	2	2	5.	3	2	-	-1
6.	4	3	6.	3	3	-1	-
7.	1	1	7.	3	3	-	-
8.	1	1	8.	4	4	-	-
9.	3	3	9.	1	1	-	-
10.	3	3	10.	1	3	-	+2
Raw Score:	23	24	Raw Score:	23	28	+1	+5

Full scale raw score Pre intervention (Recreational + Academic): 46
Full scale raw score Post intervention (Recreational + Academic): 52

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 6

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	4	3	-	-1
2.	3	4	2.	4	3	+1	-1
3.	4	4	3.	4	4	-	-
4.	4	4	4.	3	4	-	+1
5.	3	4	5.	4	4	+1	-
6.	4	4	6.	4	4	-	-
7.	1	3	7.	4	3	+2	-1
8.	1	3	8.	4	3	+2	-1
9.	4	4	9.	3	4	-	+1
10.	4	4	10.	4	4	-	-
Raw Score:	32	38	Raw Score:	38	36	+6	-2

Full scale raw score Pre intervention (Recreational + Academic): 70
Full scale raw score Post intervention (Recreational + Academic): 74

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 7

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	3	3	-	-
2.	3	4	2.	4	4	+1	-
3.	4	4	3.	4	4	-	-
4.	3	3	4.	3	3	-	-
5.	4	3	5.	4	4	-1	-
6.	4	4	6.	4	3	-	-1
7.	3	3	7.	3	4	-	+1
8.	3	3	8.	4	4	-	-
9.	4	4	9.	4	4	-	-
10.	4	4	10.	4	3	-	-1
Raw Score:	35	35	Raw Score:	37	36	-	-1

Full scale raw score Pre intervention (Recreational + Academic): 72
Full scale raw score Post intervention (Recreational + Academic): 71

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 8

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	2	2	-	-
2.	4	4	2.	2	2	-	-
3.	4	4	3.	4	4	-	-
4.	3	4	4.	3	3	+1	-
5.	4	3	5.	3	2	-1	-1
6.	4	4	6.	4	4	-	-
7.	3	4	7.	3	3	+1	-
8.	3	4	8.	3	2	+1	-1
9.	4	4	9.	2	2	-	-
10.	3	3	10.	3	4	-	+1
Raw Score:	36	38	Raw Score:	29	28	+2	-1

Full scale raw score Pre intervention (Recreational + Academic): 65
Full scale raw score Post intervention (Recreational + Academic): 66

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 9

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	3	3	-	-
2.	4	4	2.	3	4	-	+1
3.	4	4	3.	4	4	-	-
4.	4	4	4.	4	4	-	-
5.	3	4	5.	4	4	+1	-
6.	4	4	6.	4	3	-	-1
7.	4	3	7.	4	4	-1	-
8.	4	3	8.	3	3	-1	-
9.	4	4	9.	4	3	-	-
10.	4	4	10.	4	4	-	-
Raw Score:	39	38	Raw Score:	37	36	-1	-1

Full scale raw score Pre intervention (Recreational + Academic): 76
Full scale raw score Post intervention (Recreational + Academic): 74

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 10

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	3	3	-	-
2.	4	4	2.	3	2	-	-1
3.	3	3	3.	4	3	-	-1
4.	4	4	4.	2	3	-	+1
5.	3	3	5.	4	2	-	-2
6.	4	4	6.	4	4	-	-
7.	3	2	7.	2	4	-1	+2
8.	4	3	8.	1	2	-1	+1
9.	4	4	9.	2	3	-	+1
10.	4	3	10.	2	2	-1	-
Raw Score:	36	33	Raw Score:	27	28	-3	+1

Full scale raw score Pre intervention (Recreational + Academic): 65
Full scale raw score Post intervention (Recreational + Academic): 61

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 11

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	4	1.	3	4	+1	+1
2.	3	4	2.	3	3	+1	-
3.	3	3	3.	4	4	-	-
4.	4	4	4.	4	4	-	-
5.	4	3	5.	3	4	-1	+1
6.	4	4	6.	4	4	-	-
7.	3	3	7.	4	4	-	
8.	3	3	8.	4	4	-	-
9.	3	4	9.	3	3	+1	-
10.	4	4	10.	3	4	-	+1
Raw Score:	34	36	Raw Score:	35	38	+2	+3

Full scale raw score — Pre intervention (Recreational + Academic): 69
Full scale raw score — Post intervention (Recreational + Academic): 74

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 12

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	4	4	1.	4	3	-	-1
2.	4	4	2.	3	3	-	-
3.	4	4	3.	4	4	-	-
4.	4	4	4.	4	4	-	-
5.	4	4	5.	4	4	-	-
6.	4	4	6.	4	4	-	-
7.	3	3	7.	4	4	-	
8.	4	4	8.	3	4	-	+1
9.	4	4	9.	3	4	-	+1
10.	4	4	10.	4	4	-	-
Raw Score:	39	39	Raw Score:	37	38	-	+1

Full scale raw score Pre intervention (Recreational + Academic): 76
Full scale raw score Post intervention (Recreational + Academic): 77

