http://researchspace.auckland.ac.nz

ResearchSpace@Auckland

Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of this thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from their thesis.

To request permissions please use the Feedback form on our webpage. http://researchspace.auckland.ac.nz/feedback

General copyright and disclaimer

In addition to the above conditions, authors give their consent for the digital copy of their work to be used subject to the conditions specified on the Library Thesis Consent Form and Deposit Licence.

Note: Masters Theses

The digital copy of a masters thesis is as submitted for examination and contains no corrections. The print copy, usually available in the University Library, may contain corrections made by hand, which have been requested by the supervisor.
Developing information literate students who will become lifelong learners: Improving the current situation in New Zealand

Elizabeth Probert

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Education

The University of Auckland, 2011
Abstract

Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal, and if not, can this situation be improved through the use of a teacher-designed intervention?

In seeking to answer the research question, this thesis reports on a project carried out in three schools, with students from 11 to 13 years of age. The principals of the three schools formed a cluster, and in 2007 gained funding to carry out a four year project aimed at improving students’ information literacy skills and higher level thinking skills.

The New Zealand Curriculum includes the goal of developing students who are lifelong learners. To achieve such a goal, students need to be information literate. International and national research however demonstrates, that too often, such skills are not being specifically taught.

This study was a mixed method, sequential design consisting of four phases. The first phase involved the trial of the instruments. During the second and third phase, a needs analysis was carried out involving both teachers and students. The cluster Lead teachers then designed an intervention based on the needs analysis findings, and each school implemented the intervention in a different way. During the fourth phase, data were collected from teachers and students after the implementation of the intervention. Data collection included web-based and hard copy questionnaires, interviews, focus groups, and documentation.

The needs analysis revealed that teachers were not teaching information literacy skills and needed strategies to enable them to do so. Students knew very little about tackling research assignments. After initial professional development sessions during 2008, a small, significant change was seen in teacher understanding and practice of information literacy at the end of 2008.

During 2009, student pre and post intervention progress was measured using two classes from each school. Students from two of the schools demonstrated much greater knowledge and understanding by the end of 2009. Unfortunately, the cluster’s funding was then cut with 18 months of the project still to go. The positive changes were encouraging, but probably not sustainable for a number of reasons discussed in the study.
Acknowledgments

Completing a doctoral thesis is a major undertaking and difficult to accomplish without much help and support from others. First I must thank the principals of the EHSAS cluster of schools who allowed me to use the work I carried out with them as the basis for this thesis. I must also thank my supervisors, Professor Judy Parr and Dr Ngaire Hoben for their unfailing support, attention to detail and encouragement. Thanks also to my eldest son for all his help with aspects of my work. I would also like to pay tribute to the EdD process at the University of Auckland (Dr Vicki Carpenter and Professor Robin Small, 2007) which provided the firm foundation that supported these years of study. Finally, many thanks to my EdD buddy, Sandra, for all the encouragement and coffee meetings over the years and to Dr Gwen Gawith who works so hard to develop information literate students and teachers in New Zealand.
# Table of Contents

Abstract ................................................................................................................................. ii
Acknowledgments .................................................................................................................. iii
List of Tables ........................................................................................................................ v
List of Figures ......................................................................................................................... viii

Chapter 1 Overview and Introduction .............................................................................. 1
  Rationale for the research ................................................................................................. 1
  The researcher’s involvement with information literacy and with professional development ...... 1
  Background to the study: The situation in New Zealand ................................................ 2
  Background context .......................................................................................................... 2
  The nature of the project .................................................................................................... 5
  Using a formative and design experiment approach ...................................................... 5
  The structure of the thesis ................................................................................................. 6

Chapter 2 Literature Review .............................................................................................. 9
  Developing life long learners: The role of information literacy ....................................... 9
    Introduction .................................................................................................................. 9
  Lifelong learning and information literacy .................................................................... 9
    Lifelong learning .......................................................................................................... 9
  Information literacy ......................................................................................................... 10
    The history and development of information literacy .................................................. 10
    Understanding and defining information literacy ....................................................... 12
    The importance of information literacy beyond education ......................................... 15
  Information literacy and education .................................................................................. 15
    Information literacy development in schools .............................................................. 16
    Inquiry learning and information literacy ................................................................ 18
  The situation in education in New Zealand ................................................................... 21
    The lack of systematic teaching of information literacy skills in New Zealand schools .... 23
    Teacher professional development ............................................................................. 26
    Lack of research addressing teachers and information literacy ................................... 28
  Conclusion ...................................................................................................................... 29
  Further investigation ....................................................................................................... 29

Chapter 3 Literature review: Professional development .................................................. 30
  Introduction .................................................................................................................... 30
    Understanding professional development .................................................................. 30
    Characteristics of effective professional development .............................................. 35
    Sustaining change from professional development .................................................. 39
    Effective professional development relevant to the current research study ............... 41
  Conclusion ...................................................................................................................... 45

Chapter 4 The Research Process ...................................................................................... 47
  Introduction .................................................................................................................... 47
  Sub-questions .................................................................................................................. 47
  Background ..................................................................................................................... 47
  Rational for the selected approach .................................................................................. 48
  Mixed methods methodology ......................................................................................... 48
Chapter 5 Needs Analysis

Introduction ......................................................................................................................................... 74
Part 1: The needs analysis, the findings, and discussion ..................................................................... 74
  Data collection overview ..................................................................................................................... 74
Findings from teacher questionnaire and interviews ........................................................................... 76
  1. Demographic information: (see Table 5.1 and 5.2) ........................................................................ 76
  2. Understanding the concept of information literacy (see Tables 4.4–4.7) ..................................... 78
  3. Teacher practice ............................................................................................................................... 80
  4. Teacher expectations ....................................................................................................................... 83
  5. Areas where help would be welcome ............................................................................................ 84
Reported findings from student questionnaire and focus groups: February 2008 ................................. 84
  1. Demographic information ............................................................................................................. 85
  2. Understanding the concept ........................................................................................................... 85
  3. Classroom practice ......................................................................................................................... 86
  4. Areas where help would be welcomed ......................................................................................... 88
Documentation .................................................................................................................................... 88
Discussion of findings from teacher and student data ......................................................................... 89
  Towards effective professional learning .............................................................................................. 92
  The information processing model .................................................................................................... 93
  Supporting resources ........................................................................................................................... 96
Part 3: Implementing the professional development ............................................................................ 97
  Launching the project ......................................................................................................................... 100
  The cluster wiki ................................................................................................................................. 100
  Administration (of the EHSAS project) .............................................................................................. 100
  Information literacy .......................................................................................................................... 100
  Events ............................................................................................................................................. 100
  Schools ............................................................................................................................................ 101
The next chapter ................................................................................................................................. 101
Chapter 6 Findings from data after implementation of intervention .......................... 102

Teachers pre and post intervention questionnaires ....................................................... 102
Questions where responses demonstrated significant change .................................... 103
Interview responses ..................................................................................................... 105
Students: Monitoring of student progress with Year 7 and Year 9 classes .................. 109
Pre and post intervention questionnaires .................................................................... 109
Questionnaire results .................................................................................................. 110
Focus groups ............................................................................................................... 111
School B ..................................................................................................................... 118
Current progress and issues (end of 2009, early 2010) .............................................. 119
Documentary evidence .............................................................................................. 123

Chapter 7 Discussion of the Findings ....................................................................... 125
Background to the project .......................................................................................... 125
The pedagogical goal being investigated, its value and importance and the theory and the literature concerning that goal ................................................................. 126
The intervention that could or did achieve the pedagogical goal and why .................. 127
Factors which enhanced or inhibited the achievement of the goal .............................. 127
How can the intervention be modified to achieve the pedagogical goal more effectively and efficiently and in a way that is appealing and engaging to all stakeholders? ................................................................. 136
Teaching as inquiry .................................................................................................... 140
Has the instructional environment changed as a result of the intervention? .............. 144

Chapter 8 Conclusions ............................................................................................. 147
The project .................................................................................................................. 148
Challenges arising during the implementation of this information literacy strategy. .......... 149
The challenge of sustainability .................................................................................. 150
Strengths and limitations of the research study .......................................................... 152
Directions for further research .................................................................................. 153
Final comments ......................................................................................................... 155
The project .................................................................................................................. 155
The research study ..................................................................................................... 155

Appendices ................................................................................................................. 156
Appendix A: Teacher questionnaire 2007 and 2008 .................................................... 157
Appendix B: Student questionnaire 2008 ................................................................. 160
Appendix C: Indicative interview questions—to be used with participating HODs .......... 162
Appendix D: Indicative questions for Interviews with Lead Teachers ......................... 163
Appendix E: Indicative focus group questions ............................................................ 164
Appendix F: Pre/Post intervention student questionnaire ........................................... 166
Appendix G: Example of Cluster professional development planning ......................... 169
Appendix H: Example of page from teachers’ i-Lit handbook ..................................... 170
Appendix I: Example from Teacher Toolbox Resource ............................................. 171
Appendix J: Data Chart for recording information ...................................................... 173

References ................................................................................................................. 175
List of Tables

Table 4.1 Project schools .............................................................................................................. 49
Table 4.2 Project teams ................................................................................................................ 50
Table 4.3 Data collection details* ................................................................................................. 52
Table 4.4 Attributes of the definition of an information literate person ....................................... 63
Table 4.5 Key used to code use of attributes of information literacy when defining an information literate person ........................................................................................................... 64
Table 4.6 Coding for teacher and student responses when asked to name the information literacy model used* ......................................................................................................................... 64
Table 4.7 Coding used for teacher and student responses concerning the stages of the information literacy model used ............................................................................................................. 65
Table 4.8 Table of key indicators used to consider 2009 student focus group responses ...... 66
Table 5.1 Teachers who participated in 2007 .............................................................................. 76
Table 5.2 Demographic information: Teachers who chose to participate in 2007 ................. 77
Table 5.3 Previous PD in information literacy ............................................................................ 78
Table 5.4 Demographic information for students in 2008 ......................................................... 85
Table 6.1 Teachers who participated in 2007 and 2008 ............................................................. 103
Table 6.2 School A: Mann-Whitney Mean Ranks Teachers in December 2007 and December 2008 .............................................................................................................................. 104
Table 6.3 School B: Teachers questionnaire Mean Ranks in December 2007 and December 2008 ........................................................................................................................................ 105
Table 6.4 Schools A, B, and C students’ mean ranks by school .................................................. 111
List of Figures

Figure 5.1 Poster of the i-Lit process designed for display of all classroom walls ..................95
Figure 5.2 Pamphlet designed for student use .................................................................99
Figure 6.1 Example of classroom display......................................................................117
Chapter 1
Overview and Introduction

This research project addresses the question: Are New Zealand teachers equipped to develop information literate\(^1\) students, an important consideration when creating lifelong learners, a stated government goal and, if not, can this situation be improved through the use of a teacher-designed intervention?

Rationale for the research

The recently revised New Zealand curriculum (Ministry of Education, 2007) includes a vision for young people “who will be confident, connected, actively involved and lifelong learners…. active seekers, users and creators of knowledge” (p. 8). Lifelong learners, according to the literature, need to be information literate–able to define a problem, find information from a variety of sources including ICT, understand, sort and use the information to help solve a problem, and then be able to share that solution with others. Research has demonstrated, though, that New Zealand teachers are not clear about the concept of information literacy or about how to teach the relevant skills explicitly (Hipkins, 2006; Probert, 2006, 2009). There is also evidence demonstrating that most New Zealand students are not developing the relevant skills (Education Review Office, 2005; Flockton & Crooks, 1998; Flockton, Crooks, & Baker, 2002; Flockton, Crooks, & White, 2006; J. Smith, Crooks, & Allan, 2010). If the curriculum is to be implemented, and if teachers are to develop information literate students who will be lifelong learners, this situation needs to be remedied. Teachers need well planned and effective professional development to help them teach their students the necessary skills, which will enable them to become information literate citizens and lifelong learners.

The researcher’s involvement with information literacy and with professional development

The researcher trained as a teacher and then as a teacher librarian, working in a large secondary school for some years before joining the University of Auckland. As a teacher librarian, she was responsible for implementing cross-curricular information literacy and ICT

\(^{1}\) The terms information literacy and information literacy development are used throughout this thesis rather than terms such as inquiry skills and inquiry learning as the cluster schools referred to information literacy and information literacy skills in their EHSAS proposal and throughout \(i\)-\(Lit\) documentation.
programmes within the school, helping teachers and students with inquiry-style learning and
the integration of ICT. Since joining the University of Auckland, she has been involved with
Graduate Diploma Programmes, teaching teachers about information literacy, and about
learning and teaching with the Internet. These courses involve all teachers at a particular
school and are delivered face-to-face at that school, or are delivered online to teachers
enrolled from around the country and abroad. Another course, *Information literacy and
learning*, at Masters level, is also offered as part of the Postgraduate Diploma programme.

**Background to the study: The situation in New Zealand**

While there used to be centrally funded positions in New Zealand schools for trained teacher
librarians, this has not been the case since 1989 when schools became self-managing entities
under the education administration reforms set out in *Tomorrow's Schools* (Department of
Education, 1988). Teachers’ salaries are still paid centrally by the Ministry of Education, but
specialist positions such as teacher librarians are not, and schools wanting teachers in such
positions have to fund them from their operational budgets. Although training for teacher
librarianship continued for some years after 1989, many schools either chose not to fund such
positions, or could not afford to, and so information literacy skills development became the
responsibility of classroom teachers. Few teachers, unfortunately, appear to have sufficient
strategies to enable them to teach these skills explicitly to their students. Consequently, many
students lack the necessary skills, something which has become increasingly obvious
particularly with the growth of online information sources (Combes, 2009; Mokhtari, Kymes,
& Edwards, 2008; Van Zijl, Bennett, Darling, Shields, & Bennett, 2006). This situation is
beginning to be recognised by some schools in New Zealand, such as the cluster of schools–
the focus of this research project, which aimed to improve the information literacy skills of
their students and to produce students who are lifelong learners.

**Background context**

Extending High Standards Across Schools (EHSAS) (2006–2009) was an initiative of the
New Zealand Ministry of Education, designed to raise student achievement by promoting
excellence among the country’s schools. Contestable funding was made available to schools
to extend their proven practice in collaboration with other schools, with an emphasis on
developing professional networks and improving the evidence base around processes and

In 2006, a cluster of three Auckland schools began the two-stage submission process to obtain a Ministry of Education EHSAS contract. They achieved this funding in mid-2007, with a contract providing four years of funding to enable the cluster to achieve the aims detailed in the proposal. Their successful proposal stated that the focus would be on “the explicit teaching and learning of identified information literacy skills and expanding the critical and creative thinking skills that the schools have been implementing over the past three years enabled through other Ministry of Education initiatives”. They aimed to, for example:

- give students opportunities and skills to generate questions, find, process and communicate information, thus becoming more effective and autonomous learners

- provide students with transferrable cognitive strategies that allow them to participate effectively in school and life (Pasley, et al., 2007).

The proposal also described how the schools had identified areas for improvement by analysing assessment results from year entry tests, and concluded from these, that students needed explicit teaching of information literacy skills. The proposers provided further evidence of levels of critical thinking skills from within their own schools, including the 2006 asTTle results\(^2\), the 2006 PAT results\(^3\), results from NCEA\(^4\) assessments, anecdotal evidence, and classroom observations. The schools noted that many students were not able to work independently on assessment tasks using high order thinking skills such as analysis, synthesis, or evaluation. They carried out an information literacy audit in all three schools, which revealed that no policies concerning information literacy development were in place in

---

2 asTTle stands for Assessment Tools for Teaching and Learning. These are tools for assessing literacy and numeracy in English and te reo Maori. They have been developed for the Ministry of Education by the University of Auckland, and enable teachers to track the progress and achievement of both individual students and groups of students against national standards (Visible Learning Laboratory, 2010).

3 PATs (Progressive Achievement Tests) are multiple-choice tests designed to help teachers determine achievement levels of Year 4–10 students in Mathematics, Reading Comprehension and Vocabulary, and Listening. The test results help teachers decide what kinds of teaching materials are needed and which methods or programmes are most suitable for their students. PATs are also important because they identify the progress a student is making from year-to-year (NZCER, 2009).

4 NCEA (New Zealand’s National Certificates of Educational Achievement) are national qualifications for senior secondary school students. There are three levels of NCEA certificate, depending on the difficulty of the standards achieved. In general, students work through levels 1 to 3 in years 11 to 13 at school (Ministry of Education, 2009).
any department in the three cluster schools, and that information literacy was not mentioned in any curriculum scheme. The secondary schools were also hoping to improve future results for those NCEA Achievement Standards that required students to carry out research. The cluster was able to describe how the data they had collected demonstrated that when students had been explicitly taught a skill, they were able to transfer that skill successfully into practice, but that much of the information process was not being taught explicitly. Another aim was the formation of Professional Learning Communities, based on information literacy development (Dezoete, 2009).

A four year action plan was included in the proposal, setting out objectives, outcomes, actions, timeframes, resources, and review/evaluation measures. The budget from mid-2007 to mid-2011 (four years), included a two thirds contribution from the Ministry of Education, and a one third contribution from the three cluster schools. An annual breakdown was included. The proposal concluded that the data clearly “demonstrated that there is a need for a school-wide information literacy process and that creative and critical thinking skills need to be explicitly taught throughout the schools and linked with the information literacy process” (Pasley, et al., 2007).

The cluster started their contract in mid-2007. The project manager, contracted from outside the cluster, knew that the researcher worked in the area of information literacy and arranged for her to evaluate the process. The principals of the three schools gave permission for this evaluation to form part of the researcher’s doctoral thesis. At the end of 2007 and the start of 2008, data were collected to analyse the needs of teachers and students. A group of Lead teachers, two from each school, then started work on the design and implementation of the intervention informed by the needs analysis results, during 2008 and 2009.

Unfortunately, the newly elected National Government which took office in November, 2008, cut all the funding for EHSAS contracts from December, 2009. There were 87 clusters funded at that time, of which 29 (180 schools) finished their contracted four years by the end of 2009. The other 58 clusters, (27 clusters/162 schools from 2007 and 31 clusters/134 schools in 2008) had their funding cut completely as the result of “reprioritisation of funds” (A. Tolley, personal communication, April 8, 2010). It is not surprising that the cutting of the expected funds has had a negative impact on the outcomes of this cluster’s project, despite the principals’ initial resolve to continue the project.
The nature of the project

It should be noted that this professional development project was not designed to provide research on which to base a doctoral thesis, but was already underway when the researcher became involved. The proposal for EHSAS funding had already been submitted, and was undergoing scrutiny by the Ministry of Education in the second round of submissions. The researcher’s work, following and evaluating the progress of the three cluster schools in their quest to achieve their stated aims, therefore took place within the “messy situations of actual learning environments” (Collins, Joseph, & Bielaczyc, 2004, p. 19). The researcher’s aim was to provide a picture of the reality of what actually happens when schools attempt to bring about school-wide changes in aspects of teaching and learning, in this case, school-wide information literacy development.

Many problems may be encountered when working in an actual learning environment. One major issue involved the time it took for some teachers to become aware of the cluster professional development programme, despite several whole-staff meetings and the Lead teachers’ frequent distribution of notices about the project. Other problems included sudden changes in timetabling, teachers leaving (sometimes unexpectedly), new staff being appointed and having to be brought up to speed with the project, and working with busy classroom teachers who did not welcome yet more demands on their time. One issue, which fortunately was sorted in time, involved some of the teachers whose classes were participating in the pre and post testing phase in 2009. While the teachers were happy to have their classes take part, the researcher realised, just in time, that they had not fully understood her instructions about distributing the numbered questionnaires. In the end, it was more efficient to distribute and collect all questionnaires herself, and doing so also removed a burden from the participating teachers. The problem then was finding the times when the classes met, and tracking down the correct classrooms as these often changed with little notice.

Using a formative and design experiment approach

To provide a more effective discussion, the findings from this study, carried out in the “messiness of real-world practice” (Barab & Squire, 2004, p. 3), are viewed through the framework of a formative and design experiment approach, rarely used outside the field of education (Reinking & Watkins, 2000). The aim is to discover “workable instruction and
relevant theory in the real world”, investigating not only current forms and content of schooling but “what could be” (Reinking & Watkins, 2000, p. 388). In a formative experiment, the researcher sets a pedagogical goal and finds out what it takes in terms of materials, organisation, or changes in the technology to reach the goal.

Reinking and Bradley (2008) drew up a set of defining characteristics which state that formative and design experiments are: intervention-centred in authentic instructional contexts, theoretical, goal oriented, adaptive and iterative, transformative, and methodologically inclusive and flexible. The writers use the analogy of engineering to explain this approach, demonstrating that researchers in engineering science, for example, draw on basic theory, but also aim to improve practice during the course of the research. In education, on the other hand, teachers are often left by researchers to determine by themselves how the research findings could best be applied to their teaching practice. In the formative and design experiment approach, researchers and practitioners observe and modify practice in an iterative fashion, seeking “workable instruction and relevant theory in the real world” (Reinking & Bradley, 2008, p. 8). This approach allows for inquiry and investigation using both qualitative and quantitative traditions (Fisher, Frey, & Lapp, 2009), and incorporates more from the researcher and the research than just the measuring and reporting of outcomes resulting from an intervention.

The structure of the thesis

Chapter 1: *Introduction and Overview* provides the rationale for the research and its occurrence at the same time as the introduction of a new curriculum with its aim of developing young people who are lifelong learners. It also describes the context in which the research took place, the position of the researcher, and a general overview of the project’s aims.

Chapter 2: *Literature Review: Information Literacy* defines the concept of information literacy, provides a brief overview of the history of information literacy development, and examines the place of information literacy in education in English-speaking countries such as USA, UK, Australia, and Canada, as well as here in New Zealand.

Chapter 3: *Literature Review: Professional Development* reviews the research on professional development in order to provide a background against which the intervention carried out by the EHSAS cluster of schools can be measured. This chapter addresses problems with
professional development as identified in the literature, how teachers learn, characteristics of effective professional development, various types of professional development delivery, and the issue of sustainability of professional learning.

Chapter 4: The Research Process describes the methodology and the methods used in the research. The design of the research study includes the theoretical framework, the needs analysis, and the design of the intervention. The implementation of the intervention was carried out differently by the three cluster schools and therefore each is described separately. This chapter also includes descriptions of the research tools and any limitations of the tools, ethical considerations, and measures taken to establish the trustworthiness of the research.


Part 1 of this chapter describes Phase 2 of the project during which data were collected and analysed to investigate the needs of teachers and students. The design of the intervention was based upon the findings from this needs analysis. Part 2 describes the procedures followed when designing the intervention (Phase 3 of the project), and the early implementation of the accompanying professional development (Phase 4). Minutes of meetings by the Lead teachers, outlines of professional learning sessions, handouts, work sheets, wiki contents, and reports issues to principals and staff were used to inform the description of the implementation.

Chapter 6: Results of the Intervention (Phase 4) describes the findings regarding the implementation of the professional development in the three schools, from questionnaires, focus groups, teacher interviews, Lead teacher interviews, and documentation including meeting minutes, drafts of the information processing model, school and/or departmental planning policies and student assignment work.

Chapter 7: Discussion of Findings in Relation to the Research Question: Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal, and if not, can this situation be improved through the use of a teacher-designed intervention? This chapter discusses the findings and any associated implications emerging from data from each of the three schools.
Chapter 8: Conclusions includes a summary of the findings and implications arising from the different implementations of the professional development. The chapter also includes recommendations for future practice and areas for further research.
Chapter 2
Literature Review

Developing life long learners: The role of information literacy

Introduction
The purpose of this review is to explore the literature concerning the development of lifelong learners and, in particular, the role played by information literacy. This review argues that information literacy development plays a crucial, but too often unacknowledged role in developing lifelong learners, and that many teachers are not sufficiently knowledgeable to help students achieve the government’s stated goal of developing students as lifelong learners (Ministry of Education, 2007). The first section of the review briefly addresses lifelong learning, the concept of information literacy, its history, definitions, international literature, and its place in education and role in preparing students who are lifelong learners. The second section addresses the situation concerning information literacy development in New Zealand. This review thus provides the background for an investigation into information literacy development and teaching in three New Zealand intermediate and secondary schools.

Lifelong learning and information literacy

Lifelong learning
The term lifelong learning is frequently found in literature addressing knowledge economies and knowledge societies. The World Bank (World Bank Group, 2003), for example, urges countries to “engage in a policy dialogue on the pedagogical and economic consequence of lifelong learning” and a 2006 UNESCO report emphasises the development of the concept of lifelong education for all (UNESCO, 2006). According to Tuschling and Engemann (2006), the European Union now sees lifelong learning as no longer the preserve of older citizens, but as encompassing the entire population, independent of age, and of their labour market status. The importance of deep cognitive learning, creativity, and ingenuity, all considered attributes of lifelong learners, are stressed by Hargreaves (2003), although he is also wary of developing students solely to help governments achieve knowledge economies and societies. The 2009 report on social indicators for New Zealand (Ministry of Social Development, 2009), includes the desired outcome that everybody will have the knowledge and skills needed to participate fully in society, and that lifelong learning and education are valued and
supported. According to the *New Zealand Curriculum*, students are to become “lifelong learners”, “active seekers, users and creators of knowledge”.

**Information literacy**

It is important, in view of this emphasis now placed on lifelong learning, that there is a greater understanding of the important role to be played by information literacy in lifelong learning. “Information literacy” as Doyle (1994) points out, “is central to all successful learning and, by extension, to all successful living” (p. 44). Schools which already have a focus on lifelong learning have a strong focus on information literacy development according to Bryce and Withers (2003). This idea is reinforced by the statement from de la Harpe and Radloff (2000) who, when assessing the characteristics of lifelong learners, describe a number of information literacy strategies and skills that students need to develop in order to become effective learners. According to Bruce (2000), information literacy is important because people use information in both their personal and professional lives. Information literacy is the ‘catalyst’ needed to transform “the information society of today into the learning society of tomorrow …bringing information practices that are effective in professional, civic and personal life into curriculum” (Bruce, 2002, p. 4).

Despite the apparent official recognition of the importance of information literacy in lifelong learning, there are a number of problematic issues. These include a lack of understanding of the concept of information literacy necessary to develop lifelong learners, and a lack of teacher professional development, as well as a lack of recognition that these problems are, in fact, problems at all.

**The history and development of information literacy**

The concept of information literacy was developed within the United States tertiary education library sector. The term was first used by Zurkowski (1974), a librarian and then-president of the Information Industry Association, in a paper delivered to the National Commission on Libraries and Information Science, where he stated that those trained in the application of information resources “can be called information literates” (p. 6). He estimated that while nearly 100% of the United States population (1974) was literate, only 6 percent could be characterised as information literate, and called for universal information literacy by 1984. It must be noted that he offered no evidence to support his claims. Behrens (1994) pointed out that Zurkowski was positioning the library profession as a future leader in developing an
information literate nation. It is interesting that although Zurkowski suggested information was used in problem solving, going beyond library skills, most of the emphasis in his writing was on the locating and retrieval of information, as is still the focus in most tertiary libraries. Breivik (1989) urged more use of the term to encompass the concept of user education and library skills, especially in tertiary libraries. There were concerns though, in the tertiary library sector, as to whether the information literacy movement would spread beyond librarianship into the general education field, a development seen almost as a threat to the survival of tertiary libraries (Behrens, 1994).

Such an expanded concept of information literacy was indeed already being put into effect, with the implementation of Kuhlthau’s Information Search Process (ISP) (1999). This process, put into practice in 1984, was seen as carving out a niche for information literacy by describing library skills as proficiency in inquiry, in order to correct the impression that the skills are only for use in the library. Kuhlthau’s work, importantly, also took into account the affective domain, charting common patterns of thoughts, feelings, and actions which are characteristic of each stage of the information process, as well the actual search process itself (Kuhlthau, 1999).

Further evidence of the spread of information literacy into the general education sector can be seen, for example, in the New Zealand Curriculum Framework (Ministry of Education, 1993) where it is stated that “the school curriculum will foster the development of knowledge, understanding skills and attitudes… which will motivate [students] to continue learning through life” (p. 7). The skills referred to are eight groupings of essential skills “to be developed by all students across the whole curriculum throughout the years of learning.” While the term ‘information literacy’ is not used explicitly, the development of all those essential skills, including the information skills group, is involved in creating information literate students. An awareness of the importance of information literacy development is, according to Moore (2005), due to increased challenges of learning and ICT, and the subsequent need to accommodate the growing requirements for the effective handling of information. According to Henri and Asselin (2005), what Castells (1996) refers to as the rise of the networked society and the era of informationalism, are placing a new emphasis on the politics of education. The authors see issues of social justice, globalisation ethical use of information, and empowerment taking a more prominent place in the curriculum and the
classroom, and warn of the need for teachers to “develop a critical dimension of information literacy as part of new literacies” (p. 5).

**Understanding and defining information literacy**

Understanding and defining information literacy is problematic because it is viewed differently by different groups. The term information literacy was seen as a new buzzword for library user education and a bandwagon for librarians, according to McCrank (1991) who, when endeavouring to find a satisfactory definition, likened the task to swimming through treacle. The belief that there are many aspects of information literacy that are not “inherent characteristics but rather features of the ways in which we relate to the idea” (Bruce, 2002, p. 5), demonstrates the complexities involved in understanding this concept. Moore (2002) is more positive, believing that there is general agreement on elements of the definition of information literacy although her statement, “its practical manifestation is described in a multitude of complementary ways” (p. 2) seems to further underline the complex and multifaceted nature of information literacy.

There appears to be no guarantee of a shared understanding of the concept among those, for example, working in libraries, schools, tertiary institutions, other work places, or in the home, according to Bruce (1997). A number of organisations, however, do refer to the 1989 American Library Association (ALA) definition of information literacy:

> To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. Information literate people are those who have learned how to learn. (American Library Association, 1989, p. 3)

Organisations accepting this definition include the Association of American Colleges and Universities (2002), the American Association of School Librarianship, (AASL) (2007), the Australian School Library Association (ASLA) (2001), the School Library Association of New Zealand Aotearoa (SLANZA) (2006), the Education Review Office (ERO) (2005), the New Zealand Ministry of Education, and National Library of New Zealand (2002). While tertiary libraries also refer to this definition, some appear to see information literacy as mainly related to locating and evaluating information, while the concept in the school sector has widened to include the further processing and use of information that is not necessarily completed in a library, but rather in the classroom or at home for homework. The term ‘use’
in the tertiary sector seems to refer to the narrower sense of assessing the relevance
(University of Otago, 2006) of information found, but is understood in the school sector to
include activities more akin to making active use of information, including organising, note
taking, processing, synthesis, communication, and presentation of findings and solutions

It is therefore very important to ensure the existence of a common understanding of the
concept when entering into discussions with others about information literacy. Bruce’s
(19970 theoretical and phenomenological approach is very helpful, explaining information
literacy in terms of seven different ways of seeing and experiencing information use. The
participants in her research all came from higher education as Bruce hoped that experienced,
rather than new users of education, would be more likely to reveal a variety of experiences of
information literacy. The seven different conceptions of experiences with information literacy
which were identified after analysis of the data are: the information technology conception;
the information sources conception; the information process conception; the information
process conception; the information control conception; the knowledge construction
conception; the knowledge conception extension and the wisdom conception. As such these
conceptions provide and interesting method of identifying the state of a person’s current
understanding. Moore (2005) contends that Bruce’s conceptions should be seen as the facets
of a gem, implying that they are parts of a whole, and certainly these conceptions are in line
with the user-centred paradigm that “what is going on in people’s minds will shape the way
information is interpreted and utilised” (Todd, 2000, p. 163).

As well as attempts to define information literacy, there have also been attempts to describe
an information literate person. Doyle (1999) describes a number of attributes, or descriptions
of what it means to be information literate. These attributes, which include the requirements
that a person is able to recognise “that accurate and complete information is the basis for
intelligent decision making” and to use “information in critical thinking and problem solving”
(p. 97), help to expand the American Library Association (1989) definition of information
literacy, resulting in a clearer picture of an information literate person. Learning to be
information literate involves acquiring and demonstrating these attributes, according to Bruce
(2002), and involves the development and use of a large number of skills.

Changes to the definition of literacy have also affected the understanding of the term
‘information literacy’ (Cope & Kalantzis, 2000; Langford, 1999; Lankshear & Knobel, 2006;
New London Group, 1996). A variety of literacies, referred to as new literacies (Lankshear & Knobel, 2006) and multiliteracies (New London Group, 1996) have been proposed, including cultural, computer, visual, media, scientific, global, and mathematical (Doyle, 1994). There is some consensus that “information literacy is a natural extension of the concept of literacy in our information society” and the “overarching literacy essential for twenty-first century living” (Bruce, 2002, p. 1). Literacy is now viewed, according to Asselin (2005) as the “ability to gain and represent meaning from a variety of symbol systems e.g. drawing, photography, video, hypertext” (p. 1) with the result that in some parts of Canada, for example, information literacy is beginning to be viewed as an integral part of literacy development. Although written in 1998, the ALA definition of information literacy is broad enough and robust enough to accommodate the new literacies described by Lankshear and Knobel (2006), the multiliteracies of the New London Group (1996) and any technological advances related to learning in the 21st century.

Over the past 30 years, a number of staged information processing models have been developed and published, mainly by those working in libraries who noticed that students needed a framework within which to use information literacy skills as they carried out their research. One working group, sponsored by the British Library and the School Council (Marland, 1981, p. 7) aimed to produce practical guidance to teachers in what came to be called the development of information skills. It was noted that most students were not able to use the full range of learning resources, that too many students could not find information for themselves, could not take notes, could not organise their learning, and could not write essays or reports. Schools were having great difficulty “teaching pupils how to learn” (p. 9). The working group recommended the use of a series of nine stages, (not numbered), to help student through the process. Irving (1985) then incorporated these nine steps or stages, into a more formal model, numbering them, providing greater detail and demonstrating their use with the British assessment system of that time.

Kuhlthau, in the USA, published her Information Search Process (ISP) in 1984, based on work from her doctoral studies. The model was based on research carried out with high school students in the school library and involves a six stage process incorporating actions (physical), feelings (affective), and thoughts (cognitive). While most of those propounding information processing models acknowledge the importance of constructivism, Kuhlthau takes those aspects of the work of three well known theorists in constructivism that relate
most directly to information seeking: Dewey’s phases of reflective thinking; Kelly’s five phases of construction and Bruner’s phases of the interpretive task and explains that taken together, “these theories provide a vivid explanation of construction” (Kuhlthau, 2004, p. 25). While the authors of other models do not relate their models as effectively and thoroughly to constructivist theories of learning as Kuhlthau does, information processing models are based, to some extent, on constructivist principles. Gawith (1988) created and published New Zealand’s first information processing model, the six stage Action Learning model, based on Marland’s (1981) nine steps process.

**The importance of information literacy beyond education**

Nowhere is the need for information literacy skills, according to Breivik (2005, p. 3), greater than in today’s work environment where efforts to ‘manage’ knowledge are increasingly necessary to keep a strategic advantage within a global market. A number of conditions, according to Cheuk (2000), need to be present in a workplace in order to encourage an information literate culture. These include: the promotion of lateral and vertical communication among staff, flexibility rather than an insistence that staff follow rigid guidelines, and allowing staff to make and discuss mistakes. An interesting investigation in Australia (Gasteen & O’Sullivan, 2000) focused on information literacy and the creation of a profile of an information literate law firm which has since become a blueprint for law firms around the country. This study concludes that information literacy “impacts on many aspects of the business and cannot stand alone” (p. 119), requiring constant on-the-job training. The authors note that “a strategic approach is essential for commercial benefit” (p. 119). Kuhlthau (2004) also noted this need for information literacy in the workplace, discovering that her Information Search Process model was as applicable for work tasks as it was for educational tasks.

**Information literacy and education**

This section examines the development of information literacy in education, both internationally and in New Zealand.

The creation of information literate societies, so closely linked by many governments and organisations to the successful development of knowledge societies and economies, depends on the standards of education offered in schools. Members of a knowledge society, as Hargreaves (2003) states, “process information and knowledge in ways that maximise
learning, stimulate ingenuity and invention and develop capacity to initiate and cope with change” (p. 3). Only those students with well developed information literacy skills will be equipped to participate in these ways.

Developing such skills in students, however, requires that teachers themselves are not only information literate but are also able to develop these skills in their students. Unfortunately, this would not seem to be the case in many countries, including New Zealand. While a number of countries such as USA, Canada, Australia, and New Zealand do appear to support the development of information literate school students, often linking this with the development of lifelong learning, there is usually very little attention paid as to how such development will occur. The American Library Association (1998), for example, published information literacy standards for schools as did states such as Colorado (Colorado Department of Education, 2006) and Indiana (Indiana Department of Education, 2006), even aligning the standards with state academic standards but there is no mention how such standards will actually be achieved.

A significant development, demonstrating the growing recognition of the importance of information literacy, has been the inclusion of The definition and selection of key competencies (Organisation for Economic Cooperation and Development (OECD), 2005a) in the Programme for International Student Assessment (PISA), (2005b). This programme monitors reading, mathematics, science, and problem solving in high school students where students are tested against competencies, providing ‘a framework which can guide the longer-term extension of assessments into new competency domains’. The importance of information literacy development can be seen in these OECD Key Competencies where Competency Category 1b: The ability to use knowledge and information interactively, states that individuals are required to recognise and determine what is not known, identify, locate, and access appropriate information sources, evaluate the quality, appropriateness and value of that information as well as its sources and organise knowledge and information. The communication of new knowledge is covered in Competency Category 1a.

