Year seven students, information literacy skills and transfer: a
grounded theory

A thesis submitted to Charles Sturt University for the degree of
Doctor of Philosophy.

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Certificate of authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgment is made in the thesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

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Ethics Approval

Charles Sturt University, Ethics in Human Research Committee,
Ethics Approval number 2006/089
Abstract

This study took place in three state secondary schools in rural New South Wales. The key aims of the study were to a) examine and interpret the views of year seven students in these schools, on their reflections on and use of a range of information literacy skills and techniques; b) to examine and interpret the views of year seven students in these schools, on the extent to which they transferred information literacy skills across time and across subjects; and c) to develop a grounded theory relating to a) and b) above. The study also sought to interpret the views of students, teachers and teacher librarians on students’ reflections on and use of a range of information literacy skills and techniques, including brainstorming, concept mapping, question formulation, information retrieval, evaluation of sources, evaluation of information and ideas within sources, note taking and assignment writing. The study took an interpretivist approach and used constructivist grounded theory as its methodology. Data was gathered in the form of observation, student diaries, student questionnaires, and interviews with students, teachers and teacher librarians. Data analysis used grounded theory techniques, including initial and focused coding, category formulation and theoretical sampling.

From the data, two major categories were formed – valuing information literacy skills and culture of transfer. The results of the study indicated that students could be grouped into three main types – proactive and engaged students who understood and valued information literacy skills and were voluntary transferrers; reactive, disengaged students who understood but did not value information literacy skills and were reluctant transferrers; and non-participant, unengaged students who neither understood nor valued information literacy skills and were non-transferrers. Teachers and teacher librarians agreed with the categorization of students into three types and saw value in information literacy skills from a teaching perspective. The study found that all three schools lacked a culture of transfer which is required if students are to see value in transfer and put transfer into practice. Both students and school staff identified the lack of a culture of transfer, which the study found was due to the absence of a formal policy on transfer in the schools, lack of communication amongst teachers in relation to information literacy skills being taught to students, lack of reinforcement of these skills, and the lack of value placed on transfer by most students.

Following data analysis and interpretation, a grounded theory was developed in relation to students, school staff and the transfer of information literacy skills. The grounded theory established links
between the students’ views of information literacy skills, which were interpreted in the broader context of their school experience and the culture of the school, and how students valued such skills, by talking a metacognitive view of their own learning; identified students who required teacher encouragement if they were to see value in and transfer skills; identified students who were non-participants in relation to information literacy skills and who needed special attention; demonstrated that a culture of transfer depends on aspects of the wider school culture; showed that unless students value transfer, they are unlikely to put transfer into practice; and indicated that where transfer has low status in a school, in terms of policy and practice, most students will be reluctant transferrers.
Chapter 1: Introduction

Information literacy is currently one of the key topics being researched and debated by practitioners and researchers in the field of librarianship. Developing information literate students in schools and higher education, and information literate people in the workplace, has become one of the key aims of public and commercial organisations in the twenty first century. Definitions of information literacy in different contexts are discussed in the literature review below but, in this study’s context of secondary schools, it is argued that information literacy can be viewed as a critical and reflective ability, as well as a practice. From this view of information literacy, students in the early stages of secondary school are engaged not only in putting a range of information literacy skills into practice but also critically reflecting on the use of these skills. A second focus is on transfer. The issue of the transfer of learning and skills in both education and workplace contexts has been debated and researched for over one hundred years. It will be argued that the likelihood of students transferring information literacy skills depends on a number of factors, including whether a school has a culture of transfer.

The present study examined a range of complex issues relating to information literacy skills and transfer, with the focus being on year seven students in three state secondary schools in rural New South Wales, Australia. The present study builds on previous research by this author (Herring and Hurst 2006) and the structured diary and
questionnaire used in that research were used as a pilot for the present study.

This chapter sets out the research questions, the aim and objectives of the study. This is followed by an outline of the structure of the thesis.

1.1 Aims and areas of exploration

The aims of the study were to

a) examine and interpret the views of year seven students in these schools, on their reflections on and use of a range of information literacy skills and techniques;

b) to examine and interpret the views of year seven students in these schools, on the extent to which they transferred information literacy skills across time and across subjects; and

c) to develop a grounded theory relating to a) and b) above.’

The areas of exploration which sought to achieve the aims of the study included:

- The views of year seven students on information literacy skills and on transfer
- The views of teachers and teacher librarians on information literacy skills and on transfer
- The extent to which year seven students used the information literacy skills which were introduced to them by the teachers and teacher librarians
- The views of year seven students on how information literacy skills were taught in the schools
- The extent to which teachers and teacher librarians observed the transfer of information literacy skills in their schools
- The extent to which year seven students viewed themselves as transferrers of information literacy skills
- What teachers and teacher librarians considered to be the key factors in increasing the transfer of information literacy skills amongst year seven students
• What year seven students considered to be the key factors in increasing the transfer of information literacy skills

1.2 Structure of the thesis

The thesis is organised into a number of chapters. Chapter two provides a review of information literacy related literature in schools, higher education and the workplace. The intention is to give the reader an overview of research and professional literature which relates to and might inform, the present study. The inclusion of literature relating to higher education and the workplace, as well as schools, is intended to demonstrate the different contexts of information literacy and to show similarities and differences in the issues relating to information literacy in these contexts. Chapter three outlines the methodology used and includes a rationale for the use of constructivist grounded theory; an outline of the data gathering and analysis techniques used; and a discussion of the limitations of the methodology used. These limitations include the limited scope of the research which covered three NSW state schools and the lack of generalisability, given the use of constructivist grounded theory. In chapter four, the results of the data gathering and analysis are presented and the chapter includes a series of tables which show the development of the major and sub-categories. Chapter five provides an analysis of the theoretical sampling done by the researcher in revisiting the field of study to test the categories. Chapter six discusses how the grounded theory was developed, relates this study’s findings to existing literature and provides a series of theoretical statements which form the grounded theory. The researcher’s claim to knowledge – that
this is a ground breaking study in the field of teacher librarianship, as for the first time, it has analysed and synthesised the views of students, teachers and teacher librarians on information literacy skills and transfer – is stated in this chapter. Chapter seven outlines the key conclusions of the study and suggests recommendations for the schools involved in the study. A list of references is provided, followed by appendices referred to in the text of the thesis.
Chapter 2: Literature review

2.1 Introduction
This review of the literature provides the reader with an overview of issues relating to information literacy and transfer, as reflected in the research and professional literature. The literature review is selective, as there is now a huge range of books and articles on both information literacy and transfer. This chapter is organised into four sections – information literacy in schools, higher education and the workplace; and transfer. The inclusion of higher education and workplace information literacy issues is designed to give the reader a wider view of the contexts of information literacy and also to indicate where common issues, which relate to the different contexts, arise. The section on transfer covers aspects of the transfer of learning and skills in different contexts.

2.2 Information literacy in schools
This part of the literature review relates to information literacy in schools. The term ‘information literacy’ was first used in the 1970s by Zurkowski (1974). The history of terms relating to the current understanding of information literacy is presented first, to provide a context for present day use of the term. A range of definitions of information literacy is then discussed, to show the continuing debate on how the term is defined. How information literacy relates to other literacies, such as visual or digital literacy, is explored to provide a wider educational context. This is followed by an evaluation of a range of information literacy models used in schools across the world, which outlines some of the practices of information literacy in schools. The
chapter ends with a critical review of information literacy research in schools and this includes the work of Kuhlthau, research related to students’ use of information literacy skills in assignments, affective aspects of information literacy, students’ information seeking, and research on information literacy models.

2.2.1 Library skills to information skills to information literacy in schools – a historical review

This section of the literature review seeks to provide a historical context for the development of information literacy in schools by examining the ways in which what are now termed ‘information skills’ or ‘information literacy skills’ were seen to be of value in schools from the 1930s to the present day. The value of this historical review lies in the critical evaluation of how those writing about student needs in schools and school libraries, focused on teaching students to become effective users of learning resources. This historical review demonstrates the progression from the narrow, library focused term ‘library skills’ through to the wider, education focused term ‘information literacy.

From the review of the literature, it would appear that the term ‘information skills’ was not used until the 1980s and that the term ‘library skills’ was the most common term used before then although the term ‘study skills’ was used from the late 1960s. In relation to teaching skills and developing positive attributes amongst students as library users, the term ‘library instruction’ was most often used before the 1970s.
While the emphasis on the use of the library and its resources was most common before the 1970s, many authors included reference to more than basic library skills. Fargo (1939, p. 108) stressed the importance of teaching “the skilful use of books and libraries in the interest of research and self-education” and teaching students the function of the library, parts of a book, organisation of the library, reference sources and compiling a bibliography. Fargo (1939, p. 112) did include “note-taking techniques” in the scheme of instruction but gave few details on how these techniques might be taught. Douglas (1949, pp. 116-123) argued that “instruction in the use of books and libraries” should focus on “organisation and regulations”, the “make up and care of books”, organisation of the library, reference works and “bibliography making and note taking”. As with Fargo (1939), Douglas (1949) did not give any detail on teaching note taking but devoted large sections of a chapter to how books are organised. Grimshaw (1952, pp. 161-162) took a similar view of library skills but stated that “The children have to be trained a) to find the information b) To read the facts accurately c) To assess the value of what is read”. While the statement on assessing value may be regarded as a feature more of information skills rather than library skills, Grimshaw (1952) did not explain how such skills might be taught. Gardiner (1954, p. 140) stressed the importance of locational skills for students and stated that students should be taught how to “Take notes. Make and use bibliographies” but these two aspects are not expanded on. Thus these authors appear to pay lip service to more advanced skills in the use of resources such as assessing value and note taking.
In the 1960s, while there was more emphasis on students’ use of more cognitive skills such as evaluation of the content of books, the predominant view was still that students need to be taught library skills. Authors such as Leyland (1961), Rossof (1961), Brown (1963), Cheshire (1966) and Delaney (1968), continued the trends seen above by mainly highlighting the students’ use of the library, their appreciation of books as artefacts, their ability to find information in the library and their understanding of the arrangement of the library. These authors also followed earlier trends by mentioning but rarely expanding on skills in relation to evaluation. For example, Brown (1963, p. 66) included “assessing the value of information” in a list of desirable skills but gives no explanation how this skill might be taught. An exception to the above in the 1960s is Henne (1960, p. 76) who argued, while library skills are important, “the critical analysis and evaluation of materials and judgment and reflection regarding the use of their contents form part of the educational process that teaches students to be thinking people”.

There was some evidence in the 1960s of a growing realisation that students may need more than locational skills in order to be effective library users. In the Australian context, Cheshire (1966, p. 13) stated that “reading and study skills” which include “training in skim reading, in grasping essential ideas quickly and mentally discarding what is not pertinent to their quest” should be included in a library skills programme. Freund (1966) provided detailed guidance on note-taking and Cleary (1966) expanded on posing questions, skimming and selecting relevant information, but both authors viewed these skills as being used
predominantly in the library. In 1969, the USA’s *Standards for school media programs* was published and was viewed as a major step in developing effective school libraries. This document focused on (p4) “instruction to improve learning through the use of printed and audiovisual resources” and emphasised the importance of (p8) “Helping students to develop good study habits, to acquire independence in learning, and to gain skill in the techniques of inquiry and critical evaluation”. This emphasis on learning, as opposed to the use of the library for finding information, was a major step forward in the development of what was still viewed as “library instruction”. Another key publication by Davies (1969, p. 200) reflected this focus on learning by arguing that “An effective study skills program is planned for the timely integration of skills with content development” and Davies (1969, p. 202) argued that it was “No longer valid to refer to study skills as ‘library skills’; they are thinking and learning skills”. Davies (1969) was ahead of her time in calling for a whole school approach to study skills and a focus on critical thinking, as it was not until the 1980s that such aspects were seriously discussed in the school library literature.