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 13

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	3	3	-	-
2.	2	4	2.	2	4	+2	+2
3.	3	4	3.	4	4	+1	-
4.	4	3	4.	2	3	-1	+1
5.	3	4	5.	4	4	+1	-
6.	3	4	6.	3	3	+1	-
7.	1	3	7.	3	3	+2	
8.	2	3	8.	2	2	+1	-
9.	3	4	9.	3	3	+1	-
10.	2	2	10.	3	4	-	+1
Raw Score:	26	34	Raw Score:	29	33	+8	+4

Full scale raw score Pre intervention (Recreational + Academic): 55
Full scale raw score Post intervention (Recreational + Academic): 67

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 14

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	2	4	1.	2	2	+2	-
2.	3	3	2.	2	2	-	-
3.	3	4	3.	3	3	+1	-
4.	4	3	4.	3	3	-1	-
5.	3	3	5.	3	3	-	-
6.	4	3	6.	3	3	-1	-
7.	3	3	7.	3	3	-	-
8.	2	2	8.	2	1	-	-1
9.	3	3	9.	3	3	-	-
10.	3	4	10.	2	3	+1	+1
Raw Score:	30	32	Raw Score:	26	26	+2	-

Full scale raw score Pre intervention (Recreational + Academic): 56
Full scale raw score Post intervention (Recreational + Academic): 58

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 15

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	4	1.	3	4	+1	+1
2.	2	4	2.	2	4	+2	+2
3.	3	4	3.	3	3	+1	-
4.	2	4	4.	3	4	+2	+1
5.	3	4	5.	3	3	+1	-
6.	4	4	6.	2	4	-	+2
7.	2	1	7.	3	3	-1	
8.	2	3	8.	2	4	+1	+2
9.	3	3	9.	3	4	-	+1
10.	4	4	10.	3	4	-	+1
Raw Score:	28	35	Raw Score:	27	37	+7	+10

Full scale raw score Pre intervention (Recreational + Academic): 55
Full scale raw score Post intervention (Recreational + Academic): 72

Percentile ranks: Recreational
Academic
Full scale

Elementary Reading Attitude Survey Scoring Sheet

Student Number: 16

Scoring Guide
4 points Happiest Garfield
3 points Slightly smiling Garfield
2 points Mildly upset Garfield
1 point Very upset Garfield

Recreational reading			Academic reading			Change	
	Pre	Post		Pre	Post		
1.	3	3	1.	3	3	-	-
2.	4	4	2.	3	3	-	-
3.	3	3	3.	4	4	-	-
4.	4	4	4.	4	3	-	-1
5.	3	4	5.	3	4	+1	+1
6.	4	4	6.	4	4	-	-
7.	3	3	7.	3	4	-	+1
8.	3	3	8.	2	2	-	-
9.	4	4	9.	3	3	-	-
10.	4	4	10.	1	4	-	+3
Raw Score:	35	36	Raw Score:	30	34	+1	+4

Full scale raw score Pre intervention (Recreational + Academic): 65
Full scale raw score Post intervention (Recreational + Academic): 70

Percentile ranks: Recreational
Academic
Full scale

Appendix H: ERA class scoring sheet pre-intervention

Elementary Reading Attitude Survey Scoring Sheet Pre-Intervention

Number of Students: 16
Administration Date: 27/01/15

Recreational Reading		Academic Reading		Full scale raw score (Recreational + Academic)
1.	**26**	1.	**28**	**54**
2.	**39**	2.	**38**	**77**
3.	**37**	3.	**31**	**68**
4.	**38**	4.	**35**	**73**
5.	**23**	5.	**23**	**46**
6.	**32**	6.	**38**	**70**
7.	**35**	7.	**37**	**72**
8.	**36**	8.	**29**	**65**
9.	**39**	9.	**37**	**76**
10.	**36**	10.	**27**	**65**
11.	**34**	11.	**35**	**69**
12.	**39**	12.	**37**	**76**
13.	**26**	13.	**29**	**55**
14.	**30**	14.	**26**	**56**
15.	**28**	15.	**27**	**55**
16	**35**	16	**30**	**65**
Totals:	**533**		**507**	**1042**

Appendix I: ERA class scoring sheet post-intervention

Elementary Reading Attitude Survey Scoring Sheet Post-Intervention

Number of Students: 16
Administration Date: 02/03/2015

Recreational Reading		Academic Reading		Full scale raw score (Recreational + Academic)
1.	**24**	1.	**32**	**56**
2.	**39**	2.	**39**	**78**
3.	**39**	3.	**37**	**76**
4.	**38**	4.	**36**	**74**
5.	**24**	5.	**28**	**52**
6.	**38**	6.	**36**	**74**
7.	**35**	7.	**36**	**71**
8.	**38**	8.	**28**	**66**
9.	**38**	9.	**36**	**74**
10.	**33**	10.	**28**	**61**
11.	**36**	11.	**38**	**74**
12.	**39**	12.	**38**	**77**
13.	**34**	13.	**33**	**67**
14.	**32**	14.	**26**	**58**
15.	**35**	15.	**37**	**72**
16	**36**	16	**34**	**70**
Totals	**558**		**542**	**1100**