**Information literacy development in schools**

A number of countries such as Australia, USA, and Canada employ teachers with specialist training in some of their schools, who manage the development of information literacy across the curriculum both within and outside the school library. Much of the work, however, of these teacher librarians or library media specialists, is with students, and, while researchers
have demonstrated that this work can and does make a positive difference to student learning (Kuhlthau, 1999; Lance, 2006; Todd, 2003c), the importance of involving and training all classroom teachers to teach information literacy processes does not appear to have been recognised. Research suggests that classroom teachers in a number of countries, even those in schools with a teacher librarian, are not receiving the requisite professional development which would enable them to support and reinforce the work of the teacher librarian (Henri, 2004).

A variety of information literacy processing models have been developed (Eisenberg & Berkowitz, 1996; Gawith, 1987; Kuhlthau, 2004; Marland, 1981) to help students process information, but training is needed to help many under-prepared teachers put these models into practice. According to Asselin (2004), some teachers of Grades 6 and 7 in British Columbia, Canada, may not be well prepared to teach information literacy, while Williams and Wavell (2006), investigating conceptions of information literacy held by secondary school teachers in Scotland, suggested that teachers are not necessarily confident users of information themselves and tend not to use many sources. Williams also points to research demonstrating that teachers’ “own understanding of any concept, including information literacy, is fundamental to its effective delivery and development in students” (Williams & Wavell, 2006, p. 63).

There have been some attempts in Australia to discover the extent of teacher preparedness. Henri (2001) conducted a research study of secondary teachers in Australia to investigate how their personal experience of the process of seeking information predicted the teaching of the information search process. He concluded that “teachers see students as cognitive apprentices but themselves as mature information users” and that “while teachers continue to have poor understanding of what skills and behaviours are associated with information literacy, the more likely they are to assume their students are learning information skills somewhere else” (p. 126). He called for all teachers in Australia to take part in appropriate professional development, stating that classroom teachers demonstrated much of the impoverished information behaviour shown by senior school students. Cass (2004), investigated staff and student awareness of information literacy and her findings uncovered a mismatch between teacher practices and their belief in what is important for their students. Cass concluded that teachers needed to act as role models, using the full range of information sources if they wanted their students to succeed.
Engagement with information does not happen by chance, according to Todd (2003b) who believes that information literacy development is about pedagogical intervention and providing a range of intellectual scaffolds. When describing his research which evaluated the effects of school libraries on student learning, Todd (2003c) stated that the effective learning in today’s schools is complex and challenging, and that effective learning through information sources should involve the whole school community working as Learner-Partner-Leader.

It would appear, therefore, that teachers need to engage in professional development to enable them to teach these skills to their students. “Teachers” according to Doyle (1999), “are the most critical key to student attainment of information… They must become information literate themselves” (p. 23). The call for more training of teachers is echoed by researchers in several countries including USA, UK, Australia, and New Zealand (CoSN, 2005; Curzon, 2004; Henri, 2004; Lonsdale & Armstrong, 2004; Rockman, 2005; Van Zijl, et al., 2006).

Inquiry learning and information literacy

Inquiry, for some time, has been associated with science education where it has been explained as “a complex set of idea, beliefs, skills and/or pedagogies” (Abrams, Southerland, & Evans, 2008, p. xv). The authors explain that attempting to select one definition of inquiry may be an “insurmountable fruitless task” (p. xv). The term inquiry learning is now being used with increasing frequency, to refer to learning across the curriculum where students ask and answer questions or solve problems. Kuhlthau (2006) believes that the adoption of a guided inquiry approach is fundamental to reforming schools for the 21st century. The popularity of inquiry learning in all areas of the curriculum became noticeable with the increased access to online sources of information available outside the school library, formerly the main source of information for students. There are various and differing understandings of what constitutes this newer and wider version of inquiry. The definition “Inquiry is the dynamic process of being open to wonder and puzzlements and coming to know and understand the world” (Galileo Education Network, 2010) is typical of many such definitions and further reading of that website reveals few concrete details about how students actually carry out successful inquiry learning apart from asking questions and reflecting. When inquiry learning is discussed, there is often no reference to information literacy and the necessary underlying skill development. This may be because those espousing inquiry learning do not understand information literacy, or it may be due to the
over zealous application of information processing models in the past by unconfident teachers lacking sufficient understanding and professional development in the area. An example of this can be seen from the following “Misconception Alert: Inquiry is not a “method” of doing science, history, or any other subject, in which the obligatory first stage in a fixed, linear sequence is that of students each formulating questions to investigate” (Galileo Education Network, 2010, para. 1). Most information processing models are not, in fact, strictly linear but instead are iterative or even circular, with students looping back and forward through the process (Gawith, 2000).

Three types of inquiry in science education, are described by Zion, Cohen, and Amir (2007), as structured inquiry where the teacher states the problem, forms the questions and the working plan which students then carry out; guided inquiry, where the teacher poses the problem and the student then decides on the processes and solutions, and open inquiry where the student states the problem and then carries out the inquiry. The writers have found that teachers often encounter difficulties in implementing open inquiry, identifying three areas of difficulty as “teachers’ lack of knowledge and skills, students’ lack of knowledge and skills and logistic limitations of conducting inquiry at school” (p. 436). Any inquiry learning where there is little teacher guidance, no process to follow, and where students may well not have the necessary skills, has too often resulted in disappointing results with assignments containing much copied and pasted material and very little original thought (Gawith, 2000; Todd, 2003a; Woolls & Loertscher, 2005). There are also hints from the Galileo Network site that inquiry learning, as they describe it, “the dynamic process of being open to wonder and puzzlements” (para. 1) is not as simple as it would seem from that description. A recent account of inquiry learning undertaken by schools in Calgary using the Galileo approach, states that “it takes longer than three years for teachers to become fully immersed in the inquiry approach and skilled in deploying it” (Pearson, 2009, p. 11). Todd (2006) has compiled a checklist of key dimensions to incorporate into the planning and delivery of guided inquiry in an effort to support evidence-based-practice in schools which could be of use for classroom teachers.

A research-based model of inquiry learning—Guided Inquiry, which acknowledges the place of information literacy, has been created by Kuhlthau, Maniotes, and Caspari (2007) and arises from Kuhlthau’s previous Information Seeking Process (Kuhlthau, 1999). Kuhlthau comes from a teacher librarian, information literacy background, and the authors give a brief
account of the development of information literacy, but note that students and teachers are often confused about what information literacy is. They explain that their Guided Inquiry approach takes into account the American Library Association Presidential Committee on Information Literacy Final Report (American Library Association, 1989) and the Information Literacy Standards developed by the American Association of School Libraries (AASL), (2007). Their Guided Inquiry approach, though, goes further, taking a “concept approach to information literacy, integrating the concepts into inquiry in the same way that curriculum standards are met through inquiry learning” (Kuhlthau, et al., 2007, p. 79). They understand inquiry as an approach to learning, whereby students find and use a variety of sources of information and ideas to increase their understanding of a problem, topic, or issue. This approach challenges students to connect their world with the curriculum but that “without some guidance it can be daunting” (p. 2), hence the naming of the process as Guided Inquiry. The notion of guidance or guided in this instance, refers not to the teacher setting the problem, as described by Zion et al. (2007), but rather to helping students “develop research competency and subject knowledge as well as fostering motivation, reading comprehension, language development, writing ability, co-operative learning and social skills, all identified as essential for successful lifelong learning” (Kuhlthau, et al., 2007, p. 2).

Another research-based model is Focus on Inquiry: A teacher’s guide to implementing inquiry based learning, published by the Alberta Ministry of Education (Alberta Learning, 2004). This is an inquiry-based information literacy programme which guides teachers through the process, providing detailed information about every stage including, as with Kuhlthau’s work, the affective domain as well as the cognitive, and with an emphasis on reflection. The place of information literacy is seen as clearly, if not explicitly, providing the underpinning skills and attributes. This can be found in lists of suggested activities provided for teachers of students at various stages of schooling, which include reminders about the need to teach, explicitly, the various skills such for reading texts or note-taking. There is also help for teaching, for example, Reflecting or Planning. Both authors, from teacher librarian and information literacy backgrounds, teach at the University of Alberta and, as they explain in their foreword, Focus on Inquiry is an updated version of the earlier Focus on Research and brings together 13 years of research, practice, and reflection. The authors also explain that inquiry-based learning is not an ‘add-on’ but is a component of all Alberta curricula (Alberta Learning, 2004, p. ix). This is further supported by one author who explained that inquiry-based learning was embedded in all Alberta curricula, and that Focus on Inquiry...
supports an integrated, cross-disciplinary approach to inquiry (Oberg, 2004). The use of the term ‘information literacies’ in the title of Oberg’s paper seemed interesting, particularly in view of the increasing use of terms such as multiliteracies and new literacies, but in this case it referred to eight information literacies expressed in the form of student outcomes. They include ‘uses information with aesthetic appreciation’, ‘uses information responsibility’ and ‘uses information respectfully’. As the term ‘information literacies’ is not used in New Zealand, it is possible that it could be usefully used to expand the problematic term ‘information literacy’, with the plural literacies encompassing other literacies such as visual, digital, and media literacies.

The situation in education in New Zealand

As mentioned earlier, as far back as 1993 the New Zealand Curriculum Framework (NZCF) (Ministry of Education, 1993) included a section, Essential Skills, which included eight groupings of skills to be developed by all students across the whole curriculum throughout the years of schooling. The grouping, Information Skills, encouraged the development of skills which would enable students to “create, collect, manage, process, store, move or access information”, and to develop “the ability to locate, evaluate, manipulate, manage and communicate information from different sources” (p. 18). These aims imply the use of a process, during which many separate skills, including information skills, are used, although 76% of all the skills listed under Essential Skills are involved in the information process. Despite this detailing of skills, there is no suggestion of the advantages of using an information processing model such as Action Learning (Gawith, 1987) or Big 6 (Eisenberg & Berkowitz, 1996). This contrasts with the recommendations contained in the Education Review Office report (2005), which clearly state that information literacy skills need to be taught explicitly and that this includes the “explicit and systematic use of an information processing model” (p. 6). The report also describes the learning involved in this process and, along with other sources (Education Review Office, 2005; Flockton, et al., 2006; Hargreaves, 2003; Lundvall, 2006), describes the skills seen as necessary for the development of lifelong learning.

In addition, the Ministry of Education’s first ICT Strategy document (1998) appeared to confuse information literacy with ICT, with the statement that information literacy skills can be grouped into “The practicalities of using ICT–both hardware and software–appropriately and skilfully” and “The competencies involved in using ICT…..” (p. 6.). The next ICT
strategy document, *Digital Horizons: Learning through ICT* (Codd, 2002; Ministry of Education, 2002, 2004) was much clearer, placing importance on students developing information literacy skills. It, like the NZCF (Ministry of Education, 1993), was indicative of the anticipated spread of information literacy into general education, defining information literacy as:

the ability to locate, evaluate, manipulate, manage and communicate information from different sources. As learners become increasingly information literate, they develop skills in discrimination, interpretation and critical analysis. ICT offers opportunities for higher-order thinking and creativity in processing, constructing and conveying knowledge (Ministry of Education, 2002, 2004, p. 32).

This document, while providing evidence of a growing realisation by the Ministry of Education that students need to become information literate, and to have systematic opportunities to develop digital and information literacy, provides no details describing how students will develop such information literacy.

The National Library of New Zealand, supported by the Ministry of Education, has provided some help to schools. The publication, *The school library and learning in the information landscape: Guidelines for New Zealand schools* (2002), is written around six guiding principles of which information literacy is one. Each section lists critical success factors, tasks and competences as well as helpful quotations from staff in schools and libraries. This document was used as the basis for an evaluation of student information literacy development in schools (Education Review Office, 2005) but unfortunately, once again, there is no guidance provided to assist schools develop information literate students.

The introduction of key competencies in the New Zealand Curriculum (Ministry of Education, 2007) is another area for concern. Based on key competencies from the Programme for International Student Assessment (PISA), *The definition and selection of key competencies* (OECD, 2005a), the New Zealand curriculum describes five competencies that people need “in order to live, learn, work and contribute as active members of their communities” (Ministry of Education, 2007, p. 12). Unfortunately, those writing the New Zealand key competencies chose not include to Competency Category 1b from the PISA (OECD, 2005a) competencies, “The ability to use knowledge and information interactively”, with the result that there are no explicit references to information literacy. At least
information skills were listed in the previous curriculum document (Ministry of Education, 1993) but in the 2007 document, they are implicitly included within various competencies such as key competencies ‘Thinking’ and ‘Using language, symbols and text’. While the NZC states that the competencies are “more complex than skills, drawing on knowledge, attitudes and values in ways that lead to action” (p. 12), and developing information literacy, of course, includes more than just skills, it is still helpful for teachers to be aware of all the skills that are involved in, and which underlie, information literacy development. When reading through the experiences of six primary schools involved in integrating the key competencies, for example, not one school mentioned information literacy skills or inquiry skills although one school discussed inquiry learning without detailing any specific skills that needed to be developed (Boyd & Watson, 2006).

This is a very curious state of affairs given that the New Zealand government and the Ministry of Education, in several documents, have acknowledged the importance of lifelong learning, which itself depends implicitly on information literacy development.

**The lack of systematic teaching of information literacy skills in New Zealand schools**

There is growing and worrying evidence demonstrating that many New Zealand students are not developing information literacy skills. The New Zealand National Education Monitoring Project (NEMP) began in 1993 to assess and report on the achievement of Years 4 and 8 primary school students in New Zealand across all areas of the curriculum. Information skills were tested in 1997, 2001, 2005, and 2009, and analyses of the results have found little evidence of any improvement on previous low levels in the ability of Year 4 and Year 8 students to find and gather information (Flockton & Crooks, 1998; Flockton, et al., 2002; Flockton, et al., 2006; J. Smith, et al., 2010). The most recently published NEMP assessment of information skills (J. Smith, et al., 2010) states that:

> In the age of information, understanding the information skills of New Zealand’s schoolchildren has never been more important. The salience of technology, both its positive and negative aspects could not be better exemplified than by noting that in the 2009 administration of the Information Skills Survey, 96% of year 8 children report that when they need to find information, they go to the internet. This figure is twice as high as the next most popular response, going to a parent (p. 3).
The report also notes, that while students are eager users of information, they are not adept users of it nor are they good at judging the worth of the information, at comparing multiple sources of information, or at organising and employing information to buttress arguments. Year 4 students, in particular, have difficulty in even deciding what their information needs are. Overall there is little change in students’ skills from the 1997 results, 12 years ago. The report included the recommendation that teachers should provide explicit guidance for students who are using online sources of information. One very interesting point was that the name of the report had changed to *Information skills for inquiry learning*, acknowledging the fact that many New Zealand schools have taken on inquiry learning, with a growing number describing themselves as ‘inquiry schools’.

There is further evidence of NZ students’ lack of information literacy skills. An evaluation was carried out by the Education Review Office (Education Review Office, 2005) whereby, in 2004/5, ERO visited almost 400 schools looking at infrastructure, the content of information resources available to students and the skills, attitudes and values related to information literacy, and life long reading and learning. The evidence from the evaluation demonstrated that information literacy is not well developed in most schools, and particularly not in secondary schools. There was little evidence that schools were explicitly and systematically implementing an information process model across the curriculum, and few schools collected achievement data to show improvement in student information literacy skills. There was also confusion in some schools from both principals and teachers about what information literacy was as compared to literacy and skill-based ICT. It was further noted that few schools kept records to show how well students were progressing in this area, including any analysis of results at senior school external assessment level. The report also noted problems in secondary schools due to the subject specialist nature of schools at this level (Education Review Office, 2005).

Much the same conclusions were reached by Hipkins (2006) when investigating research as a student learning activity in six Wellington, New Zealand, secondary schools. Many students felt they had not been taught the skills they needed to carry out their own research projects and some were also unclear as to what constituted research. Unfortunately, many teachers also saw research skills as transferable, and therefore not something they needed to teach or assess as another teacher in another subject (usually English), would have taught them. It was also noted that students did not recognise subject-specific differences in any research process.
they followed, whereas Hipkins (2006) believes that, in senior secondary schooling in particular, certain subjects require certain specialised skills. Hipkins (2006) also observed that much of what was termed research actually consisted mainly of “information retrieval and repackaging” (p. 22). Her recommendations noted that this is an area where ongoing professional development is essential.

Another possible reason for lack of attention to the development of information literacy skills in New Zealand, particularly in secondary schools, could be due to faulty interpretation of results from the Programme for International student Assessment (PISA). This programme assesses 15 year old students from many countries to investigate “how far they have acquired some of the knowledge and skills essential to full participation in society”. There are assessments in reading, mathematics, problem solving, and scientific literacy. Between 4,500 and 40,000 students are assessed in each country. The recently published results for 2010 for reading, show that New Zealand rates seventh in the world on the overall reading scale, ahead of countries such as Australia, UK, and USA. The headings for the reading subscales include: Access and retrieve, Integrate and interpret, Reflect and evaluate. These appear to be from an information processing model where students are engaged in, for example, looking for sources of information, putting information found from various sources together in order to answer a question or solve a problem. High school teachers, after examining a chart of New Zealand’s latest results (Organisation for Economic Cooperation and Development, 2010) were heard to comment on the high level of research skills New Zealand students must have. The teachers reading these headings had misinterpreted them, and believed that they were looking at results from tests where students were asked to find information from a variety of sources, hunt around to retrieve the information, then take notes and next, with a lot of thinking involved, synthesise that information to answer a given question or to provide a solution to a given problem. However, this is not what students are actually engaged in doing. Reading through the actual assessment papers (Organisation for Economic and Cooperative Development, 2010), it can be seen that students were asked questions, but the answers were all to be found in the material supplied. While these are invaluable skills to possess, students also need to go further, finding, retrieving, and synthesising information from a wide variety of sources.
**Teacher professional development**

The Ministry of Education’s (2006b) *Enabling the 21st century learner: An e-learning action plan for schools 2006-2010*, stated that there would be support for a focus on teacher professional development in information literacy development, and that a working group would be convened to clarify national understanding of multiple literacies, including information literacy (p. 11). However, it seems that no outcomes have ever been produced.

While whole-school information literacy development is a necessary aim if education is to contribute to the development of the knowledge society and economy, this will not be possible unless all teachers have received appropriate professional development which will enable them to develop information literate students. Some countries, as mentioned earlier, rely on specialist staff such as teacher librarians to teach information literacy skills with the main focus on student learning. There can be problems though. Oberg and Henri (2005) warn that success of information literacy development led by school library programmes and the teacher librarian depends to a great extent on the support of the school principal. This was demonstrated in a large study by Todd (2006) involving over 1,300 students, 879 teachers, and 39 school libraries in Ohio. The results provided evidence that a well managed school library run by qualified staff, including a teacher librarian responsible for school-wide information literacy development with supportive leadership from school principals, can make a significant contribution to student learning, although their focus tends, from design, to be on students and not teachers. The findings were based on data collected from questionnaires, interviews involving students, teachers and teacher librarians, and analysis of student assignments.

The majority of New Zealand schools, though, do not employ trained teacher librarians since central funding, supplied for the training and employment of teacher librarians, was stopped with the implementation of the Ministry of Education’s Tomorrow’s Schools (1989) when schools became self-managing entities. As very few schools appoint teachers with responsibility for information literacy development, there is little evidence of planned, school-wide information literacy development in either primary or secondary schools (Education Review Office 2005). Moreover, with no teacher librarian training currently available in New Zealand, unlike many other countries, there are now very few trained teacher librarians still available to lead information literacy development in schools.
There has been some recognition of the need for teachers to engage in professional development to enable them to develop students’ information literacy skills. Slyfield’s (2001) survey of New Zealand schools found that 90% of secondary schools indicated that less than half their teachers had taken some form of professional development relating to information literacy. She concluded that the research “showed a strong need for professional development for teachers…relating to information literacy.” (p. 53). Such findings are not surprising when considering the work of Moore (2002) who, from interviewing 40 teachers from five Wellington primary schools, found that around 70% could not name a model or rubric for the information process. Moreover, the majority of these teachers thought students would acquire the skills naturally although they did tend to teach locating skills. While other teachers recognised that the skills needed to be taught systematically, it became obvious that they needed training in how to teach the skills. A small research project carried out in five Auckland secondary schools (Probert, 2006) also found that secondary teachers were not familiar with the concept of information literacy and most were not explicitly teaching the skills, even those skills associated with their particular teaching areas.

Newly graduated teachers in New Zealand may have experienced little explicit training in this area (Moore, 2002). A compulsory language and literacy education course, taken by Bachelor of Education students at the University of Auckland requires students to examine literacy and information literacy skills and inquiry learning as well as to plan an inquiry learning unit for imaginary students. While this at least should make beginning teachers aware of information literacy and inquiry learning, they are not given training and experience in the explicit teaching of such skills. Actually experiencing the process in the classroom is a very different proposition from just planning such a unit for a class of imaginary students (School of Arts Languages and Literacies, 2011).

There have been a number of in-service primary school teachers who have enrolled in training courses in New Zealand, with an estimated 5000 teachers, for example, taking Infolink: Information literacy skills (University of Auckland, 2010). Few secondary teachers enrol. This lack of teaching of information literacy skills was also demonstrated when students and their teachers at an Otago, high school were asked to predict the possible success of the students when undertaking information literacy tasks (Van Zijl, et al., 2006). The teachers did not think the students would do well, while the students themselves thought they had done very well. The results, though, revealed the students had performed even more
poorly in most areas than their teacher had predicted. The most interesting point of this report, though, was that the teachers at no time appeared to realise that the poor results were in all likelihood related to their poor teaching of information literacy skills.

There is evidence suggesting that teaching for information literacy can make an immediate and noticeable difference to student learning as Moore and Page (2002) discovered when they trialled and evaluated an online professional development resource, developed by Wellington College of Education, to help teachers with the teaching of information literacy. They noted improvements in both beginner readers in Year 1 and in Year 7–10 students, also noting that any changes in student performance motivated the teachers towards further increasing their understanding of information literacy. Action research carried out at a Wellington high school also demonstrated that careful and planned teaching for information literacy does indeed make a difference (Hannah, 2005). There are, however, very few professional development opportunities available for New Zealand teachers which could help them develop their students’ information literacy skills. One such opportunity is a course which is part of an academic qualification (Graduate Diploma of Education, The University of Auckland) while others are delivered by ex-teachers offering professional development in this area. Unfortunately, no research has yet been carried out to evaluate the effectiveness of any of these programmes, apart from evidence from teacher self-reports.

_Lack of research addressing teachers and information literacy_

There has been little research addressing teachers and their methods for teaching information literacy throughout the world, but the results of such research as there is reinforces the need for all teachers to engage in appropriate professional development (Henri, 2001; Cass, 2004; Asselin, 2005; Williams & Wavell, 2006). In New Zealand, there has been virtually no detailed investigations carried in schools apart from the work of Moore (2002) and Probert (2006). Slyfield’s (2001) investigation did find that most secondary teachers had not engaged in professional development addressing the teaching of information literacy and this finding is supported by the ERO report’s (2005) finding that less than half of the New Zealand schools visited appeared to be developing students’ information literacy skills to satisfactory levels. The most recent National Education Monitoring Project (NEMP) results (J. Smith, et al., 2010) which focus on the information skills students need for inquiry learning indicated that teachers in New Zealand are still not explicitly teaching many of these skills. These findings are further supported by work from recent research by Ladbrook and Probert (2011)
which found that many teachers were not helping their students develop these skills. The writers contend that “academic performance will be hindered if students do not have critical information literacy skills” (p. 118), and that the importance of developing such skills cannot be understated.

**Conclusion**

In summary, when reviewing the literature, particularly the literature emphasising the importance of the links between education, lifelong learning, and information literacy, it is remarkable that there has been so little explicit discussion of the details of achieving the aims of lifelong learners who are information literate. It is more important than ever, for students to develop these skills allow them to process information independently. Students need such skills to enable them in order to make informed decisions and to contribute fully to the society in which they live.

**Further investigation**

This review has demonstrated that in view of the need for students to develop information literacy skills, there is an urgent need to investigate the teaching of information literacy skills in schools. There is very little evidence available at the present time which demonstrates that New Zealand teachers are developing information literate students and an investigation is timely. Such an investigation should include teachers’ current understanding of information literacy, observations of methods used by teachers to teach information literacy in the classroom, and a review of currently available professional development options.

The next chapter, Chapter 3: *Literature Review: Professional Development*, reviews the research on professional development in order to provide a background against which the intervention concerning information literacy carried out by the EHSAS cluster of schools can be viewed. Chapter 3 addresses issues with professional development as identified in the literature, how teachers learn, characteristics of effective professional development, and the issue of sustainability of professional learning and professional development programmes with relevance to the current research study.
Chapter 3

Literature review: Professional development

Introduction

The introduction and implementation of a new New Zealand Curriculum in 2007 has, among other influences, emphasised the need for schools to make changes in the way some teachers teach, and to examine the ways in which many students learn. Calls for change are currently seen in many countries and, according to McLaughlin and Talbert (2006), teachers “must learn new ways of teaching if contemporary schools are to meet society’s demands” (p. 8). One of the new goals of the New Zealand curriculum is that all students will develop into lifelong learners. The current research study examines changes made by certain schools in an effort to attain such a goal.

This review argues that delivering effective professional development which results in improved and sustainable student learning outcomes is a very complex proposition and one not easily achievable. Issues arising from the professional development literature which are relevant to this study are discussed. These include: concerns about the nature of professional development programmes, reasons for changes in teacher understanding and practice which lead to improved student learning outcomes, evaluation of the effectiveness of professional development programmes, the need for provision of professional development for professional developers, the means and context of the delivery of professional development, and sustainability of change resulting from professional development. The review then examines, in light of the discussion of these issues, two large studies which aimed to discover characteristics common to successful professional development where teacher practice had changed, and student learning outcomes improved. One professional development programme, one delivery method, and one strategy for supporting change all of which have relevance to the current research study, are then examined.

Understanding professional development

Professional development can be understood as involving the “enhancement of teaching and learning practices in order to benefit the learners” (Poskitt, 2005, p. 136). Achieving effective professional development, however, is not nearly as simple as that brief explanation. Some years ago, the purpose of much staff development as it was then known, was to change the
beliefs, attitudes, and perceptions of teachers. It was then assumed that if these aims were achieved, teachers’ practice would change and student learning would improve (Guskey, 1985). More recent research suggests that professional development is, in fact, complex, very time consuming, and its success dependent on many variables. The President of the New Zealand Secondary Principals’ Association, in his foreword for Teacher Professional Learning and Development, compared teacher professional development to peeling an onion, with each of the multiple layers representing specific needs that have been identified by data (Timperley, Wilson, Barrar, & Fung, 2007).

The issues surrounding the nature of professional development processes, which lead to changes in teacher understanding and practice, have been discussed many times in the professional development literature. In the 1990s, the view of teaching in most American classrooms, according to Putnam and Borko (1997), involved the presentation and explanation of content. They felt that proposed new models of teaching and learning required teachers to practice in a very different way, and they criticised suggested methods of professional development. They took issue with, for example, the statement that teachers should be treated as active learners who construct their own understandings, and warned that teachers would not learn new practice and ideas if they could only interpret those ideas through their existing conceptions. They were concerned that teachers were limited by their own experiences in their own classrooms and might distort new views “to conform to their existing views” (p. 1225), although they agreed that it was important to build on teachers’ prior knowledge and beliefs (Joyce & Showers, 1995). Guskey and Sparks (2002) pointed out that professional development used to be “considered good by definition and, therefore, more is always better” (p. 1). Spillane, Reiser, and Reimer (2002) stated that what is new is always seen in terms of past understandings. All understanding requires prior knowledge to be accessed, and then applied to the process of noticing, framing and connecting new ideas to those already in the memory. Ensuring a common understanding between those undertaking the development and those delivering it would seem to be a crucial condition when wishing to change teacher understanding and practice.

However, even though those delivering professional development understand this problem, attempting to gain teachers’ acknowledgement that there is such a discrepancy can be another hurdle (Caulfield-Sloan & Ruzicka, 2005). Earl et al. (2003) point out that while experts believe that some teachers do not yet have sufficient knowledge and skills to enable them to
Another researcher goes further, believing that the system of professional development in the USA is broken and in need of urgent fixing. Most teachers, according to Hill (2009), apparently have little use for their professional learning experiences, stating that the professional development merely reinforced their existing practice. A minority thought it had no effect at all. Those providing the professional development, usually from outside school, were found to provide professional development on a number of subjects, rather than specialising in, for example, Maths. Hill recommends that rather than replacing one form of professional development with another, it would be advisable to examine existing methods and improve them, and then to scrap whatever cannot be changed for the better. A report written for the National Staff Development Council (Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009) to investigate professional development in the USA and around the world, is also critical of American professional development. The report found that not much was useful, and that not enough time is allowed in US schools for professional development. US teachers often have to pay for professional development unlike teachers in other countries and have fewer extended learning opportunities. Other countries, where professional development programmes appeared to be more effective, spent more on professional development which was regular and on-going.

A number of writers including Guskey (1985), Wilson and Berne (1999), Beijaard, Korthagenm, and Verloop (2007), and Wei et al. (2009) are concerned that little is known about how teachers actually learn and why they change their beliefs and practice. Professional development is rarely seen as “a continuing enterprise for teachers” (Ball & Cohen, 1999, p. 4) and is not truly developmental. Very little is known about what teachers have learned from these professional learning opportunities. The fundamental issues and obstacles in teacher learning have been overlooked, even though “experienced teachers today are expected to learn continuously” (Beijaard, et al., 2007, p. 106). There has been criticism of assumptions that teachers learn in the same way as their students and that what is known about learning can apply to both teachers and students (Bransford, Brown, & Cocking, 2000). There are also concerns about the need to better understand how professional development
translates to changes in teaching practice and improved student achievement. Achieving this could be a problem, as according to Timperley et al. (2007), there are few longitudinal studies which link professional development to student outcomes over time. Darling-Hammond, Wei, Andree, Richardson, and Orphanos (2009) also emphasise this situation, describing current research as a “limited pool of rigorous quantitative studies” (p. 9).

Guskey (1985) believed that teachers’ beliefs and attitudes only change after they see improvements in student learning, and he put forward a new model for professional development. In this model, staff development occurs which causes changes in teacher classroom practices which, in turn, lead to changes in students’ learning outcomes. Only then do teachers’ beliefs and attitudes change. He also pointed out that change is a difficult and gradual process which teachers need to receive regular feedback on student outcomes, and continued support and follow up after the initial training. Guskey put forward this model again in 2002, suggesting that most professional development programmes fail because they do not take into account the reasons teachers are motivated to undertake professional development, or the process by which changes in teaching usually occur. He claimed most teachers, for example, equate becoming a better teacher with improved student outcomes, and that they also look for programmes which offer practical, concrete ideas relating to day-to-day classroom operations. Those who do not look for programmes with such outcomes are unlikely to succeed according to Guskey. Improved learning outcomes are broadly interpreted in Guskey’s model and can include, for example, student attendance, classroom behaviour or attitudes to learning, as well as improved grades.

This view was challenged by Richardson (1994b) who found that teachers changed their beliefs before they changed their practice. Richardson and Placier (2001) point out that the research by Guskey and others was conducted within the more traditional conception of change in which teachers were told or asked to change their practices, and that this accounts for the different findings. The trial and evaluation of a professional development programme in New Zealand, however, demonstrated that teacher behaviour changed more quickly once the teachers saw improvements in their student learning (Moore & Page, 2002). Research carried out by Ingvarson, Meiers and Beavis (2005) also supported Guskey’s belief when findings from a project involving 3,250 Australian teachers in four separate studies revealed that teachers saw professional development programmes as effective when there was a positive effect on their students’ learning outcomes. The research was carried out three
months after the professional development programmes finished, to allow teachers time to
gauge the impact of their practice on student learning outcomes.

Teacher learning, according to Zwart, Wubbels, Bergen, and Bolhuis (2007), can be
understood as changes in teachers’ cognition and behaviour. These changes can have
different entry points, which are described by the authors as encompassing four domains:
personal, practice, consequence, and external. The entry point, for example, for a teacher who
reports that she changed her practice after considering how students should learn would be
the personal domain. Other teachers might say they changed their practice in response to
unexpected student outcomes, and the entry point then would be the domain of consequence.
Change needs to occur across all these domains to be effective.

A lack of evaluation of professional development programmes has also been noted. Guskey
(1998) took issue with the lack of evaluation of many professional development programmes.
He saw evaluation as key—as vital not only to distinguishing between effective or less
effective programmes, but also to explain how and why such differences have occurred. He
set out five stages critical for programme success. These range from participant reactions (as
in, for example, self report of satisfaction with the programme) to participant learning, to
organisational support and change, then to the participants’ use of new knowledge and skills,
(including allowing sufficient time) and, finally, to learning outcomes. Evaluation needs to
take place at all these levels but, according to Guskey, the bulk of professional developers
have not provided evidence to document the difference that their programmes make.

According to Desimone (2009) and Wilson and Berne (1999), professional development
evaluations have mainly consisted of teachers’ self reporting their satisfaction with the
speaker and little effort has been made to discover what teachers had learned, let alone how
they had learned.

Another issue raised in the literature concerns those who deliver the professional
development, and the apparent lack of professional development for those professional
development providers (Elliot, 2005). Whitcomb, Borko, and Liston, (2009) comment on the
sparseness of research addressing the preparation and support of professional developers.
They worry too about the lack of quality research, which reflects the difficulty and hard work
involved in delivering professional development, and about the lack of resources to study its
impact. Sometimes, as pointed out by Ball and Cohen (1999), a teacher has ‘fallen’ into the
role without sufficient preparation and support. They found that “ironically, while the role of
the teacher-educator is critical to any effort to change the landscape of professional learning... there is little professional development for professional developers” (p. 28) and this aspect is often missing from educational reform efforts. Whitcomb et al. (2009) point out that many professional developers have been trained to work with individual teachers rather than with learning communities. When they do work with larger groups, trainers can find the same problems with changing, where necessary, from the traditional ‘sage on the stage’ style of teaching to the ‘guide on the side’ style of facilitation (p. 99) as the teachers they are training experience.

The means and context of the delivery of professional development programmes are other important issues. There are many ways of delivering professional development that schools should be able to choose from, ranging from the employment of an outside expert, to professional development designed and delivered by teachers within the school. In centralised school systems, professional learning is often carried out through mandatory workshops or at courses and workshops where teachers enrol individually. There are other learning opportunities, such as collegial conversations, corridor conferences, and staffroom interchanges, as described by Wilson and Berne (1999), but these may be random, and are often unpredictable. Traditionally, teacher professional development has been delivered by an external expert, either visiting the school or holding workshops in external locations. Webster-Wright (2009) suggests that this view may have continued, despite a growing body of opinion suggesting other more effective methods of professional learning, because there is an assumption that significant learning requires external direction. Such sessions are usually attended by small groups of teachers, or by most staff at the end of the school day, and rarely build on teachers’ knowledge or “day to day classroom challenges” (McLaughlin & Talbert, 2006, p. 2). According to Borko (2004), currently available professional development of this type is inadequate, fragmented, superficial, and does not take account of how teachers learn, an issue raised by other researchers such as Desimone (2009) and Wilson and Berne (1999).

**Characteristics of effective professional development**

A number of studies have analysed and synthesised a variety of professional development implementations. The aim was to discover common characteristics, which have led to changes in teacher understanding and practice, and also resulted in improved student learning outcomes. Two particularly relevant studies for the current research study were carried out in Australia and New Zealand.
One study was a large Australian project, funded by the Australian Government, which investigated the links between professional development and student learning outcomes (Meiers & Ingvarson, 2003). This study is interesting in that rather than analysing past professional development programmes, it selected and followed 10 programmes. These programmes included a wide range of professional development models. They were carried out in 70 primary and secondary schools across the country, during the course of one year. Evidence of changes in student learning outcomes was collected using a number of assessment instruments. Despite problems such as the one year time frame of the project proving insufficient to capture changes linked to teaching practices with changes in student learning outcomes, a number of issues were identified. These are reported to have implications for further investigation of the links between teacher professional development and student learning outcomes, and included the design of the professional development where an emphasis on content was significant, looking at how students learn that content and including strategies for teaching that content. There were also school-contextual factors such as allowing sufficient time for planning, reflection, and collaboration. Staff changes could also have an effect, leading to a loss of momentum. The crucial role of school leadership was also noted, as was the need for more longitudinal studies over a longer period, giving more time for evidence of change. Evidence was also found demonstrating that improved student outcomes were an incentive for teachers to change their practices.

The other large study is of particular interest because, from the consolidated evidence they collected, the researchers have compiled a framework of 84 characteristics of professional learning which could have an effect on student learning outcomes. Teacher Professional Learning and Development Best Evidence Synthesis claims to be the “first synthesis of research into the processes by which professional learning comes to impact on student learning” (Timperley, et al., 2007 p. ix). The evidence was gathered from international and New Zealand investigations which focused on those professional development interventions which had a positive impact on student learning. After an intensive search, including New Zealand and international databases, 97 core studies which met certain criteria were chosen and mapped onto the theoretical framework “to identify what works, for whom, and under what circumstances” (Timperley, et al., 2007, p. xxiv).