In the 1970s, the trend towards including a wider range of skills than basic library skills continued although books by Bowers (1971) still concentrated on a narrow range of skills, mostly related to finding information in the library. An exception to this rule is Polette (1973) who argued that skills should include “Determining the main topics and subtopics; skimming skills; determining accuracy and authority; separating the significant from the insignificant; telling fact from
opinion; selecting main ideas; forming judgment; determining cause and effect”.

In the UK, Beswick’s (1977) influential work placed what he termed “library research skills” in the context of resource-based learning and argued that students need a broader range of skills, including the ability to identify possible bias in sources. Herring (1978, p. 21) identified a difference between library skills and study skills and argued that study skills “constitute the skills required to extract information and ideas from what is being read and to transmit the information and ideas in a written form or into new knowledge”. Also in the UK, Winkworth’s (1977) report used the term ‘user education’ in schools and this term tended to contain a mixture of library skills and information handling skills. While the term “user education” was in vogue in the 1970s and 1980s in many countries, it was replaced, particularly in the school context, by “information skills” in the 1980s.

In the 1980s, the term ‘information skills’ became the accepted term and a key influence in this acceptance was Marland’s (1981) report, which identified nine key questions which students should ask and linked these to skills students would use. Marland’s (1981) report is one of the most cited works in the literature on information skills and information literacy, as it was seen as a key influence in moving the focus of students’ information use away from a purely library-centred view to a more learning-centred view. Rogers (1994) argued that there was little agreement as to the parameters of information skills amongst researchers and practitioners in the UK in the 1980s and Rogers (1994, p. ix) stated
that “Two kinds of information skills have been identified – the instrumental, which most involve library use, and the cognitive, which researchers consider more important”. It is interesting to note here that two highly quoted researchers, Stripling and Pitts (1988) preferred the term “research skills” although this term included many of the cognitive elements of information skills such as identifying purpose, posing questions and evaluating information resources.

The 1980s also saw publications by two key authors, Irving and Kuhlthau. In the UK, Irving (1982, p. 3) stated that “study skills are those which are associated with the acquisition and use of information in the pursuit of knowledge. Most of the skills are related to ways of thinking”. A key phrase here is ‘in the pursuit of knowledge’ as Irving (1982) was attempting to drive the library skills/information skills debate away from the use only in the library context. Irving (1985) expanded on her earlier work and argued that information skills should be seen in the context of ‘learning to learn’ and this phrase, implying metacognitive ability on the part of students, may be seen as a key stage on the road to the development of the concept of information literacy in the late 1980s and particularly in the 1990s. ‘Learning to learn’ may be seen in terms of students’ abilities and attributes, rather than merely in terms of skills.

Kuhlthau (1987) in what Loertscher and Woolls (2002, p. 124) described as an “extremely important document”, argued that information literacy, a combination of information skills and computer literacy, should be a key element of any school library media programme. In the schools’ context, this is one of the first uses of the term “information literacy”.
Doyle (1994, p. 8) described Kuhlthau’s (1987) work as “a major milestone in the development of information literacy” and argued that the publication “carved out a niche for information literacy – a base to which all could refer in the next stages of development and implementation”. Kuhlthau (1987, p. 5) also took a broad view of information literacy and did not confine it to the school context, arguing that information literacy “requires the abilities to manage complex masses of information generated by computers and mass media, and to learn throughout life as technical and social changes demand new skills and knowledge”.

Thus it can be seen that by the 1990s, the wider concept of information literacy had been introduced although the use of the term “information skills” was very prevalent in the schools related literature (e.g. Eisenberg and Berkowitz 1990, Herring 1996, Small 1998). Key publications relating to information literacy in schools in the 1990s included Doyle’s (1994) overview of information literacy in society, Kuhlthau’s (1993) influential Seeking meaning, the American Association of School Librarians/Association for Educational Communications and Technology’s (1998) Information power, which declared that information literacy should a central plank in the mission of any school library, and ASLA’s (1993) Learning for the future, which identified information literacy as a key concern for teacher librarians in Australia. Information literacy was therefore accepted as the term to be used in schools by the 1990s. The aspects of information literacy discussed in
the following paragraphs, in schools take the reader into the twenty first century.

2.2.2 Definitions of information literacy

This section examines some of the attempts to define information literacy in the school context in order to seek clarification on the meaning and scope of information literacy. There appears to be no one accepted definition of information literacy in schools and there is evidence of some contradictory understandings of what constitutes information literacy or what attributes the information literate student might have.

Langford (1998, p. 59) stated “Is it [information literacy] a concept or a process? … Or is it a new literacy that has been transformed from existing literacies to complement the emerging technologies for which the Information Age students must be skilled?”. Langford (1998, p. 64) asked how information literacy is to be defined and pointed out that a range of authors have defined information literacy in terms of a set of skills or a range of “behaviours or attitudes”; as being related to library based research or to critical thinking; as being part of a process related to a style of learning or a model; and as being a broad “pedagogical framework, [which] contributes to the holistic development of an individual .. to be empowered to learn independently and interdependently”. Langford (1998, p. 66) recommended Doyle’s (1994) definition. Doyle’s (1994, pp. 2-3) definition was “focused on the
attributes of one who is information literate” and defined a person who is information literate as someone who recognises that accurate and complete information is the basis for intelligent decision making; recognises the need for information; formulates questions on information needs; identifies potential sources of information; develops successful search strategies; assesses sources of information including computer-based and other technologies; evaluates information; organises information for practical application; integrates new information into an existing body of knowledge; uses information in critical thinking and problem solving.

While Doyle’s (1994) often quoted definition is a starting place in defining information literacy in the school context, it can be seen as limited. For example, while a student might recognise the ‘need for information’, this need must be defined in terms of a clear purpose if recognition is to be of value. Also, in the school context, ‘intelligent decision making’ may not be the most pertinent attribute to highlight first. This definition does not include reference to a student’s self-reflection on or self-evaluation of herself or himself as an information literate student.

Moore (2002, p. 1) stated that information literacy in schools is a “dynamic concept [which] extends basic reading, writing and calculating skills for application in information and technologically rich environments (Kuhlthau, 2001) for the purpose of learning or solving problems.” Moore’s (2002) emphasis is on skills in this definition but Moore (2002, p. 2) also argued that “Information literacy exists, in pedagogical terms, at the confluence of resource-based learning practice, constructivist and metacognitive theories, and the practice of developing thinking skills through modelling and scaffolding”, which implies that
the term can be seen more than as only relating to skills. Thus a
distinction has to be made, in examining definitions of information
literacy, between the concept of information literacy and the
development of information literacy in schools.

The key standard for school library programmes in the USA,
AASL/AECT’s (1998, p. 1) Information Power initially provided a very
narrow definition of information literacy, stating “Information literacy –
the ability to find and use information – is the keystone to lifelong
learning”. For this report (AASL/AECT 1998, p8-9), standards for
information literacy were developed and are outlined in “The nine
information literacy standards for student learning” which seek to define
the attributes of an information literate student. Such a student (under the
heading Information Literacy “accesses information efficiently and
effectively”; “evaluates information critically and competently”; “uses
information accurately and creatively”; (under the heading Independent
Learning) “pursues information related to personal interest”; “appreciates
literature and other creative expressions of information”; “strives for
excellence in information seeking and knowledge generation”; (under the
heading Social Responsibility) “recognises the importance of
information to a democratic society”; “practices ethical behaviour in
regard to information and information technology; and “participates
effectively in groups to pursue and generate information”. This list of
attributes is accompanied by a set of indicators which expand on each
statement in the standards.
While the AASL/AECT’s (1998) definition of information literacy is comprehensive, when taken with the standards and the indicators, it can be viewed as being too all-encompassing – it can be argued that a person can be information literate but have little appreciation of literature. It can also be seen as culturally biased in that it assumes that information literature people will favour democracy and this is a questionable assumption. The reference to ‘ethical behaviour’ is also questionable as it cannot be argued that people who are able to take a metacognitive view of their own information literacy, and who effectively use information for their own ends, but not in an ethical manner, are not information literate. Although standards by their nature try to present an ideal, that ideal as presented by AASL/AECT (1998) was clearly culturally based in a western democratic context. The 1998 standards were updated by the AASL and the new standards (AASL 2007) also focus on information literacy.

Abilock (2004, p. 1) also took a wide view of information literacy arguing that “Information literacy is a transformational process in which the learner needs to find, understand, evaluate, and use information in various forms to create for personal, social or global purposes”. Abilock (2004, p. 1) presented an outline of how students who develop “mastery of information literacy over time” can employ a range of skills and develop learning attributes such as “independent, disciplined, self-motivated and metacognitive”. Abilock (2004) did not present evidence to back up her views on information literacy.
Herring and Tarter (2006, p. 3) argue that an information literate student will be able to

- identify the purpose of information and ideas being sought
- identify relevant and authoritative sources (electronic, print, human) of information and ideas
- read/view/listen to, understand and learn from such sources by evaluating the contents of such sources in relation to their purpose
- use the information and ideas found in the sources to produce curriculum related work (written or oral) in school and to extend their own learning of a concept or topic
- reflect on their ability to identify a purpose for and creative use of information and ideas both within the school and elsewhere
- transfer information skills across subjects and year levels in the school
- transfer relevant information skills from school to further/higher education and to the workplace
- learn and adapt to new information skills required in many workplace settings

In this definition of the abilities of an information literate student, Herring and Tarter (2006) introduced the notion of transfer which is not found in other definitions.

Williams (2001, p. 1) was critical of definitions of information literacy and argued that “Definitions of information literacy, drawn from many perspectives, seem to situate themselves outside the actual learning process”. [Williams’ italics]. Williams (2001, p. 4) also posed the question “What sort of information literacy - an often-used but dangerously ambiguous concept - should we be promoting and what should it accomplish?”. Williams’ (2001) comments are important in the debate about what constitutes information literacy in the school context, as the implications of her comments are that while an information literate student may be able to find and use information effectively for a purpose...
e.g. a school assignment, the question remains about what that student has actually learned from that experience.

Boyce (2004, p. 21) also challenged the concept of information literacy as viewed by teacher librarians, arguing that “the logic of information literacy is inappropriate for the new era of electronic communications technologies – that it [information literacy] is a persistent expression of the will for print-based pedagogy to transcend the changing culture of our communications environment”. Boyce (2004, p.30) concluded that current views of information literacy do not take into account “the less overt cultural dimensions of changing literacy practices” and that teacher librarians “cannot continue to proselytise a sectoral form of literacy”. While Boyce’ (2004) criticism needs to be seriously considered by educators in schools, her emphasis is more on a critical perspective on information literacy than on presenting an alternative pedagogical approach.

Limberg (2005, p. 49) urged educators in schools to change their attitude towards information literacy teaching and argued that

the essence of the change needed concerns a shift from focus on procedure and order toward a focus on more abstract and the more exciting contents of information literacy as regards what is at stake and what is crucial for becoming an information literate person.