Appendix J: ERA individual recreational reading attitude changes

Elementary Reading Attitude Survey: Individual Recreational Reading Attitude changes

Students	**Pre-Intervention**	**Post-Intervention**	**Change**
	Recreational Score	Recreational Score	
1.	**26**	**24**	**-2**
2.	**39**	**39**	**0**
3.	**37**	**39**	**+2**
4.	**38**	**38**	**0**
5.	**23**	**24**	**+1**
6.	**32**	**38**	**+6**
7.	**35**	**35**	**0**
8.	**36**	**38**	**+2**
9.	**39**	**38**	**-1**
10.	**36**	**33**	**-3**
11.	**34**	**36**	**+2**
12.	**39**	**39**	**0**
13.	**26**	**34**	**+8**
14.	**30**	**32**	**+2**
15.	**28**	**35**	**+7**
16	**35**	**36**	**+1**
Totals	**533**	**558**	**+25**

Appendix K: ERA individual academic reading attitude changes

Elementary Reading Attitude Survey: Individual Academic Reading Attitude changes

Students	Pre-Intervention	Post-Intervention	Change
	Academic score	Academic score	
1.	**28**	**32**	**+4**
2.	**38**	**39**	**+1**
3.	**31**	**37**	**+6**
4.	**35**	**36**	**+1**
5.	**23**	**28**	**+5**
6.	**38**	**36**	**-2**
7.	**37**	**36**	**-1**
8.	**29**	**28**	**-1**
9.	**37**	**36**	**-1**
10.	**27**	**28**	**+1**
11.	**35**	**38**	**+3**
12.	**37**	**38**	**+1**
13.	**29**	**33**	**+4**
14.	**26**	**26**	**0**
15.	**27**	**37**	**+10**
16	**30**	**34**	**+4**
Totals	**507**	**542**	**+35**

Appendix L: ERA individual total reading attitude changes

Elementary Reading Attitude Survey: Individual Total Reading Attitude changes

Students	Pre-Intervention	Post-Intervention	Change
	Full scale raw score (Recreational + Academic)	Full scale raw score (Recreational + Academic)	
1.	**54**	**56**	**+2**
2.	**77**	**78**	**+1**
3.	**68**	**76**	**+8**
4.	**73**	**74**	**+1**
5.	**46**	**52**	**+6**
6.	**70**	**74**	**+4**
7.	**72**	**71**	**-1**
8.	**65**	**66**	**+1**
9.	**76**	**74**	**-2**
10.	**63**	**61**	**-2**
11.	**69**	**74**	**+5**
12.	**76**	**77**	**+1**
13.	**55**	**67**	**+12**
14.	**56**	**58**	**+2**
15.	**55**	**72**	**+17**
16	**65**	**70**	**+5**
Totals:	**1040**	**1100**	**+60**

Appendix M: Monthly website statistics

Monthly Statistics for January 2015		
Total Hits		11396
Total Files		7693
Total Pages		4997
Total Visits		189
Total KBytes		86035
Total Unique Sites		99
Total Unique URLs		45
Total Unique Referrers		33
Total Unique Usernames		1
Total Unique User Agents		53
.	Avg	Max
Hits per Hour	15	2128
Hits per Day	367	5948
Files per Day	248	4521
Pages per Day	161	3058
Visits per Day	6	62
KBytes per Day	2775	53013

Monthly Statistics for February 2015		
Total Hits		2566
Total Files		2011
Total Pages		1207
Total Visits		178
Total KBytes		26341
Total Unique Sites		111
Total Unique URLs		46
Total Unique Referrers		25
Total Unique User Agents		49
.	Avg	Max
Hits per Hour	3	508
Hits per Day	91	776
Files per Day	71	659
Pages per Day	43	379
Visits per Day	6	20
KBytes per Day	941	8051

Monthly Statistics for March 2015		
Total Hits		697
Total Files		600
Total Pages		379
Total Visits		34
Total KBytes		6935
Total Unique Sites		29
Total Unique URLs		54
Total Unique Referrers		28
Total Unique Usernames		1
Total Unique User Agents		18
.	Avg	Max
Hits per Hour	3	162
Hits per Day	77	391
Files per Day	66	347
Pages per Day	42	256
Visits per Day	3	7
KBytes per Day	771	3364

Appendix N: Classroom teacher offline relationship observations

User	Friend 1	Friend 2	Friend 3
User 1	19	12	20
User 2	18	17	
User 3	5	13	
User 4	9	20	
User 5	7	3	
User 6	New Student		
User 7	5		
User 8	New Student		
User 9	20	4	14
User 10	20		
User 11	16	20	
User 12	19	1	20
User 13	11	3	15
User 14	16		
User 15	13		
User 16	14	11	
User 17	18		
User 18	17		
User 19	1	12	
User 20	Social Animal!!		

Appendix O: Classroom teacher general observations

ClassLibrary was a useful way to transition smoothly from ICT time to Literacy time.