The findings from this study challenge a number of commonly held beliefs. Effective contexts for promoting professional development, for example, included the finding that
while time for extended opportunities to learn was necessary (at least six months to five years) an important factor was how the time was used. Simply allowing extended periods of time for participation in the intervention did not guarantee success. While external expertise was seen as typically necessary, and was a feature of many effective interventions, it was also a feature of interventions with low impact. It has often been thought that ‘voluntary teacher engagement’ was an important factor in effective professional learning, but the studies demonstrated that it was more important that the teachers engaged with the learning process at some point, even if the programme had originally been compulsory. They did not need to commit prior to the intervention. Effective interventions were both school-based and/or external to the school. What was important was that teachers could process new understandings and analyse the impact of teaching on student learning. Active school leadership was very important. Where content was examined, integration of theory and practice was a key feature, and all the core studies had an underlying assumption that learning was strongly influenced by what teachers did in their classrooms. Most of the core studies included assessment to identify, for example, professional learning needs and student learning needs, or to enquire into the effectiveness of practice.

The findings concerning the core activities that aimed to promote professional learning, demonstrated a clear alignment between the goals and activities, and also highlighted that a variety of activities were needed. No single activity, however, was common to all interventions, or was seen as more effective. Of particular interest, was the finding that every type of activity associated with positive outcomes was also associated with having low or no impact. For example, extended time for opportunities to learn was necessary but not sufficient as although learning opportunities typically occurred over an extended period of time, extended opportunities also resulted in no impact on student outcomes. This situation was also seen with the use of external expertise and with teacher participation in professional communities of practice (Timperley et al, 2007). Initial activities sometimes showed that there were problems with teachers’ existing theories of practice. It was also found that teachers who before the intervention tended to assume that some groups of students could not learn as well as others, later took more responsibility for promoting learning for all students.

Interventions are carried out with the aim of improving student outcomes. Sustaining improved outcomes can be a problem, however, and most are short-lived. The findings from the study carried out by Timperley et al. (2007) emphasised the importance of having a strong
theoretical understanding as the foundation for changes in practice. A key finding of the synthesis has been the importance of providing time and opportunity to allow teachers to think about key ideas and to “integrate them in a coherent theory of practice” (p. 225). Effective professional development and learning “challenged existing assumptions and provided alternative pedagogies better able to meet the needs of students” (p. 164). All but one of the three studies that met the sustainability criteria for the Best Evidence Synthesis (Timperley, et al., 2007) were school-based rather than individually based.

Further issues which have been raised in the professional development literature, and which contribute to the effectiveness of professional development, include influences on teacher learning such as affectivity and career stage. Most teachers have a deep, emotional relationship with their work, their students, and their colleagues. Research has demonstrated that although more negative feelings were expressed when talking about colleagues rather than when talking about students, teachers were most negative when referring to the introduction of policies or requests for action or “intrusions into their physical or professional territories” (Nias, 1996, p. 300). The career stage of teachers may also affect professional learning outcomes as there is some evidence to demonstrate that the more years in teaching, the more suspicious of change some teachers may become (Drake, 2002), although this appears to apply more to secondary than to primary school teachers (Huberman, 1993). Research involving elementary teachers and Mathematics education reform in California, revealed that those who had been teaching for up to four years supported the reforms, although they had little understanding of them, whereas those in mid-career (teaching for 4–20 years) did support the reforms and had a good understanding of them. Those teaching for more than 20 years revealed a good understanding of what was involved in the reforms, but were not as supportive of them (Drake, 2002).

Another recommendation when introducing professional development is to trial the programme. It can be difficult for teachers to implement an innovation successfully without first trialing and experimenting, as in a pilot programme, to ensure they are familiar with the new practices (Neuman, 2011). Ongoing guidance and support are also needed, particularly when staff first attempt to implement what they have learned in the professional development sessions (Guskey, 1989; Ingvarson, et al., 2005).
Sustaining change from professional development

Sustainability of positive change is a very important issue when considering the professional development literature. It should surely be the ultimate goal of any professional development programme but, as O’Connell (2010) discovered, sustainability has only recently been included as a theme in either New Zealand or international research studies, and is seen as under-theorised. Furthermore, few research studies include a clear definition of the term. In the opinion of Century and Levy (2002), it can be important when considering this challenge to understand the difference between the maintenance and the sustainability of a programme. When teachers or developers talk of sustaining a programme, they might actually mean only maintenance of that programme. The authors see a programme that has been maintained as one that is well established and accepted as common practice. In order to be sustained, however, a programme must first have been maintained, and then adapted to meet current needs. Allowing such changes can lead to greater sustainability, but the adaptations must still be guided by the “core beliefs of the programme intent” (Century & Levy, 2002, p. xi).

Whitcomb, Borko, and Liston (2009) emphasise the need to recognise that professional development programmes often receive extra funding and support during the early phases, but that they must be able to survive once the extra resources and attention disappear. They also state that to be successful, a professional development programme must be scalable, and should be able to continue with professional development providers other than the original developers. Sustainability should also be planned for well before the start of an intervention, rather than afterwards (Timperley, et al., 2007).

Those delivering the programmes, such as the facilitators, sometimes do not pay enough attention to the problems and requirements of sustaining a reform. Instead, they move to another implementation or end active involvement. If theory-based change is to be sustained, there are a number of factors and conditions that need to be addressed, according to McLaughlin and Mitra (2001). These include resources, awareness of need to take account of teacher timetables, room allocation, and knowledge of the core principle that implementation is assimilation and construction. Consistent follow-up support and guidance are also needed (Mouza, 2009). Ingvarson, Meiers, and Beavis (2005) emphasise the importance of building in opportunities for feedback and coaching during and after professional development, particularly “at the elbow coaching and support in classrooms” (Ingvarson, et al., 2005, p. 17). They recommend bringing teachers together in the classroom to examine student work,
and providing the time for teachers to reflect and to develop understanding of any required changes.

Teacher turnover is “inevitably a threat to sustainability” according to Timperley et al. (2007, p. 223). It has been difficult to find reports from research which describe this particular problem, although a report on the Bay Area School Reform Collaborative (BASRC) where learning communities have been established describes how beginning teachers and newcomers “are folded” into departmental culture and community practice (McLaughlin & Talbert, 2006, p. 26). There are many warnings, however, detailing how reform momentum is often lost when strong leaders move, as happened when the district leadership, in one of the largest public school districts in the United States changed, and new agendas were taken on (Datnow, Borman, Stringfield, Overman, & Castellano, 2003). Another study also warns of possible problems that can occur when a “gifted leader of change” (Copland, 2003, p. 375) moves on, resulting in the disintegration of any significant change. Leadership within the context of a school is usually taken to refer to the leadership of the school principal. Timperley et al. (2007) note that one possible solution, found in several studies, is the use of distributed leadership, involving many people rather than one person only. A study investigating US elementary schools’ adoption of Comprehensive School Reform (CSR) found that schools taking part in the reform process were required to create new leadership positions to assist with the reform programme. These schools were more likely to engage in distributed leadership, and their leadership was more likely to engage in instructional leadership than leaders on non-CSR schools (Camburn, Rowan, & Taylor, 2003), leading to greater sustainability of any change.

Copland’s (2003) work with schools in the San Francisco Bay Area describes and defines the concept of distributed leadership, emphasising the need to share the responsibility for sustaining school improvement among a broad group of the school community. Spillane, Diamond, and Jita (2003) have put forward a wider view, believing that researchers have too often ignored other leadership sources in schools. The writers believe that school leadership is best understood as distributed practice, “stretched over the school’s social and situational contexts” (p. 535) and not the function of any individual leader. From their work among 13 Chicago schools, they came to understand several types of distributed leaderships. They describe one as collaborative distribution where several leaders (not only or even principals) work together to carry out a particular leadership task. The authors emphasise that the group
do not just divide up the tasks, but describe in their example, how the principal and two leaders worked in an interdependent fashion, each playing distinct facilitation roles. Another view of leadership referred to is collective distribution, which involves two or more leaders in a reciprocal relationship. They may work separately but interdependently on a shared goal, each contributing expertise and aiming to produce common practice. Thus, a group of leaders working together leads to a practice of leadership potentially more than the sum of the practice of each individual. Spillane et al. (2003) contend, therefore, that school leaders’ knowledge and expertise is best explored at the collective level and not just at the individual level.

A further aspect to consider when planning for sustainability, along with the focus on distributed leadership, is found in an increasing focus on schools themselves taking greater responsibility for providing professional learning opportunities for their staff, instead of relying on professional development delivered by visiting experts (Timperley, et al., 2007). The writers also suggest that systems larger than individual schools need to engage in data-based inquiry, as effectiveness is a systemic and not an individual school issue. The authors point out that standards and guidelines for performance appraisal are centrally developed, and that similar guidelines need to be established for effective professional development. Timperley (2011) equates sustainability or “keeping it all going” (p. 119) with making the processes, which underpin the cycles of inquiry and knowledge building “core business for the professionals responsible for student learning” (p. 119). She uses the term ‘adaptive experts’, taken from the work of Bransford, Derry, Berliner, Hammerness, and Beckett (2005), to describe teachers who have a focus on ongoing learning and improvement, monitoring ongoing progress, and solving new problems.

**Effective professional development relevant to the current research study**

The following section examines one professional development programme: Cognitively Guided Instruction (CGI), one delivery method (school-based), and one strategy for supporting change (professional learning communities), as aspects of all have relevance to the current research study.

**Cognitively Guided Instruction**

CGI meets many of the requirements of effective professional development already discussed in this literature review. Such requirements include teacher understanding of the need for
professional development, understanding of the theory underpinning the learning, sufficient time allowances, strong leadership, a focus on student learning, and learning content related to the curriculum. A professional development delivery method, school-based professional delivery, is then discussed as this method appears to hold promise, under certain circumstances, of producing sustainable and improved student learning outcomes. The formation and effectiveness of profession learning communities, often recommended as a way of sustaining change, is then examined.

CGI involves changes in teachers that result in continuing growth or “self-sustaining generative change” (Franke, Carpenter, Fennema, Ansell, & Behrend, 1998, p. 67). Copland (2003) also describes the building of communities of practice through the cycle of inquiry, intended to help schools “pose, investigate and respond to questions about policy and practices” (p. 380). The practice of practical inquiry used in CGI is similar to Teaching as Inquiry, described in the New Zealand Curriculum (Ministry of Education, 2007) as a “cyclical process that goes on moment-by-moment (as teaching takes place), day-by-day, and over the longer term” (p. 35). Such a process is also advocated by Timperley et al. (2007).

During the process, the teacher asks what is important and worth spending time on, determining what students have already learned, what they need to learn next, and what changes need to be made and why. Relating patterns of achievement to specific instruction though can be a challenging task and, according to recent research (Parr, 2010), not all teachers have the skills to align instructional decisions effectively with student achievement.

The recommendation that professional development be linked to specific subject content is explained in the account by Peterson, Fennema, and Carpenter (1988) of children’s acquisition of mathematical knowledge. They carried out a controlled experiment whereby some teachers completed workshops where they learned to use CGI while the control group taught as usual. Post-testing demonstrated that students in the CGI teachers’ classes had significantly greater ability to solve addition and subtraction work problems. Simply observing that a practice carried out by a child is effective and therefore works is not enough, according to the authors. The most important factor is that teachers try or struggle to understand why the practice has worked and how the student has used it, and under what conditions. If they can achieve this, teacher understanding can develop further and more connections can be made. Teachers can therefore continue to learn and to grow. The authors linked this to the concept of practical inquiry (Richardson, 1994a) as distinguished from
formal research. Richardson explains that practical inquiry is conducted by teachers to help them understand their students and may result in changes in practice or enhanced understanding. There is no formal research methodology associated with practical inquiry, and it is not carried out for the purpose of “developing general laws related to educational practice” (p. 7).

The focus of a practical inquiry determines what a teacher sees as critical, which can be an opportunity for reflection. According to Franke et al. (1998), there are two levels to practical inquiry. Teachers who search for successful practices are engaging in practical inquiry at a lower level than those who examine their own practices with a focus on detailed analysis. These teachers are seen as operating at the level of practical inquiry necessary for generative change. The authors describe how the practice of one teacher in their study, operating at the higher level of practical inquiry, continued to evolve, as opposed to other teachers who did not view understanding their students’ thinking as a way to continue to learn and grow as teachers (p. 79).

School-based professional development

Most academic, credit-bearing professional development programmes available in New Zealand to assist teachers develop their students’ information literacy skills are delivered as school-based courses, with one course delivered online. In all cases, teachers enrolled in the courses are expected to work with students during the course, practising strategies with their students and discussing and analysing progress with class members. Given that two of the three studies meeting the sustainability criteria in Teacher professional learning and development: Best evidence synthesis (Timperley, et al., 2007) were school-based, it seems appropriate to examine the literature relevant to this method of delivery. McLaughlin and Talbert (2006) make a strong case for school-based communities of learning, stating that these communities allow teachers to take responsibility for their own learning and for that of their students. As they highlight, “schools are not institutional islands” (p. 89) and teachers’ classroom efforts are affected by parents and community attitudes and expectations. They note, however, that school-based communities of learning are unfortunately rare, possibly because those funding professional development are concerned that the responsibility for learning is in the hands of those targeted to change, namely teachers. Instead, much faith is placed in the provision of external providers. This appears to be a particular problem in countries such as the US where the main source of professional development funding is often
provided centrally (e.g. at the school district level). Teaching is a “complex, intellectual and emotional task” according to Whitcomb, Borko and Liston (2009, p. 207) who believe that the lack of US policy support for school-based learning communities reflects the lack of information about such learning communities.

Although there are advantages to school-based professional development, or situated learning, Putnam and Borko (2000) warn that teachers also need to go outside the school to learn new methods and ideas. They recommend providing multiple contexts for delivering professional development. One suggestion involved the staff development team, which teachers then took away to practice with students before discussing the experiences in a later workshop. The requirements needed for successful school-based professional development as listed by McLaughlin and Talbert (2006) include ongoing human resources and coordinators to monitor and nurture progress. Even if projects do start off successfully, they can too often fall apart when there are leadership or policy changes in schools. Other problems include teacher opposition to such collaboration, which may result in other teachers and leaders choosing to work in more supportive schools.

**Professional learning communities**

Many writers on professional development refer to the need to develop professional learning communities. Among these are Timperley and Wiseman (2003) and Whitcomb, Borko and Liston (2009). The latter note the social nature of learning, and the central role that can be played by communities of practice in enhancing teachers’ professional knowledge and practice. They also note research demonstrating that professional development is especially effective when situated in a collegial learning environment. Teachers are more likely to take risks and engage in challenging discussions within a supportive and safe environment. Teacher learning can also be more powerful and can last longer because a group of colleagues are struggling together to improve the learning of their students (Lieberman & Miller, 2007). McLaughlin and Talbert (2006), describe three stages in the development of a professional learning community, including novice, intermediate and advanced. In the initiative they describe, the BASRC, the novice stage is spent collecting and struggling with baseline data to understand students’ problems and progress. Moving through a cycle of inquiry requires teachers to develop many research skills. These difficulties are supported by the work of Timperley and Parr, (2010) who describe the use of such a cycle as requiring a range of “evidence-related capabilities” (p. 13), including the collection and use of detailed
assessment information “which must be fit-for-purpose and allow for appropriate diagnoses to be made” (p. 13). Many schools, according to McLaughlin and Talbert (2006), never move beyond this novice stage. At the intermediate stage some schools struggle to shift the culture “from their school towards reflection, evidence-based decision-making and collaboration” (p. 32). The authors also describe teachers who viewed the cycle of inquiry as an add-on and a time-waster and resisted reform efforts. Many schools were stuck at this stage of community development for several years. Schools in the advanced stage had a common language that all teachers used to discover why some students learned better than others, or why writing in one class seemed more advanced than in other classes. The authors stress that this could be accomplished without finger-pointing or blame but in an effort to improve student outcomes.

**Conclusion**

Teacher professional learning is a very complex activity involving many considerations. It is important to set up conditions that are responsive to the ways in which teachers learn by engaging their prior conceptions. This type of systems thinking approach takes into account various aspects of learning, including personal, social and the classroom context (Putnam & Borko, 2000). It is also important to promote metacognitive and self-regulatory processes that help learners define goals and monitor their own progress towards them (Ball & Cohen, 1999; Poskitt and Taylor, 2005; Guskey, 2002). Professional learning is usually shaped by the context in which the teacher practices. Despite other influences such as socioeconomic and home and community, the role of the individual teacher cannot be ignored when investigating professional development which results in improved student outcomes. The finding that classroom-to-classroom differences are greater than school-to-school variations (Nye, Konstantopoulos, & Hedges, 2004) underlines the importance of the quality of individual teachers. According to Hattie’s work on the influences on student achievement, between seven and 21 per cent of the variance in achievement gains was associated with variations in teacher effectiveness (Hattie, 2009). It would appear that the effect of an individual teacher can be related to student achievement and Hattie (2009) suggests that the focus for improving student learning should be the quality of teaching.

Implementing and sustaining change in schools is a complex process at the mercy of many variables. It requires both assimilation and construction, and must be anchored both in reform principles and in concrete teaching contexts (McLaughlin & Mitra, 2001). It is essential that teachers understand the theory on which new practice is based (Guskey, 2002; Timperley, et
al., 2007). If they do not know why they are doing it implementation will only be superficial. This understanding and knowledge is crucial too to enable the change to continue after the initial special project status ends. Sustainability depends on teachers’ in-depth understanding of theory and skills of inquiry to judge the impact of teaching on learning, and to identify next teaching steps (Timperley, et al., 2007). A key strength of the New Zealand Curriculum (Ministry of Education, 2007) is the promotion of inquiry as fundamental to effective professional practice and the cycle of inquiry developed by Timperley et al. (2007) which starts with student learning needs in relation to possible outcomes, has been adapted to include teachers and leaders, identifying the relevant professional skills and knowledge which then form the basis for the professional learning which will meet the identified needs (Timperley & Parr, 2010). Thus, New Zealand schools have been provided with the tools needed to gauge and plan for improved student outcomes.

The following chapter, Chapter 4: The Research Process, describes the methodology and methods adopted in the research. The design of the research includes the theoretical framework, a needs analysis and the design of the intervention. Data collection methods used to measure changes in teacher and student understandings and practice are described. In addition, this chapter includes descriptions of the research tools (including limitations), ethical considerations, and measures taken to establish the trustworthiness of the research.
Chapter 4
The Research Process

Introduction

This research addresses the question: Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal and, if not, can this situation be improved through the use of a teacher-designed intervention?

Sub-questions

1. What do teachers understand by the term information literacy?

2. How do teachers develop their students’ practice of information literacy?

3. What do students understand by, and how do they practise, information literacy?

4. To what extent and in what ways has the professional development programme influenced teacher knowledge and practice?

5. What facilitates and/or hinders progress towards the development of information literate students?

Background

As described in Chapter 1, a cluster of three Auckland schools in 2007, obtained a Ministry of Education EHSAS contract. This contract was intended to supply the cluster with four years of funding in order for the cluster to achieve the aim detailed in the proposal, namely:

**Shared Outcome Statement:** Empowering students to be independent learners by placing the learner at the centre of the educational process. Focus on developing school-wide information literacy process and extending creative and critical thinking skills (2007).

Their successful proposal stated that the focus will on “the explicit teaching and learning of identified information literacy skills and expanding on the critical and creative thinking skills
that the schools have been implementing over the past three years enabled through other Ministry of Education initiatives” (Pasley, et al., 2007).

**Rational for the selected approach**

**Mixed methods methodology**

Until relatively recently, two broad methodological paradigms have been identified. Researchers working within the social sciences were often categorised as using one or the other paradigm, with those mainly interested in numerical data following the quantitative paradigm, and those mainly interested in narrative data following the qualitative paradigm. In the last 20–30 years, however, a third methodological paradigm, that of mixed methods, has emerged, amid much discussion and some criticism (Denzin & Lincoln, 2005; M. Smith, 2006), as a “pragmatic way of using the strengths of both [qualitative and quantitative] approaches” (Tashakkori & Teddlie, 2003, p 473). This has been further refined as ‘methodological eclecticism’ where practitioners of mixed methods “select and then synergistically integrate the most appropriate techniques” (Tashakkori & Teddlie, 2010, p. 5), from much quantitative and qualitative data. Integration is seen as a key concept in the definition given by Creswell and Tashakkori (2007b), whereby “the investigator collects and analyzes data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry” (p. 4).

Researchers also see triangulation, the findings from one source of information being checked against the findings from other sources, as an important reason for engaging in mixed methods research (Johnson, Onwuegbuzie, & Turner, 2007; Punch, 2005). In this study, data were gathered from questionnaires, interviews, focus groups, and documentation.

**Research setting and participants**

The participants for this project consisted of staff and students from the three neighbouring schools, which had formed the Cluster and gained EHSAS funding for four years (see Table 4.1 Project Schools).
Table 4.1

*Project schools*

<table>
<thead>
<tr>
<th>School</th>
<th><em>Type</em></th>
<th>**Decile Rating</th>
<th>Roll</th>
<th>Teaching staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>State Co-ed Intermediate</td>
<td>9</td>
<td>522</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Year 7–8 (11–12 years of age)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>State Girls’ Secondary</td>
<td>5</td>
<td>1364</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>Year 9–13 (13–18 years of age)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Integrated</td>
<td>5</td>
<td>768</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Year 7–13 (11–18 years of age)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* In the New Zealand school system, students start primary school at 5 years of age in Year 1. At 11 years of age, most students attend an intermediate school (Years 7 and 8) and then move to secondary schooling at Year 9 (13 years of age). The final year of secondary school is Year 13 (17 years of age).

** The New Zealand Ministry of Education uses a *decile rating system* for school funding purposes. Each decile contains approximately 10% of schools. Schools in decile one have the highest proportion of students from low socio-economic backgrounds. Schools in decile ten have the lowest proportions of these students (Ministry of Education, 2008a).

**Project organisation**

Two teams were set up once the EHSAS Cluster Contract was awarded in 2007 (see Table 4.2). The project was overseen by the school principals and the project manager (contracted from outside the school), but the day-to-day organisation was handled by the Lead teachers at the three schools.
Table 4.2

Project teams

<table>
<thead>
<tr>
<th>Principal team</th>
<th>This team met twice a term to set budgets and check progress and consisted of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007–2009</td>
<td>• The project manager (contracted from outside the school)</td>
</tr>
<tr>
<td></td>
<td>• The principals from each school</td>
</tr>
<tr>
<td></td>
<td>• The researcher once a term or when appropriate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lead teacher team</th>
<th>This team met frequently to design a cluster-wide information processing model and the accompanying professional development. They also organised the implementation of the intervention. Members of the team included:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007–2009</td>
<td>• The project manager (contracted from outside the school)</td>
</tr>
<tr>
<td></td>
<td>• The teacher librarian from School B who led the team until mid-2008</td>
</tr>
<tr>
<td></td>
<td>• Lead teacher(s) from each school (by mid-2008 most of the original Lead teacher team had left their schools and been replaced on the committee by new members)</td>
</tr>
<tr>
<td></td>
<td>• The librarian from School C</td>
</tr>
<tr>
<td></td>
<td>• The literacy specialist from School C who took over leadership of this team mid-2008</td>
</tr>
<tr>
<td></td>
<td>• The researcher (where possible)</td>
</tr>
</tbody>
</table>

Design of the research

The research project comprised a mixed method, sequential design, consisting of four phases. The researcher collected and analysed quantitative data gathered from survey questionnaires and then collected and analysed qualitative data, including data from interview and focus group discussion and from available documentation in order to refine and explain the quantitative data in more depth. This resulted in the integration of data from both methods in order to provide findings that are mutually illuminating (Bryman, 2007).

To provide a more rigorous framework for the discussion of the data analysis and interpretation, the findings from this study, carried out in the “messiness of real-world
practice” (Barab & Squire, 2004, p. 3), have been viewed through the lens of a formative and design experiment approach. A number of writers agree that educational research is often “divorced from the problems and issues of everyday practice” (The Design-Based Research Collective, 2003, p. 5), demonstrating the need for new research approaches that address problems of practice directly. In a formative experiment, the researcher sets a pedagogical goal and finds out what it takes in terms of materials, organisation, or changes in the technology to reach the goal. Instead of rigidly controlling the treatments and observing differences in the outcome, as in a conventional experiment, formative experiments aim at a particular outcome and the researchers observe the process by which the goal is achieved (Reinking & Watkins, 2000). This approach, using both quantitative and qualitative data, aligns with the mixed methods methodology used in this study.

**The role of the researcher**

The project manager knew of the researcher’s interest in information literacy development and invited her to become involved in this project in order to evaluate the project. The researcher was therefore an observer but also provided the Lead team with feedback at times, regarding findings from the monitoring of progress. Given the ‘messiness’ of the school context, the Lead teachers required this feedback with relation to, for example, the inclusion of certain questions in the questionnaire or the implications arising from analysis of teacher and student interviews and focus groups.

The researcher in this case was the observer of process, but an observer who also provided the Lead team with feedback at times, regarding the monitoring of progress. Given the ‘messiness’ of the school context, the Lead teachers required this feedback with relation to, for example, the inclusion of certain questions in the questionnaire or the implications arising from analysis of teacher and student interviews and focus groups.

**Outline of the research process**

The research was conducted in four phases which are described in detail in Table 4.3 *Data collection details*. The first phase consisted of a trial of instruments, the second of a needs analysis, the third of the design of the intervention, and the fourth phase the implementation and associated monitoring of the implementation of the intervention. Phases 1, 2, and 4 involved teachers, students, HODs, the Lead teacher team, and access to available
documentation. Phase 4, the design of the intervention, was carried out by the cluster Lead teacher team.

**Instruments used to gather data**

This project used web-based questionnaires, hard copy questionnaires, interviews, focus groups, and available documentation to gather data. These instruments: the questionnaires, semi-structured interviews, focus groups, and available documentation were trialled during Phase 1. In Phase 2, the needs analysis was carried out using web-based questionnaires in November 2007 and February 2008 from teachers at the three schools, and from students in Years 7, 8, and 9. Interviews and focus groups were also carried out. The intervention was designed during Phase 3. In Phase 4, November 2008, February and November 2009, data were collected from teachers post intervention, Lead teachers were interviewed and documentation, where available, was collected. During 2009, data were collected using questionnaire and focus groups from six classes of students in March and November. These students were new to the application of the professional development intervention and therefore an indication of the extent of its impact could be gained.

**Collecting the data**

Table 4.3

*Data collection details*

<table>
<thead>
<tr>
<th>Phase 1: Trial of instruments. September, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
</tr>
<tr>
<td>Teachers (School B) who were not returning in 2008, trialled the online questionnaire and participated in trial interviews.</td>
</tr>
<tr>
<td>Students</td>
</tr>
<tr>
<td>One Year 10 class (School B) trialled the online questionnaire and participated in trial focus groups.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
</tr>
<tr>
<td>November 2007</td>
</tr>
<tr>
<td>All teachers (Schools A, B, C) invited to complete needs analysis online questionnaire.</td>
</tr>
<tr>
<td>February/March 2008</td>
</tr>
<tr>
<td>Representative group of HODs (Schools A, B, and C) interviewed.</td>
</tr>
<tr>
<td>Lead teachers from Schools A, B, and C interviewed.</td>
</tr>
<tr>
<td>Students</td>
</tr>
<tr>
<td>February 2008</td>
</tr>
<tr>
<td>All students in Years 7, 8, and 9 in Schools A, B, and C were invited to</td>
</tr>
</tbody>
</table>
complete the online questionnaire.

Focus groups Years 7, 8 and 8 (Schools A, B, and C). Students from randomly selected classes were asked to participate voluntarily.

Documentation

HODs were asked to provide any documentation relating to the teaching of information literacy (lesson plans, processing models, worksheets etc.)

| Lead teachers | Design of the *i-Lit* process and accompanying professional development carried out by Lead teacher team. |


<table>
<thead>
<tr>
<th>Teachers</th>
<th>November 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>All teachers (Schools A, B, and C) were invited to repeat completion of the needs analysis online questionnaire (after first round of professional development). School C teachers did not participate as PD implemented differently.</td>
<td></td>
</tr>
</tbody>
</table>

November 2009

HODs re-interviewed (Schools A, B, and C).

Lead teachers re-interviewed (Schools A, B, and C). School C. Lead teacher also re-interviewed in 2010.

<table>
<thead>
<tr>
<th>Students</th>
<th>February and November 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire (hard copy) administered pre intervention and post intervention (paired samples) to the following classes:</td>
<td></td>
</tr>
<tr>
<td>Year 7 (two classes School A)</td>
<td></td>
</tr>
<tr>
<td>Year 9 (two classes School B)</td>
<td></td>
</tr>
<tr>
<td>Year 9 (two classes School C)</td>
<td></td>
</tr>
<tr>
<td>Focus groups held with six students from each class (first six names on each class roll). <strong>The same students participated in both February and November.</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Documentation</th>
<th>2008 and 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students in focus groups brought recently completed assignments with them to discuss.</td>
<td></td>
</tr>
<tr>
<td>HODs supplied templates relating to the <em>i-Lit</em> process in November interviews.</td>
<td></td>
</tr>
<tr>
<td><em>i-Lit</em> resources for cluster teachers were available on cluster wiki and examined by researcher.</td>
<td></td>
</tr>
</tbody>
</table>

**New Zealand school year: There are four school terms per year. School starts in February and finishes in December.**

- Term 1 February–April
- Term 2 April–July
- Term 3 August–October
- Term 4 October–December

**It is usually advisable to choose, for example, every 3rd or 6th name on class rolls to ensure that the membership of focus groups is representative of the multicultural and/or gender composition of the classes. In this case the first six names on each roll were chosen in order make it easier to repeat the focus group discussions with the same students, where possible, at the end of the year. The researcher did note, however, that in every case there was an even spread of cultures and genders represented (where appropriate) in each focus group.**
Phase 1: 2007

Phase 1 consisted of the trial of the instruments, to test, for example, both the content of, and the access to, the questionnaires as recommended by Punch (2003). This was to enhance, as much as possible, the dependability of the data from this project. During Term 4, 2007, trials of the questionnaires were carried out with staff and students from one of the participating schools. The questionnaires were added to the cluster website, where the cluster Lead teachers examined them and suggested changes. The questionnaire was also piloted by a group of teachers who were not returning to the school in 2008. Although part of the teaching staff questionnaire had been used in a previous project and had already been subjected to trial, it had then been in pen and paper format and it was most important, in this case, that the online aspect was thoroughly trialled. The teachers accessed their questionnaire via their laptops after being given the Internet address of the webpage containing the questionnaire.

The student questionnaire was trialled by one class of Year 10 students from the school. This year level was chosen as the students were moving to Year 11 in 2008, and therefore would not be involved in the research project during the following two years. The contents needed to be tested for comprehension, clarity, and completion time. To trial the student online version of the questionnaire, the class teacher took the students into a computer room and wrote the Internet address on the whiteboard. Students then typed the address into the browser, found the questionnaire and completed it. Teachers were concerned about possible problems such as their own lack of confidence in supervising students completing online questionnaires, and students mistyping the Internet address and therefore not being able to find the questionnaire, but these concerns proved to be unfounded during the trial. The trial did reveal an unintentional reversal of the Likert scale in one set of questions which was corrected.

Trial interviews and focus groups were also carried out where HODs and students who would not be involved in the project were invited to participate. Practice interviews were held where several HODs volunteered to role-play types of interviewees, such as a non-stop talker, a controller, or an ‘oyster’ (Kvale, 1996). The trial procedures and findings were analysed, and any necessary adjustments were made to the interviewing process before proceeding with the main project. The adjustments included ensuring that questions were sufficiently open to encourage elaboration and that the interviewer allowed enough time for the interviewee to think of replies before speaking. Instances were identified where interviewees needed to be
steered back to the question when they got diverted off the current topic and appropriate strategies for doing this were developed and trialled.

**Phase 2: November 2007 and February 2008 needs analysis**

During this phase, data were collected and analysed to investigate and understand the needs of teachers.

The results of the needs analysis, which addressed teacher and student attitudes, knowledge and practice of information literacy, informed the design of the intervention. The teachers’ questionnaire in December 2007 (Appendix A) consisted of 44 questions. Section 1 of the questionnaires was concerned with demographic information in order to gain relevant background details. In this case, teachers were asked the subjects they taught and at which levels, their years of teaching experience and previous professional development in information literacy. Sections 2 and 3 probed teacher’s understanding and classroom practice of information literacy. The student online questionnaire contained 18 questions (Appendix B). The questionnaire first gathered demographic information, and then queried student understanding and practice of information literacy.

Teachers completed online questionnaires in November 2007 and Year 7, 8, and 9 students completed online questionnaires in February 2008 at the start of a new school year. The questionnaires were placed on a secure server at the Faculty of Education. Teachers were given the Internet address to complete the questionnaire in their own time (many teachers in New Zealand state schools are issued with laptops). Students completed their questionnaires in computer rooms supervised by teachers who gave them the Internet address. The questionnaire could only be accessed at this address at certain times to avoid the possibility of repeated submissions by one person. The disadvantages of using web-based questionnaires, such as access and technical competence, were not a problem in this project as the schools involved had computer rooms with fast, reliable broadband access, and the students had the requisite computer skills. The researcher acted on the suggestion that agreement rather than frequency response formats could be more reliable (Brown, 2004) as they are not dependent on the participant’s memory. The teacher (2007/2008) and student questionnaires (2008) contained a majority of questions using a Likert agreement-response scale. Several open-ended questions were also included where, for example, respondents were asked to supply the attributes of an information literate person and, in a later question, to explain the model of information literacy processing they used. These questions could have been reformed as
closed questions with preset response options (Creswell, 2005), but it was thought that such options could prompt replies whereas the researcher wanted to discover respondents’ knowledge without such prompting.

Semi-structured interviews were used to gain evidence from participants. HODs were interviewed early in 2008 (Appendix C) to gather further details in addition to data obtained from the questionnaires (Burns, 2000) and also to gain more insights into how information literacy development was understood and practised within various departments. Participation in these interviews was voluntary, and five HODs from each school volunteered to participate, although two HODs from School B did not arrive at the interview venue. The interviews took approximately 30–45 minutes each, were held at times to suit participants, and recorded and transcribed as indicated on the participant information sheets and consent forms. The data were then coded and analysed. The researcher was equipped with planned key questions (Kvale, 1996), many of which had arisen from the analysis of the questionnaire responses, a process recommended by Bryman (2006). These interviews provided a useful indicator of how issues around information literacy were understood in the schools, and also acted as a check on responses gained from the questionnaires.

In early 2008, prior to the intervention but after completing the initial questionnaires online and after analysis of the data, students were asked to volunteer to participate in focus groups. Groups of six students from one Year 7 and one Year 8 classes at School A and three Year 9 classes at Schools B and C volunteered to take part. A set of indicative questions (Appendix E) was drawn up for use with the focus group from each school. In this way the researcher was able to explore issues and confirm attitudes as indicated from questionnaire responses, thus integrating both the quantitative and the qualitative findings (Krueger & Casey, 2000). Focus groups allowed the participants to ‘bounce’ ideas off each other (Davidson & Tolich, 2003) and they were a useful way to explore ideas and allow the researcher to gain in-depth information (Johnson & Turner, 2003) about what students thought about ‘doing research’ (the term used in all three schools)\(^5\). The discussions were recorded as indicated on the information sheets and consent forms, and the transcribed discussion contributions used to illuminate the findings from questionnaires. These particular students did not take part in completing any further focus group discussions.

---

\(^5\) The term ‘research’ has been used throughout rather than ‘inquiry’, as ‘research was the term used in all the cluster schools even though a few students referred to ‘doing inquiry’, the term used at their previous schools.
The Lead teachers were interviewed in mid-2008. Semi-structured interview questions were used (Appendix D).

**Phase 3: Design of the implementation (See Chapter 5)**

**Phase 4: Formative evaluation phase to monitor the progress of the intervention**

Teachers from Schools A and B (School C implemented the professional development differently), were invited to complete an online questionnaire again at the end of 2008 after the first round of professional development sessions. The questionnaire in November 2008 consisted of 36 questions. Four questions concerned with previous professional development associated with information literacy included in the 2007 questionnaire were omitted from the November 2008 questionnaire. Four other questions were not deemed useful to include in the November 2008 questionnaire and were dropped (see Appendix A).

The same HODs, where possible, who were interviewed in order to collect data for the needs analysis were re-interviewed at the end of 2009 to investigate any changes in understanding and practice related to information literacy after the implementation of the professional development. Only one HOD was still at School A, two HODs were still at School B, and four HODs were at still at School C, although one was unavailable to be interviewed. The members of the Lead teacher team were also interviewed three times between 2008 and early 2010 to investigate their view of the process. Semi-structured interview questions were used (Appendix D).

Students: A questionnaire in hard copy was administered to newly arrived students in February and again in December 2009 (Appendix F). The findings acted as indicators of the progress of the intervention. Although the use of online questionnaires has considerable advantages in terms of time and cost as outlined above, in this case the researcher was faced with a situation beyond her control in that the Faculty of Education webmaster, who had all the online questionnaire expertise, had been seconded to assist with a major upgrade of the main university website. Rather than use a commercial site such as SurveyMonkey.com, and since the student numbers involved were not large, it was decided to revert to hard copy questionnaires.