Limberg (2005 p. 47) stated that information literacy teaching in schools should be aimed at “students developing a repertoire [Limberg’s italics] of understandings of information seeking and use” and not merely at students learning a process.
It is clear that there is no one definition of information literacy that will encompass all aspects of this complex concept. It is also clear that, given the criticisms of prevailing definitions of and attitudes towards information literacy in schools, research in this area needs to take into account not only skills and processes, but attributes of information literate students, as well as a recognition of cultural contexts and the impact of ICT in the school context. For this researcher, information literacy is seen as a critical and reflective ability to exploit the current information environment, and to adapt to new information environments; and as a practice. It can be seen as a critical ability in that, before students can effectively use information literacy skills in their current information environment, they must have the ability to think critically about why they might use the skills, how they might use the skills and whether they might use these skills in the future. It can be seen as a reflective ability in that, students also need to think about information literacy skills in relation to their own learning style i.e. take a metacognitive view. Kuhn (2000, p. 178) stated that metacognition included “metacognitive awareness of what one believes and how one knows” i.e. the ability to think about one’s own thinking. Aspects of metacognition in the school context were discussed by Zimmerman (1990), Keene and Zimmerman (1997), and subject related issues of metacognition were examined by Eva-Wood (2008) and by Michalsky, Mevarech and Haibi (2009). Information literacy as a practice can be viewed in the students’ application of information literacy skills in the context of their own information environments.
2.2.3 Information literacy and other literacies

The use of the word “literacy” has expanded from its original context of being able to read and the impact of information technology has led to the expansion of the term to include a range of “literacies”, of which information literacy is regarded as one. Knowledge Network Explorer (2002, para. 1) argued that “Today discrete disciplines have emerged around information, media, multicultural, and visual literacies. It is the combination of literacies that can better help K-12 students and adult learners address and solve the issues that confront them.” Abilock (2004) cited a range of literacies including language, information, visual, historical, cultural, political and scientific as being important, and argued that students can be encouraged to develop knowledge of and abilities in these literacies, in order for them to enhance their understanding of what is being read, viewed or listened to.

If information literacy is seen as emerging from a print-based culture as Boyce (2004) argued, then it may be argued that the term “information literacy” has been overtaken by “digital literacy” in relation to students’ use and sometimes stated preference for, web based information sources. The literature on digital literacy is perhaps as confusing (and confused) as that of information literacy, with little agreement on definitions and parameters. Bawden (2001, p. 230) reviewed a range of definitions of digital literacy in the 1990s and concluded that

It is cognition of what you see on the computer screen when you use a networked medium. It places demands upon you that were
always present, though less visible, in the analog media of newspaper and TV. At the same time, it conjures up a new set of challenges that require you to approach networked computers without preconceptions. Not only must you acquire the skill of finding things, you must also acquire the ability to use these things in your life.

McCarthy (2002, para. 3) stated that “One definition of digital literacy is the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers”.

While digital literacy can be recognised as a pre-requisite for learning in digital age schools, it would be false to assume that digital literacy was somehow separate from or in addition to information literacy. Some aspects of digital literacy such as the evaluation of the authority of a web based source may be more crucial in general than with some print based sources such as books, but students can be encouraged to view all sources with a critical eye. Information literacy can be seen as enabling students to take a critical approach not only to information resources in any format but also to their own learning and understanding. Students’ use of digital information resources is important and thus digital literacy is increasingly important. However, students can learn from non-print and non-digital sources such as analog video and interviews with people. It is argued here that information literacy enables students to develop a critical understanding of all sources of information and ideas and supports critical learning.

Kapitzke (2005, p. 30) sought to widen the concept of digital literacy to “hyperliteracy” and stated that “this term [hyperliteracy] encapsulates the notion of being literate about literacy, and refers to critique of the
information process itself, as students are provided opportunity to consider their positioning as information users and producers”.

Kapitzke’s (2005) view of hyperliteracy is very similar to views of metacognition and learning to learn.

Kapitzke (2005, p. 29) argued that “critical literacy” implies a higher order of thinking amongst students than does information literacy, and that “Whilst its meaning is highly contested, critical literacy is generally understood as a repertoire of practices that probematize and interrogate, deconstruct and reconstruct text”. The implications of Kapitzke’s (2005) views on critical literacy is that teachers and teacher librarians often ignore what is perceived as an inherent cultural bias in whatever is being read, viewed or listened to by students. Critical literacy, according to Kapitzke (2005, p.30) allows students to examine “the dimensions of a text’s power” and that this will, in turn, inform the students’ own understanding of the text. Critical literacy is thus a much more cognitive approach to understanding text than information literacy which, Kapitzke (2005, p. 30) argued, merely asks students to locate information and record information. Although Kapitzke’s (2005) arguments add an important dimension to any discussion of information literacy, her narrow and rather dismissive views of the critical thinking aspects of information literacy, make her case less convincing.

2.2.4 Information literacy models

... Although an information literacy model was not used in the field research of this study, students were provided with an information skills
scaffold which combined elements of many of the available models. A review of the literature on information literacy models can help to inform both the scaffold used in this study and the analysis of the data gathered. Loertscher and Woolls (2002, pp. 106-121) reviewed a large number of information literacy models which have been developed for use in schools, although the actual evidence of how and where many of the models are used is sparse.

As was noted above, Marland’s (1981) report for the British Library was an influential document in changing the thinking of many teachers and teacher librarians in the UK and elsewhere, on the importance of information skills as opposed to library skills. Marland’s (1981) model consists of nine steps which students might take in identifying a purpose for, finding, using and presenting information and also a reflection on what has been achieved by the student. It is clear that subsequent models took their lead from Marland’s (1981) thinking. The nine steps were outlined as a series of questions that students might ask themselves accompanied by a more formal statement of what students should do (e.g. “1. What do I need to do? (formulate and analyse need)”). The plan contained lower order skills such as locating information but also higher order skills such as evaluating the relevance and content of sources, synthesising ideas and information, and evaluation by the student of her/his performance, normally in terms of completing an assignment. Whether Marland’s (1981) model should be viewed as an information skills model or an information literacy model is open to debate. It can be argued that, while students may evaluate what they have achieved after
completing an assignment, this is not necessarily done at the metacognitive level.

The Big Six model (Eisenberg and Berkowitz 1990), according to Loertscher and Woolls (2002, p. 117) “is by far, the most well known model in the field and is being taught widely to students as a guide to their research” and extensive information about the model is available via the Big6 website (www.big6.com). The Big Six model is similar to Marland’s in that it contains similar stages e.g. Task definition in the Big Six model is similar to the “formulate and analyse need” stage of Marland’s model. The Big Six model tends to conform to Kapitzke’s (2005) find and extract information view of information literacy, although it does refer to skills such as synthesis and evaluation and asks students to reflect on their “information problem-solving process” but this is viewed in terms of “efficiency”. However, Wolf’s (2003) study of the Big Six model as a metacognitive tool (see below) tended to contradict this view.

Stripling’s (1995) model “Thoughtful learning cycle” is often quoted in the literature and Stripling (1995, p. 166) argued that, based on the findings in Pitts’ dissertation, “A cyclical model like the Thoughtful Learning Cycle should help students understand that learning is continual and recursive, and that the main goal is not a final product or solution but the formulation of ideas, understandings, and further questions”. Stripling’s (1995) model is one which seeks to inform teachers and teacher librarians of the implications of students’ “personal understandings”. Stripling (1995) emphasised that the model is a cycle,
and that learning does not end with the completion of a student
assignment, as students may complete an assignment but will still have
questions related to their topic remaining. Stripling’s (1995) model is one
which has influenced the teaching of information literacy as an academic
subject and has influenced research in information literacy, but it is not
clear how the model has been used in schools.

Loertscher and Woolls (2002) also cited this author’s PLUS model
(Herring 1996, 1999 and 2004). The elements of the model are Purpose,
Location, Use and Self-evaluation and although the model appears linear,
it can also be viewed as an iterative model (Herring 2009) in which
students, as in Stripling’s (1995) model, move forwards and backwards
between stages depending on their need. Loertscher and Woolls (2002, p.
116) stated that the PLUS model contains elements of other models
“while adding emphasis on thinking skills and self-evaluation”. In
relation to the self-evaluation element of the PLUS model, Herring
(2004, p. 73) stated that self-evaluation skills included: “the ability to
reflect on the processes involved in assignment-related work and to
identify areas of improvement in planning, finding information for and
writing/presenting an assignment in the future”.

Research on the use of the PLUS model in schools (see below), indicated
that the use of the model led to greater reflection by students on their
own information seeking attitudes and processes, and improvement in
the standard of their work. The PLUS model can be criticised, along with
other models, for being a “one size fits all” approach to students’ use of
information skills in schools, and the development of information
literacy attributes in students. Herring (2004) argued that teachers and teacher librarians might recommend the model to students as one possible approach. It is clear that no one model will suit the diverse learning styles of all students in schools.

Kuhlthau’s (1989, 1993 and 2004) Information Search Process model has been very influential in teaching about information literacy in teacher librarianship courses, in information literacy related research, and in the development of school library programmes. Kuhlthau’s (1989) innovative approach to research examined not only the cognitive aspects of students’ approach to the research process, but also the affective aspects. Kuhlthau’s (1989) key findings were that students often expressed anxiety and uncertainty at certain stages of the research process and became more confident as they progressed. Thus Kuhlthau’s (1989, p.22) model has similar elements to other models such as “Task Initiation” and “Topic Selection” but these are accompanied by “Feelings”, which include aspects such as uncertainty and lack of confidence, through to greater confidence as students’ understanding of their task and topic increases e.g. when they start writing an assignment. Like Stripling’s (1995) model, Kuhlthau’s (1989, 1993 and 2004) model was meant to inform teachers and teacher librarians rather than being actively used by students.

In Australia, the model which is used most in schools is Information Literacy Planning Overview (ILPO), which Ryan and Capra (2001, 1) described as “a planning tool for teachers to use when integrating information literacy strategies and skills into their curriculum planning”.

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Ryan and Capra (2001) saw ILPO as a means towards establishing a whole school approach to the development of information literacy in students. The elements of the ILPO model are similar to those of other models such as the Big Six and PLUS outlined above and Ryan and Capra (2001, p. 3) argued that ILPO was also an iterative model in that the “Defining” stage “is constantly revisited during the entire process to refine or redefine the problem or task for further clarification”. In order to encourage students to take a metacognitive approach while using ILPO, Ryan and Capra (2001) urged teachers to design challenging assignments and encourage students to reflect on the research process throughout.

Green (2004, p. 70) was critical of information literacy models, stating that “Many existing models are too linear in progression, do not embed metacognition throughout the various stages or ignore the affect variables associated with the learner’s profile”. Green (2004, p. 70) also argued that, in the use of such models with students “individuality is overlooked”, and students focus too much on the end product e.g. the assignment, as opposed to what they are learning and, importantly, how they are learning. Green (2004) also argued that teacher librarians needed to influence teachers’ approaches to setting assignments, in that more challenging assignments would lead to more student-centred learning and greater emphasis on metacognition. Green’s (2004) criticism of the use of information skills models in schools are relevant, although some research studies on the use of models in schools (see Herring, Tarter
&Naylor 2000, 2002, and Wolf 2003 below) indicated that some students do demonstrate metacognitive abilities when using a model.

There is empirical evidence (Stripling, 1995; Kuhlthau 1993; Herring, Tarter & Naylor, 2002) that if students are supported by a scaffold or structured model, they are likely to take a more cognitive or metacognitive approach to information seeking and use and, to a certain extent, to their own learning. The information literacy models reviewed above may be seen as examples of possible scaffolds or guides to scaffolding, which teachers and teacher librarians may adopt or adapt to improve their students’ approach to information use, and to encourage students to take a more reflective view of their own learning.

2.2.5 Research in information literacy in schools

While there is a large and growing literature on information literacy in schools, much of the writing on information literacy, while informative and of use in a contextual manner, is not based on empirical research. This section seeks to review key studies in information literacy research, which will inform the present study by critically reviewing existing research, in terms of findings and methodology.

The review by Woolls and Loertscher (2002) was a valuable contribution to the information literacy area and covered aspects of such as the research process, key issues, and relevant strategies and models. One indication of the quantity of information literacy research is that Loertscher and Woolls (2002) cited 262 references to research-related literature. While Loertscher and Woolls (2002) reviewed a large number
of research studies, some of which are examined in more detail below, they included studies citing students’ reflections on the information skills process in schools, but the focus of their review tended to be in relation to assessment. Loertscher and Woolls (2002) did not cite transfer as an aspect of information literacy in their review. The elements covered in this review of information literacy research are listed as 2.2.5.1 to 2.2.5.6 below.