From a practical point of view, it made it a lot easier to manage children browsing the classroom library. Being short on space as most classrooms are, our library is in the corner of a room with limited space to manoeuvre. There is only room for two or three children to browse simultaneously. With 32 children in the class, it's challenging to manage this without it taking half the day. Using the app meant that children could browse, take a peek at books recommended by friends and suggest books to other friends without a huge disruption. They could also browse from home, which they loved doing and a large portion of the class did this. They could strike while the iron was hot as soon as they'd finished a book and start checking out new books to read or review the one they just read.

I also found it instilled a little bit of healthy competition in them. They were dying to recommend a book to people, which meant they had to actually read it first. I overheard a child thanking another child for her recommendation and questioning her as to what the book was about.

I would say that we are a friendly, inclusive class and because we switch seats on a regular basis, the children are happy to work with anyone in the room. In the yard, they tend to stick to friendship groups. I wondered which category the app would fall into. Would friends just stick together or would they reach out to others. Happily, the recommendations and interactions about their reading crossed their traditional friendship boundaries and extended to anyone they thought would enjoy the book – and also be able for the book.

Appendix P: Pre-intervention recreational reading score analysis

The first section of the questionnaire to be analysed considers the learners attitude towards recreational reading.

Table 5.1 Individual student pre-intervention recreational reading scores

Students	**Pre-Intervention**
	Recreational Score
1.	**26**
2.	**39**
3.	**37**
4.	**38**
5.	**23**
6.	**32**
7.	**35**
8.	**36**
9.	**39**
10.	**36**
11.	**34**
12.	**39**
13.	**26**
14.	**30**
15.	**28**
16	**35**
Total:	**533**

Table 5.1 clearly shows us that the overall attitude of the class to recreational reading was quite positive, even before the intervention took place, and reflects the observations of the classroom teacher. A total score of 533 from a maximum of 800 was achieved which is considerably more than

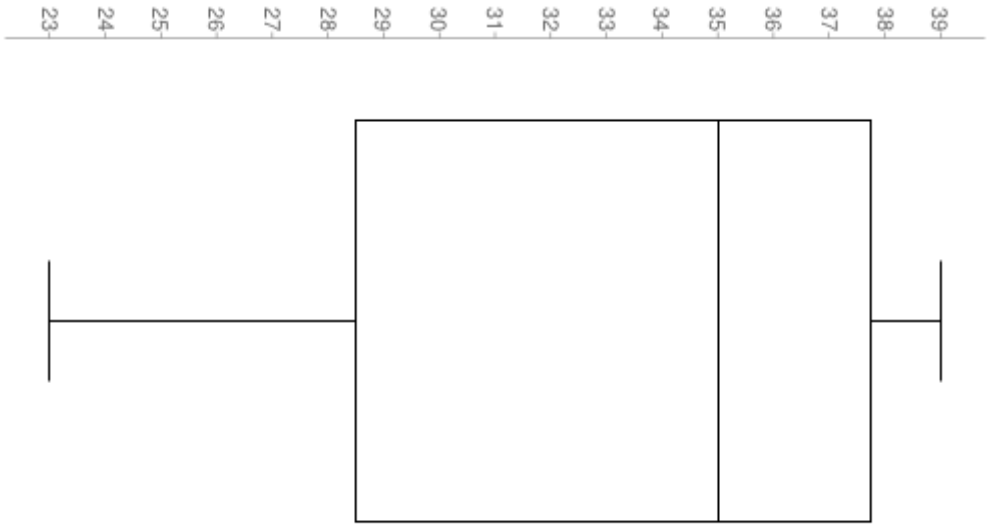
the 400 which would have indicated apathy to recreational reading. Within the individual data for each learner there was a considerable range of 16, however, with the highest scoring individuals achieving a near perfect 39 and the lowest scoring individual a score of 23. This learner was the only individual to have a negative attitude towards reading, though at only two points under the threshold they could be considered to be closer to apathy than to a totally negative attitude. There are also three other learners who achieved just above the threshold of apathy, whose positivity towards reading is not strong and who could be considered generally apathetic.

Table: 5.2 Analysis of pre-intervention recreational reading scores

	Pre-Intervention
Total score of 16 learners	533
Highest value	39
Low	23
Range	16
Interquartile range	9.25
First quartile	28.5
Third quartile	37.75
Sample variance	27.1625
Mean	33.3125
Median	35
Mode	39
Sample standard deviation	5.21176553579

The pre-intervention mean of the learners was a 33.3125, the median was 35 and the mode 39. This again indicates that the general attitude to recreational reading was positive before the intervention took place, though the high frequency of a near-perfect score of 39 demonstrated by the mode masks the lower scores and we must remain cautious of reading too much in such a small sample. The sample variance of 27.1625 and sample standard deviation of 5.21176553579 help to give us a view of the spread of the data, as does the interquartile range of 9.25. The value of the third quartile of 37.75 shows us the high scores achieved by many learners, see table 5.2. For a clear graphical representation of this data a box and whisker plot has been constructed, figure 5.1 below.

Figure 5.1 Student pre-intervention recreational reading scores box and whisker plot



Appendix Q: Pre-intervention academic reading score analysis

The second section of the questionnaire to be analysed considers the learners attitude towards academic reading.