The questionnaire included Likert agreement-response scale with six descriptors: 1. Strongly disagree, 2. Disagree, 3. Tend to disagree, 4. Tend to agree, 5. Agree, and 6. Strongly agree. Another set of questions used an ordinal scale to describe actions. 1: No I haven’t learned to
do this, 2: No I think we were told but I can’t remember, 3: Yes and sometimes I do, 4: Yes and I usually do this. Options such as ‘Don’t know’ and ‘No opinion’ which could be an easy choice for some students were thus avoided.

After the questionnaires were completed by the six classes in February, the first six students from each class roll then participated in focus groups. The focus groups were conducted again with the same students where possible after the questionnaire was repeated in November 2009. At each focus group, the students were asked to bring with them any assignment work involving research or inquiry-type assignments. The focus group questions asked students to describe in detail any process they used (see Appendix E).

The researcher conducted all interviews and focus groups.

*Documentary sources*

Documents from the three schools were collected for analysis in order to gain possible new information and interpretations (Davidson & Tolich, 2003). The documents gathered at the start of the project by the projects’ Lead teachers were examined for any intentions concerning information literacy development and/or teaching. At the start of the project, in late 2007, there were very few documents available. School A had posters and some work sheets associated with an information processing model that the school had recently adopted, and School C produced Social Studies work sheets which involved the use of several information skills but there was no other documentation provided at this point. Later documentation included research-based assignments students brought with them to talk about in the focus groups at the end of 2008.

One useful source of documentation was provided on the cluster wiki, where the minutes and notes of all meetings and discussions involving the planning and implementation of the professional development since 2007 were posted by the Lead teacher running the wiki and these were consulted for the researcher.

*Data analysis*

The data from each school were analysed separately rather than collectively, as although all schools in the cluster used common materials for the professional learning sessions, each school actually implemented the intervention differently.
• The Lead teacher at School A, working with a staff of 25, held both weekly whole
staff sessions and also visited individual classrooms on a regular basis to provide
assistance.

• The Lead teacher at School B in 2008 held weekly sessions for the staff of 119. These
took place early in the morning, once a week, when students started school later.

• The Lead teacher at School C worked only with six teachers of English and Social
Studies during 2008 when regular professional development sessions were held for all
six teachers. The Lead teachers also worked with the teachers individually. In 2009,
other teachers in these departments as well as those teaching Religious Education and
Science at Years 9, 10, and 11 were included. After school sessions were held, and the
Lead teacher also held departmental sessions. It was intended to include all the staff
from 2010 onwards.

The material used in common included the information processing model, \textit{i-Lit}; strategies for
teaching various information literacy skills that teachers could use, and posters, diagrams,
and explanations of the \textit{i-Lit} process printed in all student homework diaries from 2009.

Data analysis was undertaken in line with Neuman’s (2006) belief that analysis and
interpretation should begin as soon as data have been gathered. Doing so allowed the results
of early analysis to guide subsequent data collection, and the analysis of data from the Phase
2 needs analysis was designed to inform the intervention. As noted, questionnaire responses
informed interview questions and focus group discussion questions. Consequently, the
analysis of questionnaire data and data from interviews and focus groups was commenced
during the collection of such data.

\textbf{Quantitative data}

\textit{Questionnaires in Phases 2 and 3}

The researcher faced problems when wishing to measure change by comparing the teachers’
2007 results with the 2008 questionnaire results. This came about because the teachers in
2007 had insisted that there be no possible way to identify them, and therefore would not
agree to identification by numbering. Without paired samples, it was not possible to measure
change by carrying out statistical tests such the parametric paired-sample t-test or the non-
parametric Wilcoxin paired-sample signed-ranks test to establish whether two means
collected from the same sample differed significantly. It was therefore decided to use the Mann-Whitney test, a non-parametric equivalent of the independent t-test. Non-parametric statistics are appropriate because of non-normal data and a small sample size. They are also more robust with respect to violating assumptions and the likely violation of the requirement for independent samples. This decision also takes into account the argument that while the Likert response categories have a rank order, the intervals between the values are not necessarily equal so that ordinal scales should not be treated as interval scales (Jamieson, 2004). It is very difficult to establish, for example, that the intensity of feeling between ‘strongly agree’ and ‘agree’ is the same as that between ‘strongly disagree’ and ‘disagree’ (Cohen, Manion, & Morrison, 2000). When analysing such ordinal data, it is more appropriate to use tests involving non-parametric data such as the Mann-Whitney test. The aim with the teachers’ questionnaires, therefore, was to focus on global changes and trends.

**Phase 4: Implementation of intervention: Formative evaluation and monitoring of progress**

It was possible to obtain paired samples from the classes participating in student pre and post intervention questionnaires and this allowed analysis of participant-specific pre test and post test changes using the non-parametric Wilcoxon paired-sample signed-ranks test.

**Qualitative data**

Strategies for analysing data are discussed by a number of researchers including Bazeley (2009) who, for example, describes the advantages of using software packages as opposed to the use of manual methods when analysing qualitative data. Computer-based coding of qualitative data, often claimed to be more complex and more detailed than manual thematic sorting, supports the conversion of qualitative coding to variable data and “so leads to greater insights” (p. 206). In contrast, Kvale et al. (2009) believe that the “ready availability today of computer programs for coding” (p. 199) could cause researchers to prefer coding for analysis of interviews rather than other methods which are more time consuming but which could lead to a richer interpretation of the data. Consideration had been given to using the software NVivo to code the data from open-ended questions and interviews in this project but it was considered that, while the use of such software can be very helpful when analysing data, especially large amounts of data, qualitative studies are not usually as large as quantitative. Furthermore, no package can take the place of the researcher when it comes to explaining the link between data and theory (Pope, Ziebland, & Mays, 2000). It was decided, therefore, to code the data from open-ended questions in the questionnaires, focus groups, and interviews.
manually. The coding procedures were checked for reliability by a colleague who was knowledgeable but not connected with the project. The researcher made every effort to obtain high inter-rater agreement.

The replies to the open-ended questions were coded through an iterative process and then analysed according to the frequency and attitudes of various responses. To deal with responses to the open-ended question (Question 10 for teachers and Question 4 for students) asking for the attributes of an information literate person, for example, attributes were drawn from the two definitions of information literacy being used for this project (see below) and from four models, recognized in NZ. The models used are i-Lit (XXX Cluster (NZ), Action Learning (NZ), Learning for the future, (ASLA, Australia), Big6, (USA) (see Tables 4.4, 4.5). Students may have used some or all of these definitions and models at previous schools so it was important to include terminology that covered a wide variety of understandings of an information literate person.

To be information literate, a person must be able to recognize when information is needed and have the ability to effectively, locate, evaluate, and use the information. Information literate people have learned how to learn (ALA, 1989). a broad concept that embraces information skills, ICT skills and library skills along with the problem-solving and cognitive skills, and the attitudes and values that enable learners to function effectively in the information landscape (Ministry of Education and National Library of New Zealand, 2002).
<table>
<thead>
<tr>
<th>Attributes (terms taken from the definitions (above) and the models named in Col 2)</th>
<th>Information processing models*</th>
<th>Skills involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Defining Recognise need Deciding Identify problem Identify requirements</td>
<td>Westhaven Model Action Learning NZ ALA ASLA Australia Big6 USA</td>
<td>Brainstorming Mapping Questions ID of key words Planning</td>
</tr>
<tr>
<td>2 Retrieving Able to locate Finding Gather Locating Determine scope, range of resources Locate and access</td>
<td>Westhaven Model Action Learning NZ ALA ASLA Australia Big6 USA</td>
<td>Identifying resources paper, online people, media etc. ICT Keep data retrieval chart Book parts (index etc.) Website evaluation and navigation Skimming and scanning</td>
</tr>
<tr>
<td>3 Extract Use Selecting Engage</td>
<td>Westhaven Model Action Learning NZ ALA ASLA Australia Big6 USA</td>
<td>Selecting and rejecting Note taking Comparison of texts</td>
</tr>
<tr>
<td>4 Recording, Interpret Organise, analyse, process, synthesise, assess</td>
<td>Action Learning NZ Westhaven Model ALA ASLA Australia Big6 USA</td>
<td>Critical literacy Critical thinking Synthesising Evaluating</td>
</tr>
<tr>
<td>5 Create Communicate Presenting</td>
<td>Westhaven Model, Action Learning ALA ASLA Big 6</td>
<td>Styles of presenting: e.g. Writing, multimedia, oral</td>
</tr>
<tr>
<td>6 Reflection Evaluate</td>
<td>Westhaven Model Action Learning NZ ALA ASLA Australia Big6 USA</td>
<td>Critical reflection: * What am I learning? * What could I do differently? * If I haven’t learned anything–why is this?</td>
</tr>
</tbody>
</table>

*Information processing models provide students with a process containing several stages whereby the information problem is defined, information to solve the problem is located and used, and then the solution is shared in some way. This process involves critical reflection at all stages. There are many skills involved in this process which need to be explicitly taught and teachers often need to be provided with teaching strategies to enable them to do so.
Table 4.5
Key used to code use of attributes of information literacy when defining an information literate person

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Code assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil response, don’t know, or ?</td>
<td>1</td>
</tr>
<tr>
<td>Incorrect/irrelevant response</td>
<td>2</td>
</tr>
<tr>
<td>One or two attributes or skills from 1–6</td>
<td>3</td>
</tr>
<tr>
<td>(find/gather locate are taken as the same as are synthesise/process/ or present/communicate)</td>
<td></td>
</tr>
<tr>
<td>Three or four different attributes or/and assoc. skills from 1–6 (see 3)</td>
<td>4</td>
</tr>
<tr>
<td>Five different attributes or/and assoc. skills from 1–5 (see 3)</td>
<td>5</td>
</tr>
<tr>
<td>The complete process e.g. Action Learning 6 stages</td>
<td>6</td>
</tr>
<tr>
<td>ICT attributes only e.g. “good at using computers”, “knows how use the Internet”</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 4.6
Coding for teacher and student responses when asked to name the information literacy model used*

The name of the information processing model I use:

<table>
<thead>
<tr>
<th>Response</th>
<th>Code assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absent</strong></td>
<td>0</td>
</tr>
<tr>
<td>Nil response</td>
<td>1</td>
</tr>
<tr>
<td>Don’t know/incorrect</td>
<td>2</td>
</tr>
<tr>
<td>Known model–not i-Lit</td>
<td>3</td>
</tr>
<tr>
<td>i-Lit</td>
<td>4</td>
</tr>
</tbody>
</table>
Table 4.7

Coding used for teacher and student responses concerning the stages of the information literacy model used

<table>
<thead>
<tr>
<th>Response</th>
<th>Code assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absent</strong></td>
<td>0</td>
</tr>
<tr>
<td>Nil response</td>
<td>1</td>
</tr>
<tr>
<td>Don’t know/incorrect</td>
<td>2</td>
</tr>
<tr>
<td>1–2 stages</td>
<td>3</td>
</tr>
<tr>
<td>3–5 stages</td>
<td>4</td>
</tr>
<tr>
<td>All stages</td>
<td>5</td>
</tr>
</tbody>
</table>

*A frequency count was used when analysing responses to questions asking teachers to describe attributes of an information literate person, to name the information literacy process they used, and then to describe the stages of that process.

**Absent was not used with teacher responses but only with responses from students in the 2009 pre and post intervention questionnaires to avoid including data from students who were not present on both occasions.

**Interviews**

The data from the interviews were analysed for general themes, patterns, and trends according to three broad themes taken from the research question: knowledge and practice of information literacy, skill development, and professional learning.

**Focus groups March 2009 and November 2009**

The unit of analysis for the focus groups was the group rather than the individual (Morgan, 1988; Stewart, Shamdasani, & Rook, 2007). While unsuitable in some situations, it was felt that in this situation it was important to judge the progress of the group within a discussion around the themes identified, rather than to measure the progress made by individual members. In an effort to gain an impression of student responses when discussing information literacy, transcripts were stripped of all but the student responses and total word counts obtained. The transcripts were then analysed using the same themes used to analyse the student questionnaire open-ended questions: knowledge and practise of information literacy, use of an information processing model, and skill development and teacher help.

Key indicators (see Table 4.8 Table of key indicators used to consider 2009 student focus group responses) for each theme were drawn up to guide this analysis. The findings were then viewed in the light of results from the quantitative questionnaire data. The researcher was aware that findings from these focus groups cannot be projected to the project population (Krueger & Casey, 2000). The findings could, however, indicate the effectiveness, or not, of
student learning outcomes resulting from the professional learning undertaken by the teachers.

Table 4.8

Table of key indicators used to consider 2009 student focus group responses

<table>
<thead>
<tr>
<th>Topic of interviewer’s questions</th>
<th>Details from focus group</th>
</tr>
</thead>
<tbody>
<tr>
<td>An information literate person</td>
<td>Can decide what they need to find out, knows how to find answers, knows how to evaluate information, can synthesise information from different sources to answer questions or solve a problem, can communicate finds, and can reflect on process and product (taken from definitions on p. 61).</td>
</tr>
<tr>
<td>The information processing model I use</td>
<td>Cluster model = i-Lit Windmill</td>
</tr>
<tr>
<td>Description of the model</td>
<td>Has six stages Defining (deciding on topic, questions, types of questions, b/s, mapping) Retrieving (various sources, use of resources) Processing (notes, skim/scan, select/reject), synthesis strategies Creating (methods) Communicating (methods) Reflecting (in middle of windmill)</td>
</tr>
<tr>
<td>Skills used when information processing</td>
<td>Forming questions Use of key words Use of library Use of online resources Reliability of online resources eg Wikipedia Taking notes Communicating information Reflecting</td>
</tr>
<tr>
<td>Teaching of the skills</td>
<td>Teacher models ways to eg take notes or Discusses types of questions</td>
</tr>
</tbody>
</table>

Document analysis

The documentary evidence gathered during this project, from late 2007 until late 2009 by the project’s Lead teachers, was examined for any intentions or statements concerning information literacy development and/or teaching. The evidence was analysed in conjunction with the findings from the teacher and student questionnaires, the HOD interviews and student focus groups and the wiki contents. Other documentation included assignments brought to the focus groups at the end of 2008 and at the end of 2009.

The implementation documentation analysed included minutes of meetings by the Lead teachers, outlines of professional learning sessions, handouts, work sheets, wiki contents, and reports issued to principals and staff.
All documentary examples were considered alongside the data from interviews, focus groups, and questionnaires in order to demonstrate the extent to which what teachers say they do is what students gain from their instruction (Black & Wiliam, 1998). Documentary evidence was examined for evidence relating to the teaching of information literacy skills including departmental policies and any worksheets or templates used by teachers. The researcher also needed to take account of how readers understood the documents and also of what readers made of them and what they needed to know in order to make sense of the various documents—not to take the documents at face value but instead to “treat them as social products—to examine them” (Hammersley & Atkinson, 1983, p 137).

**Ethical considerations**

This research conformed to the University of Auckland Human Participants Ethics Committee (UHPEC) procedures, and approval for the study was granted for the duration of the thesis. This approval included the use of web-based questionnaires for teaching staff, and in early 2008, for students under 16 years of age. For students, this procedure involved teacher supervision and limited site access and was thoroughly discussed within the schools to ensure that the students were safe online and that anonymity could be guaranteed, in that the researcher would have no way to identify authors of particular responses. Students in the 2009 pre and post intervention classes completed hard copy, not online questionnaires. Participants were numbered and questionnaires in February and December matched by these numbers with the assistance of the classroom teachers.

**Informed consent**

Informed consent for this research was obtained from all participants: Lead teachers, teachers, and students. Care was taken when writing the participant information sheets, as it is known that the style in which these are written is one of the factors that can influence the response rate to questionnaires (Sarantokas, 2005). The information sheets for this research, therefore, were written in a friendly and non-threatening style in the hope that teachers would understand the aims of the research, feel reassured and therefore be more willing to be involved. Information given to participants (or their parents) included a description of what was involved, the approximate time involved, and assurances that participation was voluntary and confidential. Students were also given this information written in a style appropriate for their levels of understanding. Information for parents was translated into several languages.
where necessary. Students under 16 years of age were asked to sign an assent form and their parents a consent form. Older students were given an information sheet and signed the consent forms themselves.

Teacher participants were informed that they could withdraw at any time up until data were processed and also that during interviews they could choose not to answer a particular question or request that the tape or digital recorder be turned off. They were also informed that they would have the opportunity to read and edit the transcript of their interviews if they wished (Kvale & Brinkmann, 2009) but no HOD or other teacher chose this option. They were informed that the transcriber had signed a confidentiality agreement. Students were also informed that they could withdraw at any time up until data were processed. Those who were part of focus groups were informed that withdrawing their data might be more difficult as no names were used during the group discussions and it could be difficult to identify voices in the case of a student wishing to withdraw. If teachers or students chose not to participate, or parents indicated they did not wish their children to participate, they were all informed that the researcher had an assurance from the principals and teachers, respectively, that participation or non-participation would not affect relationships with the school. Participants were also assured that all data would be stored in secure storage in the Faculty of Education for six years. Participants were also made aware that while data might be published in academic journals or presented as part of conference papers, every effort would be made to ensure participants would not be able to be identified.

One possible ethical issue, in the sense of providing data for the research, was that principals might have persuaded their staff to be involved. However, HODs and teaching staff could not be required to participate and assurance was sought from principals to reassure HODs and teachers that, whether or not they participated, their working conditions would not be affected in any way.

A small number of schools were involved, and while they might be able to be identified, participants, staff and students, are not able to be identified. Teacher questionnaires were anonymous, as requested, and teacher interviewees were identified by numbers only. Students were identified by year level and class and, where necessary, by numbers but not by name.
Validity

It is important when carrying out research, to check the validity and reliability of the research findings so that researchers can draw “meaningful and justifiable inferences from scores [or other data] from a sample or population” (Creswell, 2005, p. 600).

Validating findings in qualitative research involves the researcher in determining the accuracy or credibility of the findings through a strategy such as triangulation (Creswell, 2008, p. 600) where data from a number of separate sources are “brought to bear on the research question” (Richards, 2005, p140). Robinson and Lai (2006) describe four key strategies for increasing validity whereby procedures are needed: to reduce bias in the selection of information; to increase the accuracy of the description of what has been selected; to increase the plausibility of interpretations made through for example, audit trails and triangulations and to establish the reasonableness of conclusions using participant feedback. Validity depends on how well these procedures are completed.

The use of an additional independent coder, who sampled a large proportion of the data, assisted with the reduction of bias in this study. The accuracy of the description of the material selected was increased by referring to the work of recognised authorities. Different sources of evidence (Davidson & Tolich, 2003), including interviews with Lead teachers and HODs, focus groups involving students, and the examination of documentation were used to investigate the research problem in more detail. Triangulation in this study was achieved by cross-checking, for example, of student and teacher reports. When teachers were asked how and what they taught students about information literacy, students were asked how their teachers taught them about information literacy and relevant assignments examined. It was hoped that the use of several different sources of evidence would enlarge on, affirm, or challenge results from the questionnaires, thus ensuring greater validity.

Furthermore, in terms of the use of a formative and design experiment approach when discussing the findings from this study, it is useful to examine Krathwohl’s (2009) five judgments of internal validity, particularly the first of two judgements that constitute initial conceptual evidence, namely explanation credibility and the first of three judgments constituting initial empirical evidence, demonstrated result, and relate them to the current study. These judgements are referred to by Reinking and Watkin (2000) who point out that in the formative and design experiment approach, statistical analysis of quantitative data is not
necessarily conducted to establish unequivocal causal relationships (Tashakkori & Teddlie, 2010) but instead is “conducted to support or refute inferences about linkages among certain factors or events” (Reinking & Watkins, 2000, p. 398) thus enhancing Krathwohl’s (2009) explanation credibility judgement. Along with the other judgement, demonstrated results, these can be seen to “determine what factors enhance or inhibit progress towards a pedagogical goal” and that success in negotiating those factors to achieve progress towards the goal “comprise a measure of validity and thus quality”(Reinking & Watkins, 2000, p. 398). The use of the formative and design experiment lens therefore in this study serves to reinforce the validity of the findings as well as better encapsulating the complexities of the project.

External validity or the “generalisability of findings” (Davidson & Tolich, 2003, p. 32) can be problematic as the results may apply only to a very specific setting. However, one can be reasonably confident that the findings from this particular research are valid as the results from several research reports provide support for the overall findings regarding New Zealand students’ lack of knowledge and practice of information literacy skills (Education Review Office, 2005; Flockton, et al., 2006; Hipkins, 2006; Probert, 2006). The Education Review Office report into the “Information Landscape in schools” stated that many students, especially in secondary schools, were not developing information literacy skills and that most schools were not using a model of information processing to help students process information (ERO, 2005). The National Education Monitoring Project (J. Smith, et al., 2010), when investigating information skills, found that skill levels were not increasing and mentioned several areas of concern including the inability of many students to explain how they carried out research and student’s poor skills when using online sources of information. Hipkins (2006), investigating what students understood research to be, concluded that mostly they were just carrying out information retrieval and repackaging. The researcher’s MEd thesis involved an investigation into teacher understanding and practice of information literacy at three Auckland secondary schools and reported results that are similar to those obtained in the needs analysis phase (Chapter 5).

Reliability

Reliability is concerned with consistency over time and with internal consistency (Punch, 2009). Individual scores from an instrument should be nearly the same or stable on repeated administrations of the instruments and they should be free from sources of measurement error.
and should be consistent (Creswell, 2005, p. 600). A method is reliable if the results can be reproduced regardless of researcher, conditions, or respondents (Sarantakos, 2005). There are various techniques which can be used to increase reliability or consistency, such as the use of a second independent coder as described below.

**Interrater reliability**

Using more than one analyst when coding data from, for example, interviews or open-ended survey questions is a recognised method to improve the consistency or reliability of data and to help to avoid the accusation that results are based on the subjective findings of one researcher (Pope, et al., 2000). The coding of data in this research, therefore, was independently checked for reliability by a second coder. The second coder was an experienced teacher and teacher educator, involved in a range of educational contexts over the last 20 years. This person was given the coding for the open-ended question in the student questionnaire, “An information literate person is able to…..” and checked the attributes the researcher had used when coding replies. She then, using the unmarked, completed questionnaires, coded the first five responses from each of the six classes involved in the paired sampling, 20 in all. The same process was followed for five other open-ended questions and included much discussion. Coding used for teacher interviews were also examined by the second rater using unmarked transcripts of teacher interviews. After more discussion an agreement rate of 96% was achieved for the teacher transcript coding of open-ended questions, and further discussion between the researcher and the rater resolved most of the differences, resulting in a 98% agreement. A 95% agreement was reached regarding the teacher interview transcript coding and, again, further discussion resulted in 99% agreement. Percentage of inter-rater agreement was calculated using the formula below. Previous material was recoded according to the agreed resolution of differences.

\[
\frac{\text{Total number of ratings that agree}}{\text{Total number of ratings}} \times 100 = \% \text{ agreement}
\]
Limitations

When planning this research, the researcher recognised and acknowledged as many limitations, potential weaknesses or problems as possible (Creswell & Plano Clark, 2007) and has therefore attempted to anticipate any possible limitations.

There were several issues which arose concerning the use of online questionnaires. It was decided to accept the Faculty of Education, University of Auckland invitation to use their newly set up web survey design service, partly for convenience, but also as data storage on campus seemed a more secure option than using a service such as surveymonkey.com. However, unexpected problems arose when the webmaster involved was seconded to work on the University of Auckland’s new website for some months. This made updating of the questionnaire for use during the second year more difficult and resulted in several delays.

Another issue also related to the use of online questionnaires concerned teachers, after one teacher warned that she was sure most teachers would not want to use such a format despite the fact that many teachers in New Zealand are issued with laptops and that the three schools involved in the project had excellent campus-wide wireless networks. The researcher, concerned at hearing this, arranged a discussion about online questionnaires during project information meetings in all three schools. As it turned out, possibly because fears were allayed, the teachers embraced the use of online questionnaires, commenting on their efficiency and time-saving qualities.

Several issues however arose that exemplified the ‘messy’ situation and unexpected circumstances that can arise when working within schools. One issue occurred when teachers at one school and then at the others, insisted on complete questionnaire anonymity. This resulted in the inability of the researcher to carry out statistical testing as had been planned, as it was not possible to pair up respondents in order to carry out the paired-samples t-test. It appears that there may have been some conflict between staff and the former Lead Teacher, which could account for many staff at School B only participating if anonymity could be guaranteed. Unfortunately, this situation was not fully revealed until interviews were carried out in March 2009.

Another issue involved the frequent changes of staff, particularly those who had been leaders of the project. A Lead teacher from School A left early in 2008, just as the professional development was starting. The new Lead teacher found it difficult at first to catch up with
developments. The Lead teacher who helped plan the whole development, left School B at the end of 2008. The teacher who replaced her within the school (HOD of a large department) had to work hard to learn more about information literacy and to work with the Lead teachers in the other schools. Both the Lead teachers at School C changed, one early in 2008 (the new Lead teacher then took over the organisation of the whole project) and the other in late 2008. This resulted in delays as both teachers gained sufficient knowledge of and confidence in the project.

Time was a limitation for this project in several ways. The Ministry of Education, after the government changed in late 2008, cut the funding for EHSAS contacts with the result that this contract ended in 2009 and not in 2011.

The next chapter, Chapter 5 has three parts: Part 1: Needs analysis, Part 2: Designing the intervention, and Part 3: Implementing the intervention. Part 1 of the chapter describes the data collection carried out for the needs analysis upon which the design of the intervention and its implementation was based. Part 2 describes the procedures followed when designing the intervention and Part 3 describes the implementation of the intervention that the Lead teachers designed.
Chapter 5 Needs Analysis

Part 1: The needs analysis, the findings and discussion

Part 2: Designing the intervention

Part 3: Implementing the intervention

This chapter has three parts. Part 1 describes the needs analysis, (Phase 2), carried out to discover how teachers and students understood the concept of information literacy and how they practised it in their classrooms. The findings from this needs analysis are then described and discussed. Part 2 describes how the Lead teachers, informed by the findings, designed the intervention which was underpinned by a detailed information processing model with accompanying support material (Phase 3). Part 3 part briefly describes the implementation of the intervention at the three schools. The findings from the monitoring carried out to evaluate progress of the intervention (Phase 4) are described in Chapter 6.

Introduction

The three principals of the cluster schools, A, B, and C, as described in Chapter 1, had identified information literacy development as their major goal when applying for an EHSAS contract in 2006/7 from the Ministry of Education. The principals and team who wrote the funding proposal had been concerned at the apparent low information literacy levels among students and had already carried out an information literacy audit. This revealed that no policies were in place in any department of the three schools and that information literacy was not mentioned in any curriculum scheme. In the proposal, they detailed their aims to “empower students to become independent learners” by focusing on developing school-wide information literacy processes and extending creative and critical thinking skills (Pasley, et al., 2007).

Part 1: The needs analysis, the findings, and discussion

Data collection overview

As detailed in Chapter 4 (Table 4.3), data were collected to establish existing levels of knowledge and practice regarding information literacy. Teachers were asked to complete online questionnaires at the end of 2007 (Appendix A). Students from the three schools were asked to complete online questionnaires early in 2008 (Appendix B). Interviews were held
with teachers in early 2008. Focus groups with participating students were held during March, 2008.

The 2007 teacher questionnaire contained 44 questions in three parts. Part 1 gathered demographic information, queried previous professional development concerning information literacy, and included one open-ended question asking participants to complete the statement “An information literate person is someone who…” Part 2 contained questions exploring attitude using a Likert response scale and three open-ended questions. Part 3 contained questions using a Likert response scale to explore the frequency of aspects of teacher practice and one open-ended question.

Open-ended questions in both questionnaires were coded and analysed.

Interviews were conducted with five heads of subject departments (HODs) at Schools A, B, and C in early 2008 (Appendix C). Student focus groups were also held at this time with two focus groups from School A and three groups from both Schools B and C. Each group involved up to six students who volunteered to participate (Appendix E).

Data from the semi-structured interviews and focus groups were used to expand on data from the questionnaires and to provide “the lived experience of other people” and “the meaning they make of that experience” (Axinn & Pearce, 2006, p. 9). The researcher also requested any documentation used within the schools that could be associated with information literacy.

After discussions with the Lead teachers designing the intervention, it was decided to group the data for analysis and report under the following headings in order to provide as full a picture as possible of teachers’ current understandings and practice of information literacy:

1. Demographic information
2. Understandings of the concept of information literacy
3. Teacher practice
4. Teacher expectations
5. Areas where help would be welcome.
Findings from teacher questionnaire and interviews

1. Demographic information: (see Table 5.1 and 5.2)

There was a good response from teachers invited to complete the questionnaire online at the end of 2007, with 147 responses from a total of 200 teachers, 120 female and 27 male, who chose to participate. As can be seen from Table 5.1, fewer teachers from School B chose to participate in the project than from School A or School C. School B and C are girls schools, which could account for the greater number of female teachers employed. All three schools had teachers represented in all four age groups (see Table 5.2) although the majority of teachers at School A were in 20–40 years age group (68%) while the majority of teachers at School B (74%) were aged 40–50+ years. At School C, 50% of teachers were aged 20–39 years and 50% aged 40–50+ years. The majority of teachers at School A (72%) had less than 10 years teaching experience while the majority of teachers at Schools B and C had been teaching for over 10 years. At School B, 28% had been teaching for over 20 years and 33% at School C. The majority of teachers at all three schools had been trained in New Zealand (98% from School A and 90% from School B) with School C having the greatest number of teachers (23%) trained in UK, Australia, South Africa, or India.

Table 5.1

Teachers who participated in 2007

<table>
<thead>
<tr>
<th>School</th>
<th>Staff</th>
<th>2007 participants</th>
<th>% of teaching staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25</td>
<td>25</td>
<td>100%</td>
</tr>
<tr>
<td>B</td>
<td>119</td>
<td>71</td>
<td>60%</td>
</tr>
<tr>
<td>C</td>
<td>56</td>
<td>51</td>
<td>91%</td>
</tr>
</tbody>
</table>
Table 5.2

Demographic information: Teachers who chose to participate in 2007

<table>
<thead>
<tr>
<th>Ages of teachers</th>
<th>n</th>
<th>20–29 yrs</th>
<th>30–39 yrs</th>
<th>40–49 yrs</th>
<th>50+ yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>25</td>
<td>24%</td>
<td>44%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>School B</td>
<td>71</td>
<td>14%</td>
<td>39%</td>
<td>32%</td>
<td>42%</td>
</tr>
<tr>
<td>School C</td>
<td>51</td>
<td>17%</td>
<td>33%</td>
<td>23%</td>
<td>27%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years in teaching</th>
<th>9 years or less</th>
<th>10–19 yrs</th>
<th>Over 20 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>25</td>
<td>72%</td>
<td>20%</td>
</tr>
<tr>
<td>School B</td>
<td>71</td>
<td>47%</td>
<td>28%</td>
</tr>
<tr>
<td>School C</td>
<td>51</td>
<td>41%</td>
<td>29%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Where trained</th>
<th>NZ</th>
<th>UK, SA, Australia</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>25</td>
<td>98%</td>
<td>2%</td>
</tr>
<tr>
<td>School B</td>
<td>71</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>School C</td>
<td>51</td>
<td>77%</td>
<td>21%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subjects taught</th>
<th>English</th>
<th>Maths</th>
<th>Science</th>
<th>Social Sciences</th>
<th>Art/Music/PhysEd/Technology/Religious Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>25</td>
<td>Specialised teaching of English and mathematics. Other subjects taught by class teacher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School B</td>
<td>71</td>
<td>23%</td>
<td>17%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>School C</td>
<td>51</td>
<td>24%</td>
<td>12%</td>
<td>16%</td>
<td>20%</td>
</tr>
</tbody>
</table>

School A, although an intermediate (middle) school, was organised along the lines of a secondary school where specialist teachers taught English and mathematics. Although 40% of teachers at School B did not respond to the questionnaire, those who did represented all teaching areas, with the majority teaching English, mathematics, science and social sciences followed by art, languages, physical education, art and music. The teaching subject spread of respondents in School C was similar; 91% of teachers there responded to the questionnaire. The smaller proportion of teachers at School B than at Schools A and C who chose to respond appeared to be due to their lack of conviction about the aims of the cluster proposal. Some who did respond were suspicious of the purpose of the questionnaire and did not wish to be identified in any way. This attitude could possibly be traced to the problems the original Lead teacher at this school had with some staff. Teacher comments made to and subsequently reported by the Lead teacher in School B, July 2008 included “I can’t stand having to go to more meetings”, “We don’t want to be told what to do” and “We already do this”. Another commented that she thought students were “sick to death of research” as if there was no point pursuing any concerns. Such comments reflected negative attitudes held by a number of staff at this school. The Lead teacher estimated that while only 10% of the teachers were not happy about the need to undertake this professional development, the percentage seemed much greater due to the frequency and volume of their objections.
Previous professional development experience

When asked if they had participated previously in professional development aimed at improving information literacy practice, and if so, to describe details about the course, 38% of the teachers at School A responded that they had. One teacher named a recognisable course while the remainder did not give details or indicated they did not know the name of the course or described a course unconnected with information literacy. At School B, half of the 71 participating teachers replied that they had taken part in professional development but only three of those gave the name of a recognisable course, two named ICT courses and the remainder either did not give further details or referred to unrelated courses. At School C, 36% replied they had undertaken such professional development. Two teachers named a recognisable course while the remainder either named unrelated courses or gave no details (see Table 5.3).

Table 5.3

<table>
<thead>
<tr>
<th>School</th>
<th>Staff</th>
<th>Yes</th>
<th>Course named and described</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25</td>
<td>38%</td>
<td>4% (n=1)</td>
</tr>
<tr>
<td>B</td>
<td>71</td>
<td>49%</td>
<td>4% (n=3)</td>
</tr>
<tr>
<td>C</td>
<td>51</td>
<td>36%</td>
<td>4% (n=2)</td>
</tr>
</tbody>
</table>

2. Understanding the concept of information literacy (see Tables 4.4–4.7)

When investigating teachers’ knowledge and understanding of information literacy, the group of Lead teachers saw the responses to the open-ended question ‘An information literate person can…..’ as the starting point upon which to base the design of the intervention. The questionnaire responses revealed that few staff at any of the three schools appeared to have a good understanding of the qualities of an information literate person as related to the researcher’s stated definitions (see Chapter 4). The responses from School A were divided, with one third of teachers not responding or giving irrelevant responses, one third giving one or two attributes and almost one third understanding information literacy as exclusively concerned with the use of information and communications technologies (ICT). Three teachers, from School A, when interviewed, stressed the use of ICT by an information literate person, and made comments such as “Someone who can utilise all forms of technology” The
remaining two teachers demonstrated more understanding by providing four or five attributes, such as the comments, when interviewed, from two teachers who talked about “using a range of sources” and “using any sort of information whether from books, internet or oral, interpret it and use it for a purpose”.

When asked to describe an information literate person, participants from School B, by identifying one or two attributes only, had the greatest number of responses demonstrating limited or little understanding of information literacy. Three teachers did, though, identify three or four attributes, a higher response than the other two schools. Three HODs, when interviewed, talked about “articulating what you want to find out”, “understanding resources, scanning stuff” and “having strategies to enable you to judge the worth of the information” and certainly seemed to have a better understanding than appeared to be the case according to the tenor of the questionnaire responses. Of School C participants, again, over half had limited or little understanding. Only one teacher, at School C was able to describe all the attributes of an information literate person according to the criteria compiled for the coding process. Again, though, three of the HODs interviewed at that school referred to skills and aspects of information literacy such as scanning, interpreting and understanding the problem. This appeared to indicate a slightly better understanding than that shown in the School C questionnaire responses.

The Lead teacher from School A suggested that the greater emphasis teachers there placed on the use of ICT could be partly be due to the fact that the school had recently taken part in a Ministry of Education ICT contract to develop the use of ICT across the curriculum which had the effect of emphasising the use of ICT in all areas of school life. Further light on School A teachers’ confusion of information literacy with ICT was revealed by teacher responses to a question later in the questionnaire where teachers were asked to agree or disagree with the statement that information literacy skills were mostly concerned with ICT. The majority at School A agreed with this statement while the majority of teachers at Schools B and C did not. Those teachers appeared to recognise that information literacy skills include a wider range of skills than just those associated with the use of ICT even if they did not demonstrate much familiarity with the actual concept of information literacy. Teachers at

---

6 The Ministry of Education Information and Communication Professional Development (ICT PD) cluster programme began in 1999 and continued through 2011. Clusters of schools were part funded to work together to explore and foster innovative use of ICT in the classroom to support teaching and learning.
School A thought information literacy was mostly concerned with ICT and also that information literacy skills were the same as library skills. Teachers at Schools B and C did not confuse information skills with library skills.

During interviews there was some further concern expressed by HODs from School B about the use of ICT, with one teacher admitting that while she knew she was supposed to think that using computers was really important, she still thought “books are really important for gathering information and [at her teaching level] actually easier to get the right information from”. Another HOD, also at School B, stated that there was “too much keyboarding. Exams are handwritten so they need to use a pen”.

Overall, those participants with some or good understanding of information literacy taught English, languages and social studies while those with less understanding of information literacy taught mathematics, science, technology, health and physical education.