2.2.5.1 Kuhlthau’s research

In the school context, the work of Kuhlthau (2004) has been the most influential and is the most quoted. Kuhlthau (2004) outlined a number of research projects carried out from the 1980s onwards. In terms of techniques, Kuhlthau’s (2004, p. 30) studies included “journals, search logs, short written statements, case study interviews …[and] a questionnaire to elicit perceptions”. Kuhlthau’s (2004, p. 37) study broke new ground in information literacy research in the school context by examining not only how students went about finding relevant information for an assignment, with a focus on the task the students faced, but also on “thoughts, feelings, actions, strategies and mood”. From this study, Kuhlthau (2004, p. 44) developed the Information Search Process Model (ISP) which included “the affective (feelings), the cognitive (thoughts) and the physical (actions) common to each stage”. Although Kuhlthau’s model was named ISP, it was in fact a model of more than searching for information, as it included a number of stages in the assignment process which students experienced. For example, Kuhlthau (2004, p. 44) stated that “The first stage is task initiation” and
amongst the strategies which students employed were “brainstorming, discussing, contemplating possible topics, tolerating uncertainty”. This was a precursor to any information search process. The other stages in Kuhlthau’s (2004, pp 45-50) model were “Topic selection”, “Prefocus exploration”, “Focus formulation”, “Information collection”, and “Search closure”. It can be seen that there is no self-evaluation stage as, for example, in the PLUS model (Herring 2004), but Kuhlthau (2004) noted that a seventh stage was added later.

Kuhlthau (2004) reported that the initial study was done with high achieving students who might be expected to be more proficient than their peers in relation to information searching. A second study which included high, middle and low achievers verified the model, although it was not possible to collect enough data from low achievers. One significant finding of this study, Kuhlthau (2004, p. 57) reported, was that “the quantity and variety of sources used may not necessarily indicate construction, that is, clarification of thought”, and that this finding “does not support the traditional view of information use within the bibliographic paradigm”. Kuhlthau (2004, p.59) emphasised the importance of learning being the outcome of the “search process” (although ‘assignment process’ may be more appropriate), and that teachers did not find any correlation between the quality of the students’ work and the quantity of information sources used.

Kuhlthau’s (2004) third study had school and college students and public library users as participants and provided further verification of the
model, particularly in relation to the affective aspects of the process.

Kuhlthau (2004, p. 69) argued that

The low level of confidence of students, both in high school and in college, at the beginning of assignments indicates the need for guidance in the process of searching and support in the early stages of learning from gaining access to information.

Kuhlthau (2004) also reported on longitudinal studies completed towards the end of the 1980s, which involved a small number of students who had been part of earlier studies while at high school. These students had now completed four years of undergraduate study. Kuhlthau (2004, p. 76) stated that “the [ISP] model held over time for this select group of students” in that students perceptions of “formulating a focus” had developed and that these perceptions reinforced the value of the model.

One of the key differences between these students’ perceptions in high school and after four years in college, was that the students now expected themes to develop within their topic. Students were also now able to cope with changes to “their preconceived notions of a topic”. A possible criticism of Kuhlthau’s (2004) conclusions is that the selected students were initially high achieving students, and that these students might be expected to develop into more independent learners who are able to cope with changes in their initial topic formulation.

Overall, Kuhlthau’s work can be viewed as important to the development of information literacy research although it should be noted that Kuhlthau (2004) used the term “information literacy” sparsely and referred much more to “information skills”. While Kuhlthau’s (2004) work is relevant, it does highlight a lack of focus on transfer.
Kuhlthau’s more recent work has focused on what she termed ‘guided inquiry’ (Kuhlthau, Maniotes and Caspari 2007) and Kuhlthau et al (2007, p. ix) argued that “Guided Inquiry offers an integrated unit of inquiry planned and guided by an instructional team of a school librarian and teachers, together allowing students to gain deeper understandings of subject area curriculum content and information literacy concepts.” In relation to information literacy, the authors stated that “a shared commitment” (p. 53) amongst teachers and teacher librarians is needed to foster independent learning amongst students, and that one of the roles of the teacher librarian is “information literacy teacher” (p. 57). Kuhlthau et al (2007) stated that information literacy skills should not be taught separately from the curriculum and that these skills should relate to Kuhlthau’s ISP model. It is disappointing that although Kuhlthau et al (2007) stated that students will use information literacy skills, they do not explain fully how students would acquire these skills which students need to take an active part in guided inquiry units.

2.2.5.2 Assignments, concept mapping and student journals

Gordon (1999) sought the views of students in an international school in relation to the setting, organisation and assessment of an assignment. Gordon’s (1999, How did students and teachers judge the unit?, paragraph 14) study found that students were in favour of formulating research questions and that “Many students found that they needed to modify their research questions as they learned more about the topic”. Although, Gordon (1999) cited students’ responses referring to future assignments – that students found that the experience of a structured and
scaffolded assignment would help them in the following year - there is no reference to students transferring skills or attributes to future assignments, as the present study seeks to do.

Gordon’s (2000) study of the use of concept mapping by students was also pertinent to the present study, as students in the present study developed concept maps as part of the first assignment and reflected on the use of concept maps in both assignments. Gordon (2000, Conclusions, paragraph 2) stated that students who used concept maps were more successful in searching for information than students who did not use concept mapping. Students using concept mapping were also, according to Gordon (2000, Conclusions, paragraph 4) “more inclined to concept-driven searching as evidenced by their ability to focus and make connections, and more inclined to make metacognitive judgments that led to successful searching”.

Gordon’s (2000) study used a small sample of students likely to go on to higher education and this may have affected the results. The focus of the present study is different from Gordon’s (2000) research, but there may be parallels to be drawn from her study. Kinchin and Hay (2003, p. 43) studied the use of concept maps in science classes and argued that: “concept mapping can be a helpful metacognitive tool, promoting understanding in which new material interacts with the students’ existing cognitive structure”, but they did not examine concept mapping as part of information literacy teaching in the school. Cain (2004) reported that the use of concept maps in a primary school study showed that students’ concentration was enhanced; students kept on task more than previously;
teachers noted an improvement in the quality of questions posed by students; students made better use of resources and worked more independently. Cain (2004) also stated that students were able to relate the concept map to later stages such as writing. This finding was similar to that found by Herring, Tarter and Naylor (2000 and 2002) which is discussed below.

Robins and Snow (2005) conducted a study to examine the use of a student portfolio in the assessment of students’ information literacy skills. The portfolio was created using an open-source program which included categories relating to the process in which students were engaged when completing an assignment. The categories were “Explore, Create, Discuss, Reflect” and the questions in each category were related to elements of the “AASL information literacy standards and indicators” (Robins and Snow 2005, p. 6-7). Robins and Snow (2005, p. 11) argued that the advantages of a portfolio included having a standard approach to assessing students’ information literacy skills, the ease of interpretation by teachers and teacher librarians, and the ability to extend portfolios over time which “could create a body of evidence of information literacy skills”. While Robins and Snow (2005, p. 10-11) did not refer to the transfer of information literacy skills, they stated that “Future research can determine if it is possible to observe [how] skills develop over time”. Robins and Snow (2005) highlighted the positive elements of portfolio-based assessment but it was not clear if this assessment was embedded into the evaluation of the students’ performance in a holistic way, i.e. in
a way which assessed student learning as well as their use of information literacy skills.

Barranoik (2001, p. 25) sought to elicit the views of high school students on “the process of research” and students completed journals while doing assignments. Barranoik’s (2001) findings indicated that students’ interest in the assignment was enhanced when it related to their own interests; students varied in their understanding of the research process, depending on experience; teachers often assumed that students had or would develop information skills without effective scaffolding; and that students and teachers differed in their perceptions of the value of assignments. Barranoik’s (2001) article presented only a brief analysis of the study. Despite being qualitative in orientation, Barranoik chose not to include quotations from student journals. Quotations would have been useful in more clearly expressing the students’ views.

A further study by Barranoik (2004, p. 33) took a constructivist approach to examining how teachers and teacher librarians might develop students “to actually become architects of meaning”. One key aspect of Barranoik’s (2004, p.34) study was that students identified a “meaningful project” as one in which students were given a choice of topic which “enabled them to select something that was of personal interest and stimulated their thought”. Barranoik (2004) studied students at a higher level in school than the present study and some of her findings were less relevant than others. Barranoik (2004, p.36) concluded that “there is value in listening to what the students have to say about doing research projects”.

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2.2.5.3 Development of students’ information literacy skills

Ryan and Hudson (2003) provided evidence of the development of information literacy in one school through a continuing project which sought to embed students’ use of information skills into the curriculum. Ryan and Hudson (2003, p. 33) stated that strategies used included “Providing scaffolding and modeling tools to assist learners of varied abilities”. The authors provided evidence from surveys completed with year seven students between 2000 and 2002. As the present study also examined year seven students, Ryan and Hudson’s (2003) research is of particular relevance. The findings of the first survey of students indicated that year seven students were most adept in “The ability to make a plan to produce the final product” and “the identification of library resources as the primary source of relevant information” (Ryan and Hudson 2003, p. 36). Students lacked an overview of the assignment process, which the authors call “Research Process” (p. 36) and lacked sufficient information skills such as the evaluation of sources and their own search strategies.

Following a range of activities in teaching information skills to these students, Ryan and Hudson (2003) found, in a follow up survey, that students’ understanding of and skills in brainstorming, location of information, selection of information, note taking and compiling bibliographies had improved. Ryan and Hudson (2003, p 37) noted that improvement ranged “from beginning to established” but did not provide any data on how many students fell into categories such as “beginning” or “established”. Ryan and Hudson (2003, p.37) tracked the same class of students over three years and concluded that students “improved in
knowledge of all areas of the Research Process”. The students also “achieved an overall improvement rate of 35% from the year 2000 to the end of 2002” according to the use of a measurement tool designed by the researchers. Ryan and Hudson (2002) provided evidence of improvement of students’ understanding and use of information skills following a structured programme of information skills teaching in the school. The authors implied that providing a sound scaffold for students would enhance students’ application of information literacy skills in the assignment process, but they did not address the question of transfer of skills across subjects and time. The study by Ryan and Hudson (2003) informed the present study in its evaluation of student progress in understanding and use of information skills, but the present study took a less quantitative approach to eliciting student views on information skills use and focused more on transfer.

### 2.2.5.4 Affective aspects of information literacy

Farmer (2005, p. 1) evaluated the links between information literacy and social-emotional behavior in high school students, and sought to explore whether students with “emotional readiness” were more likely to be better exponents of information literacy practices. Farmer’s (2005) study focused on how students viewed their own attributes such as confidence, cooperation with others, and diligence with school work. It also examined how this related to their self-assessment in areas related to completing research assignments, such as identifying purpose, having an effective search strategy and evaluating information and ideas. Farmer’s (2005) conclusions indicated that the findings of her study were relevant
to teachers and teacher librarians, in that students appeared to need support in understanding the research process when completing assignments e.g. having a holistic view of the task and thinking about their own learning style. Students also needed support to recognise their own social and emotional state e.g. being resilient when facing difficulties or frustrations. Farmer (2005) stated that further research in this area would be valuable. Part of the study examined, through student diaries, some aspects of students’ assessment of their emotional well-being at different stages of the assignment process.