Table 5.3 Individual student pre-intervention academic reading scores

Students	**Pre-Intervention**
	Academic score
1.	**28**
2.	**38**
3.	**31**
4.	**35**
5.	**23**
6.	**38**
7.	**37**
8.	**29**
9.	**37**
10.	**27**
11.	**35**
12.	**37**
13.	**29**
14.	**26**
15.	**27**
16	**30**
Total:	**507**

Table 5.3 indicates that the overall attitude of the class to academic reading was also quite positive reflecting the observations of the classroom teacher. A total score of 507 from a maximum of 800 was achieved. Within the individual data for each learner there was a slightly smaller range of 15, with the

highest scoring individuals on 38 and the lowest scoring individual a score of 23. This learner was the same learner who had a negative attitude towards recreational reading and was again the only individual to score a negative attitude. As with the learner's recreational reading attitude, the score was only two points under the apathy threshold and is, as such, a low level of a negative attitude. There are four other learners who scored only slightly above the threshold of apathy, whose positivity towards academic reading is not strong and who could be considered generally apathetic.

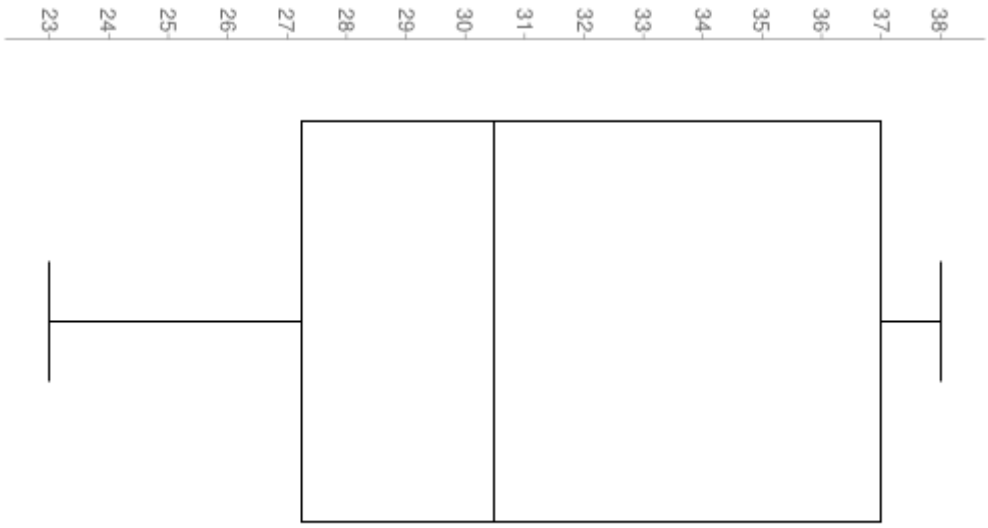
Table: 5.4 Analysis of pre-intervention academic reading scores

	Pre-Intervention
Total score of 16 learners	507
Highest value	38
Low	23
Range	15
Interquartile range	9.75
First quartile	27.25
Third quartile	37
Sample variance	24.6291666666667
Mean	31.6875
Median	30.5
Mode	37
Sample standard deviation	4.9627781198303

The pre-intervention mean academic score of the learners was lower than the pre-intervention recreational score at 31.6875. The median and mode were also lower at 30.5 and 37, respectively. This indicates that the general attitude to academic reading was positive before the intervention took place, though not as positive as the learner attitude to recreational reading and we must remain

cautious of reading too much in such a small sample. The sample variance of 24.6291666666667 and sample standard deviation of 4.9627781198303 show a closer spread of the data when compared to the recreational reading scores, see table 5.4. For a clear graphical representation of this data a box and whisker plot has been constructed, figure 5.2 below.

Figure 5.2 Student pre-intervention academic reading scores box and whisker plot



Appendix R: Post-intervention recreational reading score analysis

The first section of the questionnaire to be analysed considers the learners attitude towards recreational reading.

Table 5.7 Individual student post-intervention recreational reading scores

Students	**Post-Intervention**
	Recreational Score
1.	**24**
2.	**39**
3.	**39**
4.	**38**
5.	**24**
6.	**38**
7.	**35**
8.	**38**
9.	**38**
10.	**33**
11.	**36**
12.	**39**
13.	**34**
14.	**32**
15.	**35**
16	**36**
Total:	**558**

Table 5.7 clearly shows us that the overall attitude of the class to recreational reading was quite positive after the intervention took place. A total score of 558 from a maximum of 800 was achieved which is considerably more than the 400 which would have indicated apathy to recreational reading.

Within the individual data for each learner there was a range of 15 with the highest scoring individuals scoring 39 and the lowest scoring individuals 24. There were two learners with a score marginally under the apathy threshold at 24. The remainder of the learner's scores indicated a strongly positive attitude towards reading, the next lowest score was 32.