3. Teacher practice

Use of a model

While the majority of teachers at School A said they used an information processing model when students were engaged in research,\(^2\) most could give no details. A teacher there had introduced her own school-wide, six stage model for information processing to teachers and students in 2006 before the formation of the cluster. This teacher reported that she had also carried out teacher professional development and ensured that diagrams of the model were on the walls of every classroom. She assumed that the questionnaire findings would reveal that teachers at School A were familiar with her school information processing model and was very surprised, therefore, to find that while over half of School A teachers said they used and could name the model, very few teachers could actually describe the process. It became obvious that, contrary to her expectations, the model was not being used in the way she had expected, presumably because it had not been sufficiently understood and embedded in day-to-day classroom teaching. This became clear from interview responses from other School A teachers which included:

“Can’t remember the details”

“The language keeps changing, like immersion became ignition”
“I use my own model. Each [school] term I figure out what worked well and what didn’t and discard any, just improve it really”

“Off the top of my head, it has a whole lot of stages where you go through you know sort of the ignition and I can’t remember all the names of all the steps”

One teacher described “spending a session talking about how to design research from my own experience” but could not give any specific details.

The majority of teachers in Schools B and C either indicated that they did not use a model or did not respond when asked to name and describe any model, even though the names of well known and commonly used models were provided as examples in the questionnaire. When interviewed, one HOD at School B said that students “get information on processing information from common sense and synthesising bits and pieces”. while a HOD at School C remarked that, after being told about a proposed school model, “we were aware that [using] the model would have helped students but we went away and continued on our own way basically”. Another teacher at School C said he thought there was a model but that it was up to individual teachers to use it while another teacher there could describe the way she would teach students to research a topic although she was not using a formal information processing model.

When asked to describe the model they used, teachers’ responses that were deemed irrelevant or inadequate included ‘Inspiration’, ‘my model’ or ‘dot and jot’. Inspiration is a software program used for mind mapping, which, while it could well be used in the information literacy process, is not an information processing model. Again ‘dot and jot’ is a note taking method, which can be used in the information literacy process but it is not an information processing model. The response of ‘my model’ was considered insufficient as no other details were supplied, even when given the opportunity to describe ‘my model’ in a later question.

**Teaching and modelling of skills**

The majority of teachers at all three schools indicated that they often or always modelled skills such as brainstorming, categorising information, taking notes, mind-mapping and thinking skills, presenting information and finding information in books. Fewer reported that they always modelled methods of finding information online although the majority at each school sometimes or often did so. This finding applied also to modelling methods of
engaging in critical reflections. The interview responses, though, did not corroborate these ratings in that few teachers interviewed from any school could, for example, describe methods or strategies they used for teaching students to take notes, categorise material, skim and scan information or evaluate information from books or from websites. Two HODs at School A could describe the methods they used to teach note taking but another from that school responded with “Um, I’m just trying to think. I haven’t done a lot of that this term. I know a lot of skills like this are worked on with my form class you know... and just giving them, I guess I sort of talk about the basics of it and you know obviously you don’t want to write heaps”. Five secondary HODs from Schools B and C, after several minutes of thought, stated that they expected the students to already have such skills so did not teach them. Another HOD, from School C, stated that “it was pretty unstructured and informal”. An HOD from School B referred to teaching the dot and jot note taking method “Most of us use the sort of dot and jot” but could provide few details. Two further HODs from School B and three from School C complained that students did not know how to take notes but could not describe how they should be taught nor did they indicate that they, as the teachers, would be teaching these skills. Another HOD in School C thought a teacher in her department did explicitly teach a variety of information literacy skills but was not sure how this was done. Another stated that it was “hard to find the time”.

One HOD, from School B, did give a lot of detail about teaching skimming and scanning, stressing the importance of key words and described rapid reading techniques although there was no departmental policy in place. “We’re quite experienced here so I guess everyone has evolved their own techniques but it depends on the class”. No other HODs in any school who were interviewed, could describe methods for teaching students to skim and scan material. A teacher at School A, when asked about website evaluation, stated “I haven’t thought about that, the websites we use in the science programme - I haven’t really done an evaluation to be honest”. One HOD mentioned that his students use Wikipedia and he expressed no problems with that while another HOD at the school was more critical, saying “Yeah but that can be dubious as well because people add to it and yeah it’s difficult”. Another teacher at School A said that “for me pretty generally I just talk about that just because something is a website doesn’t mean it’s providing good information” and went on “it’s just kind of general discussion”. One HOD in School B thought using online sources had been covered in the library but no HOD at any school could give explicit details for teaching website evaluation.
An HOD at School C did comment that this “might be good idea” while another said she “wouldn’t say that I’ve taught them explicitly to evaluate websites”. Another commented, when asked if she taught her students to evaluate websites, “No, not really, as staff we tend to have a look at the website, has it got the information we require on there? Is it pitched at the level we need and, if it is, then we’ll stick it onto the intranet site”. No HOD could provide or describe departmental policies for the development or assessment of information literacy skills.

These findings are interesting given that, according to questionnaire responses, a clear majority of teachers from all schools, A (88%), B (73%) and C (88%) believed information literacy skills needed to be explicitly taught. Almost half the teachers at School A (48%) also believed the skills would develop naturally over time although teachers at Schools B (56%) and C (55%) did not. It appeared from the interview responses that, despite questionnaire responses to the contrary, teachers were not explicitly teaching the skills, despite believing that the skills should be explicitly taught.

4. Teacher expectations

Teachers at all schools expected student to arrive at their schools with good information literacy skills and took for granted that this was the case. Checking the skills of new students did not seem a priority at any of the schools. At School A, two thirds of teachers never checked these skills at the start of the year with the same proportion at Schools B and C rarely or sometimes doing so. According to responses during HOD interviews, reportedly no HOD could describe how they checked skill levels and most admitted to never doing so although they conceded it would be a good idea. They were also unsure whether teachers in their departments did so and stated that:

“there is no formal technique for doing so. I think I can tell after a few weeks”

“We test for literacy and numeracy and that’s all”

“They’ve done it at intermediate school and you can’t plan or orchestrate it”

“I just assume they have no understanding of inquiry process whatsoever and start from there”

“Most teachers walk around the classroom and can see what they’re doing”
One teacher felt there was no point asking the students as they would not understand what the teacher was talking about. “We don’t ask the kids, very few of them actually know the language because it’s all teacher speak”.

5. Areas where help would be welcome

When asked if they would find it helpful to have a common method or process to use with students, a large majority of teachers at all three schools, A (80%), B (76%), and C (84%) agreed or strongly agreed that this would be helpful. Again, the majority of teachers at each school (96%, 81% and 86%, respectively) agreed or strongly agreed that it would be helpful to have a school-wide information literacy development plan and even higher proportions (96%, 88% and 88%, respectively) agreed or strongly agreed that it would be helpful if they were provided with a variety of strategies for teaching information literacy skills. When interviewed, many welcomed the idea of professional development to introduce a cluster wide model for information processing although an HOD pointed out that “very often these things are implemented and then they’re not seen through to fruition and I feel, I mean, in the last few years we have had habits of mind, thinking, literacy, extending high standards, we’ve got careers, we’ve got sustainability [professional development programmes] and that’s in the last two or three years Now I feel it’s really good and we have to change and … but I’m really concerned about burnout”.

Reported findings from student questionnaire and focus groups: February 2008

The student questionnaire consisted of 18 questions (Appendix B). Early questions gathered demographic information; a group of questions probed students’ understanding of information literacy while other questions, using a Likert response scale, investigated students’ current classroom practice and areas where they would like help. Eight focus groups discussion were also held with students from two randomly chosen classes from School A and three from each of Schools B and C. Each group consisted of approximately six students who volunteered to participate. The data from these focus group discussions were used to illuminate the findings from analysis of the data gained from the questionnaire.

(Note that these focus groups were not interviewed again. The focus groups were only used at this time to contribute information to help the Lead teachers design the intervention).
When considering the data in order to analyse student learning needs, the Lead teachers decided, where possible, to use the headings that were used when analysing the teachers’ questionnaires.

1. Demographic information
2. Understanding the concept
3. Classroom practice
4. Areas where help would be welcomed

1. Demographic information

All students in the target year levels (Years 7, 8, 9) at Schools A, B, and C who were present on the day in February 2008, and who had permission from parents or caregivers, completed the online questionnaire:

Table 5.4
Demographic information for students in 2008

<table>
<thead>
<tr>
<th>School</th>
<th>n</th>
<th>Level</th>
<th>Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>515</td>
<td>Years 7, 8</td>
<td>11 and 12 years of age</td>
</tr>
<tr>
<td>B</td>
<td>271</td>
<td>Years 9, 10</td>
<td>13 and 14 years of age</td>
</tr>
<tr>
<td>C</td>
<td>130</td>
<td>Years 8, 9</td>
<td>12 and 13 years of age</td>
</tr>
</tbody>
</table>

2. Understanding the concept

Responses to the student questionnaire indicated that students had very little understanding of the concept of information literacy. When asked what they thought information literacy was, the majority of student responses at all three school indicated that they did not know although 18% of students at School C gave responses that indicated they had some knowledge. When asked if information literacy skills are the same as library skills, again the majority of students at all three schools responded that they were unsure. When asked if information literacy skills were the same at ICT skills and if information literacy was mostly about using ICT, the majority at all three schools were unsure. When discussing information literacy in the focus groups, most students talked about doing research and using Google as their first source of information. Very few mentioned using the library at all and none connected the library or the use of ICT with information literacy.
3. Classroom practice

Evidence of students’ lack of knowledge or uncertainty about information literacy was further seen in their responses to questions about any information processing model they might use. The majority of students at all three schools said they did use an information processing model. However, when asked to name the model, over 90% at each school did not reply or did not know, even though the names of well known models were provided as examples, and well over 90% from each school did not reply or did not know when asked to describe the stages of any model they used. They all agreed that they used the term research to describe assignments where they had to investigate a topic although several students from School A preferred the term ‘inquiry’.

One interesting finding concerned the situation at School A described earlier, which involved the introduction of her own information processing model by a teacher at that school. She had been surprised at how little the teachers knew about the process and was even more disappointed at how little the students knew. Before the Year 8 focus groups were held, the teacher had told the researcher that these students would know a lot more about information literacy processing than the Year 7 students in another focus group who had only been at the school a month or so. This was due to the introduction the previous year of her information processing model to all classes. During the discussions, though, it was clear that the younger Year 7 students, newly arrived from their previous primary schools, were actually very familiar with information processing and referred to components of models used at their previous schools. Descriptions of the process they used included “we had to get questions”, “we’d figure out some questions”, “we’d find answers and then we’d display it and we’d just show everyone else”. Another student referred to “the five Ws. who, what, where, why and when” and another described how his class would “brainstorm ideas for a topic”. The group talked about skim reading, making notes and using headings and keywords and the difficulty of writing material in their own words “You’ve got to change the sentence pretty much completely but saying the same thing. It’s quite hard”. One student could offer advice on using the internet such as noting domain names and he also described the benefits of adding K12 to search terms to get material more appropriate to school students. It was interesting that this knowledge was not evident in the students’ questionnaire responses.

The Year 8 students, on the other hand, did not demonstrate quite such familiarity with a research process. They seemed unfamiliar with the School A process they were said to be
using, and yet had forgotten the processes used at their previous primary schools which were largely the same schools the Year 7 students had attended\textsuperscript{7}. They did discuss some aspects of information processing, such as question formation and not copying and pasting material but not in as much detail as did the Year 7 students. One student, who was familiar with the possible pitfalls of using Wikipedia, said his father had taught him about using the internet. The other students could not describe any method for evaluating the usefulness or worth of websites.

The teacher who had introduced the model at this school, said later that she had not taken into account any skills the students might bring with them to their new school but that “\textit{we all}” tended to view Year 7 students as ‘\textit{blank canvases}’. When she was able to put the results from the students’ questionnaire responses and focus groups alongside the questionnaire and interview findings from School A teachers, this teacher realised that her professional development was not as effective as she had believed.

At School B, a minority of Year 9 students could still remember processes used at their previous schools although most associated research with the use of Google and were confused by encountering different methods in different subject areas. “\textit{They do it differently in each subject}” and “\textit{They give you a certain format and you have to use it}”. One student used the term ‘define’ in relation to a topic she might study and others mentioned skimming and scanning. They thought they knew about key words although their description of when they would use keywords only concerned Google. Another student, when asked about taking notes, mentioned the dot jot method and could describe it while others said they used a star instead of a dot, demonstrating some familiarity with the strategy. These students did not have any strategies for assessing the value of websites. The other group, from Year 10, did not seem to know a lot more about information processing although they mentioned taking notes and key words. One thought it was possible to use a process called \textit{The six steps of learning}, seen in the school library, although the student who contributed this could not give any further details. The students thought they had heard of the dot jot note taking method and they could remember doing ‘savvy searching’ in the library when looking for information on the internet for science.

\textsuperscript{7} The researcher noted that two of the contributing primary schools attended by the Year 7 focus group students had undertaken whole-staff information literacy training as part of the University of Auckland Graduate Diploma of Education qualification during 2006 or 2007.
Students at School C described, in focus groups, how they went about carrying out research. Some of the groups were familiar with key words and using bullet points for taking notes, which they said they had learned about in previous schools. Not all in the groups knew about these aspects and their teachers at School C had not mentioned them. “I think they think we know these things” said one student. One group in School C used an information processing model introduced by their Social Studies teacher. These students were familiar with the terms and could describe the process. They were knowledgeable about various aspects such as key words, topic sentences, skimming and scanning, focus questions and had been taught to use at least three sources of information when answering a question. One student also added that reflection was important and that “you did a reflection question”. They knew a little about website evaluation, although when asked if they had a list of criteria to check, replied “no, we just know”. Students explained they did not like using books because “they are not as helpful as the computers”, “you can’t ask specific questions” and “sometimes you can’t understand the text”.

4. Areas where help would be welcomed

When asked in the questionnaire if they would like a plan or model to use when dealing with information, fewer than half the students from School A, 43%, agreed or strongly agreed they would while 24% were undecided. At School B, 54% agreed or strongly agreed they would while 29% were undecided and at School C 67% agreed or strongly agreed they would while 26% were undecided. From these results it is probable that many students, not familiar with the concept or practice of information literacy, did not realise that using an information processing model could be helpful to them. During focus groups though, students were more positive and several students in each group expressed support for a common method as “it would be much less confusing”. The response was more positive from all three schools when students were asked if it would be helpful if teachers taught them more ways of dealing with information. The majority of students in all three schools agreed with this suggestion. One student at School C, for example, said she had not been taught how to take notes “it’s up to you what you want to do while another stated that “we just do it our own way”.

Documentation

Teachers were asked to supply any documentation they might have that involved information literacy skills or research/inquiry learning models and/or methods. The HOD Social Studies at School C was the only teacher interviewed there who discussed the use of a model and
supplied documentary evidence demonstrating how the model was used in her subject. This teacher supplied work plans, drawn up in 2007, for 2008 Year 9 classes in Terms 2 and 3, using an unnamed model. Worksheets led students though a process of inquiry including defining their topics, retrieving and processing material. The model did not have a title and was not used by other departments but the HOD realised a cluster model was about to be designed and welcomed this progress. The HOD at School A who had introduced her own process, again described her disappointment at finding teachers and students seemed unaware of it, despite diagrams on classroom walls and some professional development given to staff. No other HODs interviewed could supply relevant documentation relating to the development of information literacy or research/inquiry methods.

**Discussion of findings from teacher and student data**

These findings were important as they had serious implications for the cluster-wide professional development that was planned. The lead team saw that the intervention they were designing would need to take into account the fact that very few of the teachers had much understanding of the concept of information literacy. They acknowledged that any professional learning they put into place would need to focus on ensuring that teachers understood the reasons for making changes and that they gained a good understanding of this concept if they were to achieve the desired long term changes in cognition and behaviour (Guskey, 2002; Timperley, et al., 2007; Zwart, et al., 2007). The experience of the School A teacher, who had introduced an information processing model and accompanying professional development to the teachers at her school only to discover later that this had not been the success she had thought it had been, provided a good example of the complexities involved and the need for ongoing monitoring when introducing such change (Ball & Cohen, 1999; Guskey, 2002; Poskitt, 2005).

The findings from the section in the teachers’ questionnaire which explored teachers’ classroom practices gave a good example of the benefits of using a mixed method methodology (Creswell & Tashakkori, 2007a). By not relying on ratings data alone, one can gain an “appreciation of multiple ways of knowing” (Brewer & Hunter, 2006, p. 153) through including data from other sources. The majority of teachers appeared, from the questionnaire responses, to model a variety of skills for their students. Interviews with HODs, and focus groups with students, however, revealed that a number of skills were reportedly not modelled at all nor explicitly taught. These responses were also interesting, particularly as the
interviewer, mindful of the observations of Elbaz (1981) and Claxton (2000), tried to give interviewees as many opportunities as possible to describe methods for teaching skills such as note taking and website evaluation, and also to report on any related school policies. Considering that all the schools had recently been involved in Literacy initiatives, it could have been expected that all teachers at School A and some at School C who taught Years 7 and 8 students would have been familiar with the book *Effective literacy practice in Years 5 to 8* (Ministry of Education, 2006a) which was distributed to all schools. This book contains a section on information literacy, including a `definition and explanation of the importance of teaching the skills, many of which should be taught as part of literacy development. There is also an example given from a teacher demonstrating how she teaches students to search online. The importance of “deliberate, strategic teaching” (p. 80) is emphasised, including direct instruction, modelling, scaffolding and multiple opportunities for practice. No teacher, however, referred to the contents of this book even when the discussion touched on literacy strategies.

When talking with the students in the focus groups, it was apparent that a few students had been taught various skills while others had not, depending apparently on the individual teacher’s own knowledge and practice of information literacy. Even within the focus groups, student understanding and practice varied greatly. The students’ knowledge or lack of knowledge concerning their use of websites was of particular concern. Given the amount of time students are online, it seems crucial that students learn to evaluate and assess the contents effectively (Kuiper, Volman, & Terwel, 2005). New Zealand students’ management of information from online resources has not improved since the early days of online resource provision, according to results of the National Education Monitoring Project (NEMP) testing from 1997 through 2001, 2005 and 2009 (Flockton & Crooks, 1998; Flockton, et al., 2002; Flockton, et al., 2006; J. Smith, et al., 2010). In fact, when asked, in 2009 where they first went to get information, 96% of Year 8 students taking part in NEMP, reported using the internet, a figure twice as high as the next most popular response, going to a parent. In 2005, the figure was 88% and 72% in 2001. For Year 4 students, 77% reported using the internet first in 2009, 61% in 2005 and 47% in 2001. The authors recommend that in view of these NEMP findings, teachers need to give students explicit guidance when they are using this source [online] to find information. These recommendations are also supported by the work of Oberg and Gibson (2001), Combes (2009), and Walraven, Brand-Gruwel, & Boshuizen
(2008) all of whom have noted students’ poor use of online information when using the internet for other than personal communications or requirements.

It was noticeable that no department in any of the three schools seemed to have a policy for routinely checking skills at the start of each year or for teaching information literacy skills. This situation underlined the questionnaire findings that most teachers took it for granted that their students arrived at the schools with good information literacy skills and they did not check skill levels. All those interviewed, though, thought information literacy development was very important. “I think there’s too much information out there and they just don’t know how to access it effectively….it’s too overwhelming for them”.

On the whole, both teachers and students from all three schools were confused about information literacy and most were unclear about what was involved in carrying out research, a term used within all the schools. Very few teachers, at any of the three schools, demonstrated good understanding of information literacy. Of the students at the three schools, Year 7 students at School A, who had recently attended primary schools where information literacy models were in regular use, demonstrated the greatest understandings. Several Year 9 students at School B had some knowledge of information processing but no student could describe a whole process as did the Year 7 students at School A. The majority of teachers and students at all three schools, though, did indicate that they would welcome the introduction of a school-wide information processing model and teachers would welcome help with teaching and developing the process and the various skills. The majority of students would welcome more help from their teachers when processing information.


Part Two of this chapter describes the procedures followed by the Lead teachers when designing the intervention and implementing the accompanying professional development. The group of Lead teachers heard in mid-2007 that their cluster’s proposal for EHSAS funding had been successful. They decided that while the detailed needs analysis was being planned and carried out, they should spent time investigating the literature surrounding professional development to establish what constituted effective, successful, professional development. They felt they would then be better equipped to design professional development, which would address the aim of the project: to focus on the “explicit teaching and learning of identified information literacy skills and to expand on the critical and creative
thinking skills that the schools have been implementing over the past three years enabled though other Ministry of Education initiative” (Pasley, et al., 2007). The documentation provided by the main Lead teacher (Dezoete, 2009) gave further details of the goals:

1. To empower teachers with the skills to teach students in a way that enables students to become independent thinkers and inspires them to become lifelong learners.
2. To obtain a seamless transition for Year 8 students to contributing high schools
3. To increase students’ critical awareness with a view to creating in more students the ability to meet the demands of the excellence questions in NCEA.

To ensure high levels of student engagement and student success, each of these goals was then described in more detail. The section listing factors critical to successful implementation demonstrated that much thought had gone into the planning of the project with reference to appropriate research. In this way, they hoped to improve teacher understanding and practice of information literacy and thus to improve student learning outcomes.

**Towards effective professional learning**

The Lead teacher from School C documented the progress of the lead team as they set about designing and implementing the intervention (Dezoete, 2009). This documentation detailed factors the Lead teacher group considered would be critical to successful implementation and drew heavily on the work of Timperley, Wilson, Barrar and Fung (2007). The list included ensuring sufficient time and effective use of time; external expertise involvement; engaging teachers in the learning process; challenging assumptions; creating opportunities for teachers to be involved in a professional community, having active leaders of professional development, the contents of the professional learning, activities promoting professional learning and sustainability. Alongside each factor were further explanations detailing strategies that the Lead teachers would use to ensure success. The explanation relating to the issue of learning over time, for example, stated that “By participating in a series of workshops that have been planned to make optimum use of time, substantive learning for teachers should occur. Evidence shows that teachers attending one-off workshops seldom change their practice” (Timperley et al., 2007, as cited in Dezoete, 2009, p. 10). The details attached to the success factor ‘Involving external expertise’ stated that external support was not being used for the professional development workshops but that expertise within the schools would be involved. These staff members included the librarian who had expertise in information literacy and the Lead teacher who was completing a postgraduate level course in
information literacy. Other elements included frequent PD sessions, frequent whole-staff, departmental and individual sessions and planning for new staff to be upskilled. The issue of sustainability included the statement that teachers needed an in-depth understanding of the theory behind the programme and the skills to engage in the Teaching as Inquiry process (Ministry of Education, 2007, p. 19).

There were other issues the group addressed such as the ‘black box’, found between acts of teaching and what students learn (Black & Wiliam, 1998) and they were also interested in the second ‘black box’, between teacher professional learning opportunities and teacher outcomes, such as changes in practice or no change in practice (Timperley, et al., 2007). They realised they also needed to acknowledge the importance of engaging teachers’ prior understanding and beliefs (Robinson, 1993; Robinson & Lai, 2006), of providing extended (as opposed to one-off) opportunities to learn, and also that they needed to address the conditions needed for creating effective extended learning (Knapp, 2003; Parr, Timperley, Reddish, Jesson, & Adams, 2006). The Lead teachers discussed the “importance of tacit knowledge in organisational learning and innovation” (Lam, 2000, p. 487). They recognised that challenging tacit knowledge can result in cognitive dissonance whereby teachers are required to reconcile contradictory attitudes and behaviour and to reconstruct current knowledge (Hannay & Ross, 2001; Timperley, et al., 2007). This could be an uncomfortable process but the Lead teacher group recognised that such dissonance can lead to positive outcomes.

**The information processing model**

At the end of 2007, and in early 2008, after discussing the specific findings from the needs analysis data, the Lead teacher group decided that their main task then was to decide on an information literacy model to be used across all the cluster schools. This was something that the majority of teachers and students had indicated, when interviewed or participating in focus groups, would be welcome and which would provide them with the process and scaffolding for carrying out inquiry-based learning. The Lead teachers realised, from the results of these needs analysis findings, that if students at the three schools were to develop the skills needed to ensure they become lifelong learners, it was most important that all teachers were familiar with the concept of information literacy and that they were able to teach the skills effectively (Williams & Wavell, 2006).
The Lead group defined the skills used at each stage of the process and decided how to provide strategies for teachers which would enable them to teach those skills explicitly. They then investigated a number of information processing models including *Guided Inquiry* (Kuhlthau, et al., 2007) but decided that although they liked way the writers linked *Guided Inquiry* to information literacy (Kuhlthau, et al., 2007, p. 79) they felt the book and accompanying literature could seem too academic for some staff at the cluster who might feel alienated. They did take note of the term ‘guided’ in the title as they felt that reminded teachers they needed to provide guidance, such as teaching of skills and checking of progress, if their students were to succeed.

They decided then to base their model on the Alberta Inquiry Model (AIM) (Alberta Learning, 2004). They saw AIM as a “learning centred model in which all members of the school community are active learners”, one which “brings together 13 years of research, practice and reflection.” (Alberta Learning, 2004, p. 4) (Dezoete, 2009). Alberta Learning had first published the model in 1990 but reviewed the process in 2004 to include new evidence on effective pedagogies, the implications of technology and the work of researchers such as Kuhlthau (Alberta Learning, 2004). To the Lead teachers, AIM also exemplified the Teaching as Inquiry approach which aligned with Teaching as Inquiry in the Effective Pedagogy section in the New Zealand Curriculum (2007, p. 34) and with the curriculum goal of developing students who are lifelong learners (Ministry of Education, 2007, p. 8). They also felt the approach was teacher-friendly and approved of the many practical suggestions for classroom teachers. They saw the provision of such support as crucial to the success of their professional development sessions and had already planned to create their own supporting materials for cluster teachers, particularly as classroom teachers in New Zealand did not have access to help and advice from teacher-librarians. A diagram of the model was created using a pinwheel (see Figure 5.1) which the Lead teacher felt would give ample scope for emphasising the many skills teachers needed to ensure their students developed.
The pinwheel blades were labelled with the stages of the process: defining, retrieving, processing, creating and communicating, all revolving around the centrally placed reflection. These terms were taken from the Essential Skills area of the previous national curriculum (Ministry of Education, 1993) and from the newly introduced draft curriculum (Ministry of Education, 2007). An early physical model of the pinwheel allowed the blades to be unfolded, revealing details such as lists of skills needed for each stage and examples of reflective questions. A start was made to design a poster to illustrate the model and a suitable logo, although the final designs of the poster and logo were not decided until early 2008. All 2009 homework diaries included the i-Lit pinwheel and an explanation of the process. It was
planned that every classroom would receive a laminated, A2 size colour poster of the model during 2009.

The team decided to call their model the *i-Lit* information literacy model and, during the first part of 2008, many drafts of the model were worked through to ensure it addressed the findings from the needs analysis. Information from the teachers’ repeat questionnaire at the end of 2008 was used to refine the model further for use in 2009.

**Supporting resources**

The Lead teachers created a large number of resources (see Appendices G, H, I, and J), organised under the headings of the stages of the *i-Lit* process. Each stage of the *i-Lit* process had a “Teacher Focus which covers Reflective Planning Questions, Explicit Teaching and Modelling of Strategies and a Toolkit, and a Student Focus, which contains Focus Questions and Reflective Questions” (Dezoete, 2009, p. 5). The toolkit included strategies for teaching skills involved in identifying key words, brainstorming, question starters, and using *What I Know* charts (KWHL Chart, 2010) according to the stage. The process is also linked to the Curriculum Key Competencies (Ministry of Education, 2007). The stated student focus included the need to acknowledge the feeling of students at each stage, and included advice such as “you need to tell them that their feelings will change throughout the process” (Pasley, et al., 2007). Boxed areas contained reflective planning questions for teachers and reflective questions for students.

Other resources such as the Toolbox for teachers, included strategies to help teachers in developing units of learning associated with the use of the *i-Lit* model within various subject areas such as Junior Social Studies (Appendix H and I). Workbooks were provided for students to use as they worked through the *i-Lit* process and these contained strategies to help students, for example, keep track of the resources they used (Appendix J).

A list of professional development resources was provided for teachers who wanted to know more about information literacy, inquiry learning, or the place of ICT in information literacy. There were also resources to help teachers, for example, understand the use of *Teaching as Inquiry* to improve students’ information literacy learning outcomes (West & Dezoeta, 2008). Each professional development session plan was aligned both with *Teaching as Inquiry* and the *i-Lit* model for learning. The intention was to show teachers “how our model fits with the inquiry learning model, *Teaching as Inquiry*, outlined in the *New Zealand Curriculum*… the
Teaching as Inquiry cycle may continue as teachers identify problematic student outcomes” (Ministry of Education, 2007). It was also planned to develop information literacy learning progressions to help teachers know what information literacy skills students were expected to attain at the end of each year level.

The teaching strategies were to be modelled during the professional development sessions so that teachers could then, in turn, model the strategies with their students and report back on progress at the next professional development sessions. The Lead teacher in School C described the process as follows:

The central piece of the circular pinwheel, ‘Reflecting’, fitted well with the cluster’s beliefs that metacognition underpins information literacy. It was felt that the model’s circular nature would enhance student and teacher understanding of the non-linear nature of the inquiry process. (Lead teacher, School C, Personal communication, April, 2009)

During this time, and mindful of the need to ‘train the trainers’ (McLaughlin & Talbert, 2006), the Lead teachers undertook their own professional development. Some attended the Extending High Standards Across Schools conference in 2007 and 2008, where they gave presentations about the project. Others from the Lead teacher group attended the Ministry of Education ULearn conference in 2008, again reporting on the progress of the project so far. Some team members attended sessions addressing Thinking maps and the Key Competencies with a particular focus on Thinking and also attended Ross Todd’s (Rutgers University) sessions on Leading learning: A guided inquiry approach (Kuhlthau, et al., 2007), held in Auckland, 2008.

Part 3: Implementing the professional development

It is important to note that, although each school took a different approach when delivering the professional development, according to their perceived needs, the i-Lit model, the teaching strategies, templates and plans and the teachers’ toolbox were common to all schools. It was expected that staff in each school would create additional resources to suit their particular needs as they undertook and started to practise strategies from the professional development programme.
School A: The School A Lead teacher joined the school at the start of 2008. With a teaching staff of 25, she found it manageable to carry out after-school whole-staff sessions working with the *i-Lit* process. As the ICT specialist teacher, she did not have a permanent class to teach and was also given extra release time which allowed her to visit classrooms and to work with individual teachers as they started to implement the *i-Lit* process with their students. By the end of 2009, the Lead teacher reported that School A was doing well with each curriculum area set up and the model integrated with the school vision statement.

School B: The Lead Teacher here explained in early 2008 that she aimed to involve the whole staff in professional development sessions rather than starting with one or two faculties. Professional development was delivered once a week early in the morning with students arriving later on those days. The sessions were led by the Lead teacher who decided to teach one stage of the process at a time. All teachers were to teach the same strategies. It was hoped that doing so would enable students to transfer the skills from subject to subject more easily. Support such as time allowances was to be given to departments to free staff to develop more resources.

The next Lead teacher at School B, who took over during 2008, noted in August 2009 that “it was difficult to get teachers to understand that they must explicitly teach the stages and skills”. This teacher had developed Professional Learning Teams (PLT) within the school to help staff develop teaching and learning strategies when developing information literacy skills. PLT tasks were placed on the school intranet, *i-Lit* certificates had been introduced to be given to those students who demonstrated a good understanding and practice of the process.

School C: The Lead teacher here trialled the professional development and the process with a small number of teachers from Social Studies and English in order to refine the professional development (Dezoete, 2009). The Lead Teacher, with help from another teacher, modelled the strategies for the *i-Lit* model. Teachers then worked with their classes on the strategies after which there was a feedback session led by the Lead Teacher. Other teachers started receiving professional development in 2009 and it was planned to involve all staff by 2010. In August 2009, the School C Lead teacher reported that the teacher handbook was complete, the student pamphlet finished (Fig 5.2) and there was discussion about producing a pamphlet for parents.
Large coloured copies of the i-Lit poster had also been distributed to all the cluster schools during 2009, with all teachers receiving A4 posters and one large size A2 laminated poster for their classroom walls.
Launching the project

The EHSAS project was officially launched in February 2008. Schools closed early after lunch that day and all staff from the three schools gathered in the auditorium at School B. After the principals opened the proceedings, the researcher reported on the preliminary results from the teacher and student needs analysis and the Lead teacher group outlined the professional development programmes for each school that would start during the second half of 2008. Well known figures in New Zealand education were also invited to speak in order to make the launch an occasion for celebration.

The cluster wiki

The cluster wiki (West & Dezoeta, 2008) was set up in 2008 by the project manager and was then administered by the Lead teacher of School C. The booklets and the toolkit for teachers were uploaded to the wiki site and were available to all staff by 2009. It was also planned to hold a series of meetings during 2010 to explain the i-Lit process to parents who would be given specially designed pamphlets. The aim was eventually to create an information literate school community (Henri, 1999). The main headings on the wiki home page included:

Administration (of the EHSAS project)

This section included the EHSAS Funding Proposal and minutes of all meetings. The progress of the design of the information processing model was detailed here as were details of the professional development in the three cluster schools.

Information literacy

These pages contained information about various models, research around information literacy, resources, including strategies for developing information literacy skills and the cluster’s i-Lit model.

Events

The launch of the EHSAS Cluster Project and accompanying photos were displayed on these pages. Appropriate upcoming seminars and professional learning opportunities were also publicised here.
**Schools**

These pages contained details of the three cluster schools and contact details for the Lead teachers.

**Phase 4: Formative Evaluation to monitor progress of the intervention 2008 and 2009**

Teachers from all three schools were again invited to complete the questionnaire at the end of 2008 after the first round of professional development. The same HODs who were interviewed in 2008, were re-interviewed, where possible, in November, 2009. The Lead teachers were re-interviewed at end of 2008 and during 2009 with one re-interviewed in 2010 after the contract had been ended.

In early 2009, six classes of students, two from each school, were chosen to take part in pre and post intervention questionnaires and focus groups. Teachers had first volunteered their classes and the Lead teachers had then chosen two classes from each school to participate. All the teachers had taken part in the professional development offered so far during the latter part of 2008 but reportedly had not yet put what they had learned into practice. The students were all new to the schools, A, B or C, in 2009 (it had been planned to repeat this process in 2010 and 2011 but funding cuts resulted in changes to the way the project proceeded).

**The next chapter**

The next chapter, Chapter 6, gives the results from data collected after the start of the professional development to monitor its impact. These results include data from the teachers’ questionnaire repeated in 2008; from the six classes from Schools A, B, and C where, in 2009, new students completed questionnaires pre and post the professional development intervention and participated in focus groups, from Lead teacher interviews, HOD interviews, and from the examination of documentary evidence.

---

8 The students involved in the 2009 pre and post intervention questionnaires and focus groups were not involved in the 2008 questionnaires and focus groups needs analysis process.
Chapter 6
Findings from data after implementation of intervention

This chapter examines the influence of the professional development intervention. Data collected from teachers who responded to survey questions in 2007, prior to the intervention, are compared with survey responses one year later in 2008. Interviews were conducted with HODs and with Lead teachers in 2008 and 2009 and data from the transcripts analysed. Students from six classes in Schools A, B, and C who were new to the schools in 2009, were surveyed at the beginning and end of the year. In addition, groups of students from those classes participated in focus groups in February and December. Documentary sources were also examined.


Teachers pre and post intervention questionnaires

Teacher in Schools A, B, and C were invited to complete an online questionnaire (Appendix A) in November 2007 in order to establish how they understood the concept of information literacy and how they practised information literacy in their classrooms. Questions included queries about understandings of information literacy skills and library skills; the need to teach information literacy skills explicitly; the use of online resources and books; assessment of student skill levels; the need for information literacy skills; the use and description of information processing models and modelling and teaching of various skills. The findings from this questionnaire and teacher interviews and the findings from student questionnaires and focus groups were used by the Lead teachers when they designed the intervention, a model for information processing with associated support material (see Chapter 5). At the end of 2008, after the first round of professional development implementing the intervention, teachers in Schools A and B were invited to repeat the same questionnaire to gauge any change in understanding and practice of information literacy and to allow any refinements to be made to the intervention design. Teachers from School C were not included as that school had trialled the professional development with only six teachers in 2008, but planned to include 30 more teachers in 2009 and the remainder in 2010. Fewer teachers in Schools A and B responded than did so in 2007 (see Table 6.1).
Table 6.1

*Teachers who participated in 2007 and 2008*

<table>
<thead>
<tr>
<th>School</th>
<th>Staff</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25</td>
<td>25 (100%)</td>
<td>17 (68%)</td>
</tr>
<tr>
<td>B</td>
<td>119</td>
<td>71 (60%)</td>
<td>62 (52%)</td>
</tr>
<tr>
<td>C</td>
<td>56</td>
<td>51 (91%)</td>
<td>Did not participate as professional development did not involve all staff in 2008</td>
</tr>
</tbody>
</table>

*Questions where responses demonstrated significant change*

As explained previously, teachers in 2007 had insisted that there be no possible way to identify them. Because it was not possible to identify teachers in order to match those teachers who participated in 2007 with those who participated in 2008, the paired samples necessary for use in statistical tests such as the paired samples t-test were unavailable. It was therefore decided to use the Mann-Whitney test, a non-parametric equivalent of the independent t-test. Some significant change in Schools A and B responses was revealed in the 2008 responses suggesting teachers had acquired at least some basic knowledge of information literacy as a group.