2.2.5 Students’ information seeking

As was noted above, the term ‘information search process’ referred to by authors such as Kuhlthau (2004), is often used to mean a wider process than using resources to find relevant information. There have been a number of studies which took a narrower view of information seeking by students in schools and which examined students’ strategies when using print or digital resources. Branch (2003) studied students using a CD-ROM encyclopedia and reported that the findings of her study indicated that students had initial problems in defining key words for their search strategies, were reluctant to use advanced searching and had difficulties in coping with articles that were lengthy. Branch (2003, p. 56) stated that students were observed to be showing the affective elements of Kuhlthau’s Information Search Process model, and that “These feelings included uncertainty, confusion, frustration and doubt, clarity, sense of relief and satisfaction”. Branch (2003) recommended that teacher
librarians and teachers supported students not just in the mechanics of information searching but also in relation to the affective aspects.

Chelton and Cool (2004) presented a range of research studies, mainly from North America, on how children and adolescents seek information in a variety of contexts. Gross (2004) examined how primary school children coped with finding information for school assignments, mainly using books. An interesting element of Gross’s (2004, p. 211-215) findings is that she viewed the context of the students’ information seeking as being “the imposed-query model”, in which the teacher is viewed as the imposer, the student is viewed as “the agent” and the teacher librarian is viewed as “information intermediary”. Gross (2004) argued that although teachers often viewed the assignments they set as encouraging students to choose their own topics within a larger topic, there remained a large element of imposition on students. Gross (2004, p. 234) argued that “the generation and transfer of questions is central to the information seeking process”, and that there is a need for more research into students’ capabilities in posing questions.

Bilal (2004, p. 273) reported on her studies of students’ use of a search engine developed for children (Yahooligans!), and stated that the students were involved in “fully assigned tasks” which were imposed by the teacher; and “fully self-generated tasks” in which students chose “the main topic and an aspect of it”. Bilal’s (2004) definition of self-generated tasks differed from that of Gross (2004) above, in that the teacher was still in control of the overall area of study (the ozone layer), even if students choose which element to research. Bilal’s (2004)
findings indicated that students were more successful in finding relevant information for the self-generated task, for which they used keyword searching and browsing of subject categories, than for the assigned task, for which they had to find factual information and their strategy of keyword searching was less successful. In another study, Bilal (2004, p. 277) evaluated search engine use by middle school students and her findings indicated that students “were most likely [to be] seeking specific answers to the task rather than developing an understanding of the information found”. Bilal (2004) concluded that students lacked skills in fully exploring the purpose of their task. Future research in this area, according to Bilal (2004), should include a focus on students’ wider information skills as well as aspects of search and navigational strategies employed by students. Bilal’s (2004) research studies added to the evidence relating to students’ use of information literacy skills and mainly examined students’ behaviours in certain contexts. They were limited in relation to students’ understanding of how using a search engine was part of a wider information skills process, what students learned from using a search engine, and whether students could take a metacognitive view of their own use of search engines. The above studies on information seeking, taken as a whole, show that, although focusing on different areas of research, the studies support each in other in demonstrating the difficulties faced by students in seeking relevant information.
2.2.5.6 Research on information literacy models

Wolf (2003) conducted a case study of the use of the Big Six information skills model and examined the model as a potential metacognitive tool. Wolf’s (2003) study examined the extent to which students reflected on their own learning, and on the information skills process which they experience when doing a school assignment. Wolf’s (2003) study also included student journals as a technique. Wolf (2003, Student logs and journals, paragraph 2) noted that “These journal entries consisted of free-form responses to open-ended prompts as well as more structured responses to the prompts within the guides section of the DP database”; and that the students’ journals “were examined for patterns among the students, insight into their experiences and feelings, and indications of metacognitive thought processes”. The findings of Wolf’s (2003) study indicated that students who used the Big Six model had a higher level of engagement with not only the content of their learning but with the process of completing the assignment. Wolf (2003, Results and discussion, paragraph 2) stated that “Students also told the researcher that the process they used for the news article writing would be helpful in other subject areas having complex activities involved in the curriculum” which might indicate a level of transfer of skills. However, only one quotation from one student was provided and transfer was not the focus of this study. Wolf (2003) reported that students benefited from using the Big Six model as a scaffold, and that the use of the model encouraged students to reflect more on how different elements of the model were related. Wolf (2003, Conclusion, paragraph 3) concluded that models
such as the Big Six provided students with “the elements for mental
modelling so necessary in helping the novice construct a method to meet
the information use tasks placed before him or her”. Wolf (2003)
recommended that future research might study students’ metacognitive
abilities over a longer period than one assignment, and in the present
study, students’ metacognition was one of the aspects studied over the
course of two school terms.

Herring, Tarter and Naylor (2000) examined secondary school students’
use of the PLUS information skills model and in particular, students’ use
of brainstorming and concept mapping, student strategies to evaluate
information sources, students’ use of keywords in reading for
information, and students’ views of the usefulness of the PLUS model
when completing assignments. In their findings, Herring et al (2000)
stated that students favoured the use of the model as it aided them in
identifying existing knowledge, searching for information, forming
questions and being organised in their approach to completing an
assignment. The findings also showed that most students benefited from
using a concept map as they viewed it as a way of organising their
thoughts and as a tool to be used later. Herring et al (2000) argued that
there was some evidence of metacognition amongst students who, in the
questionnaire responses, stated that they were conscious of the
importance of defining a clear purpose at the start of the assignment, as
this would be of benefit to them at later stages. A minority of students,
Herring et al (2000) stated, preferred to use their own approach to
completing the assignment task and stated that the PLUS model did not suit their learning style.

In a second study of the use of the PLUS model with year eight students in the same school, Herring et al (2002) reported similar findings to those of the first study but with a greater emphasis on students’ ability to reflect on their understanding and use of information skills. Herring et al (2002, p. 7) stated that students’ reflection on brainstorming showed that they “were able to analyse the functioning of the group and identify the benefits of brainstorming”. The researchers also stated that students identified the benefits of group brainstorming as “sharing of ideas”, “collecting more ideas and information” and “working as a team”, but that when students were asked about the negative aspects of brainstorming, they identified mainly behavioural aspects such as disputes within groups, lack of agreement within groups and aggressive behaviour of some group members (Herring et al 2002, pp. 7-8). The study also sought students’ views on note taking methods, strategies for coping with information/ideas/concepts which students did not understand when using information resources, as well as students’ views on their future use of the PLUS model. Herring et al (2002) stated that most students indicated that they viewed the PLUS model as a helpful guide which would be of use in future projects.

The studies of the PLUS model by Herring et al (2000 and 2002) were significant because of their focus on the views of students and because little research has been done on the use of information skills models. The limitations of these studies were that the evidence is gained from post-
assignment questionnaires, which depended on students being able to accurately recall their previous thoughts and actions. Also, there was little attention paid to the affective aspects of students’ reflections. The question of transfer was raised but there was no attempt to follow up the study to discover whether students’ indications of future use of the PLUS model resulted in actual future use.

A more in depth study of students’ and teachers’ views of the use of information literacy skills in school assignments by Herring (2006) partly focused on students’ use of the PLUS model, but also evaluated students’ views of their levels of confidence at the start of their assignment, their individual use of concept maps, their reading for information strategies, and their preferences for print and digital information resources. This research (Herring, 2006) also sought the views of teachers on their students’ use of information literacy skills and used post-assignment questionnaires, and also group interviews with students and teachers to triangulate the study. The key findings of the study were that a majority of students viewed the PLUS model as a beneficial tool and that it enabled some students to take a metacognitive view of their understanding and application of information skills. Herring (2006) states that students displayed a range of understandings of the benefits of brainstorming and concept mapping ranging from the superficial to the deep, but that most students were not confident of their ability to write a good assignment, which parallels with Kuhlthau’s (2004) uncertainty principle. Herring’s (2006) study showed that students in general, preferred to use digital as opposed to print resources,
as digital resources were regarded as more user friendly, easier to search and provided more in depth information. Herring (2006) noted that the study did not examine what factors might have influenced students’ views on using information resources. The views of teachers in this study (Herring, 2006) indicated that they saw benefits in students’ use of a scaffold such as the PLUS model, and there were some indications that teachers saw evidence of students transferring information skills across levels in the school, although the evidence was anecdotal. Herring (2006) noted that this study did not seek to relate students’ use of information literacy skills to student learning, and did not investigate the issue of transfer from the students’ point of view.

2.2.6 Conclusion

This overview of information literacy in the context of schools has identified a range of definitions of information literacy as well as a number of research studies on aspects of information literacy. The debate on what constitutes information literacy in schools and how information literacy might be effectively taught, continues apace. The key points to be noted from this review of the literature are:

- The term ‘information literacy’ developed from research and practice in librarianship and education and relates to student work not only in the school library but in all learning situations

- There is no agreed definition of information literacy but this author defines the term as a critical and reflective ability, as well as a practice. This ability and practice incorporates thinking about
the use of information literacy skills as well as the practical application of these skills

- Information literacy may be seen as relating to other literacies such as digital literacy and visual literacy

- In practice, a range of information literacy models have been used in schools across the world

- Research in information literacy in the school context has identified not only a range of skills which students use but also affective, cognitive and metacognitive aspects of students’ information use

- Very little attention has been paid to the transfer of information literacy skills in the literature reviewed for the present study

This researcher defines information literacy as a critical and reflective ability to exploit the current information environment, and to adapt to new information environments; and as a practice. The researcher’s definition extends the scope of previous definitions by including a reference to adapting to new information environments i.e. that transferring information literacy skills is part of the critical and reflective ability.

The following section provides a critical review of information literacy in higher education.
2.3 Information literacy and higher education

Examining information literacy in higher education is relevant to a study of information literacy in schools in that, what students are taught in schools in terms of identifying a need for, finding, evaluating, effectively using and reflecting on information and information sources, is often seen as a preparation for some students for their studies in the higher education context. This section critically reviews the origins and development of information literacy in higher education; standards for information literacy in higher education; models of information literacy which have been developed and used in the higher education sector; the differing definitions of information literacy in higher education; and the teaching of information literacy in higher education.

2.3.1 Origins and development of information literacy in higher education

Lupton (2002, Information literacy education, para. 1) stated that ‘The evolution of information literacy is based in library programs variously described as ‘user education’, ‘library skills’, ‘bibliographic instruction’ and ‘information skills”’. Although Lupton’s (2002) article focused on Australian university libraries, the same evolution of information literacy can be seen in the USA, the UK and other countries. Marcum (2002, p.2) highlighted that “it was Patricia Breivik’s presentation of a comprehensive model, and program, of information literacy in the 1980s that marked the serious beginnings of the initiative in academe”. Breivik and Gee (1989) argued that if information literacy was to be adopted by universities as an integral part of student learning and lifelong learning,
then it was important that information literacy was no longer seen as the responsibility only of librarians in the higher education sector. Breivik and Gee (1989) insisted that what had been taught as user education, bibliographic instruction and information skills, focused too narrowly on students’ use of libraries, and in particular their ability to locate information and provide correct citations for what they found. Instead, librarians in universities and colleges needed to broaden their horizons and embrace the concept of information literacy which focused more on student learning both while at university and later in life. Breivik and Gee (1989) argued that information literacy was not something which university librarians could view as their own area of expertise. University librarians needed to collaborate with their academic colleagues if students were to become information literate. This reflects similar developments in the use of terminology (e.g. ‘information skills’) in schools, noted above.

The Association of College and Research Libraries (ACRL) (2000) noted that the first significant initiative in information literacy was in 1989 when a report of the American Library Association’s Presidential Committee on Information Literacy reported, and defined information literacy as being the ability to recognize when information is needed, and to locate, evaluate and use effectively the needed information. The Council of Australian University Libraries (CAUL) (2001) reported the same initiative and added that in 1989, the Ross Report was established to examine library provision in the higher education sector in Australia. ACRL (2000) stated that in 1990, the National Forum for Information
Literacy, which included representatives from education, business and government, was formed to promote information literacy across a number of sectors. CAUL (2001, p. 21) stated that information literacy was given a society wide impetus in Australia with the publication in 1991 of a House of Representatives report entitled “Australia as an information society”. This report argued that “There is also a need for people to develop an understanding of their information rights and become information literate”. Both the ACRL (2000) and the CAUL (2001) standards noted that in the 1990s, information literacy was developed in other sectors including schools and that these sectors developed their own standards for information literacy.