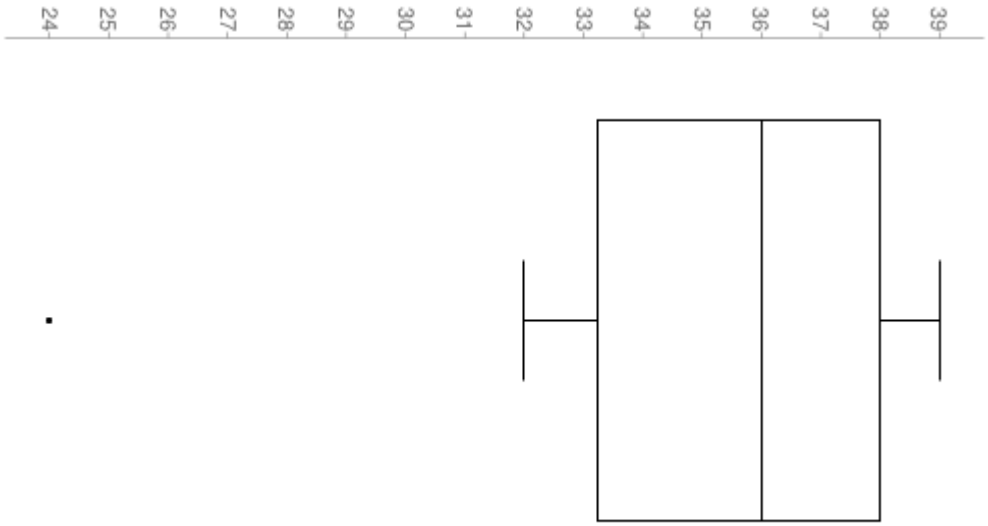
Table: 5.8 Analysis of post-intervention recreational reading scores

	Post-Intervention
Total score of 16 learners	558
Highest value	39
Low	24
Range	15
Interquartile range	4.75
First quartile	33.25
Third quartile	38
Sample variance	22.7833333
Mean	34.875
Median	36
Mode	38
Sample standard deviation	4.773189

The post-intervention mean of the learners was a 34.875, the median was 36 and the mode 38. This is again an indication that the general attitude to recreational reading was positive after the intervention took place, though we must remain cautious of reading too much in such a small sample. The sample variance of 22.7833333 and sample standard deviation of 4.773189 give us a view of the narrow spread of the data, as does the interquartile range of 9.25. The value of the first quartile of 33.25 shows us the high scores achieved by the majority of the learners, see table 5.8. For a clear

graphical representation of this data a box and whisker plot has been constructed, figure 5.4 below. In this box and whisker plot we can see the tight clustering of data and the two learners as outliers, away from the bulk of the other learners.

Figure 5.4 Student post-intervention recreational reading scores box and whisker plot



Appendix S: Post-intervention academic reading score analysis

The second section of the questionnaire to be analysed considers the learners attitude towards academic reading.

Table 5.9 Individual student post-intervention academic reading scores

Students	**Post-Intervention**
	Academic score
1.	**32**
2.	**39**
3.	**37**
4.	**36**
5.	**28**
6.	**36**
7.	**36**
8.	**28**
9.	**36**
10.	**28**
11.	**38**
12.	**38**
13.	**33**
14.	**26**
15.	**37**
16	**34**
Total:	**542**

Table 5.9 indicates that the overall attitude of the class to academic reading was positive. A total score of 542 from a maximum of 800 was achieved. Within the individual data for each learner there was a range of 13, with the highest scoring individuals on 39 and the lowest scoring individual a score of 26.

There were no learners who scored a negative attitude towards academic reading, which is an encouraging indication, though the small sample size only allows us to speculate. There were four learners who scored less than 30, indicating that their attitude was not very strongly positive, though three of these learners scored 28 which is closer to 30 than to then threshold of apathy of 25.

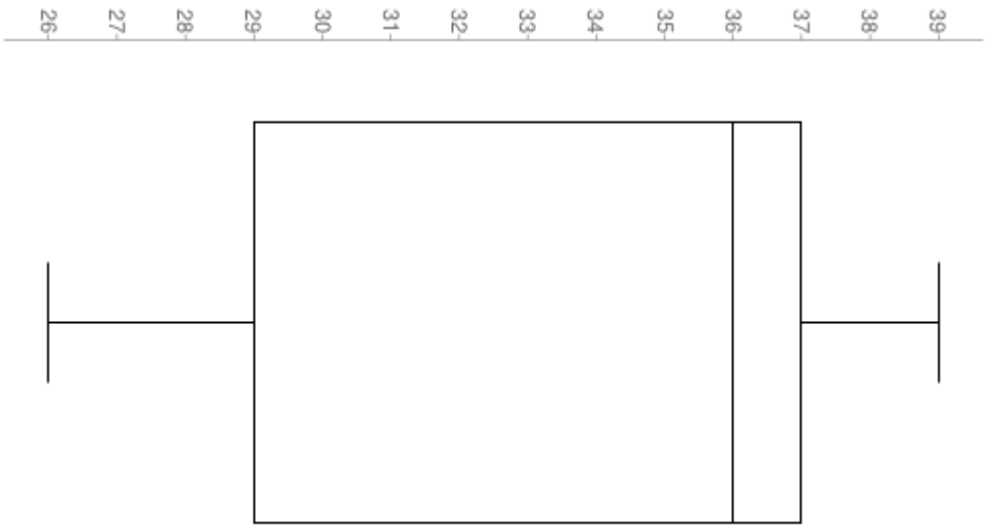
Table: 5.10 Analysis of post-intervention academic reading scores