For School A, the Mann-Whitney test revealed significant differences between the two time periods for questions 10, 11, 13, 26, 27 and 18. Table 6.2 shows the mean ranks at both points. Question 10 concerned teachers’ knowledge of information literacy ($z=-2.760, p = .006$) and the result suggested that there was more knowledge of what information literacy was at the end of 2008 than at the end of 2007. Question 11 asked teachers if they thought there was a difference between information literacy and library skills ($z=-5.271, p=.000$) and it appeared from the result that by the end of 2008 teachers at School A did not confuse the two. Question 13 asked teachers to agree or disagree, using a Likert scale, with the statement that information literacy was mostly concerned with using ICT ($z=-2.656, p=.008$) and the result indicated that significantly more teachers in 2008 understood that information literacy involved more than using ICT. Question 26 asked teachers to name the information processing model they used ($z=-2.594, p=.009$) and the result showed that by the end of 2008, significantly more teachers could name the model they used. Question 27 asked teachers to name the stages of the model used ($z=-2.643, p=.008$) something an increased number of teachers could do at the end of 2008. Question 18 tested the extent to which teachers agreed that information literacy skills would improve with practice and without explicit teaching.
(z=−2.738, p=.006) and significantly fewer teachers agreed with this statement at the end of 2008 than had done so at the end of 2007, indicating more appreciation of the need for teaching information literacy skills.

Table 6.2

School A: Mann-Whitney Mean Ranks Teachers in December 2007 and December 2008

<table>
<thead>
<tr>
<th>Question</th>
<th>Year</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. An information literate person is...</td>
<td>2007</td>
<td>25</td>
<td>17.40</td>
<td>435.00</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>27.53</td>
<td>468.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. (Reverse) Information skills are the same as library skills</td>
<td>2007</td>
<td>25</td>
<td>15.50</td>
<td>387.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>30.32</td>
<td>515.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. (Reverse) Information literacy is concerned mostly with using ICT</td>
<td>2007</td>
<td>25</td>
<td>24.80</td>
<td>620.00</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>16.65</td>
<td>283.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. (Reverse) Information skills will develop naturally without explicit teaching as students do more research assignment</td>
<td>2007</td>
<td>25</td>
<td>25.14</td>
<td>628.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>16.15</td>
<td>274.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. The name of the information literacy model I use with my students</td>
<td>2007</td>
<td>25</td>
<td>17.98</td>
<td>449.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>26.68</td>
<td>435.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. The stages of the model I use with my students</td>
<td>2007</td>
<td>25</td>
<td>18.62</td>
<td>465.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>17</td>
<td>25.74</td>
<td>437.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For School B, significant differences were revealed between the two time periods in four questions. Table 6.3 shows the mean ranks for those questions. Question 25 concerned teachers’ use of an information processing model with their students (z=−2.407, p=.016) and this result indicated that more teachers in 2008 reported using an information processing model with their students than did so in 2007. Question 26 asked teachers to name the information processing model they used with their students (z=−3.004, p=.003) and the result indicated that more teachers could name the cluster model in 2008 than could do so in 2007 when few could name any model. Question 13 asked teachers to agree or disagree with the
statement, using a Likert scale, that information literacy was mostly concerned with using ICT ($z=-2.464, p=.014$) and the result indicated that significantly more teachers in 2008 agreed that information literacy involved more than using ICT. Question 19 gauged teachers’ agreement with the statement that information literacy skills are only needed when completing a research assignment ($z=-2.225, p=0.26$) and this result suggested that teachers’ appreciation of a wider use of information literacy had increased during 2008.

Table 6.3

<table>
<thead>
<tr>
<th>Question</th>
<th>Year</th>
<th>$n$</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. (Reverse) Information literacy is concerned mostly with using ICT</td>
<td>2007</td>
<td>71</td>
<td>24.80</td>
<td>620.00</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>62</td>
<td>16.65</td>
<td>283.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. (Reverse) Information literacy skills are only needed when students are completing a research assignment</td>
<td>2007</td>
<td>71</td>
<td>60.74</td>
<td>4312.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>62</td>
<td>74.17</td>
<td>4598.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. The name of the information literacy model I use with my students</td>
<td>2007</td>
<td>71</td>
<td>17.98</td>
<td>449.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>62</td>
<td>26.68</td>
<td>435.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. The stages of the model I use with my students</td>
<td>2007</td>
<td>71</td>
<td>18.62</td>
<td>465.50</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>62</td>
<td>25.74</td>
<td>437.50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>133</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interview responses

Heads of Departments (HODs) from Schools A, B, and C had been interviewed in February 2008 in order to gain information to assist the Lead teacher group with the design of the professional development intervention. HODs from Schools A, B, and C were re-interviewed towards the end of 2008. Of the five HODs interviewed at School A in 2008, only one was still at the school in December 2009. Four teachers who had joined the school during 2008 also volunteered to be interviewed. At School B, of the five HODs who were interviewed in February 2008, three were still at the school in December 2009. At School C, four of the five HODs interviewed in February 2008 were still in the same positions in December 2009 although one was not available to be re-interviewed. During the semi-structured interviews, the HODs were asked the same questions in 2009 as in 2008 in order to gauge any change in
their understandings and reported classroom practice of information literacy and also to investigate their views of the professional development opportunities at their schools.

School A

All the teachers talked positively about the professional development organised by the Lead teacher at the school and thought it was effective as it got the whole staff on board. Most of these teachers thought the sessions where they went round classrooms and listened to the teachers talking about what they did and answering questions or seeing the process in action provided valuable learning for their own teaching practice. Most also mentioned that they thought the most effective professional development was when they had to do the process or part of it and then report back at another whole staff session about what they did. Another method mentioned favourably was “sitting with someone who is an expert”. However, the teacher who had helped deliver some of the professional development, commented that working with other teachers was difficult as “most staff went straight to the presentation stage, just like students, and didn’t want to work properly through the whole [i-Lit] process”.

The one HOD available to be re-interviewed believed in 2008 that information literacy depended on ICT, “I mean- information literacy is basically about using computers” and he had his own information processing model he had developed over the years and which he said he improved each year. He was not able to describe in any detail to the researcher how this model worked. In 2009 he described the cluster i-Lit model in great detail, said he liked the visual displays on classroom walls and stated that he thought “it was important for students to be information literate. They can control their own learning and organise themselves”. He also now thought it useful to have a common model for students to follow to avoid confusion and said he carried out more explicit skill teaching. He had not seen all the resources on the cluster wiki and did not give a clear description of how he taught, for example, note taking although he said he modelled this. He did not conduct a skills assessment or keep a check on student progress in developing skills in information literacy.

Four teachers who joined School A after February 2008 were interviewed. They had all taken part in the professional development in late 2008 and during 2009. The first teacher stated that he could not see much evidence of school-wide change since he joined the school mid-2008. He talked of the i-Lit model as a linear model, said that he should teach skills like note taking but did not and likewise did not teach website evaluation. He did not usually check
students’ skills before starting research using the i-Lit model and said that “I wouldn’t teach any skills beforehand, kind of kill the moment maybe”. Of the three other teachers interviewed, teacher two said that using the i-Lit model had changed her way of teaching. She liked the i-Lit model “rather than a linear thing [she had previously used] as it’s something, a sort of cycle you can go back to it and I think that’s good”. The Lead teachers had said in interviews that they emphasised the non-linear nature of the process during in professional development sessions. The School A teacher also said she had noticed more teaching of skills, had been given a folder of resources and tried to model skills such as note taking and using websites. She did not check student skill development although she “thought it was up to each teacher to do so and some probably did”. The third teacher said she thought there had also been some transference of skills in that she had noticed students using the skills taught, such as dot and jot note taking, in Social Studies classes although they had only been taught this method in English classes. She found the structure of the i-Lit model easy for students and for her to use. She also referred to the folder of resources she had been given and stated that skills “really do need explicit teaching”. The fourth teacher approved the big classroom displays of the model and the stages saying that “kids always have something concrete to look at”. She had tried to do more explicit skill teaching but had not thought about checking ‘where they are with skills”.

School B

It was evident from the interviews that understandings about information literacy were still underdeveloped although all three HODs spoke positively about the model being introduced. One of the HODs, when re-interviewed in December 2009, stated that her department (English) used the model “quite a lot” although she thought she “was the only one to use the whole windmill thing [i-Lit process]”, yet she needed some prompting to recall the name of the model. She did not currently teach students to evaluate websites, although she thought younger teachers probably did so and she could see the need to do this. She thought skimming and scanning was an old fashioned technique that is not taught anymore although it was up to individual teachers and that maybe some teachers were teaching it “but quite possibly they don’t”. She also said that when teaching Year 9 “you assume nothing so start from scratch. If they are Y10 you assume they know from Y9”. She thought it was good to have the consistency and common methods that were possible using the i-Lit model. This HOD liked the way the professional development delivery had changed in 2009, with whole
staff sessions then working in departments and then “working with a small group and actually producing something and then getting feedback and refining it”.

The second HOD re-interviewed knew about i-Lit and was aware of the cluster developments such as posters in classrooms and the professional development opportunities. She thought it was more important than ever for students to be information literate as “there is so much need for evaluation of sources of information”. She did not think there were any common methods for teaching note taking in the school and thought all Year 9 students were taught about website evaluation by library staff but was not sure about this. She thought the professional development had been effective but more so in some departments than in others and that some staff felt “it’s a wee bit like teaching your grandmother to suck eggs”. She too liked the way, that in 2009, there were professional learning teams set up in departments with smaller groups working on producing resources and she knew about the resources on the school intranet and on the cluster wiki.

The third HOD who was interviewed stated that the i-Lit model also worked well for students planning essays and she liked the way students had the model in their homework diaries. However, her understanding of the rationale for the model was limited as she did not know why it had been designed. She did not teach note taking or website evaluation, and was not sure if students were developing these skills as she tended to send students to particular websites which she considered appropriate. She spoke positively about the professional development sessions, particularly as they became more flexible in 2009 and found that other PD initiatives her department were involved in, English for Speakers of Other Languages (ESOL) and Pasifika, could be combined with i-Lit.

School C

The HODs interviewed were positive about the introduction of the i-Lit model. One HOD re-interviewed in December 2009 emphasised, this time, the importance of reflection and evaluation in the process, noting that students were not good at this. This teacher also described the i-Lit process in detail although she said there was no checking of skills but “it’s a work in progress”, perhaps acknowledging that she was considering checking her students’ skill levels. She had several student assignments with her and described the process to the researcher, emphasising, for example, the use by students of colour coding of information that could answer several questions. She also described how she taught skills such as note
taking and skimming and scanning and said a guide for website evaluation for the department was currently being designed with library staff. She thought that some teachers only paid lip service to the professional development, possibly because there are so many new professional development ventures each year but that also many did not read all the material they were given. A second HOD interviewed said he knew about information literacy, “I think it’s just not the internet” but did not use the i-Lit model as he “hadn’t really got into it”. He talked about plans some 10 years ago to introduce a common model (he said exactly the same in the February, 2008, interview). He did not teach note taking explicitly but said he did ask students to “make sure they have some record, to keep their own notes as we talk in class”. He did not check current skill levels and, as he did not use it, did not explain the model or describe how it worked.

A third HOD gave a definition of information literacy, which closely followed the definitions used for this project and said that, before the professional development, she had not thought about information literacy or research models but now was using the i-Lit model with her students. She was teaching note taking skills such as the dot and jot method and making sure students were familiar with the idea of key words. She said the librarian often helped her. She, too, brought student assignments with her and explained the process, emphasizing the need to teach the skills explicitly. She was not sure about how effective the professional development had been for some teachers as she had talked with a teacher the other day who had not heard of i-Lit. [As not all staff had undertaken the professional development at this time, this was understandable]. She found all the information available overwhelming at times but thought that the professional development sessions looking at the model and then applying it to a unit worked best.

**Students: Monitoring of student progress with Year 7 and Year 9 classes**

*Pre and post intervention questionnaires*

In 2009, two classes from each of the three schools were surveyed to investigate learning related to information literacy. The classes were chosen after consultation with the cluster Lead teachers, and were taught by teachers who were starting the professional development that year. Students in each class were numbered according to the rolls, and numbered questionnaires were able to be distributed to the same students at both points. Responses from any students not present on either occasion were removed before analysis. The researcher distributed and collected the questionnaires in February and December of 2009.
The questionnaire (Appendix F) consisted of 22 questions including two questions relating to demographic information, four open-ended questions investigating students’ understanding of information literacy and their attitudes towards assignments involving research, three questions investigating their current use of an information processing model, five Likert response questions on attitudes, and eight Likert frequency response questions. The responses to the open-ended questions investigating students’ understanding and practise of information literacy were coded and analysed.

**Questionnaire results**

Wilcoxon matched-pairs signed-ranks tests were run for each school. Non-parametric statistics were considered appropriate because of non-normal data and a small sample size. Table 6.4 shows the mean ranks, by school, for those questions which were significant.

For School A (N=48) Questions 7 and 11 revealed a significant difference (z=-2.570, p=.010 and z=-2.762, p=.006), respectively. Mean ranks for both questions from pre test to post test showed an increase. Question 7 related to the student’s understanding of research skills in relation to library skills and results for this question suggested that by the end of the year, students had gained a greater understanding that research skills included more than library skills. Question 11 related to student use of information skills when carrying out research. Results for this question suggested that students were more aware that they were using information skills when carrying out research by the end of the year.

When the test was run with student data at School B (N=32), only Question 8 was significant. The mean ranks for this question from pre test to post test showed a significant increase (z=-2.874, p=.004). Question 8 investigated students’ confidence in finding book-based information. This result suggests that students felt more confident about using books to find information at the end of 2009 than they did at the start.

At School C (N=24), data from only one question revealed a significant difference over time. Again the mean ranks for Question 19, showed a significant increase (z=-2.387, p=.017). Question 19 asked students whether they knew how to evaluate and reflect on their progress. The result suggested that students knew more about this process at the end of 2009 than they did at the start.
The questionnaire results suggested minimal growth in student understanding over the year. More in-depth exploration of student understandings in focus groups, however, suggest that learning had occurred.

Table 6.4

*Schools A, B, and C students’ mean ranks by school*

<table>
<thead>
<tr>
<th>Question</th>
<th>Question</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7. Information literacy skills are the same as library skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>30</td>
<td></td>
<td>21.72</td>
<td>651.50</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>12</td>
<td></td>
<td>20.96</td>
<td>251.50</td>
</tr>
<tr>
<td>Ties</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q11. I use information literacy/research skills when I am answering questions and finding out about a topic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>25</td>
<td></td>
<td>20.12</td>
<td>503.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>11</td>
<td></td>
<td>14.82</td>
<td>163.00</td>
</tr>
<tr>
<td>Ties</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q8. I am good at finding information for research assignments in books</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>17</td>
<td></td>
<td>12.53</td>
<td>213.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>5</td>
<td></td>
<td>8.00</td>
<td>41.00</td>
</tr>
<tr>
<td>Ties</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School C</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q19. I know how to evaluate and reflect on my progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>2</td>
<td></td>
<td>10.25</td>
<td>20.50</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>13</td>
<td></td>
<td>7.65</td>
<td>99.50</td>
</tr>
<tr>
<td>Ties</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Focus groups**

Six students (the first six students on each roll) from each of the six classes, two from each school, took part in separate focus groups. During the discussions in March 2009, after the students had completed the pre-intervention questionnaire, the researcher asked the groups about research (if that is how they referred to what they did when investigating a topic); tried to discover how much they knew about information literacy (as that was the term used in the cluster proposal documents); how they went about research, and whether they would welcome any help. They were also encouraged to discuss any current research assignments. The same students, where possible, again took part in focus groups in November, after the classes had repeated the questionnaire, post intervention. The researcher asked the same
questions as in March and encouraged the students to discuss the completed assignments they had brought with them. In March, although 40 minutes had been set aside for each focus group discussion, the discussion with students from all three schools dried up after 10 or 15 minutes. In December, the focus group participants from School B finished after 15-20 minutes while the groups from Schools A and C continued for at least 40 minutes. The researcher used a table of key indicators taken from the definitions used for the project in order to gain an overall impression of the groups’ reflection on their knowledge and practice of information literacy (see Table 4.8).

At School A, in March, 2009, the focus group participant referred 38 times to various key indicators listed to consider focus group responses (see Table 4.8). The focus group participants were not familiar with the concept of information literacy and the majority said they had not heard of the term. Half the students did refer to Action Learning, a processing model they had followed at their previous school. One student explained that their current teacher did not use this model. Another student thought it would be helpful to have a process to follow. The students were able to name some relevant skills such as using key words, brainstorming and the need to have good scanning skills.

In contrast, in November 2009, the same students referred 93 times to the key indicators (see Table 4.8). When asked how they went about research, the students talked about the i-Lit mode. One student started with “Well we used the i-Lit model, we first started off with gathering, jotting down notes, then was it defining, no defining was first”. The other students then contributed with various stages ending with “And isn’t it communicating somewhere?”, “Yeah communicating”. The students named and described the process and one student said that the iLit model also “helps which order to do things in when you forget so like when you research first you get the question you want and then you research it”. The students appreciated having the process to follow as “it’s a good system because it’s in the order of what you’re supposed to do” although one student said “it gets really frustrating sometimes like the information you want that comes up with things that are completely the opposite”, indicating that he had some understanding of using search engines for an explicit reason. Another was amazed at an irrelevant search result that asked if she wanted to adopt a gorilla so “You just have to keep going through and through” she concluded, appreciating the need for perseverance and that searching online requires a certain amount of scepticism. Several students gave detailed responses when discussing types of questions to ask which will give
them the information they need. “But you also need to get as much information out of one question”, “You couldn’t say something like how often do you watch television or how often do you go to the movies because they can just say six times”. Not all students found the process enjoyable. One student found research “boring and frustrating” although he could see the benefits of using the i-Lit process. Another student thought that last year (at her previous school) they were “allowed to go to a lot of places that I think were unsafe” and appreciated the methods used at School A, such as membership of the Netsafe organisation (Netsafe, 2011) which aims to keep students safe when using online sources.

At School B, there were 64 references to key indicators in March 2009 and 54 in November 2009. In March, none of the focus group participants had heard of the term ‘information literacy’ although at the end of the discussion, one student did ask what it meant. The majority of the students were familiar with using a staged process although one did not think they used a process and could describe but not name, (Action Learning) the process used at her previous school. There were many information literacy skills mentioned such as brainstorming, mapping and using keywords. They discussed question formation and types of questions, referring to ‘fat’ and ‘skinny’ questions although they could provide few details. Two students thought ‘skinny’ questions were better than ‘fat’ questions but was not sure why that was so. Few could describe how they would take notes and they appeared to associate finding information only with the use of Google. When asked what help they received with research, one student replied “The teacher doesn’t tell you how to do research – just says to get three questions and then find answers”. One student stressed the need for time management so that a research assignment could be finished on time.

In November, when the students were asked about the information process they used, students gave various responses but were not familiar with the term i-Lit although one student said “Oh yeah it’s in our diary” when the researcher mentioned i-Lit. One student still employed the research model she had used the year before at her previous school because she knew what to do. The teacher there had shown her “and then you start to know how to do it yourself”. One student said a teacher had “taught” her how to take notes but had not modelled the process so she was not sure what to do. When asked about using books as sources of information, several students mentioned using key words and also that in the library “you just have to be quiet”, as if it was taken for granted by library staff that the
students all knew exactly what to do without any help although they also did not think they
had been taught how to search for information.

At School C, students referred 27 times to various key indicators in March, 2009 and 85
times in November, 2009. In March, focus group participants were not sure what an
information literate person was, and most could not describe a process to use when dealing
with information. One student could describe a process, used at her previous school, but
could not name it. Several students mentioned key words, and could describe mapping and
brainstorming from the previous year. Several students said “the teacher gives us questions
and tells us to go and find the answers” and when asked if they received help from the
teacher one replied “Not really we’ve just told to do it”.

In November, most of the students brought recent research assignments with them and talked
the researcher through the process. While some students could not give the name of the
model they had been introduced to (i-Lit), all of the students contributed to describing the
process. When one student, for example, said “Didn’t we do defining first?” another replied,
“Well we did defining first”. Another was more specific saying “This is what we had to do
first. We had to first choose a country from the Pacific region and then we had to link to our
prior knowledge. What do you know already about this country and its cultural traditions
which was the KWL chart”. They were also familiar with the need for them to check the
worth of information in books or websites, saying “you can check the front of the book where
the book was made and like so if the information is up to date” and when referring to the
internet, “but if you look on the internet anyone can put any information”. This group of
students seemed to be aware of the pitfalls that using online information might present.
Several students described the retrieval plan they used which included a process for colour
coding questions and matching information whereby “we would colour one question and then
with all the information that related to one question we’d highlight that colour so it would be
easier for us to use”. One student thought that questions you can answer yes or no to
“sometimes it could be helpful” while another student noted that such questions “are not
really helpful” and that the question might need to be reworded to make sure it required more
information to be included in the answer.

Several students said that using reflection during the process and at the end of the process
was the highlight of their assignments as “it wasn’t just to do the assignment, it was kind of
fun learning about it” and “My highlight was…. finding out things for myself so I wasn’t
really reliant on other people, I was more reliant on myself”. Later a student said that “we had to reflect on what we would do better next time” implying that she appreciated the opportunity to participate in her own learning. All the students said they liked having a process to follow “because you’ve got everything written down so you can follow that process”. When asked how they managed all the notes they had taken from various sources, students replied “You just had to sort of make the structure sort to”, ”so it makes sense”, “yeah makes sense”, “not just sticking a whole pile of bullet points together”.

Lead teacher interviews

Each school had one main Lead teacher. These teachers were interviewed several times during the project (Appendix D) to discover how they saw as their role and how they planned to implement the professional development in their respective schools. They were also asked how they felt the professional development was proceeding, what issues they discovered during the time, what had been successful and any recommendations for the project in the future.

School A

The Lead teacher at this school took over early in 2008 after the original Lead teacher left. Implementing the professional development: This teacher commented that she found it was hard work taking over from the previous teacher. She found the school seemed to have several information processing models in use but got agreement from the staff that i-Lit would be the only model in use throughout the school. She planned workshops for Term 2 on note taking, Google searching strategies, skimming and scanning. She also had a time allowance to go into classrooms to help teachers which proved very successful according to comments from teachers during interviews. She had added supporting materials to the school’s KnowledgeNET website⁹. Attending the Extending High Standards Across Schools (EHSAS) Conference mid-2008 was very helpful and she was very pleased to note that their project appeared to be of such a high standard. Their presentation received very good feedback and she realised that what they were doing was much ‘deeper’ and that some schools were “just doing” graphic organisers whereas “we’ve got a whole model”.

---

⁹ KnowledgeNET is a school management system used by many New Zealand schools. http://www.knowledge.net.nz/
This Lead teacher also invited the Librarian from School C to give School A staff training in the use of the EPIC databases. EPIC is a purchasing consortium which enables access to quality databases in NZ libraries. This resource is available free to all New Zealand schools through the National Library of New Zealand and is hosted by Te Kete Ipurangi (TKI) (EPIC Databases, 2011) but is often under-used. The Lead teacher was also very pleased when another local school, not part of the cluster, asked her to come and talk to them about what her cluster was doing.

She said she encouraged displays on classroom walls of the *i-Lit* posters and these were clearly visible in many classrooms (see Figure 6.1) and also displays of any student work which she hoped would encourage other students. However, she did not provide a lot of the detailed documentation, expected by the researcher, which related to the professional development she carried out, such as timetables, evaluation sheets, teacher handouts.
Figure 6.1 Example of classroom display
Current progress (end of 2009)

By August 2009, the Lead teacher reported that she considered School A was doing well. Each curriculum area was up and running and the model was integrated with the school vision. The Lead teacher described further resources available to help staff, such as colour coded sheets with stages and reflections for students and staff. She also reported that staff found it helpful to have a common language for learning. Under the circumstances she felt she was lucky to be in a much smaller school with only 25 teachers and commented that she thought School B “is having a rough time getting the staff on board so I feel lucky”. Overall she found the project exciting and was pleased to be part of the team and felt really lucky because “my principal has backed me all the way – it’s a project he’s signed on to and he knows it has to be done” and could not think of any real issues that had arisen once she became familiar with the process. Her main recommendations concerned recognition of the important role played by supportive senior management.

School B

Implementing the professional development: The Lead teacher here led the initial development of the information processing model and the intervention until she left during 2008. Her aim had been to involve all the staff in the professional development at the school, not just one department as she felt that could cause problems later. She initially set up committees within departments but these soon lapsed and she found that some staff did not welcome any professional development as they felt it was not needed while others sat and nodded but changed nothing. While it was good to have the professional development sessions in school time (students started later one morning per week) she found that too often other matters did get in the way and part of the time could be used, for example, to discuss school administration matters.

This Lead teacher had decided to tackle one stage of the model at a time. During the first term, therefore, the professional development sessions were concerned with defining the task and she felt it did not go well. In fact, this stage proved to be the most difficult. Teachers had previously identified the ‘worst’ question they were asked by students to be “What are we supposed to be doing?” The Lead teacher tried to get teachers to understand that working on this stage would help them to help students trying to understand tasks but instead she reported comments ranging from, “never heard about this at all before” to “what are you talking about?” to “I already do this”, “I know all about it, you’re wasting my time”. This Lead
teacher said that she knew from her time in classrooms in the school that many teachers did not seem to know all about it and that tasks often were not defined. She also noted that many teachers seemed to want to know how to give students the answer rather than teaching students how to get into the task and find the answer themselves. There was some positive feedback from staff from a couple of departments who told her that they recognised the model as contributing to powerful teaching and learning. Term two had a focus on locating information and that was more successful as teachers appeared to feel more comfortable acquiring strategies for helping students search for and find information.

At a later interview, held in March 2009, once she had left the school, the teacher reflected on the process and felt there had been a lot of resistance to her personally and lots of politics involved with people not showing up for meetings or not taking the process seriously. She did not ever “get the feeling of the whole staff wanting to do something together”. Working in a cluster, though, was a positive experience as it meant “you didn’t have to try everything yourself” and “we had good conversations among three different schools”. She had also discovered, since leaving, that some Year 13 students had written in their exit interviews that they were pleased to be taught the model and that it helped them to learn on their own. She felt that this indicated that “the model teaching had percolated through somehow as senior students were not part of the project but their teachers had obviously passed on their knowledge gained from the professional development”.

Current progress and issues (end of 2009, early 2010)

The teacher who took over as Lead teacher in School B during 2008 was interviewed in October 2008 and again in February 2010. She commented that staff had felt frustrated that the professional development had been carried out one step at a time so that each stage was in isolation. She felt people “didn’t get a sense of the over-arching model of information literacy – just lots of little things in isolation” so “I let them adapt the model to their department’s needs” and that worked well especially as they were given time to create resources to go on the intranet. She said she had to work hard to help teachers see that the process was not just for research but “very useful when writing essays and also for planning”. She said that a recent Education Review Office (ERO) report, (Education

---

10 The Education Review Office is the government department that reviews and reports publicly on the quality of education in all New Zealand schools and early childhood services, including private schools, kura kaupapa Māori (Māori language immersion schools), special schools and ngā kōhanga reo (Māori language early childhood groups).
Review Office, 2010), for the school had noted a “lot of fundamental stuff that needed to be worked on across the school”. That was the idea of “getting back to the nuts and bolts of good lesson planning. It’s that whole thing that falls by the wayside … forgetting to really define the learning objectives and the learning outcomes for the students and actually if you use the i-Lit model it does make sure you step your way through that”. She noted that not all departments were involved – “you rely on HODs to be professional and make sure their staff were doing what were supposed to be doing. Some wanted to use the PD time for marking and moderation”. She also emphasised how essential it was for teachers to teach explicitly.

This teacher has also since left School B.

School C

As with the other schools, this Lead teacher was not part of the original Lead teacher team but joined at the start of 2008. She did, however, take over from the first Lead teacher at School B as overall project leader. The regular Lead teacher group meetings, originally held at School B, then moved to School C. The researcher interviewed this teacher in May 2008, November 2008 (along with another member of the Lead teacher group from School C who left early in 2009) and in December 2009.

Implementing the professional development: This teacher explained in May 2008 that “we decided we wouldn’t go for whole school straight off because we wanted to refine, we wanted to make sure that what we were doing with the whole school was something that would work really well and had been trialled” She had approached two departments she knew used research (English and Social Studies) and discussed areas of weakness they had identified in students’ learning. “Social Studies teachers thought retrieving and processing were the two areas needing most help”. The feedback from these Social Studies teachers was that teaching processes of information literacy would help students in the senior school to focus on cognitive skills such as evaluation and drawing conclusions, problem areas in the past. At professional development sessions, the Lead teacher modelled the appropriate strategies for the i-Lit model. The six teachers then worked with their classes on the strategies after which there was a feedback session led by the Lead teacher. Other teachers started receiving professional development in 2009 and it was planned to involve all staff by 2010.

This Lead teacher was planning, in 2010, to produce information literacy student learning progressions, detailing knowledge and skills they should exhibit, for Year 7–10 thus enabling
teachers to know what students have covered in previous years. She also ran departmental professional development days and introduced the model and stages as well as regularly visiting classrooms to offer support. The Library manager helped with this and ran a lot of sessions, working with teachers and students and the Lead teacher commented that “it’s invaluable having our [librarian] working with teachers”. The librarian was also given extra time to work with teachers from other clusters.

Along with other willing teachers, the Lead teacher created resources for initial use which teachers could adapt. A lot of time was allotted for reflection on the process. She reported that teachers liked the model as it was clear and gave them specific skills to teach. She also noticed more explicit teaching of skills. “We modelled the different skills ...and really focussed on explicit teaching. I modelled how I would teach students to skim and scan so they could follow that. It was really focusing on guided inquiry rather than I’m just going to teach you the skills and off you go. I actually went into classes and taught the students because the teacher said I’d really like to see how you do it”. This system worked well as “teachers get two bites at it, you teach the students the skill in tandem with doing the practice activity and then they get to do it again with you at their elbow”. She thought that teachers really appreciated having some professional development that was specifically created for them and that “all the social sciences staff could see that at senior level subjects these skills are invaluable”. She was also pleased that the professional development worked in well with the Literacy Initiative, another professional development project the school was involved in.

The goal was to go school-wide in 2010 when all teachers would be involved. A considerable number of resources were going up on the wiki to help teachers in all the schools. All members of the Lead teacher group noted that it was important to repeat the professional development as teachers said they forgot and they asked for refresher sessions. They noted more interdepartmental planning which worked well, and one teacher at School C felt that much of the success of the project was due to the Lead teacher at School C and her manner with staff.

By August 2009, the School C Lead teacher reported that the teacher handbook was complete, the student pamphlet finished and there was discussion about producing a pamphlet for parents. The finalised design for the i-Lit poster had also been printed in colour and A2 and A3 copies were distributed to all schools. It was decided that class sets were to be
laminated and distributed. *i-Lit* was also being used to create well designed lesson structures for teachers.

She also noted that she had started work on creating information literacy learning progressions at each level. She and another teacher were also providing professional development on Hyerle Thinking Maps (Hyerle, 2009), following on from the external workshops they themselves had attended. There was also a booklet planned containing a lesson sequence teaching plan for each department. The other School C teacher present emphasised the time it took to implement strategies such as the Hyerle Thinking Maps with staff. Both teachers stressed the importance of teachers modelling the skills they wanted their students to develop.

**Current progress (end of 2009):** When interviewed in December 2009, after the project was terminated 18 months earlier than expected (to her great disappointment), the Lead teacher was, nevertheless, very pleased with work produced by her own class that year and felt the higher standard was due to the use of the *i-Lit* model and explicit skill teaching. She also reported that classroom teachers had told her that they liked the way the model could be refined and used for able students and for less able students.

**Issues:** The main issues she had faced during the project were getting enough time for herself and others, including having to persuade some teachers who did not want release time for professional development as they did not want to lose their classes; getting buy-in from staff although some who were not very enthusiastic changed their attitude when they saw the benefits. She did say that “*a few just don’t get it*”. Senior staff changes were another challenge as the deputy principal (DP) changed twice, in 2008 and again in 2009. The DP she started with was an integral part of the team but left and the next one then left. “*We will get another one next year and she may have her own agenda and won’t be so interested in our PD*”.

**Recommendations:** Changes this Lead teacher would make if repeating the project included: ensuring there was enough ICT equipment for students and that it worked; having more people involved; involving the school librarian in a larger role, “*I would have used her more if I had known how helpful she would be*”. Her biggest challenge and greatest disappointment was the early end to the project when the incoming government cut all the funding. Had she
known this might happen, she would have included all the staff in the professional
development during 2009 instead of planning to do so during 2010.

**Documentary evidence**

As mentioned previously, much of the documentation of the implementation was supplied by
the School C Lead teacher. Apart from the explanations, descriptions and rationale for their
choice of intervention, the documentation included an action plan covering four years for the
cluster schools. This plan detailed objectives, outcomes, actions, resources, the review and
monitoring process as well as a timeframe for completion of the stated actions and an
emphasis on the importance of taking note of current research, for example, in information
literacy and in assessment. Much of this material was posted on the cluster wiki and so was
available from a central location for all teachers at the cluster schools.

Other resource included as an example was the outline for a professional development
session with a focus on the Defining stage (Appendix G) which was planned to take two
hours. Also included were examples of resources from the teachers’ i-Lit Toolbox such as
information for teaching the Defining stage of the process (Appendix H), using *Teaching as
Inquiry to improve students’ information literacy learning outcomes* (Appendix I) and a
resource to help students record information (Appendix J). Teachers from School C, who
were involved in the early i-Lit model professional development sessions, completed
evaluations on their progress implementing the i-Lit process. These reflections gave
indications of how the teachers were managing when first implementing the process and
comments included: “Explicit teaching – this was effective”, “Structure was helpful. Difficult
to get access to computer rooms. Process is time consuming”, “Students didn’t understand
keywords, time in library was beneficial”, and “Need explicit teaching of thinking strategies”.

No evidence was offered by any Lead teacher or HOD to demonstrate that departmental
policies now included information literacy development or that information literacy was now
mentioned in any curriculum schemes. The original EHSAS proposal referred to this situation
but it would appear that no changes have yet been made.

There also appeared to be no progress on the goal of including *Teaching as Inquiry* or on the
formation of a learning community, both of which were mentioned in the earlier
documentation of the project. When queried during interviews, no teacher seemed familiar
with the process of *Teaching as Inquiry* from the New Zealand Curriculum (2007) or with the concept of learning communities.

Next chapter: Chapter 7. Discussion of findings in relation to the research question: Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal, and if not, can this situation be improved through the use of a teacher-designed intervention? This chapter discusses implications emerging from the findings from each of the three schools and includes recommendations.
Chapter 7
Discussion of the Findings

As referred to in Chapters 1 and 4, the findings have been viewed through the framework of a formative and design experiment approach (Reinking & Bradley, 2008). Doing so allowed the researcher to encapsulate more readily the variety of findings emerging from the “rich and diverse sources of data” with “complexity of context” (Stinson, 2008, p. 42) found in the messy situation of actual learning environments such as schools (Collins, et al., 2004). The discussion of the findings from this research is therefore based around the six questions derived from the framework associated with the formative and design experiment approach (Reinking & Bradley, 2008). These aim to establish the pedagogical goal of the intervention, the reasons it was important and the literature informing the accomplishment of that goal, the intervention that could or did achieve the goal and why, the factors that enhanced and inhibited the achievement of the goal, suggested modifications of the intervention, any unanticipated effects, and changes made to or suggested for the instructional environment as a result of the intervention. In short, the framework allows for a comprehensive examination of the various processes by which the goal is or is not achieved. In this project though, as explained earlier, the process was cut short when a new government cut all EHSAS funding. This, along with other considerations, resulted in the goal being achieved to a limited degree, but aspects of the project provide the promise of success under certain circumstances.

Background to the project

This project was carried out by three schools that formed a cluster and gained EHSAS funding for four years to improve teachers’ understanding and practice of information literacy and students’ information literacy skills. The researcher was asked to evaluate the project and, in turn, was granted permission by the principals to use this work as part of her doctoral thesis which addressed the research question: Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal, and if not, can this situation be improved through the use of a teacher-designed intervention?

In order to carry out the evaluation, the researcher used a mixed method methodology, gathering data from questionnaires, interviews, focus groups, and documentation over two years. An intervention was designed based on the findings from a preliminary needs analysis
which had been carried out at the end of 2007 and early in 2008. The intervention, designed
by the Lead teacher group, included the creation of an information processing model, a
programme of workshop sessions, one to one meetings with the Lead teachers, classroom
visits, posters, pamphlets, a variety of teacher resources, and a cluster wiki. The Lead group
met regularly to discuss progress of the professional development and to make adjustments
resulting from ongoing monitoring. After the first round of professional development in late
2008, and analysis of the repeated teacher questionnaires, the workshop sessions were
changed in the light of these findings. In 2009, two classes from each school took part in pre
and post intervention questionnaires and focus groups. The students in these classes were new
to their schools and so had not previously been taught by teachers who had undertaken the
professional development. The findings again were discussed by the Lead group with the
intent of adjusting the workshop contents and other resources accordingly before further staff
sessions in 2010. Each school, while using the same content for their professional
development sessions, delivered that content in different ways and at different times.