2.3.2 Standards for information literacy in higher education

For the purpose of this review of national information literacy standards, the standards drawn up by ACRL (2000), CAUL (2001), the UK’s Society of National and University Libraries (SCONUL) (1999) and the Australian and New Zealand Institute for Information Literacy (ANZIIL) (Bundy, 2004) are examined here. It should be noted that the SCONUL (1999) standards referred to information skills in their title and not information literacy but they do refer to information literacy as a goal, thus their inclusion.

It is widely recognised that the ACRL (2000) standards are seen as the most definitive, and both CAUL (2001) and ANZIIL (2004) openly stated that their standards are based on the ACRL standards, and that permission has been sought from ACRL to include sections of the ACRL
standards verbatim in their own standards. The ACRL (2000, p.2) standards provided a definition of information literacy and stated that “Information literacy is a set of abilities requiring individuals to ‘recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information”, with the quotation emanating from the 1989 Presidential Committee on Information Literacy. The ACRL (2000) standards indicated that information literacy should now be seen as a crucial skill across society because of the huge expansion of information sources, including the internet, with which people had to cope at home, in education and at work. ACRL (2000, p.2) referred to information literacy as a key element in an informed democracy, arguing that “The sheer abundance of information will not in itself create a more informed citizenry without a complementary cluster of abilities necessary to use information effectively”.

In these standards, information literacy was also seen as important to lifelong learning and ACRL (2000) stated boldly that “Information literacy forms the basis for lifelong learning”, although it is likely that this statement might be disputed by writers and researchers on lifelong learning. It was also claimed that information literacy would enable students to “become more self-directed, and assume greater control over their own learning” but there was no recognition of the many other factors that would affect this self-direction and control.

The ACRL (2000, pp.2-3) standards provided an often-quoted list relating to an information literate person, who:
is able to: Determine the extent of information needed; Access the needed information effectively and efficiently; Evaluate information and its sources critically; Incorporate selected information into one’s knowledge base; Use information effectively to accomplish a specific purpose; Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

The emphasis was mainly related to the use of information sources but also implied aspects of learning, awareness of information use issues, and ethical use of information. In the view of ACRL (2000), the information literate person was socially aware and morally upright, which may be seen as a judgmental view. For example, if a person met all the requirements of being information literate as outlined by ACRL (2000) and agreed upon by other standards cited below, except the ethical use of information (e.g. to use information to plan a crime), would this disqualify that person from being information literate? It would be difficult to argue a case that, unless a person meets all the requirements of being information literate, the person would not qualify as being information literate. This is similar to the criticism of the AASL/AECT (1998) standards noted in the schools section above.

The ACRL (2000) standards stressed that information literacy was viewed as a key outcome for higher education students and contributed to lifelong learning once students have graduated. The standards urged university library staff to collaborate with academic staff and administrators to integrate information literacy into all higher education courses. The standards outlined definite roles for academics, who taught students; librarians, who organised resources and “provide instruction” (p.4) when needed; and administrators, who should encourage
collaboration and fund staff development. Thus the standards had a more limited view of the role of librarians in higher education than those who have advocated the development of teaching librarians (e.g. Lupton 2002).

In a section on the use of the standards in higher education, ACRL (2000, p.6) stated that “Students also will find the competencies useful” as students would recognise “the need to develop a metacognitive approach to learning”. It seems unlikely that students would read the standards and, as with other standards discussed below, this statement appears to assume attributes of information literacy that are not included in the competencies. Developing a metacognitive approach to learning will involve students in a much wider range of competencies and attributes than those included in the standards. In the schools section above, similar problems in developing metacognition in students was noted.

The detailed standards set out by ACRL (2000) formed the basis of the main Australian higher education standards produced by CAUL (2001) and ANZIIL (2004), although there were some differences of interpretation. A comparison of the ACRL (2000) and CAUL (2001) standards illustrates these differences and serves as the basis for the discussion of information literacy definitions and parameters below.

In both ACRL (2000) and CAUL (2001) Standard One related to how information literate people identify their need for information. The CAUL (2001) standards expanded on the outcomes of Standard One by
stating that the student “Identifies their existing knowledge framework” as well as recognising, as ACRL (2000) did, that new information could be combined with existing knowledge. This is rather ambiguous in that it might mean that students can think about what they know – prior knowledge – or that they can identify a framework within which their knowledge exists, which is a much more advanced competency.

In ACRL (2000) and CAUL (2001), Standard Two related to effective information retrieval and the outcomes included the determination of “investigative methods” (p.9) for research which include work in laboratories and the use of research methods such as surveys. It is questionable whether such competencies come under the remit of information literacy and this may be an example of what Marcum (2002, p.20) argues when stating that “information literacy reaches too far”. In ACRL (2000, p.11) and CAUL (2001, p.11) Standard 3 related to an understanding of the origins and context of information sources and information, as well as the participation in online forums and chat rooms.

The ACRL (2000) Standard Four related to how students organised the product of information gathering and evaluation, and communicated the results in an appropriate format, using ICT effectively. This was replicated, with some amendments to CAUL’s (2001) Standard Five. The ACRL (2000) Standard Five covered the students’ understanding of the origins and context of information sources and information within these sources, as well as the ethical and legal use of information. These higher education standards, in many ways, replicated the skills noted in the schools section above, in that both school and university students were
expected to define an information need, relate to prior knowledge, engage in information retrieval and evaluate sources and information.

CAUL (2001) introduced two new standards in addition to the ACRL’s five standards. The new Standard Four related mainly to note-taking and the avoidance of plagiarism and the new Standard Seven was “The information literate person recognises that lifelong learning and participative citizenship requires information literacy” (p.19) While individuals may recognise the value of information literacy for lifelong learning, it does again appear to stretch the parameters of information literacy by appearing to include consideration of “participative citizenship” as a competency. A similar criticism of the AASL/AECT (1998) standards was noted above in the schools section.

The ANZIIL standards (Bundy 2004) were also based on ACRL (2000). In some instances, the ANZIIL standards included some questionable statements about information literate people. For example, in relation to lifelong learning, the standards stated that information literate people “are prepared for lifelong learning, because they can always find the information for any task or decision at hand” (Bundy 2004, p.5), but the inclusion of the word “always” would appear to limit the number of information literate people in any society. The standards did make clearer some parameters of information literacy which were not seen in the ACRL (2000) or CAUL (2001) standards, for example arguing that “Information literacy can be seen as a subset of independent learning, that in turn is a subset of lifelong learning” (Bundy, p.5). However, in relation to other parameters, the ANZIIL standards could be seen to have
similar faults as ACRL (2000) and CAUL (2001). For example, the standards stated that information literacy “Values and beliefs include using information wisely and ethically, social responsibility and community participation” (Bundy 2004, p.7) but did not explain how the wider values of ‘social responsibility’ and ‘community participation’ related to the more specific values of using information. There also appeared to be an implication, noted above, that people without such values may not be considered as information literate. Similar expectations of school students were noted above.

In the UK, SCONUL (1999) produced standards relating to information skills in the title rather than information literacy, although information literacy is referred to a number of times in the standards, but always in the form of ‘information literacy’ [SCONUL inverted commas]. Since 1999, SCONUL’s website (www.sconul.ac.uk) has indicated that work on information literacy is being carried out by a working group. The SCONUL standards argued that IT skills should been as basic skills, and that “Information handling, [SCONUL emphasis] defined by Corrall, includes information sources, evaluation criteria, navigation methods, manipulation techniques, and presentation issues” (SCONUL 1999, p.3).

SCONUL nominated seven skills, in the form of abilities, which include identifying an information need, developing search strategies, searching for and finding information, evaluating information, organising and communicating information and “7. The ability to synthesise and build upon existing information, contributing to the creation of new knowledge” (SCONUL, 1999, p.6). It can be seen that only the last skill
or ability lies outside the use of information resources. SCONUL (1999) proposed a model which includes library skills and IT skills at a basic level, and then seven pillars which represented a hierarchy of skills or abilities from the lowest level of “recognise information need” to the highest level of “synthesise and create”. These skills or abilities would be progressively used by students as they move in five stages from “novice” to “expert” (SCONUL, 1999, p.8). The standards argued that new undergraduates would start as novices and use the lower four skills, whilst postgraduate students will be expected to use the upper level skills. This would be disputed by academics who would expect even year one students to be proficient in the first six skills. SCONUL (1999) proposed that information literacy was represented by the seventh skill.

Teachers and teacher librarians would also expect their students to leave school with a higher range of skills than expected by SCONUL.

The standards for information literacy in higher education provided useful guidelines for universities and colleges in terms of attempting to define information literacy, to outline what competencies, skills and abilities students might be expected to acquire while in a higher education institution and to provide guidelines for integrating and embedding information literacy in academic courses. The standards could also be seen as examples of librarians seeking to influence their academic institutions’ policies and strategies, particularly those related to lifelong learning. While the standards provided a starting point for debate within institutions, it is clear that there remains some ambiguity about what constituted information literacy in the higher education context.
The standards contained some questionable statements about the parameters of information literacy, especially in relation to areas such as critical thinking, learning to learn and lifelong learning. It is also clear that many of the aspects referred to in these standards are also seen as important in developing information literate school students.

2.3.3 Information literacy models in higher education

Unlike the school sector, where there is a proliferation of information literacy models, the higher education sector has not seen the emergence of many models for information literacy. The model most cited in the literature is Bruce’s *Seven Faces of Information Literacy* (Bruce 1997, 2004, 2005 and 2006) and was described by Bruce (2004, p.9) as a “relational model [which] was developed through researching the information experiences of professionals representing a range of disciplines”. CAUL (2001, p.21) referred to the publication of Bruce’s model as “a theoretical and phenomenological approach to information literacy research, which has attracted worldwide interest and usage”. Marcum (2002, p.3) stated that in proposing the seven faces model, “Bruce (1997) objects to the linear, objective and presumably quantifiable practices of IL instruction and proposed a relational, phenomenological alternative method focusing on the conceptions of the learner”. Catts (2005, p.19) argued that the seven faces model “provides a useful framework for conceptualising both the notion of information literacy and the approaches to be adopted for the development of self and others as information literate persons”. 

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Bruce (1997, paragraph 2) argued that the seven faces, which were developed from her phenomenographical research into the views, practices and experiences of educators in higher education, “provide a picture of information literacy that is very different from the lists of skills and attributes that are usually found in literature on the subject”. Bruce (1997) viewed information literacy in terms of a range of student learning experiences, and argued that if students were to become information literate, they needed to experience the different faces of information literacy in different contexts, and reflect upon these experiences to enhance their own learning and their awareness of information literacy as a tool for lifelong learning. It should be noted that Bruce’s research was based on the views and experiences, not of students, but of educators (including librarians and IT staff) in higher education although there is no suggestion that this invalidates her conclusions.

The seven faces of information literacy presented by Bruce (1997, Categories 1-7) placed emphasis on ICT as the key factor, with students taking an objectivist view of information (Face one). Faces two and three related to finding information, while face four examined the extent to which people control the information retrieved. The fifth face was seen as a more advanced facet of information literacy than controlling or storing information, as it focused on an individual’s ability to construct a knowledge base by taking a critical and analytical view of information and information sources. The focus of the sixth face was how individuals used information in a way which involved “a capacity for intuition, or
creative insight”, in order not just to construct knowledge but to extend personal knowledge. A key factor in this face was that an individual’s personal experiences were a source of knowledge, as well as the knowledge constructed from using a range of information sources. In face seven, people who considered themselves to be information literate, reflected on their personal code of ethics and values, in order to use information wisely. Such people also had the capacity to view information in a wider societal context than that of their own learning. The emphasis was not on the personal use of information but on the way an individual could contribute to others in the society in which they lived.