	Post-Intervention
Total score of 16 learners	542
Highest value	39
Low	26
Range	13
Interquartile range	8
First quartile	29
Third quartile	37
Sample variance	17.85
Mean	33.875
Median	36
Mode	36
Sample standard deviation	4.224926

The post-intervention mean academic score of the learners was lower than the post-intervention recreational score at 33.875. The median of 36 was equal to the median for recreational reading. The mode of 36 was lower than the equivalent measure for recreational reading. This indicates that the general attitude to academic reading was positive after the intervention took place, as positive as the learner attitude to recreational reading and we must remain cautious of reading too much in such a small sample. The sample variance of 17.85 and sample standard deviation of 4.224926 show a close

spread of the data, see table 5.10. For a clear graphical representation of this data a box and whisker plot has been constructed, figure 5.5 below.

Figure 5.5 Student post-intervention academic reading scores box and whisker plot



Appendix T: Wall.php

```
<?php
	session_start();

	require("include/database.php");

	if($_SESSION['userid'] == -1)
	{
		header("Location: index.php");
	}
?>

<!doctype HTML>
<html>
	<head>
		<link rel="stylesheet" type="text/css" href="reset.css">
		<link rel="stylesheet" type="text/css" href="stylesheet.css">
		<meta name=viewport content="width=640">
	</head>
	<body>
		<div id="container">
			<div id="wall">
				<a href="#">
					<img id="profilepicture" alt="<?php echo $_SESSION['username']; ?>"
src="images/<?php echo $_SESSION['profilepicture']; ?>"/>
				</a>
				<div id="username"><?php echo $_SESSION['username']; ?></div>
				<div style="clear: both"></div>
				<a href="pickmonster.php" style="text-decoration: none; color: black">
					<div id="bio"><img src="images/Bio.png"/><?php echo $_SESSION['bio']; ?></div>
				<a/>
				<div id="newsfeed">

					<?php

 $con=mysqli_connect($GLOBALS["hostname"], $GLOBALS["username"],
$GLOBALS["password"], $GLOBALS["database"]);


if (mysqli_connect_errno())
{
	echo "Failed to connect to MySQL: " . mysqli_connect_error();
}

$sql = "SELECT User.ProfilePicture, User.UserName as UserTo,
  Wall.Username as UserFrom, Wall.Verb, Wall.BookTitle FROM Wall INNER JOIN User ON Wall.UserId = User.UserId WHERE
  (User.UserId = ".$_SESSION['userid']." AND Verb = 'Recommends') OR (User.UserId <> ".$_SESSION['userid'].") ORDER BY
  Wall.DateTime DESC LIMIT 0 , 10;";

$result = mysqli_query($con, $sql);
$num_rows = mysqli_num_rows($result);

if($num_rows < 1)
{
	echo "No News Today!";
}

while($row = mysqli_fetch_array($result))
{

	echo "<div class='newsitem clearfix'>";
		echo "<div class='newsitemicon'>";
			if($row['Verb'] == 'likes')
			{
				echo "<img src='images/Heart.png'/>";
			}
			else
			{
				echo "<img
  src='images/ThumbsUp.png'/>";
			}
		echo "</div>";

		echo "<div class='profilepicture'>";
			echo "<img src='images/".
  $row['ProfilePicture']."'/>";
		echo "</div>";
```

```
                                                        echo "<div class='username'>".$row['UserTo']."</div>";
                                                        echo "<div style='clear: both'></div>";
                                                        echo "<div class='bookname'>".$row['UserFrom']." ".
$row['Verb']." ".$row['BookTitle']."</div>";
                                                echo "</div>";
                                        }

                                        mysqli_close($con);

                                ?>

                        </div>


                </div>
                <div id="menu">
                        <div id="reading"><a href="readinglist.php?List=1"><img alt="Reading Now"
title="Reading Now" src="images/OpenBook.png"/></a></div>
                        <div id="hasread"><a href="readinglist.php?List=2"><img alt="Already Read"
title="Already Read" src="images/ClosedBook.png"/></a></div>
                        <div id="recommendations"><a href="readinglist.php?List=3"><img alt="Recommended
Reading" title="Recommended Reading" src="images/ThumbsUp.png"/></a></div>
                        <div id="willread"><a href="readinglist.php?List=4"><img alt="Going to Read"
title="Going to Read" src="images/BookPile.png"/></a></div>
                        <div id="logout"><a href="index.php"><img alt="Logout" title="Logout"
src="images/CloseButton.png"/></a></div>
                </div>
                <div style="clear: both"> </div>
                <div id="search">
                        <form action="http://classlibrary.eu/results.php" method="post">
                        <div>
                                <span id="loginname" class="label">Search the Library</span><br/>
                                <input type="text" name="q">
                                <input type="submit" value="Search" name="Search">
                        </div>
                        </form>
                </div>
        </div>

    </body>
</html>
```