The pedagogical goal being investigated, its value and importance and the theory and
the literature concerning that goal

The pedagogical goal of the project evaluated in this research arose from the concerns of the
three principals of the cluster schools (see Chapters 2 and 3 for literature reviews and Chapter
5 for full details of the EHSAS goal). In their EHSAS proposal, the cluster had identified the
development of information literate students as the major goal to be achieved when applying
for an EHSAS contract in 2006/7 from the Ministry of Education (Pasley, et al., 2007). Those
writing the proposal referred to assessment results and research, which demonstrated that
students lacked the required skills and that teachers were not explicitly teaching the skills.
Much of the rationale for the decisions the Lead teacher group (one or two teachers from each
school) made about the aims and delivery of professional development drew heavily on the
synthesis, Teacher professional learning and development: Best evidence synthesis
(Timperley, et al., 2007) which investigated interventions that had a positive impact on
student learning. This study was published by the New Zealand Ministry of Education and
widely distributed around New Zealand schools. The Lead teachers did make references to
other researchers including Black and Wiliam’s (1998) work on formative assessment and
Robinson and Lai (2006), with respect to teacher based inquiry into practice. In conversations
with the researcher, they also referred to aspects of professional learning such as the
importance of tacit knowledge and cognitive dissonance, although at the time they were not sure where they had read this. Most of these references were found in Timperley et al. (2007) and followed up by the Lead teacher group. This study provided a very useful structure for the Lead teachers, around which they could plan their intervention, including the key features of those professional development studies deemed to be effective according to the criteria the authors had developed.

**The intervention that could or did achieve the pedagogical goal and why**

With the pedagogical goal of improving teachers’ understanding and practice of information literacy, the group of Lead teachers from the three schools had decided back in mid-2007 that the intervention should include a common information processing model that all teachers and students could follow (see Chapter 5). They understood the importance of using a model that was theoretically informed and research based. After intense research, the Lead team chose to use *Focus on Inquiry: A teacher’s guide to implementing inquiry-based learning* (Alberta Learning, 2004) as the inspiration for their own model. They particularly approved of the statement by the developers that their model “brings together 13 years of research, practice and reflection” (Alberta Learning, 2004, p. x). As explained in Chapter 5, the Lead teachers had also considered basing their *i-Lit* model on another research-based model, more explicitly underpinned by information literacy practices (Kuhlthau, et al., 2007). They decided on AIM (Alberta Learning, 2004), however, as the accompanying material was closer to the type of resources they hoped to produce for their own busy classroom teachers who did not have the benefit of advice and assistance from teacher-librarians in their schools.

The Lead teachers wished to explain to staff the reasons for choosing to base their own model on the Alberta model (Alberta Learning, 2004), and also explain to staff how the learning theory underpinning the model linked to the goals of the New Zealand Curriculum (Ministry of Education, 2007). As they worked on designing their own model and the accompanying professional development, they also ensured that their professional development aims were aligned with the cluster schools’ own improvement goals and priorities, a characteristic of successful professional development projects (Wei, et al., 2009).

**Factors which enhanced or inhibited the achievement of the goal**

There were a number of factors which enhanced the project. The development and design of the model and the accompanying professional development, to be used at all three schools,
were research based and included much detail linking theory to practice. A variety of resources for teachers were developed from evidence of effectiveness (see Chapter 5). Basing their i-Lit model on *Focus on Inquiry: A teacher’s guide to implementing inquiry-based learning* (Alberta Learning, 2004), a very detailed guide, could have run the risk of plagiarism, even if unintentional, as the Lead team did not correspond with those responsible for *Focus on Inquiry* to discuss their intentions. However, the researcher closely examined all the documentation produced by the Lead team for use with and by the cluster staff, including worksheets, strategies, and teaching suggestions and there appears to be no cause for concern. The Lead teachers have fully acknowledged the authors, Dr Dianne Oberg and Dr Jennifer Branch, and the debt they owed to their work. It seems that *Focus on Inquiry* provided a starting point for achieving the aims of the cluster when designing an information processing model and accompanying resources. The Lead teachers ensured that they were very familiar with the requirements of the New Zealand curriculum and they had clear ideas of how they intended their own model to work in with these requirements, with the result that their i-Lit model being closely aligned to New Zealand conditions.

The Lead teachers’ decision to deliver the professional development as a school-based programme can also be seen as a factor likely to enhance success (McLaughlin & Talbert, 2006) although the project documentation does not explain or justify the reasons for this decision. Another enhancing factor, and one recommended by Putnam and Borko (2000), was the plan that teachers, introduced to new strategies in workshop sessions, would then go away and practise the strategies with their students before evaluating their experiences at later workshop sessions. This was an expectation at all the project schools and was commented on favourably by teachers from the three schools during interviews.

The actual delivery of the professional development, however, differed at each school. According to changes in teacher and student understanding and practice of information literacy, it would appear that the methods of delivery chosen by the Lead teachers at Schools A and C were enhancing factors, while the delivery method at School B, especially by the first Lead teacher, led to conditions and attitudes which inhibited change. At School A, the Lead teacher carried out whole staff sessions once a week where she introduced teaching strategies to help teachers implement the i-Lit process in their classrooms. She also visited classrooms and arranged for other teachers to visit classrooms. This Lead teacher found it a real struggle when she first took over her role mid-2008, as she had to learn about the EHSAS
project aims and procedures and become familiar with a new school. When interviewed, she reported she was willing to learn about information literacy and to become involved in a leadership role at the school, despite her initial dismay at the challenge confronting her. She was, however, working in a smaller school than Schools B and C, her principal gave her constant, visible support, and the majority of the staff were the same age as she was and had much the same number of years of teaching experience. This Lead teacher did offer the comment, though, that she felt lucky not to be facing the difficult situation occurring with staff at School B. The teachers at School A appeared to be happy with the professional development and the way it was delivered, offering positive comments when interviewed. The researcher attended several meetings at the school where staff visited each others’ classrooms to discuss student work and to comment on displays (Figure 2). There was an atmosphere of support and involvement in the project.

At School B, the Lead teacher, one of the original EHSAS team experts, was already very familiar with the i-Lit process and started the professional development earlier in the year before the other schools. She planned to tackle one stage of the i-Lit process each half term (5 weeks) during staff sessions held once a week when students started school later to allow this to happen. This Lead teacher’s plan to tackle one stage at a time appeared to be unsatisfactory to staff early on in the professional development delivery as reported during Lead teacher interviews. HODs also commented during interviews to the effect that they would have liked to see the whole process instead of being introduced to it one stage at a time as they could lose track of what they were doing when they could not get an overview. There were apparently too few references to the whole process during sessions. While the original Lead teacher at School B did not feel she had made a great success of introducing and getting the project underway in her school, the researcher discovered later that this teacher, while highly qualified in her field, had, in fact, had very little actual classroom teaching experience whereas School B at that time had a large staff of 119, most of whom were very experienced teachers. The Lead teacher’s description of the problem as a “loud 10% who dominated which made them seem a larger group than they were” and who had told her that they already “knew it all” gave an indication of the problems she faced. An interviewee commented to the researcher that a number of teachers felt they were being “taught to suck eggs”. The group of critical teachers who did not appreciate the aims of the project, presumably did not help make for a supportive atmosphere conducive to learning. The comment volunteered by the School C Lead teacher was also revealing about the situation at School B. Such vocal criticism of the
process by some staff should have been dealt with more effectively as soon as the protests became obvious. Another problem occurred early on when it became evident that part of the professional development time was often taken up with unrelated administrative matters. While a more experienced teacher may well have avoided these problems, it was surprising that staff at senior management level did not step in to provide more support and assistance to the Lead teacher.

The original Lead teacher of School B left and was replaced late in 2008 by another teacher who was HOD of a large department. While she reported that she found it hard work getting up to speed with the project, she was, unlike the previous Lead teacher, a very experienced teacher and did manage to introduce changes to the professional development delivery which were well received by many staff. Her decision, for example, to give teams of teachers within subject areas time to develop resources proved to be a successful strategy (Supovitz, 2002). The professional learning teams (Newmann, 2007) she set up apparently did not become as effective in supporting groups of teachers when implementing new teaching strategies as she had hoped. She also demonstrated during an interview that she had a good understanding of the wider benefits of using of the i-Lit model when she noted that the use of it could go some way to remedying the lack of planning noted in a recent ERO\textsuperscript{11} report for School B. There were ongoing problems, though, such as teachers who insisted on marking student work during professional development sessions, something she considered very unprofessional. The information literacy certificates seemed to be a good idea for motivating teachers and students but, as no HOD referred to them when interviewed, their impact may have been questionable.

At School C, the Lead teacher who took over during later 2007, was an experienced teacher as well as being a former literacy leader in the school, and staff were accustomed to her taking a leadership role. A supportive atmosphere prevailed at School C among the small group of teachers who did participate in the trial of the professional development in the second half of 2008 and also from the larger group participating in 2009. All the teachers interviewed were positive about such support and one teacher volunteered the opinion that any success with the project at School C was due to the Lead teacher’s manner with staff. The Lead teacher had decided to trial the professional development with only six English and Social Studies teachers in 2008. This decision is supported by researchers such as Guskey

\textsuperscript{11} The Education Review Office (ERO) reviews schools and early childhood education services, and publishes national reports on current education practice. (www.ero.govt.nz).
who reported that it is very difficult to implement such an innovation without a trial or pilot programme to make sure those introducing it are familiar with the practices and can evaluate initial progress. The School C Lead teacher had included another 30 teachers in 2009 and planned to include the remainder in 2010. She also planned to hold professional development sessions for departments in order to develop professional learning teams, referring to the work of Neumann (2007), who found that teachers working in collaboration benefit from expanded resources, and Timplerley et al. (2007). Unfortunately, these intentions did not eventuate due to the funding cuts and the Lead teacher being returned to full time work in the classroom.

When examining what the teachers learned from the intervention, the results of the repeated questionnaires completed by teachers at Schools A and B (School C did not participate in the questionnaire at this time as the professional development there had not yet included all teaching staff) demonstrated that some small but significant change in teachers’ knowledge and understanding of information literacy had occurred since the professional development commenced during 2008. Teachers at School A understood that information literacy was not just about library skills or using ICT; they could also name and describe the i-Lit model and they believed that information literacy skills needed to be explicitly taught. Teachers at School B also knew more about the model and saw that information literacy included more than using ICT and some saw that the skills had wider uses than just with research.

Introducing and using an information processing model with students is a very complex process, and one which can seem inhibiting to many teachers. It can take three years or more for teachers to become competent in this area (Moore, 2002; Pearson, 2009) and introducing the process to a class of thirty or so Year 7 or 9 students can therefore seem overwhelming at times. While teachers at the three schools, when interviewed, were on the whole more knowledgeable about the concept of information literacy, could discuss the model, recognised the need to teach skills explicitly and found it useful to have a common model, the demands of actually working with students in the classroom in this new way were often daunting. Some admitted to finding the whole process very complicated. They mentioned the complexities involved in checking and then, where necessary, developing students’ skills as well as ensuring that the students understood the whole process. Although teachers from School C brought student assignments with them to interviews which they discussed in detail, enthusiastically describing a system of colour coding used with sources of information, they
were not actively checking skill levels and were only teaching some skills explicitly. Given the short length of time the professional development had been in place, however, it was not surprising that so few teachers were checking their students’ skill levels or explicitly teaching information literacy skills. There were plans, though, to introduce information literacy skills progression tables for use at all schools. Adjustments were made to parts of the professional development in that more emphasis, for example, was put on the development of questioning skill after early findings revealed that most students were operating at low levels of thinking when forming their questions.

It was also clear, from the interviews and questionnaire findings, that teachers’ lack of understanding of the project was another inhibiting factor. The project launch, for example, took place in the auditorium of the largest cluster school one afternoon after the schools finished early for the day. The occasion included several nationally well known speakers and the provision of a light meal catered by students. However, the reasons for this celebration, despite many whole-staff meetings held during 2007, the distribution of research consent forms, many progress reports from the school principals and talks about the cluster aims in all three staff rooms, still escaped a number of teachers. They were unsure what the occasion was all about and said they knew nothing about the EHSAS contract or the cluster their schools had joined. Other teachers, although seeming to welcome the idea of using a common i-Lit information processing model, did not understand the theory on which the required new practice was based. Some were not sure why they needed to change their practices. This is a crucial requirement if there is to be change (Borko, 2004; Guskey, 2002; McLaughlin & Talbert, 2006; Timperley, et al., 2007), particularly so in secondary schools where there are many teachers focussed mainly on their own subject area and department and seemingly immune for all other happenings around them (McLaughlin & Talbert, 2006).

It appears that the professional delivery methods at Schools A and C could have been an enhancing factor while those at School B inhibited progress. The results from the 2009 student pre and post intervention questionnaires and focus groups demonstrated obvious differences among the schools, occurring over time and across schools. Although the questionnaire responses demonstrated some significant changes from March to November 2009 in one or two questions at each school (two questions at School A and one question at Schools B and C), analysis of the focus groups revealed much greater differences among the schools over the same time period. It is difficult to find reasons for these across-schools
differences other than possibly the fact that the Lead teachers at Schools A and C appeared to receive more senior management support than did the Lead teacher at School B, combined with the differing methods of delivering the professional development to the teachers at the three schools. This is an interesting aspect as other variables such as age, experience, training and teaching material indicate that the teachers of the six classes were a homogeneous group in terms of these variables. The six participating classes, two from each school, were taught by teachers who had all participated in the professional development. All six teachers from the three schools were from 23–30 years of age and had been teaching for similar lengths of time. All had trained in New Zealand and none had undertaken any previous professional development involving information literacy. Although individual teacher qualities could account for the differences, in this case, neither class at School B demonstrated greater understandings of information literacy by the end of 2009 whereas the other four classes from Schools A and C did. The Lead teachers had all remarked, during interviews, that they had chosen teachers, from those who volunteered their classes, who appeared to be enthusiastic about the intervention. The same model and materials were used at all three schools.

The gains made by students in selected classes over the course of a year of the intervention from Schools A and C were very encouraging. Their ability to refer to at least three times as many indicators of an information literate person in November than in the March focus groups demonstrated a much greater depth of understanding of information processing. It was particularly pleasing to listen to these students discussing the i-Lit process in detail, and to hear that they liked having such a process to follow, that they understood the problems that could arise when searching the web. They could discuss, with surprising confidence, types of questions and give examples of both ‘good’ and ‘bad’ questions. It was interesting to hear them noting that questions that could be answered by yes or no were not really useful. It was also pleasing to hear that they felt they received more help from their teachers now than they had been offered previously. The robust discussion of the process to which all the focus group members contributed, particularly those from School C, was further evidence of the familiarity students felt with the i-Lit process. The colour coding strategy which the School C teachers had been so enthusiastic about was also described in great detail by their students. Several students stated that they now liked reflection which was interesting as an HOD from School C, when interviewed earlier, had thought reflection was almost too hard for students. The detail students went into when describing why they enjoyed carrying out research assignments was also very revealing and a contrast to the “it’s boring” response received in
March from the majority of groups from all three schools. The response from one student at School C, that you “can’t just stick a whole pile of bullet points together” revealed, on further discussion, a commendable depth of knowledge about forming and answering questions and also revealed an awareness of the need for higher level thinking.

The very different situation at School B indicated that the students there had not gained the same knowledge and understanding of both the i-Lit model and of the process. These groups of students referred to fewer key indicators in November than in March and contributed less than the other groups. That the students in the groups still did not recognise the i-Lit model and could not describe it in any detail and that at least one student was still using the model she had used at her previous school seems to indicate that the professional development undertaken by the teachers of those classes was not effective. Students did not perceive that teachers gave them a lot of help or taught them any information literacy skills apart from the one student who said that, at her previous school, a teacher had helped her, and that since then she felt she was able to help herself through the research process. Another student said the teacher had told them how to take notes but had not modelled the procedure so she was still unsure of what to do. Several students said that the teacher just told them to find three questions and then to answer them. There was a noticeable lack of the talk about the i-Lit process unlike the animated discussion that had occurred at Schools A and C. Both groups at School B finished their discussions well short of the allotted 40 minutes whereas the groups from Schools A and C continued for at least 40 minutes. It appeared that the teachers of the four classes at Schools A and C had benefited more from the professional development and had made more impact on their students than had the teachers from School B.

There were also other inhibiting factors noted in this study. These included staff turnover, the teachers’ view of the supporting resources, and time. Frequent staff turnover is a common problem in schools and, in projects such as this, needs to be taken into account at the planning stage. McLaughlin and Talbert (2006) note that too many staff or leadership changes can cause a project to falter or even fail while such turnover is “inevitably a threat to sustainability” (Timperley, et al., 2007, p. 223). As described above, the position of Lead teacher at all three schools in this project changed at least twice during the 30 months of the project. It seems surprising, in view of all these staff changes and the lack of initial, explicit planning to ensure sustainability, that the project managed to continue or to have any impact at all. It is possible to explain the continuation of the project by the cluster’s
(unacknowledged) practice of distributed school leadership, “‘stretched over’ the schools’ social and situational contexts” (Spillane, et al., 2003, p. 535). The project provides examples of both the collaborative and collective distribution described by Spillane et al. (2003), with principals working together and with the Lead teachers, either sharing responsibilities or working in a reciprocal way, separately but interdependently to contribute to the project’s continuation. Thus, a group of leaders (teachers and principals) working together leads to a practice of leadership potentially more than the sum of the practice of each individual. The principals also made strategic staff replacement choices when Lead teachers left. It was fortunate, though, that none of the three principals themselves left during this time and that two of the principals in particular remained supportive and provided the necessary ongoing encouragement and leadership (Meiers & Ingvarson, 2003; Timperley, et al., 2007).

The provision of many resources for teachers was both an enhancing and an inhibiting factor. It was a positive factor in that they were centrally located on the cluster wiki and available to all staff. However, traffic to the wiki was not high at the end of 2009 when the project funding ceased. The Lead teachers, in particular the Lead teacher from School C, were very enthusiastic about the variety of material available on the Wiki but it would have been wise to check how staff felt about this plethora of resources. Several teachers, when interviewed, commented on feeling overwhelmed by the amount of material available, with the result that they tended to ignore it. Posters of the model were distributed to all classrooms, pamphlets were also designed and distributed and a diagram of the model was included in the students’ homework diaries, although several students during the focus groups revealed that they had not realised it was there. As noted by Timperley et al. (2007) just the presence of various success factors, such as supporting resources, does not guarantee success.

Time was a factor that worried and inhibited all the Lead teachers. Although all three had been freed from much or all of their normal classroom teaching loads, they still found they did not have enough time to carry out the professional development as they wanted to. Not only did they need time to design, develop and deliver the professional development, they also needed time to develop resources, work with staff, write up progress reports and attend meetings. Many studies investigating professional development state that it is very time consuming (Guskey, 2003; Poskitt, 2005; Timperley, et al., 2007) and it must be noted that it had taken the Lead teachers over two years of regular meetings and planning to have made the small amount of progress they did by the end of 2009. Despite their concerns about the
time needed to carry out the professional development effectively, the Lead teachers were not allotted the extra time they requested and one was even given extra duties in 2009.

One factor which has enhanced the research relating to this project, has been the value of using a mixed method methodology. The results of the November, 2009 post-intervention questionnaires, when the results were analysed, showed only small significant change whereas the focus group responses supplied many more details of “the lived experience of other people” and “the meaning they made of that experience” (Axinn & Pearce, 2006, p. 9). During this project, many of the advantages of focus groups, as outlined by Vaughan, Schumm and Sinagub (1996, p. 14), were readily observable. These included synergism from groups interactions; snowballing when the statement of one participant initiates a chain reaction of additional comments; stimulation, observed when several groups of students from School C were describing the i-Lit process with some excitement; security as individuals felt safer responding within a group, and spontaneity because the group members are able to answer those questions they feel strongly about. Interviews with the Lead teachers and HODs have also contributed accounts of attitudes, experiences and feelings that are not available through questionnaire responses alone (Burns, 2000).

**How can the intervention be modified to achieve the pedagogical goal more effectively and efficiently and in a way that is appealing and engaging to all stakeholders?**

While this project did enjoy some success in the shortened time it operated as a fully funded project, there are a number of modifications that arguably need to be made to ensure greater success if the project were to be repeated or continued.

**Planning for sustainability**

One of the most important issues arising from any professional development is sustainability. There would seem to be little point in spending money and time for only short term effect yet, according to Timperley et al. (2007), most effects from professional development are short lived. Sustainability, according to the findings from *Teacher professional learning and development* (Timperley, et al., 2007), depends on teachers acquiring “an in-depth understanding of theory to assist instructional decision making and the skills of inquiry to judge the impact of teaching and learning and to identify next teaching steps” (p. xxxii). The Lead teachers did address the problem of sustainability in their initial planning, referring to statements from Timperley et al. (2007) concerning issues relating to sustainability, and
writing that these issues were “key factors in our planning” (Dezoete, 2009, p. 12). They also stated that support was needed for new teachers along the lines of Mclaughlan and Talbert’s (2006) description of ‘folding’ new teachers into departmental cultures and communities of practice. The Lead teachers also specified that a range of learning opportunities should be available, including whole-staff sessions and individual departmental support. Once the project was underway, though, there was little more talk about the sustainability issue.

One method of embedding the learning, and possibly achieving sustainability, could be through the appraisal system. It is a mandatory requirement in New Zealand schools (Ministry of Education, 2008b) that all teachers are appraised annually, usually in areas such as teaching responsibilities, school-wide responsibilities and management responsibilities. The area of teaching responsibilities includes planning and preparation; teaching techniques; curriculum knowledge and student assessment. Building students’ information literacy development into teacher appraisal systems could provide a useful strategy for ensuring the sustainability of the project. When appraised, teachers would bring evidence with them, such as student assignments, to demonstrate and explain how they have approached student information literacy development.

Another factor, which could lead to sustainability of this project, is increased teacher motivation. It has been found that teacher motivation is improved when teachers can see improved student learning outcomes (Guskey, 1985, 2002; Ingvarson, et al., 2005). Motivation is also improved when time and opportunities are provided for teacher feedback and follow up, time when they can meet to discuss and to reflect on the programme and the effects (Ingvarson, et al., 2005; Putnam & Borko, 2000). The results from Schools A and C, particularly from the focus groups in November, 2009, could be traced to these factors. At School A, a smaller school, the Lead teacher was able to visit classrooms more easily, to provide “at the elbow” help and support and to organise classroom visits where teachers viewed and discussed student work in various classrooms after school. The decision to trial the i-Lit programme at School C also made it possible for the Lead teacher to provide more concentrated help to those few teachers in the trial in 2008 and then to the next group of teachers in 2009. As Guskey (1989) noted, teachers need much guidance and support when required to make changes to their current understanding and practice. Working with a small trial group of teachers made such assistance more readily available.
This project was funded for four years and the cluster planned accordingly, not taking into account that a change of government might result in funding cuts or long term sustainability. At the final meeting of the Lead team, however, all three principals strongly indicated that they intended to continue the professional development programme after 2009 when the EHSAS funding stopped, by funding it themselves. This has not come to pass unfortunately and it appears that during 2010 the project wound down. The Lead teachers were given other responsibilities, with the main Lead teacher from School C losing her release time and spending more time in the classroom. The Lead teacher from School B, who left at the end of 2009, was not replaced until February 2010 and the replacement teacher had a new position not directly connected with the i-Lit project. Despite their best efforts to keep the project alive, the principals were not able (or chose not to) to fund all the release time necessary and the professional development impetus slowed. Considering that it had taken the Lead group over two years to reach this point, including in this time designing the i-Lit model and conducting the needs analysis and that they felt they were just getting “into their stride” (personal communication, December, 2009), it seems most unfortunate that the project did not continue. The researcher heard anecdotally that some teachers in all the schools are continuing to follow the i-Lit process and to use strategies they learned but only on an individual basis. It would appear that the principals were not as determined as they seemed to ensure the project continued as planned after the funding was cut. Even had funding not been prematurely cut, specific planning for sustainability should have been in place or at least underway (Whitcomb, et al., 2009). Reasons for the lack of planning for sustainability could possibly have been due to pressures of time or, arguably, it could have been due to a lack of specific knowledge about how to plan for sustainability.

Two and a half years appears to be not long enough to effect whole school change given the size of the project which involved three schools and 200 staff. Most researchers recommend up to four or five years to effect change although time alone does not guarantee success (Timperley, et al., 2007). It took time to carry out the needs analysis, time to plan and design the intervention and time to implement the professional development. Just designing and beginning to implement the intervention was a very ambitious undertaking. Sustainability of educational reform is problematic for several reasons. While there is a large body of literature addressing sustainability which details many school-based conditions, there is no framework offered with which to integrate these conditions (O’Connell, 2010). In addition, very few studies connect such conditions with ongoing student achievement (Timperley, et al., 2007).
Had the funding continued for another 18 months, it might have been possible for the Lead teachers to concentrate on sustainability although, as O’Connell (2010) observed, this could involve forging “the path to sustainability by walking it themselves” (p. 200). Timperley et al. (2007) found, though, that two of the three schools in the study that met the sustainability criteria for the *Best Evidence Synthesis* (Timperley, et al., 2007) were school-based projects.

**Involvement of external expertise**

Given that only one of the Lead teachers had any knowledge of information literacy development, the decision not to involve outside experts seemed unwise. This issue was mentioned in the documentation but no reasons were given for the decision not to involve experts, except in a minor role. Researchers such as Putnam and Borko (2000), while endorsing school-based professional development, also recommend the use of external expertise. Guskey’s (2003) findings noted that while school-based professional development was preferable, problems could arise as teachers sometimes tended to pay insufficient attention to appropriate research evidence. This situation could be avoided if external experts were available at times. Timperley et al. (2007) also note that external expertise was a feature of many effective interventions although the use of external expertise alone is not enough to ensure success. Using external expertise was found to be particularly helpful where changes called for major shifts in thinking and practice. External experts were able to challenge teachers’ theories without involving the in-school leaders in uncomfortable situations with colleagues. The Lead teacher at School C explained to the researcher in an interview that the Lead teachers did not involve external experts as there were so few experts in information literacy available. They, therefore, felt they had good reason for designing their own professional development, taking their lead from the original Lead teacher at School B who did have qualifications in information literacy and encouraging other Lead teachers to become knowledgeable about information literacy development. For this reason, the Lead teacher at School C enrolled in a postgraduate level paper *Information literacy and learning* in early 2009.

However, given the negative comments, especially from School B teachers, during the intervention, this might have been a time when the presence of, or advice from, an external expert might have been sought. Advice from an expert, if not in information literacy, then in change management, for example, or one skilled in teaching teachers to teach teachers may have proved effective. An expert, for example, could have demonstrated to teachers how best
to align instruction with assessment (Parr, 2010). The Lead teachers delivering the professional development to the teachers had received little professional development themselves in this area (Ball & Cohen, 1999). Furthermore, they were not trained to teach other teachers and doing so can be a different matter from teaching school students, particularly at times where teachers were having their views and opinions challenged (Timperley, et al., 2007).

Teaching as inquiry

In the project documentation, the Lead teachers supported the process of Teaching as Inquiry as described in the New Zealand Curriculum (Ministry of Education, 2007, p. 35). The documentation linked it with descriptions of ‘practical inquiry’, “a cyclical process that goes on moment by moment…day by day and over the longer term” (Franke, et al., 1998, p. 67) and with the cycles of inquiry from Focus on Inquiry (Alberta Learning, 2004). The project documentation of the process stated, under the heading of teaching, that “Teachers are active participants in the sessions. They will conduct their own inquiry project into how their teaching impacts on student learning and research better strategies to teach information skills” (Dezoete, 2009, p. 10). The Lead teachers no doubt intended teachers would do this as they wrote that the Teaching as Inquiry cycle may continue “as teachers identify problematic student outcomes” (Dezoete, 2009, p. 6) and also that “through the Teaching as Inquiry process, each department will also identify information literacy goals”. Unfortunately, this aspect of the professional development programme did not appear to have been implemented by the end of 2009. Although the resources provided did include a brief survey for teachers to use to gauge students’ current knowledge and practice, no teacher or HOD described using such a survey and could not describe cycles of inquiry when interviewed. Some were not sure of what was meant by the term or confused it with student inquiry learning, something also noted by O’Connell (2010). Perhaps if the project had continued to be funded and had progressed as planned, this aspect may have been addressed. It certainly needs to be addressed if any changes achieved are to be sustainable and progress continue.

Creating opportunities for teachers to be involved in a professional community

The Lead teachers hoped to form a professional learning community based around information literacy development as the cluster comprised three schools all in the same geographic area and with some students from one school moving on to one of the other two
schools. They had decided early on to carry out school-based professional development and had talked of the development of this community of learning (Henri, 2004; McLaughlin & Talbert, 2006). The documentation does not, however, give a description of a professional learning community and it appears that the Lead teachers may not have had a clear idea of what actually constitutes a learning community. It seemed they were thinking of departmental learning communities as the documentation states that “professional development sessions have been designed to involve individual departments as professional learning communities” (Dezoete, 2009, p. 10) rather than seeing the schools as individual learning communities or the cluster as a learning community.

If funding for the project had continued for the expected further 18 months, then the situation may well have been modified. But, during the project, the Lead groups’s aims to establish a learning community seemed far from the ideas of writers such as McLaughlan and Talbert (2006). While the Lead teachers and some of the teachers in the three schools were interested in such questions and were ready to form a professional learning community, the majority of teachers were not. Most were focussed on their day-to-day teaching and either saw themselves as too busy to consider wider questions or were sufficiently satisfied with their current classroom practices that they did not welcome what they saw as an intrusion. This was especially so at secondary school level.

Costs

Other complaints from teachers, apart from the time it took to become familiar with the model and to implement it, concerned the cost to departments of photocopying. Two HODs, from Schools B and C, referred to the high cost of photocopying the booklet designed as a student work book and other information literacy resources, fearing that this would take up too much of their departmental photocopying budgets and that the cost could therefore prevent teachers and their students having the materials. One teacher thought that there must be some way of solving this problem and that she and her colleagues needed to address possible solutions. If the model and associated resources were to continue to be used, then departmental budgets must to be modified accordingly or alternatives (possibly electronic) found.
Making efficient use of the school library

The findings from the project revealed that few students knew how to evaluate information particularly information from online sources, something that very much concerns the writers of the latest NEMP report (J. Smith, et al., 2010). During the project, the Lead teacher from School C often commented on the value that the school librarian brought to the project. This staff member was particularly knowledgeable in the field of finding and evaluating relevant information from many sources, including online information, and also was ‘borrowed’ by School A to work with staff there.

As described in Chapter 2, every school in New Zealand has a school library of some description. While not all are staffed, larger school libraries often have full or part time qualified librarians or unqualified library assistants. Most secondary schools have library staff and some have a teacher with responsibility for the library. Unfortunately, the teacher with this role rarely has any training in either running a library or in information literacy, and the position does not carry automatic release time. Training for teacher librarians did exist for a few years in the late 1980s and early 1990s with positions funded by the Ministry of Education. With the introduction of Tomorrows Schools (Ministry of Education, 1989) when each school became an independent entity, such funding ceased and it was left to individual schools to decide whether or not to fund the position of teacher librarian. As most chose not to do so, the qualification ceased to be offered in 2005 and, consequently, there are very few qualified teacher librarians working in New Zealand schools. Those who still exist will almost all retire within the next 10 years or so.

Given then that most schools have libraries and that many students do use them, if only to change reading books, it seems as if this expensive facility is not being used as effectively as it could be (Education Review Office, 2005). It seems unrealistic to expect one teacher librarian or one information literacy expert in a large school to train all teaching staff and students. If, however, teaching staff received appropriate professional development from an outside expert, then a strong school library team, well supported by the principal (Oberg & Henri, 2005), led by a trained teacher librarian or a teacher with training in information literacy and including trained librarians, would represent a very strong force for supporting professional learning and sustaining change. Such a team could work with teachers and students to good effect as reported by Todd’s research (Todd, 2003c) which investigated the assignments and the opinions of 3000 students from Ohio about their perceptions of the help
and support they received from the staff in their school libraries. It should be noted that some school libraries in USA have more than one teacher librarian.

**Unanticipated positive and negative effects resulting from the intervention**

The results from senior student exit interviews were unexpected and very gratifying for the original Lead teacher at School B when these had been reported to her by a member of the senior management team. The fact that these students, who were not in the target group for the project, saw that using the *i-Lit* process could benefit their learning in the future, demonstrated that at least one teacher at that school introduced the process to her senior students because she understood the wider benefits to learning for all students.

One aspect the Lead teachers did not seem to fully anticipate and were not equipped to deal with effectively was the reaction of some teachers to the intervention. While they had recognised the findings from Timperley et al. (2007) that teachers need to have their current beliefs challenged, they did not seem knowledgeable or experienced enough to deal with the situation which arose when their alternative approaches to the development of information literate students created dissonance among some teachers. As stated by Timperley et al. (2007), dissonance and repositioning is usually triggered when an alternative teaching approach is shown to be more effective. Teachers need to be convinced of the value of any new approach and to see a positive impact on the learning of their own students (Drake, 2002). Some teachers thought they were already practising as required, using a variety of strategies (Caulfield-Sloan & Ruzicka, 2005) which illustrates the situation described by Earl et al. (2003) whereby those providing professional development felt the teachers did not have sufficient knowledge and skills to enable them to make the required improvements whereas the teachers themselves felt they were sufficiently knowledgeable. The Lead teacher from School C pointed out that the discomfort some staff seemed to feel during the early sessions of professional development could well be a sign of cognitive dissonance (Hannay & Ross, 2001) and that the disaffected teachers were feeling challenged and insecure. She felt that such teachers might well accept new methods and engage with the learning process particularly if they had evidence that learning outcomes could be improved (Timperley, et al., 2007). Unfortunately, in the case of School B, where there were a number of such teachers, this did not appear to happen until the original Lead teacher left and was replaced.
Another unanticipated and surprising finding from this research was the assumption by many teachers that few students brought with them any prior knowledge of information literacy or possessed any relevant skills on their first day in a new class. No teacher described any method for assessing the prior knowledge and/or skill development students might bring with them in order to build on what students already knew. One teacher, when interviewed, even commented that students were viewed as “clean slates” and she did not build on any prior knowledge or understanding students might have. The explanation by a teacher that because students come from so many different schools and they were at “so many different levels”, it was easier to start again, represented missed opportunities to build on prior knowledge. This is seen in the example of the Year 7 and 8 students at School A where the Year 7 students could still remember the information processing model they used at their previous school while the Year 8 students had forgotten the process and yet were not familiar with the new model. Had the students’ prior knowledge of information processing been investigated, with the teacher “deliberately building on what the students know” (Ministry of Education, 2007, p. 34), those students could more effectively have made the connections between the new model and the previous model they had used (Asselin, Early, & Filipenko, 2005b; Bransford, et al., 2000; Nuttal & Alton-Lee, 1994).

There was also, though, the contradictory finding, that other teachers took it for granted that someone else, somewhere else would teach students the skills and most, when questioned, did not seem to see it as their role. It was surprising, for example, to hear teachers, when interviewed, complain that a number of their students could not take notes efficiently, and yet appear to be unaware that they themselves were responsible for teaching this skill.

**Has the instructional environment changed as a result of the intervention?**

Any change in the instructional environment that has occurred is due, in the main, to the few teachers in the cluster schools who understood the wider benefits to student learning that come from using an information processing model such as *i-Lit*. (The researcher is not now in touch with the schools but there have apparently been staff changes at School A although the effect of these on any gains made from the project is not known). The project appears to have come to a halt at School B where, although a trained teacher librarian was appointed early in 2010, it appeared that her immediate responsibilities were not to continue to develop information literacy skills and encourage the use of the *i-Lit* model but rather to establish her
teaching credentials and to introduce the use of e-asTTle\textsuperscript{12}. When writing the original EHSAS proposal, the cluster had referred to poor asTTle results as evidence of the need to improve students’ skills. At that time (2005/6), asTTle was often being used at many schools as a generic literacy test to help with student placement, especially at junior secondary school level. Advances in the programme, such as the introduction of the online version, \textit{e-asTTle} (Ministry of Education, 2011) and the refinement of testing areas now make it possible to test some information skills such as finding information and note taking. The introduction of teachers to the diagnostic functions of e-asTTle, the electronic version of asTTle could prove a valuable asset to teachers when checking student progress and could have worked in with the information literacy learning progressions the Lead teacher at School C planned to compile for the cluster schools. In view of the lack of teaching experience of the initial Lead teacher at School B, this intent to provide evidence to staff that the new appointee is an experienced teacher is an interesting angle. Perhaps the principal is taking the long term view and is intending to emphasise information literacy development and the \textit{i-Lit} model again in 2011. If so, there is a danger that, as a year is a long time in the life of a school, any gains made from the professional development in 2008 and 2009 may well have been forgotten (Wei, et al., 2009).

Although the Lead teacher at School C is still providing resources, it is noticeable that she often appears to do so in her own time as can be seen from updates made to the cluster wiki during the 2010 summer break. It is not known how many teachers actually use the wiki now. Unfortunately, the Lead teacher does not now have time to complete the information literacy learning progressions she had been working on for the cluster schools and which possibly could have been used to good effect alongside, for example, results from the e-asTTle system that includes assessment for associated literacy skills such as finding information.