Bruce’s (1997) model was more of a framework or conceptual analysis of information literacy than other models. The model focused on the individual as a learner, problem solver, decision maker and, finally, as an altruistic user of information. There is no guide for others to implement this model, for example in the form of questions that individuals might ask themselves when using information sources or information retrieved, as was seen in the schools section above (e.g. Marland 1981). Bruce (1997) denied that this was a linear model, but there was a definite idea of progression from faces one to seven, with face seven appearing to be perhaps the zenith, incorporating the other faces, and presenting an individual who was a reflective, analytical, problem solving constructor of knowledge, and user of information with a high moral stance. The model presented by Bruce, Edwards and Lupton (2006, p.3) contained six frames: “(1) The Content Frame, (2) The Competency
Frame (3) The Learning to Learn Frame (4) The Personal Relevance Frame (5) The Social Impact Frame and (6) The Relational Frame”. The first five frames were to be viewed as different ways in which an individual interacted with information. The sixth frame brought together the experiences, knowledge and competencies of the first five frames. Bruce et al (2006) provided two case studies in which the six frames could be used as a basis for teaching students in higher education how to search the internet effectively (Case A), and how to research an essay in a first year course (Case B). The authors (p.15) concluded that the greatest value of the frames lies in their power to challenge each of us to identify our primary frame(s) and to inquire into how our professional practice might develop if we were willing to adopt a different frame or a wider range of frames.

This model could be viewed as a framework to encourage educators to rethink their approach to information literacy in higher education, but it could also be linked directly to a potential curriculum which attempted to encourage students to reflect on a variety of experiences with information sources and information, in order to learn more effectively. It can be argued that, for students in the final year of high school, most of these frames can be seen as relevant. Also, for year 7 students, the first three frames may be relevant.

2.3.4 Definitions of information literacy in higher education

From examining standards and models of information literacy in the higher education sector, it becomes clear from the literature, that there is a range of definitions of information literacy.
Hiscock and Marrott (2003, p.2) stated that “Information literacy is seen here as a set of skills which are incorporated into the wider context of lifelong learning”, with ‘here’ being the context of embedding information skills. Lupton (2002, p. 3) argued that many university information skills programmes have a very narrow, library centred view of student needs in relation to information literacy, and argued that “In contrast, information literacy is a holistic educational outcome, involves all information formats, includes evaluation, analysis and synthesis, is learner centred and involves the learner in all aspects of their lives”.

Willison and O’Regan (2005, p.634) stated that information literacy is: “an abstract notion which embraces a broad set of skills related to engaging in meaningful ways with others’ textual or multimedia information and making it one’s own and often re-presenting it for specific audiences.” This reflects Williams’ (2001) criticism of information literacy definitions in the schools context. Willison and O’Regan also argued that context is very important in relation to information literacy. Bruce, Chesterton and Grimison (2005, p.31) referred to information literacy as part of “the generic capabilities agenda” in Australian universities, and, following their research studies, viewed information literacy as “encompassing the ability to access, evaluate and use information in contemporary information and communications technology (ICT) environments”. Johnston and Webber (2006, p. 111) argued that information literacy could be viewed less in terms of “an enumeration of personal attributes”, and more in terms of “the information literate person, situated in a range of dynamic, social
and personal contexts”. Johnston and Webber (2006, p. 113) also argued that information literacy might also be viewed as “an emergent discipline”.

Taken with the definitions of information literacy included in the ACRL (2000) and CAUL (2001) standards, the above definitions were an indication of the different interpretations of information literacy that exist in the higher education sector. While the differences were often subtle and while there was general agreement on some elements of information literacy, e.g. that it is a competency, capability or attribute that should be acquired by all graduating students, some significant gaps in interpretation existed. Thus there was general agreement that information literacy was a meaningful and acceptable concept in the higher education section.

Marcum (2002, p.3) challenged the whole notion of information literacy, including: “the generally accepted premises underlying the idea, the assumptions about the learning process that inform it and the print-based and academic orientations of the effort in the era of multiple-media and perpetual workplace learning”. Marcum (2002) argued that information and communication needed to be seen as inseparable and interrelated, and should not be discussed as separate phenomenon, rather we should be examining ‘cominformunication’ (p.6) as the key feature of student learning. Marcum (2002) also attacked the idea that the information processing model is the most appropriate theory related to learning, and implied that this model formed the basis of most approaches to information literacy. Marcum (2002) stated that, while the goals of
information literacy as stated by some authors were realistic, the practices in university teaching and learning did not accommodate the new range of multiliteracies, including technological and visual literacies. Marcum’s (2002) views are similar to those of Kapitzke (2005) who questioned the validity of information literacy in the schools sector.

As was the case with school-related definitions of information literacy, it was clear that in higher education, there was no agreement about how information literacy might be defined or what the parameters of information literacy might be. What is interesting is that there are many overlaps between the school and higher education definitions and a critical view suggests that higher education definitions appeared to ignore or be unaware of the definitions relating to schools.

2.3.5 Information literacy teaching in higher education

Bruce (2004) argued that information literacy teaching in higher education should move away not only from bibliographic instruction, but also from a skills oriented approach in which students were taught how to use information sources, including the internet, but were not taught to be reflective learners, who can adapt to changing technologies and changing internet content. Bruce (2004, p.17) outlined the requirements for effective information literacy programmes in higher education, and argued that these should include adequate resources for teaching, a curriculum that allows both the integration and embedding of learning activities in an ICT environment, and a “Curriculum that provides embedded opportunities for reflection and documentation of learning
about effective information practices”. Bruce (2004) did not attempt to quantify the extent to which information literacy teaching in the higher education sector in developed countries met the above criteria. A review of the literature on information literacy teaching provides some evidence of progress towards Bruce’s (2004) ideals. Bruce’s (2004) comments reflected Limberg’s (2005) argument that school students should not only be taught a limited range of skills.

Ellis and Salisbury (2004) stated that while they agreed that university librarians needed to move away from bibliographic instruction and embrace the issues relating to information literacy, there was still a need to teach students how to use libraries in particular and information sources in general. The key to this approach, according to Ellis and Salisbury (2004) was building upon students’ prior knowledge of information sources and also information skills, such as identifying keywords related to an academic topic which they were researching. The study undertaken by Ellis and Salisbury (2004) found that students preferred the web as the key source of information, but they argued that this was mainly due to the inexperience of students. University teaching librarians, Ellis and Salisbury (2004, p.9) insisted, needed to make sure that students understood “the connection between critical reading of a broad range of material and producing thoughtful and scholarly essays”.

Hiscock and Marriott (2003) developed a portal which the authors claimed focused on graduate ability related to lifelong learning. The
portal aimed to reinforce students’ information literacy skills in relation to both digital and print resources. It is interesting that the skills were presented to students as communication skills and not information literacy skills. This focus on skills, as opposed to the wider aspects of information literacy such as lifelong learning, awareness of the origins of information resources, and the social implication of using information, was reflected in a number of studies, such as those by Williamson (2001), Hartmann (2001), Dickson (2004), Palmer and Tucker (2004), Mackey and Jacobsen (2004) and Jones et al (2005). However, these studies were clearly different from traditional bibliographic instruction as they included elements of integrating information literacy skills in academic programmes, and might perhaps be seen as making progress towards developing the more comprehensive information literacy programmes envisioned by Bruce (2004).

Bruce et al (2006) presented two case studies, which they saw as attempts to widen the scope of information literacy programmes by concentrating mainly on teaching students how to use particular information sources. The first case study related to providing students with a variety of ways and experiences of internet searching. Bruce et al (2006, p.8) stated that ROSS (Reflective Online Searching Skills), an online guide for students, could be applied to any subject. One of the key differences between ROSS and other forms of information literacy teaching was that, according to Bruce et al (2006), ROSS enabled students to reflect while they were searching, and to identify not only results of searches but also the differences in searches.
In the second case study, students were preparing to write an essay for a first year environmental studies course. Bruce et al (2006) argued that students needed to be given a variety of experiences of using a range of information sources, and that students should be encouraged to reflect on the approach taken by themselves and by their peers. Bruce et al (2006) further argued that students needed to be encouraged to reflect on aspects of essay writing, such as how to present an argument and distinguish between a point of view and an argument i.e. something supported by evidence. The two case studies, while being taught to university students, nevertheless contain many similar elements to information literacy skills taught to school students in studies by Herring (2006) and Wolfe (2003).

One key issue emanating from the literature on information literacy in higher education is the need for collaboration between teaching librarians in universities and academics. Lupton (2002) argued that if librarians in the higher education sector work only with other librarians and not with academic staff, they are likely to be seen as only teaching lower order skills. Lupton’s (2002) view was that university teaching librarians should seek to become more like the teacher librarians who work in Australia’s schools, in that they would be recognised as having a much more integrated role in teaching students. Asher (2003) argued that if information literacy programmes were to be effective, there needed to be collaboration between librarians and academic staff at all stages of the development and delivery of the programmes. Palmer and Tucker (2004, Elements in the delivery of information literacy, para. 2) argued that
collaboration might extend beyond that of library and academic staff “if student support staff, information technology staff and academic professional development staff are also considered”. Dickson (2004) reported on the use of focus group interviews to identify the information literacy needs of academic staff and students, and concluded that both librarians and academic staff needed to take a more student centred approach. This focus on collaboration is very similar to that recommended in the school sector by Todd (2008) and Kuhlthau et al (2007).

Conclusion
This critical review of information literacy in higher education has highlighted a number of key points of discussion and a number of issues which remain a source of debate amongst those studying or reflecting on information literacy. The various standards for information literacy are mostly based on the ACRL (2000) standards, although they have been adapted to local (e.g. Australian) contexts. The standards have been shown to be on the one hand, comprehensive in terms of definitions of information literacy, the attributes of the information literate student, and the diverse elements of information literacy which the standards hope universities and other higher education section institutions will address. On the other hand, the standards have been shown to be somewhat unrealistic in their requests for institutions to review their missions and goals and in some cases, too all encompassing in their claims for information literacy in relation to student learning.

There are few models of information literacy in higher education, and while Willison and O’Regan’s (2005) continuum might be regarded as a
model, Bruce’s (1997) model is most often referred to in the literature. Bruce’s (1997) model has influenced the thinking about information literacy in higher education, particularly in Australia, although there is little evidence of all the model’s features being put into practice by teaching librarians in the higher education sector.

That there is a definite and positive progression away from bibliographic instruction taught in isolation by higher education librarians, and towards more integrated and potentially embedded information literacy programmes, featuring collaboration between librarians and academic staff, cannot be denied. This progression reflects similar developments in the schools sector. What is also clear is that the practice of information literacy teaching does not reflect the wide ranging ideas either of the information literacy standards or models reviewed here. It also remains unclear as to whether notions of information literacy as necessarily being a force for democratic and altruistic ideals can be upheld, or whether higher education institutions (or schools) can produce information literate people who have the requisite information literacy attributes to be effective information users in the workplace.

2.4 Information literacy in the workplace

As was seen above, in both the schools and higher education sector, there was a view expressed in some of the literature that information literacy skills, competencies and attributes gained at school or in higher education, would provide the basis for information literacy in the workplace. In both the school and higher education sector, information literacy was seen as being either linked to or as being part of, lifelong
learning which included workplace learning. These views are now being challenged as researchers explore information literacy in the workplace more extensively, and question prevailing views on issues, such as what it means to be information literate in different workplaces, and whether what is learned or taught in the school or higher education sector has relevance in particular workplaces. This section will examine the literature on information literacy in the workplace in relation to:
definitions of information literacy; the focus on skills and lifelong learning in the workplace; the focus on the importance on context; the importance of non-textual information in workplaces outside the information/knowledge industries; and the issue of whether information literacy skills can be transferred within the workplace setting.