Appendix U: Stylesheet.css

```
body
{
        font-family: helvetica;
        background-color: #9CBA7F;
}

#container
{
        max-width: 640px;
        position: relative;
        width: 100%;
}

#wall
{
        position: relative;
        top: 50px;
        background-color: white;
        background-color: #FFFFFF;
        padding: 20px;
        margin: 0px 20px 20px 20px;
}

#search
{
        position: relative;
        top: 0px;
        background-color: white;
        background-color: #FFFFFF;
        padding: 20px;
        margin: 0px 20px 20px 20px;
        border: solid 20px #CFDBC5;
}


#profilepicture
{
        position: relative;
        top: -45px;
        left: -10px;
        height: 200px;
        width: 200px;
        border: solid 10px white;
        padding: 10px;
        float: left;
        background-color: #636F57;
}

#username
{
        height: 175px;
        line-height: 175px;
        font-size: 70px;
        text-align: center;
        float: left;
        color: #5A6351;
}

#title
{
        font-size: 30px;
        line-height: 30px;
        height: 30px;
        margin-bottom: 10px;
        text-align: center;
        float: left;
        color: #5A6351;
}

#bio, #genres
{
        position: relative;
        top: -20px;
```

```
    vertical-align: center;
        height: 40px;
        line-height: 40px;
        font-size: 20px;
        text-align: left;
        margin-bottom: 5px;
}

#bio img, #genres img
{
        vertical-align: middle;
        height: 40px;
        margin-right: 10px;
}

#newsfeed, #readinglist
{
        background-color: #CFDBC5;
        padding: 10px;
        margin: 10px 0px 10px 0px;
}

#newsfeed .newsitem, #readinglist .book
{
        position: relative;
        background-color: #FFFFFF;
        margin: 60px 10px 10px 10px;
        padding: 10px;
        min-height: 130px;
}


#newsfeed .newsitem .newsitemicon img, #readinglist .book .bookcover img
{
        position: relative;
        top: -50px;
        left: -10px;
        border: solid 10px white;

        padding: 10px;
        background-color: #636F57;
        float: left;
}

#newsfeed .newsitem .newsitemicon img
{
        height: 100px;
        width: 100px;
}

#readinglist .book .bookcover img
{
        max-width: 150px;
        max-height: 150px;
}

#newsfeed .newsitem .profilepicture img
{
        position: relative;
        top: -50px;
        left: 0px;
        height: 100px;
        width: 100px;
        border: solid 10px white;
        padding: 10px;
        background-color: #636F57;
        float: left;
}

#newsfeed .newsitem .username
{
        height: 70px;
        line-height: 70px;
        font-size: 35px;
        text-align: center;
        float: left;
        color: #536351;
```

```
        color: #5A6351;
}

#newsfeed .newsitem .bookname, #readinglist .book .bookname
{
        position: relative;
        top: -20px;
        font-size: 20px;
}

#readinglist .book .booktitle
{
        top: 10px;
        font-size: 24px;
}

#readinglist .book .booksummary summary, #readinglist .book .booksummary
details, .booksummary, .recommendation
{
        top: 30px;
        font-size: 18px;
        padding-top: 8px;
        line-height: 24px;
}

#menu div
{
        width: 20%;
        float: left;
}

#menu img
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */
        width: 106px;

       height: 106px;
       padding: 20px;
       margin: 20px;
       border: solid 1px #CFDBC5;
}

#rlmenu
{
       position: relative;
       right: 0px;
       bottom: 0px;
       text-align: right;
       margin-top: 20px;
}

#rlmenu img
{
       -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
       -moz-box-sizing: border-box;    /* Firefox, other Gecko */
       box-sizing: border-box;         /* Opera/IE 8+ */
       padding: 5px;
       margin: 5px;
       border: solid 1px #CFDBC5;
       width: 60px;
       height: 60px;
       background-color: #9CBA7F;
}


#menu img:hover, #rlmenu img:hover
{
       background-color: white;
}

#menu img:first-child
{
       margin-left: 10px;
```

```
}

#menu
{
        position: relative;
        top: 25px;
        margin: 0px 10px 0px 10px;
}

#loginname, #password
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */

        text-align: center;
        margin: 20px;
        font-size: 28px;
        color: #5A6351;
}

input[type="text"], input[type="password"]
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */
        text-align: center;
        font-size: 28px;
}

#submit
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */

       text-align: center;
       margin: 20px;
       font-size: 28px;
}

#searchsubmit
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */
        text-align: center;
        margin: 20px;
        font-size: 22px;
}

input[type="submit"]
{
        font-size: 24px;
        background-color: #636F57;
        color: #FFFFFF;
        margin: 20px;
        padding: 10px;
}

summary, details
{
     outline:none;
}

details[open] summary
{
        color: #DDD;
}

.recommendtouser
{
        position: relative;
```

```
        position: relative;
        width: 33%;
        float: left;
        margin-bottom: 30px;
}

img.recommendtopicture
{
        -webkit-box-sizing: border-box; /* Safari/Chrome, other WebKit
*/
        -moz-box-sizing: border-box;    /* Firefox, other Gecko */
        box-sizing: border-box;         /* Opera/IE 8+ */
        width: 100%;
        padding: 10px;
        max-height: 130px;
}

.recommendtoname, .recommendtoname a
{
        text-decoration: none;
        color: #000000;
        text-align: center;
        width: 100%;
        font-size: 20px;
}
```