One aspect of the project which might have had a positive effect, was the proposed involvement of the parents of students at the schools. The Lead teachers had planned to hold parent evenings (Dezoete, 2009) to explain the project more fully, particularly as it relates to the New Zealand curriculum (Ministry of Education, 2007), to outline possible gains in learning outcomes and to demonstrate to parents how the \textit{i-Lit} model worked and what the schools expected of students when using the model. They had started designing an

\textsuperscript{12} asTTle stands for Assessment Tools for Teaching and Learning. These are tools for assessing literacy and numeracy, in English and te reo Maori. They have been developed for the Ministry of Education by the University of Auckland and enable teachers to track the progress and achievement of both individual students and groups of students against national standards. (Visible Learning Laboratory, 2010).
information pamphlet for parents similar to the pamphlet in Figure 2. Those parents who were interested could well have provided much support for their own children which might have had a positive effect on others in the schools.

One of the reasons for carrying out this project, according to the cluster EHSAS proposal, was the continuing development of information literacy across the three schools (Pasley, et al., 2007). The proposal noted that no school had departmental policies in place concerning information literacy development nor was it mentioned in any curriculum scheme. When interviewing the Lead teachers and HODs during 2009, no one mentioned policy changes which included information literacy or changes to curriculum schemes although the Lead teachers in Schools A and C did explain that they intended to make such changes and had discussed how this would be done.

The next chapter, Chapter 8. Conclusions, includes a summary of the findings and implications arising from the different implementations of the professional development. The chapter also includes recommendations for future practice and directions for further research.
Chapter 8
Conclusions

This chapter provides a broad summary of the main findings from the study, referring to the research question, and to elements seen as essential to effective and sustainable professional development (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; O'Connell, 2010; Parr, 2010; Timperley, et al., 2007; Whitcomb, et al., 2009). The implications arising from the summary also serve as guidance for principals and teachers from schools who might be contemplating undertaking such a project in the future. Directions for further research are also suggested.

Almost 20 years ago there was a sense of achievement among those working in the field of information literacy and teacher librarianship when information skills were included in the Essential Skills section of the New Zealand Curriculum Framework (Ministry of Education, 1993). Finally, it seemed that this important area of the curriculum had been recognised. But it appeared any anticipation was premature. While schools were told to ensure that all students had the opportunity to develop the full range of skills, doing so was not mandatory. Furthermore, no provision was made to ensure that teachers were equipped to develop such skills in their students.

With the increasing use of ICT, these information literacy skills have become even more important (Asselin & Moayari, 2008; Combes, 2009; Hipkins, 2006; Ladbrook & Probert, 2011; Probert, 2009; Walraven, et al., 2008), yet research demonstrates little or no improvement in the development of information literacy. According to the latest report from the National Education Monitoring Project (NEMP), Year 8 students did not perform well when evaluating the worth of information, when comparing many sources of information, or when organising information to support an argument. Year 4 students also have trouble deciding what their information needs are. Students, although using the Internet more, are too often not using it well except when using it for personal reasons. In the 12 years since the NEMP project began, there is little gain in the performance of Year 4 students, and no change in information skills performance overall for Year 8 students (J. Smith, et al., 2010).
The project

This EHSAS project, funded for four years, was a most ambitious undertaking on the part of the cluster of three schools. The cluster leaders had high aims, motivated by the desire to improve student outcomes (Pasley, et al., 2007). In line with current research findings, referred to in the previous paragraph, the principals had noted that their students seemed poorly equipped to undertake research projects or to engage in inquiry learning. They lacked the requisite information literacy skills, and it was felt students would benefit from the introduction of an information processing model to help them deal with the variety of information it was hoped they would access. The principals recognised, though, that many teachers were not currently developing students’ skills and attributes. They hoped that by remedying this situation, students at School A would gain better information literacy skills before moving on to secondary (high) school education. They also hoped for improved NCEA\textsuperscript{13} results from those students at Schools B and C who undertook Achievement Standards which involved research.

Answering the research question

Are New Zealand teachers equipped to develop information literate students, an important consideration when creating lifelong learners, a stated government goal, and if not, can this situation be improved through the use of a teacher-designed intervention?

There are three parts to this question: Part One addresses teachers’ state of preparedness to develop information literate students. The second part addresses the design of the intervention and the third addresses the effectiveness of the implementation of the intervention.

Part One was answered with the findings from the needs analysis, an essential element of effective professional development, which was carried out in 2007 and 2008. The findings indicated that most of the teachers in this study were not equipped to develop information literate students who will become lifelong learners. Teachers and students knew little about information literacy or about the skills involved in information processing and teachers held varying beliefs about teaching the skills. Very few teachers checked the skills their students

\textsuperscript{13} NCEA, New Zealand’s National Certificates of Educational Achievement (NCEA), are national qualifications for senior secondary school students. There are three levels of NCEA certificate, depending on the difficulty of the standards achieved. In general, students work through levels 1 to 3 in Years 11 to 13 at school (Ministry of Education, 2009).
might already have and few teachers were explicitly teaching many of the skills. These findings about the low levels of teacher and student knowledge are supported by the work of other researchers including New Zealanders (Flockton & Crooks, 1998; Henri, 2004; Hipkins, 2006; Moore, 2002; Probert, 2009; J. Smith, et al., 2010; Todd, 2006).

The second part of the research question concerned the intervention to address these issues, the provision of effective professional development. In this instance, the Lead teachers designed their own professional development and were able to produce, after a year of hard work, a research-based intervention based on findings revealed by the needs analysis and inspired by an inquiry learning model from Alberta, Canada (Alberta Learning, 2004). It appeared to have many of the ingredients necessary to improve student learning outcomes and the school principals gave their support to the programme when meeting with the Lead teachers. The use of the adapted inquiry learning model as a common model for years 7 to 9 appeared to be a popular factor as a number of teachers and students commented positively on using common methods and a common vocabulary across the curriculum. This was in contrast to earlier complaints from students that teachers used a lot of different models which students found confusing, reporting that they tended not to use such models.

The third part of the original research question concerned the effectiveness of the intervention which was implemented differently in each school. There were positive findings, indicating some reported change in knowledge and attitudes, in the teachers’ responses to the second questionnaire at the end of 2008. The focus groups, post-intervention, with students from two of the schools were also encouraging, given that, at that stage the project still, supposedly, had 18 months to run. However, even had the project run the full course, it was likely that it would only have been sporadically successful in some of the schools in the long term as too many of the challenges involved in the delivery of effective professional development had not been fully addressed.

**Challenges arising during the implementation of this information literacy strategy.**

- This project was a very complex, long term undertaking, involving the design of a detailed professional development programme, the implementation of the programme in three schools and ongoing teacher support. No one on the Lead team, however, including the principals, appeared to grasp just how complex this project was, even though they had had previous involvement with Ministry of Education contracts such
as the ICTPD Clusters\textsuperscript{14} or literacy improvement professional development. The principals hoped for change, though, and expressed these hopes several times during meetings.

- None of the Lead teachers in this project had experience in teaching other adults, let alone their peers. One of the Lead teachers, for example, although a trained teacher, had had very little actual classroom experience and seemed taken aback when some staff reacted negatively at professional development sessions.
- It could have been advisable for senior management at school B, in view of the inexperience of the Lead teacher there, to monitor teacher reactions to the early professional development sessions. Doing so may have averted later problems.
- Each school faced a number of staff changes over the time of the project. Each Lead teacher, for example, was replaced and there were several changes at Deputy Principal level.

There did appear to be fewer problems encountered at Schools A and C. The principal at school A did attend some of the PD sessions which could account for the fact that fewer problems were encountered at that school although staff turnover was an ongoing concern. The principal at school C also seemed to liaise regularly with the Lead teacher there. Also the school C Lead teacher’s decision to trial the professional development programme enabled her to start the process with a small group of staff who were positive about the \textit{i-Lit} process, who wanted to be involved in the professional development and who were able to offer helpful suggestions (Guskey, (1985, 2003). The following year the number of teachers involved was increased with few apparent problems. Trialling new procedures is both time and cost effective and highly recommended (Neuman, 2011).

\textbf{The challenge of sustainability}

When reviewing these challenges, it was noticeable that no plan or detailed ‘road map’ had been drawn up to cover the four years of the project’s funding or to sustain the project beyond that time. Had the principals and Lead teachers worked together on such a plan, many of the complexities involved in the project would have been revealed and conceivably, many of challenges could have been met and problems solved or avoided. Strategies could have

\textsuperscript{14} The Ministry of Education Information and Communication Professional Development (ICT PD) cluster programme began in 1999 and continued through 2011. Clusters of schools were part funded to work together to explore and foster innovative use of ICT in the classroom to support teaching and learning.
been drawn up to monitor the early PD sessions to assess staff reactions and to make changes if necessary at an early date. The principal at school B, for example, where staff reaction was unfavourable, had earlier stated that she hoped for change. This principal could have used her leadership position (Robinson et al, 2009) to present the case to her teachers for making changing in their teaching in order to gain improved student learning outcomes. It would also have been possible at this time to gauge the usefulness of involving an outside expert, even in a consultant capacity, to work alongside the Lead teacher to discuss change management issues and issues relating to the teaching of teachers (Timperley, 2007). Other problems to do with the use of time during the PD sessions, such as encroaching on this time for administrative matters would also have been better understood had the principal been present and actively involved in the sessions. Strategies to maintain and extend any resulting positive changes to student learning outcomes could also have been created and included in the plan.

Although there was no overall plan for sustainability, one suggestion for embedding any positive changes that did occur in professional learning and student learning outcomes was provided at an early stage by the Lead teacher of school C but not carried out once funding was cut. This teacher planned to compile a school/cluster-wide information literacy skills learning progressions plan, similar to the Literacy Learning Progressions tool. Such a ‘smart’ tool is designed for a specific purpose as part of a collection of shared resources for teachers (Carrington & Robinson, 2009). Compiling Literacy Learning Progressions, agreed to by staff, would allow teachers to see what skills their students should already have developed and what areas needed their current attention. This could work in well with the use of asTTle or e-asTTle, as explained in the previous chapter.

Such information literacy learning progressions would also have supported the introduction of the Teaching as Inquiry process found in the New Zealand Curriculum (Ministry of Education, 2007) referred to several times in the documentation (Dezoete, 2009). This process though did not appear to have been integrated into the professional learning. In view of the Ministry of Education’s increasing emphasis on evidence based teaching, introducing the Teaching as Inquiry process to teachers would have been of great benefit to teachers and teaching and to students and learning. Adapting the “cyclical process” from the New Zealand Curriculum (Ministry of Education, 2007, p. 35) or referring to the cycles of inquiry, “Keeping it going through coherence of inquiry” described by Timperley (Timperley, 2011, p. 124) should lead to continued learning and improvement, particularly if schools adopt the
notion of teachers as adaptive experts (Bransford, et al., 2005), intent on providing ongoing improvement. It must be noted that, as discussed earlier (p. 139), the majority of teachers involved in this project were not sure of what was meant by the term Teaching as Inquiry and tended to confuse it with student inquiry learning.

Since it is a mandatory requirement in New Zealand (Ministry of Education, 2008b) that all teachers participate in an annual appraisal, the Teaching as Inquiry process, once satisfactorily explained, could then be incorporated into annual appraisals. Building evidence of students’ information literacy development into teacher appraisal systems could provide a useful strategy for embedding learning and ensuring the sustainability of the project. When appraised, teachers should bring evidence with them, such as student assignments, to demonstrate and explain how they have approached goals to improve student information literacy development. Being required to provide evidence of student progress in information literacy development would underscore its importance and also the importance of the professional development. In order for this strategy to be effective, however, schools would need to source teachers who have demonstrated knowledge in information literacy to oversee continuing professional development in this area.

These suggested actions could then have fed into the overall planning for sustainability. However, it is also important that principals, too, play an active and visible role in such a project, not just, for example, at a formal launch and at committee meetings but by visibly participating with their staff all the way through (Robinson et al, 2009). This aspect, together with careful and detailed planning for sustainability could make it more possible to achieve the desired changes to teaching and learning, thus leading to improved student learning outcomes.

**Strengths and limitations of the research study**

One strength of this study was the use of interviews and focus groups to gather data rather than just relying on questionnaire self-report responses. The study has emphasised the finding that what teachers say when responding to a survey question is not always what they actually practise or believe (Robinson & Lai, 2006). The use of interviews in this study gave participants the opportunity to clarify and enlarge upon self report comments in questionnaires. Interviews also assisted teachers to contribute other information they had not thought important when answering questionnaires. The student focus groups added
invaluable information and the students appeared to enjoy participating in the discussions (Krueger & Casey, 2000; Kvale & Brinkmann, 2009).

A feature that strengthens the learning from this study was the decision to view it through the framework of a formative and design experiment approach (Reinking & Bradley, 2008). The use of such an approach allowed the discussion to be based around six questions from the framework in a way that better encapsulated the findings from a complex, school-based situation where circumstances can change quickly without notice. This formative experiment approach also allowed for a much fuller examination of the processes by which the goal was or was not achieved and also accommodated any modifications to the stated goal that were made during the course of the study, premised on the notion that there will be modifications to an intervention.

Some tension did arise from the use of the formative and design experiment approach. This related to the researcher’s involvement in modifications made to the intervention. It was possible, for example, to discuss some changes to the teachers’ 2008 questionnaire and to recommend that teachers place more emphasis on explicitly teaching questioning techniques when the analysis of the HOD transcripts were discussed. When it came to larger issues, such as the sustainability of changes in teacher practice, the Lead teachers initially felt this had been addressed satisfactorily and the researcher had to refrain from interference as this was not her project. The Lead teachers apparently intended to address the issue more fully, possibly during the last 18 months of the project. As it turned out, the funding was cut, the principals chose not to continue the professional development on the same scale and issues such as sustainability were never satisfactorily resolved.

**Directions for further research**

Vision: Young people who will be confident, connected, actively involved lifelong learners (Ministry of Education, 2007, p. 7).

As has been pointed out, there is very little research carried out in New Zealand or elsewhere with a focus on student development of the skills needed to carry out inquiry learning or school-based research. There has been even less research reported concerning the development of students into lifelong learners, even though that goal is stated in the New Zealand Curriculum. More research is needed to define the parameters of this goal and to investigate the extent to which this goal is being achieved in New Zealand schools.
More research into the efficacy of professional development delivered within schools and that delivered by outside experts would be helpful. Recent work (Parr & Timperley, 2010) (Timperley & Parr, 2010) suggests the efficacy of a partnership with independent experts who can be called upon when those leading the professional development in schools realise the process is beyond the skills of the current group. The formation of such a partnership, however, would depend on those leading the professional development recognising that they needed expert assistance.

Many schools now refer to themselves as inquiry schools, meaning that students undertake inquiry processes (sometimes referred to as research) in order to answer questions relating to the topic which is being studied (not to be confused with Teaching as Inquiry). It is very difficult to find, in the literature or elsewhere, any definition of an inquiry school. Research into inquiry methods and into student learning outcomes of schools which state they are developing a culture of inquiry would be beneficial to many other schools planning such programmes.

It could be helpful for teachers to read research findings that demonstrate the benefits of processes recommended by the Ministry of Education. In this case, under the heading Teaching as Inquiry, the curriculum states that “effective pedagogy requires teachers inquire into the impact of their teaching on their students” (p. 35). Few teachers though, seem confident about carrying out this process so it could be helpful to provide accounts of individual teachers engaging in the process of Teaching as Inquiry (R. Hill & Sewell, 2010). These accounts should detail how teachers understood the rationale underpinning the process, how they went about the actual process, how they interpreted their findings, what changes they then made and their next course of action. It could also be helpful for teachers to read research-based accounts of larger, evidence-informed inquiry based professional development initiatives. One such project, the national Literacy Professional Development Project, could provide much useful insight into teacher and student learning (Parr & Timperley, 2010). The authors of this recently published account stress the fact that the project provided potentially several interrelated contexts for learning. They note the importance of empowering learners to conduct inquiry into, evaluate and then hone their own performance, and further stress that it was the evidence-informed inquiry process that contributed to the success of the national LPDP with inquiry and feedback serving learning and leading to changes in practice at several levels.
Final comments

The project

Despite the problems and ultimate lack of overall success, the cluster Lead team can be commended on several counts. Firstly, they recognised the need to carry out specific professional development when introducing new methods of teaching such as those associated with the introduction of a model to use when processing information. There are many such models available as evidenced by a Google search using the search term ‘Model to use when processing information K12’ which returned over 1,300,000 pages. Very few of these models, if any, are associated with specific professional development to help schools implement the model and to make sense of any accompanying documentation. Teachers benefit, for example, when introduced to new teaching strategies if they can then practise these with their students before returning to discuss progress with their colleagues (Putnam & Borko, 2000). Secondly, the Lead team took the time and effort required to research and create an information literacy model, which, while inspired by work from another country, was revisioned and reworked to align with the New Zealand curriculum (Ministry of Education, 2007). Unfortunately, the actual delivery of their planned professional development programme, not helped by the untimely ending of the EHSAS funding, was only sporadically successful for reasons already elaborated upon.

The research study

This thesis has demonstrated that teachers are not necessarily equipped to develop information literate students who are lifelong learners, as they are required to do, according to the New Zealand Curriculum (Ministry of Education, 2007). It should be a matter of great concern to those involved in education in this country to read that many students are not developing or improving the levels of their information literacy skills. Teachers’ lack of preparedness to develop students’ skills and attributes in this area should be of even greater concern. Teachers must be provided with appropriate teaching strategies through an effective and sustainable professional development programme if this predicament is to be remedied. The need for students to be well equipped, information literate citizens will only increase, particularly as access to online sources of information increases. The current situation needs serious consideration, now, if the vision contained in the New Zealand Curriculum (Ministry of Education, 2007, p. 8) that all students “will be lifelong learners” is to be fulfilled.
Appendices
Appendix A: Teacher questionnaire 2007 and 2008

Please note: This questionnaire was delivered online using drop down boxes and radio buttons. Text boxes were provided for the open-ended questions.

**Questionnaire: Information literacy skills: Teacher understandings and practice**

The purpose of the project is to investigate the understanding and teaching of information literacy by teachers in this cluster of schools.

There are THREE parts to this questionnaire. Please answer by using the drop down menu, clicking a radio button or by writing a brief explanation where indicated.

1. School I teach at
2. I joined this school 2007 or before; 2008 (Added for December questionnaire)
3. Gender
4. Age band
   - 20-29 yrs
   - 30-39 yrs
   - 40-49 yrs
   - 50 + yrs
5. The subjects I mainly teach are
6. The students I mainly teach are
   - Year 7-8
   - Year 7-10
   - Year 9-11 (junior secondary)
   - Year 9-13 (all secondary)
7. I have been teaching for
   - Less than 5 yrs
   - 5-9 yrs
   - 10-14 yrs
   - 15-19 yrs
   - Over 20 yrs
8. I trained as a teacher
   - In New Zealand  Y  N
9. Country where trained if not NZ
10. An Information literate person is someone who can...
Please select the number which best describes your opinion about the statement
1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree

11 Information skills are the same as library skills

12 Information literacy skills need to be explicitly taught

13 Information literacy is mostly concerned with using ICT

14 It would be/ is helpful to have a common method /process for helping students deal with information

15 It would be/ is helpful to have a school-wide information literacy skills development plan

16 It would be/ is helpful if teachers were provided with a variety of strategies for teaching information skills to students

17 I expect students coming to secondary school to already have good information skills

18 Information skills will develop naturally without explicit teaching as students do more research assignments

19 Information skills are only needed when students are completing research assignments

20 Information literacy is concerned with using libraries

21 I am familiar with the way the process of finding and using information can be broken down into stages

22 I expect students coming to secondary/ intermediate /middle school to already have good information literacy skills

23 Students master content better when it is learned through involvement in research/ inquiry tasks

24 Students are highly motivated to complete research tasks using ICT

25 I use an information processing model with my students when they are carrying out research assignments  Yes  No

26 The name of the information processing model I use is (eg Westhaven; Big 6; SAUCE; Action Learning; 3 Doors; i-Lit (added to December questionnaire) :Research Cycle.

27 The stages of the model I use are

Please select the number which best describes your actions


28 I check the information literacy skills levels of my class/es at the start of each year

29 I model brainstorming with my classes

30 I model methods of categorising information with my classes

31 I model methods of taking notes with my classes
I model methods of mind mapping with my classes
I model methods of presenting information with my students
I model methods of finding information in books with my classes
I model methods of finding information using online resources with my classes
I model methods of engaging in critical reflection with my classes

Questions used in the December 2007 questionnaire but not in the December 2008 questionnaire:

1. I have participated in professional development about teaching information literacy skills to help students find and use information to answer questions effectively and to carry out research assignments
2. Duration of course
3. Name of course
4. Institution or person who ran the course
5. Year of PD
6. Information literacy usually demands the use of a wide range of print, digital and personal resources
7. Students are highly motivated to complete tasks that are ‘hands-on’.
8. What evidence (eg examples of actions or strategies or opinions) would persuade you that a student was well on the way to becoming a critical thinker?
Appendix B: Student questionnaire 2008

Please note: This questionnaire was delivered online using drop down boxes and radio buttons. Text boxes were provided for the open-ended questions.

### Questionnaire: Information literacy skills: Student understandings and practice

The purpose of this questionnaire is to investigate the way you find, use and present/communicate information.

Please answer by either writing a brief explanation where indicated, by circling the number that is closest to what you do, according to ratings explanation above the questions, or by clicking on boxes (radio buttons).

1. School I attend……
2. I am in
   - Year 7
   - Year 8
   - Year 9
   - Year 10
3. The school I attended before this school was called
4. Describe what you think people mean when they talk about information literacy.
   - Information literacy is….
5. Information skills are the same as library skills
   Please select the number which best describes what you think about the following statements
   - 1.= no, no, no
   - 2= no
   - 3= don’t know
   - 4= yes
   - 5= yes, yes, yes
6. Information skills are mostly about using ICT
7. We only use information literacy skills when we are completing research / inquiry assignment
8. Information skills are mostly about using libraries
9. I would like to have a plan or model I could use when dealing with information
10. It would be helpful if teachers taught us more ways to deal with information
11. I use information literacy skills when I am answering questions and finding out about a topic
12. When I have to do some research or inquiry on a topic I will (click on those actions that you usually do)
   - a. Brainstorm my topic
   - b. Map or categorise my brainstorm
   - c. Think of some questions to ask
   - d. Check I understand what I need to do
   - e. Find out how I will present my work
   - f. Search for information
   - g. Skim and scan
   - h. Select and reject information
   - i. Combine my notes to answer the questions
   - j. Plan my presentation
   - k. Reflect on my progress
   - l. Review my work

160
13. Select the box by the best answer to each question: I need keywords when I have to
   a. Turn on the computer
   b. Use the library catalogue
   c. Use the TV remote

14. I am better as some parts of the inquiry or research process than others some parts where I
    would like help are …..

15. I use an information processing model when I am doing a research/inquiry assignment Y/N

16. The name of the information processing model I use when doing research/inquiry is called
    (eg Big6; Westhaven; SAUCE; Action Learning; 3Doors; Research Cycle etc)

17. The stages of the model I use are….

18. I do/do not enjoy doing research/inquiry assignments because….

Thank you very much for your help.
Appendix C: Indicative interview questions--to be used with participating HODs

To be used with those HODs who have indicated they are willing to participate.

1. Describe, in detail, the information process you use (to check for common understanding)
2. How do you manage, (at Year 9 level) with students from a number of different intermediate schools who may have used different methods and models?
3. Is there any planning across the school to develop information literacy skills in students?
4. Can you give some examples of how you would teach eg note taking? Website evaluation? Skimming and scanning?
5. How do you know if students in your classes are developing these skills?
6. Is there any school-wide assessment programme for information literacy development?
7. Why do think it is important for your students to be information literate? (Personal stories)
8. How do you, in this school, manage the research process required in a number of NCEA achievement standards ie is there any across-subject planning as to which area teachers which achievement standards? (secondary staff)
Appendix D: Indicative questions for Interviews with Lead Teachers

1. Describe the process so far:
   - Is it going as you thought it would?
     - Reasons for the PD design and delivery? Based on what/
     - meetings with others,
     - timetable of the PD –
     - can you send me any handouts

2. What problems are there?

3. If any, how have they been solved?

4. Have you seen any benefits from either the process design and/or the professional development?

5. What changes can be noticed?

6. Are people working together?

7. Any suggestions for the rest of the year?

8. Any other comments?
Appendix E: Indicative focus group questions

1. I just want to ask you a few questions about when you do research or Inquiry. Do you have another name for such a process?
2. Do you like doing things like that?
3. What’s a good topic you might have done in the past?
4. When you’re doing it, do you have a process that you follow?
5. What was the process called?
6. Can you explain the process?
7. Several of you say you brainstorm. Why would you brainstorm?
8. And when you’ve done the brainstorming, what did you do next?
9. How many questions would you have to have?
10. Since you’ve been here at this school, have you done any inquiry or research?
11. What are the skills you think you need to have in order to do research enquiries?
12. What’s skimming and scanning?
13. Have you got a process for skimming and scanning?
14. Where do you get the key words from?
15. How do you know what the key words are?
16. Is there anything else you can do with key words?
17. Tell me about making notes or taking notes. How do you do that?
18. How do you know you are looking at a good website?
19. Do you use Wikipedia?
20. Do you ever copy and paste?
21. Have you heard of Information Literacy?
22. What do you think it could mean?
23. Do you know about lifelong learners? What’s a lifelong learner?
24. Do you use Google? Or do you use other search engines?

25. When you think you have answered your questions, what do you do with the answers?
   Why?

26. How do you let others know about what you have found out?

27. Do you think about the process you’ve followed? How well do you think you managed?

28. What do you think you learned from going through this process?

29. What changes would you like to see made?

30. What would you keep the same? Why?
Appendix F: Pre/Post intervention student questionnaire

Westhaven Extending High Standards Across Schools Cluster

Questionnaire for students
School:________________________________________

The purpose of this questionnaire is to investigate the way you find, use and present/communicate information.

1. I am in Year seven [ ] Year eight [ ] Year nine [ ] Year ten [ ]

2 The school I attended before this one was ____________________________

3 Describe all the things that you think a good researcher or information literate person can do

A good researcher or information literate person can…

4. I use an information processing model when I need to do some research

   Yes (Go to Q 5) [ ]
   No (Go to Q 7) [ ]

5 The name of the information processing model/plan I use when I am doing a research assignment is called: (eg Big6, the Westhaven model, SOURCE, i-Lit, Action Learning, 3 Doors, Research Cycle etc)

________________________________________
The stages of this model/plan I use are

Please turn over and complete P2

Please circle the number which best describes what you think about the following statements

1=strongly disagree  2=disagree  3=tend to disagree  4=tend to agree  5=agree  6=strongly agree

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Information literacy/research skills are the same as library skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>I am good at finding information for research assignments in books</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>I am good at finding information for research assignments online</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Information literacy/research skills are about using ICT</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>I use information literacy/research skills when I am answering questions and finding out about a topic</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Questions 12 – 19  Read the possible responses below (1-4) then read the statements (Qs 12-19) and circle the number by each statement that best describes what you know and do.

1. No, I haven't learned to do this  3. Yes and I sometimes do this
2. No, I think we were told but I can't remember  4. Yes and I usually do this

When I do research....

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>I know how to brainstorm my topic</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>I know how to organise/map my brainstorm using headings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>I know about using different kinds of questions such as skinny and fat or factual and complex in my research assignment</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>I know what keywords are and how to use them</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>I know how to make and use a time line so I will get my assignment finished on time</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>I know how to take notes from several sources eg books, web pages, interviews</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>I know how to present my work in several different ways so I don't always do it the same way (report, PowerPoint, video,</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>I know how to evaluate and reflect on my progress</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Complete either Question 20 or 21 and then do Question 22.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>I enjoy doing assignments where I have to do some research because</td>
</tr>
<tr>
<td>21</td>
<td>I do not enjoy doing assignments where I have to do some research because</td>
</tr>
<tr>
<td>22</td>
<td>When I am doing research I would really like some help with (finding information or taking notes or ?????)</td>
</tr>
</tbody>
</table>

*Please make sure you give this questionnaire to your teacher.*

*Thank you very much, Elizabeth Probert*
### Appendix G: Example of Cluster professional development planning

**Session 1:** XXXXX – Information Literacy

<table>
<thead>
<tr>
<th><strong>Teaching as Inquiry Stage:</strong></th>
<th>Focusing Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>i-lit Stage:</strong></td>
<td>Defining</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Time:</strong></th>
<th>2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Venue:</strong></td>
<td>Library Multi-Media Room</td>
</tr>
<tr>
<td><strong>Attendees:</strong></td>
<td>Lead Teacher, Deputy Principal - Curriculum), Librarian, Social Studies teaching staff</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Goals:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• to develop an understanding of information literacy as defined by the Ministry of Education and the National Library of New Zealand (2002)</td>
</tr>
<tr>
<td>• to re-engage with the reasons why information literacy is our focus for the EHSAS initiative</td>
</tr>
<tr>
<td>• to be introduced to the Teaching as Inquiry strategy as effective pedagogy, <em>The New Zealand Curriculum</em> (MOE, 2007)</td>
</tr>
<tr>
<td>• to be introduced to the format of the professional development workshops that teachers will be involved in</td>
</tr>
<tr>
<td>• to decide on a focus Year Level for the Teaching as Inquiry process</td>
</tr>
<tr>
<td>• to begin inquiring into student achievement in information literacy by deciding how we will gather evidence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Resources:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hyerle Circle Map information</td>
</tr>
<tr>
<td>• i-lit Teacher Handbook (Appendix 2)</td>
</tr>
<tr>
<td>• <em>The New Zealand Curriculum</em> (MOE, 2007)</td>
</tr>
<tr>
<td>• Professional Development Workshops Outline (Appendix 4)</td>
</tr>
<tr>
<td>• Teaching as Inquiry handout (Appendix 5) – example from Social Sciences Department Professional Development</td>
</tr>
</tbody>
</table>
### Defining

In this stage of the Hit model students will find out what they need to do, pose questions and make a plan.

#### Teacher Focus:

#### Reflective planning questions:
- How will I engage the students with the content?
- Do I know what my students need to achieve this task?
- How will I clearly explain the task and its assessment schedule?
- Is the task feasible?
- What sort of thinking is required? E.g., critical, caring or creative thinking.
- How will I give students opportunities for generating and developing their own ideas?

#### Explicit teaching, modelling of strategies at each stage:
- Immersion in the topic
- Linking to prior knowledge
- Time-management skills to enable managing self.
- Unpacking tasks
- Identifying key words/search terms
- Writing questions
- Planning strategies
- Thinking strategies

#### Toolkit:
- Hit pre-survey
- Brainstorming
- KWHL
- Bloom’s Taxonomy
- Question starters
- Identifying Keywords
- Search strings
- Essential Questions
- Question stems
- Hyperle circle map
- Hyperle tree map
- Hyperle Flow map – to plan outline of task
- Question wheel

#### Student Focus: At the beginning of the learning process students will feel optimistic, but perhaps also uncertain and worried. You need to tell them that their feelings will change throughout the process.

#### Focus questions for students:
- What do I need to do?
- What do I really want to find out?
- What information do I need to do this?
- What is my plan?

#### Reflective questions for students
- What do I already know?
- What is my purpose and who is my audience?
- What tools could I use?
- What are the possible barriers to my plan?
Appendix I: Example from Teacher Toolbox Resource

Information Literacy – Social Sciences
Using Teaching as Inquiry to improve our students’ information literacy learning outcomes

At xxxxxx we use an Information Literacy model to guide our students’ learning and engagement with information in all subject areas. We can also use this model to guide us in finding out what we need to know about our students and to inform our teaching and learning. The model identifies six stages of interacting with information. There are different skills and tools that are useful at each stage. The model will help to guide you through the steps of our Teaching as Inquiry project.

<table>
<thead>
<tr>
<th>Teaching as Inquiry</th>
<th>i-lit Stage</th>
<th>Description</th>
<th>Possible Actions/ Questions</th>
<th>Junior Social Studies Example</th>
</tr>
</thead>
</table>
| Reflecting          | At each stage you need to think about how you are doing— Are you finding answers? Do you need more information? What is going well? What can you do better? | At every stage of the inquiry process you will need to reflect on what you are doing. You might consider:  
- Do I have enough information about my students?
- Do I need support, feedback or guidance at this stage?
- Am I sticking to my action plan?
- Is my action plan realistic and/or meeting my desired outcome? i.e. improving student engagement and achievement? | Possible means of measuring: AsTTle results, Social Studies test results, student inquiry projects, interviews, surveys, pre-testing using ARBs? |
| Defining            | You find out what you need to do, and pose questions for yourself. What class am I going to focus on? How am I going to decide what to prioritise? |  
- Which class do I want to focus on?
- How do I measure/reflect on my own areas of strength and weakness?
- How do I best measure where my students are at right now?
- How will I measure improvement in student learning outcomes? | I have chosen to use the following means to collect data:  
- Look at my Year 9 results for last year  
- AsTTle results  
- Do a range of formative tests using ARBS resources.  
- Conduct a survey. |
| Retrieving          | You plan how you will find out what you need to know, whether it be data collection from testing, reading past exams, interviewing or surveying your students. |  
- Analysing past NCEA results
- Gathering your present classes results from last year
- Gathering AsTTle results
- Conducting pre-tests or formative assessments
- Interviewing students
- Assessing their learning styles
- Gathering and assessing students’ past test papers. | |
| Processing | Process your data, identifying needs and opportunities, looking for patterns and trends. From this you need to make decisions about how to best meet the needs of your students. | ● Processing and working out what your findings mean; looking for areas of need in terms of your teaching and your students learning.  
● Identify 2–3 areas to focus on.  
● Taking your findings and creating an action plan around your foci.  
● Choosing a range of students who you might track.  
| After looking at the data I have identified the following areas to focus on:  
● Improving internet retrieval skills  
● Improving reading comprehension  
● Improving ability to make notes |
| Teaching & Learning | Take your findings from your data analysis and create resources and develop teaching strategies to fit your needs and the needs of your students. | ● Seeking and participating in the professional development to meet your needs.  
● Looking at your year planner to ensure you are allowing time to address the topics or skills that you are focusing on.  
● Finding and developing resources to support the teaching of these topics and skill sets.  
● Looking at ways to support and extend students e.g. three level guides, aiming for excellence, developing a class wiki/blog, etc.  
| Internet Retrieval skills – Participate in professional development which will help me teach this skill. Discuss with other teachers their internet retrieval teaching strategies. Enlist the support of the librarian or Lead Teacher when the class will be using the internet to find resources. Research strategies that will support students in their internet searching. Create resources. |
| Teaching & Learning | Implement your resources and teaching strategies in your classroom teaching. | ● Teaching the topic and/or skill set  
● Using developed resources to improve learning outcomes  
● Using effective pedagogies  
● Observing teachers and being observed  
| Teaching internet retrieval skills using resources created and new teaching strategies as they come up in units of work/assignments. |
| Learning Inquiry | Final reflection: What happened as a result of the teaching, and what are the implications for future teaching? | How do I measure if improvements have been made?  
● Conduct formative assessments?  
● Interview students?  
● Post-surveys?  
● Reflecting on results next year, comparing 2008 and 2009 data??  
● Getting colleagues to come and observe your teaching and feedback.  
| ● Look at my Year 9 test results for this year – any improvements?  
● Look at Term 4 astTle results for “Finding Information” to measure possible improvements.  
● Conduct a post-teaching survey.  
● Gather a portfolio of student work from throughout the year to look for improvements made with choosing the best internet sources for their needs. |
Appendix J: Data Chart for recording information

<table>
<thead>
<tr>
<th>Questions</th>
<th>KEY QUESTION 1:</th>
<th>KEY QUESTION 2:</th>
<th>KEY QUESTION 3:</th>
<th>KEY QUESTION 4:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Use the sheet below to record details of each source that you consult - staple this to the notes that you make from each source.

<table>
<thead>
<tr>
<th>Author:</th>
<th>Title:</th>
<th>Date of publication:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publisher:</td>
<td>Place of Publication:</td>
<td>Source:</td>
</tr>
<tr>
<td>URL:</td>
<td>Other information:</td>
<td></td>
</tr>
</tbody>
</table>

Source type: □ primary □ secondary □ written □ visual □ oral

Confirms what I know? yes/ no

Reliable? yes/ no

Comments:

Use the sheet below to record details of each source that you consult - staple this to the notes that you make from each source.

<table>
<thead>
<tr>
<th>Author:</th>
<th>Title:</th>
<th>Date of publication:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publisher:</td>
<td>Place of Publication:</td>
<td>Source:</td>
</tr>
<tr>
<td>URL:</td>
<td>Other information:</td>
<td></td>
</tr>
</tbody>
</table>

Source type: □ primary □ secondary □ written □ visual □ oral

Confirms what I know? yes/ No

Reliable? yes/ no

Comments:
References


Organisation for Economic Cooperation and Development (OECD). (2005b). *Programme for international student assessment (PISA)*. Retrieved 5 March, 2007 from http://www.pisa.oecd.org/pages/0,2987,en_32252351_32235731_1_1_1_1_1_1_1_1_1,00.html


189