2.4.1 Definitions of information literacy in the workplace

Table 2.1 below shows a range of definitions of information literacy in the workplace and these definitions fall into two categories, one of which is skills oriented and the other which is conceptual.

Cheuk (2002) stated that the abilities in the definition are linked to the effective use of ICT, working in teams and sharing knowledge. Cheuk (2002) added that the identified abilities needed to be discussed in a particular context within a domain-specific information environment. Rosenberg (2002) stated that the definition provided was the ‘conventional’ definition of information literacy, but that for small businesses the definition was problematic because information needs were difficult to define, and access to information resources was
restricted. Irving (2006) cited the UK’s Chartered Institute of Library and Information Professionals’ definition of information literacy and extended the skills-oriented definition to include ethical use. These workplace related definitions are similar to some of those found in the literature on information literacy in the school and higher education sectors but were criticised by others who view information literacy more conceptually.

Tuominen et al (2005) provided a definition which included the production and evaluation of knowledge. Bruce’s (1999 and 2004) definitions were all-encompassing and included critical thinking and ethics as part of being information literate. Lloyd’s (2003, 2004 and 2006) definitions focused on ‘a way of knowing’ about the information environment, and were similarly all-encompassing in that the definitions included a range of cognitive attributes and critical thinking about that information environment. The definitions encapsulated a range of views on how information literacy should be interpreted in the workplace.

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
<th>Category</th>
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<tbody>
<tr>
<td>Cheuk (2002, p.2)</td>
<td>“a set of abilities for employees to recognize when information is needed and to locate, evaluate, organize and use information effectively, as well as the abilities to create, package and present information effectively to the intended audience”</td>
<td>Skills oriented</td>
</tr>
<tr>
<td>Rosenberg (2002, p.2)</td>
<td>“the ability to know when information is needed and then having the skill to identify, locate, evaluate, organize, and effectively use that information”</td>
<td>Skills oriented</td>
</tr>
<tr>
<td>Irving (2006, p.1)</td>
<td>“know when and why they need information, where to find it, and how to evaluate, use and communicate it in an ethical manner”</td>
<td>Skills oriented</td>
</tr>
</tbody>
</table>
Tuominen et al (2005)  “The sociotechnical practice approach entails an understanding that people are information literate in a given domain if they can recognize and evaluate (read) and produce (write) knowledge claims in that domain and if they have the ability to assess the knowledge produced in the domain”, Conceptual

Bruce (1999, p.)  “Information literacy is about peoples’ ability to operate effectively in an information society. This involves critical thinking, an awareness of personal and professional ethics, information evaluation, conceptualising information needs, organising information, interacting with information professionals and making effective use of information in problem-solving, decision-making and research” Conceptual

Bruce (2004, p.9)  “Learning to be information literate .. involves becoming aware of different ways of experiencing information use through engaging in relevant information practices and reflection” Conceptual

Lloyd (2003, p.88)  “a constellation of competencies that engage the synchronous and serial applications of a range of perceptual, cognitive skills and process skills that together constitute a way of knowing” Conceptual

Lloyd (2004, pp.222-223)  “An information literate person has a deep awareness, connection, and fluency with the information environment. Information literate people are engaged, enabled, enriched and embodied by social, procedural and physical information that constitutes an information universe. Information literacy is a way of knowing that universe” Conceptual

Lloyd (2006, p.182)  “Information literacy is a way of knowing, of being in the world and interacting with it through engagement and interaction with signs, symbols, artefacts, and people from which information relevant to the context – and thus meaning – can be drawn” Conceptual

Table 2.1 Definitions of information literacy in the workplace

2.4.2 Information literacy skills and lifelong learning

In the literature on information literacy in the workplace, there was constant reference to information literacy skills, although there were differences of opinion as to which skills are encompassed. The key difference in approach in relation to skills was that, for some authors, the focus on a defined set of skills in finding, evaluating and using information is the key focus. For others, while there was a recognition
that such skills exist, the focus on skills failed to fully encapsulate the meaning of information literacy in the workplace and the focus was seen as being too narrow.

Smith and Martina (2004) discussed the information literacy skills needed by practising bakers and apprentice bakers, and argued that the key information skills which were lacking amongst these workers, were limiting searches, evaluating information retrieved and knowing about different information sources. Smith and Martina (2004, p.328) examined key competencies identified for Australian workers and argued that information literacy skills were part of the key competency of “Learning that contributes to ongoing improvement”. Apprentices in the bakery trade should be taught information literacy skills while in college, according to Smith and Martina (2004), so that they might be able to use such skills in the workplace. Smith and Martina (2004) did not recognise information literacy as extending beyond the use of mainly textual information.

Cheuk (2002) also reviewed the range of skills which people needed in the workplace and suggested that, in many areas, a lack of information literacy skills amongst employees was costly to their employers. Cheuk’s (2002) review of information literacy skills examined skills which workers would need in the information and knowledge industries, and argued that the skills needed in the workplace e.g. in relation to finding information, in using information resources and evaluating information, are similar to those needed in the educational context. This can be seen as a narrow view in that many workers do not work in information and
knowledge based industries, and will require skills not related to published information sources.

Rosenberg (2002) argued that small business employees should improve their skills in recognizing how information can have value, and in information retrieval, since small businesses did not have information specialist backup that larger companies did. Rosenberg (2002) emphasised that small business employees often lacked key information literacy skills such as evaluating information found on the internet. As with Cheuk (2002) and Martina and Smith (2004), Rosenberg’s (2002) views took the stance that most workers work in industries where information is mainly textual, whether digital or in print. Irving (2006) conducted a small scale research project, interviewing people who worked in a range of information based professions, and found that while employers put a high level of emphasis on employees bringing information literacy skills with them to employment, there was little training provided to employees in relation to finding, evaluating and using information. Irving’s (2006) conclusions were that more needed to be done in the educational sector to ensure that employees have the requisite information literacy skills that employers seek. Irving’s (2006) views are similar to those of Cheuk (2002), Martina and Smith (2004), and Rosenberg (2002), in that there is an assumption that information literacy skills are those required to deal effectively with text based information sources. While these authors implied a need for the transfer of skills, they did not focus on transfer in their research.
Much of the literature on information literacy in the workplace focuses on information literacy as a set of defined skills, which should be viewed as core skills in, or a key part of, lifelong learning. Martina and Smith (2004) stated that apprentice bakers had no appreciation of information literacy skills as being needed for lifelong learning. Cheuk (2002, p.11) stated that information literacy “is going to be a fundamental lifelong learning skill” which was needed in the workplace. Houghton and Halbwirth (2002) argued that the skills needed to develop both information and knowledge management in the workplace were related to issues of lifelong learning. Candy (2002, p.6) argued that “information literacy and lifelong learning are inextricably intertwined”, and Irving (2006) viewed school based information literacy skills teaching as related to lifelong learning. The key problem with viewing information literacy skills as a key area of lifelong learning is that the authors presented little evidence that the skills identified for example in the ACRL (2000) or CAUL (2001) standards, to which some of the authors cited here refer, are key skills in learning in the workplace or in society in general. There is an assumption that such skills, which are clearly related to formal learning, must then be an important aspect of lifelong learning, but this presupposes that skills related to mainly text based information sources are the key skills needed by most people’s learning in the workplace and in society. That most people may in fact learn from others, or from non-text based sources in non-educational contexts, is not considered by these authors.
This view of information literacy as a set of skills related to lifelong learning was disputed by a number of authors studying information literacy in the workplace. Among these authors, the work of Lloyd (2003, 2004 and 2006) has been most prominent recently. Lloyd (2003, p.88) argued that information literacy is reified in academic settings. It is treated as a single and discrete operational competency rather than as a constellation of competencies that engage the synchronous and serial applications of a range of perceptual, cognitive skills and process skills that together constitute a way of knowing.

Lloyd (2003, 2004 and 2006) questioned the notion of information literacy skills acquired in schools and higher education as being easily transferred into the workplace, and being the basis for lifelong learning, because these skills were not always relevant to the context of workplaces and were not easily transferred. Bruce (2004, p.14) also dismissed the idea of information literacy as a defined set of skills, arguing that it was not skills that were important but the “reflective and conceptual capabilities that are part of the character of the information literate”.

2.4.3 The importance of context

The importance of context in considering information literacy has been highlighted by those studying information literacy in the workplace. As Lloyd (2003) pointed out, information literacy researchers in the school or higher education areas had examined the skills, competencies and attributes of information literate people only in an educational context and had assumed that that when students entered the workplace, the same
skills, competencies and attributes would be needed. Context was all important in considering information literacy, Lloyd (2006) argued, because of the differences between the “information landscapes” of the workplace and the educational setting, and that to understand information literacy in the workplace, it was necessary to examine how people became critical thinkers and problems solvers in a particular information environment. As will be seen below, one of the crucial differences between the educational environment and the workplace environment is that, in the workplace, people have to engage with more information which is not text based.

Bruce (1999) took the view that information literacy was not primarily about skills but argued that while some information literacy skills learned in the educational setting would be relevant in the workplace, it was only when these skills were re-learned in the context of the workplace that they would be useful to employees. Bruce’s (1999) research was based on people working in the educational context, as opposed to studying in that context. Candy (2002, p.7) also stressed the importance of context, stating that “there is a strongly context-dependent element as well, and information literacy is influenced both by the domain or subject area” and that, in each context, it was necessary to ensure that information users had the capability to make judgments about domain specific sources of information. Cheuk (2002, p.9) argued that information literacy “needs a context and subject-specific content to be meaningfully discussed” and that one of the barriers to enhancing
information literacy in the workplace was a failure to recognise this need for context related skills development.

Winterman and Abell (2003), who focused on information literacy skills in the workplace, stated that it was difficult to define the range of skills needed in particular contexts, because different skills were needed in different organisations and at different levels. Donnelly and Craddock (2002) also viewed information literacy in terms of skills, but stated that the workplace was different in context from the educational context to which the scientists at Unilever were accustomed, and that there could not be an assumption that new employees would have the requisite skills to be effective workers.

Tuominen et al (2005, p.330), taking a similar view to that of Lloyd (2005) above, argued that information literacy was too often viewed as “a set of attributes—or personal fluencies—that can be taught, evaluated, and measured independently of the practical tasks and contexts in which they are used”, and that information literacy skills could not be taught and retained independently, because they were dependent on the workplace situation and the tasks which people carried out within social systems and work organisation. Tuominen et al (2005, p.334) stated that information literacy was not merely a set of generic skills, but that information literacy “should be contextualized within the structures and modes of thought of particular disciplines”, and that the emphasis needed to be on people acting and interacting in social contexts and learning the values and practices of that domain including the technologies used there. This point is very relevant to the issue of transfer across subjects in
schools, given the ‘structures and modes of thought’ which exist in different school subjects.

It can be seen from the above that when information in the workplace is considered, there is a need to consider the context of information use, and that this context is likely to be different from the educational context of information use in schools and universities. Authors such as Bruce (2004), Lloyd (2006) and Tuominen et al (2005) argued that those researching or writing about information literacy in the educational sector took too narrow a view of information literacy, and ignored the possibility that being information literate in the workplace is likely to be very different from being information literate while a student.

2.4.4 Non-textual information

Discussions of information literacy in the educational sector and in some cases in the workplace (e.g. Smith and Martina 2004 and Irving 2006), focus on information that is predominantly textual in nature and gained from sources such as the web, library databases or organisational intranets. This view is contested by a number of authors. Candy (2000) argued that, in the workplace, people are a key source of information and more so than in the educational setting, where students might learn from each other, but tended not to be key sources of information. Bruce’s (1999, p.37) second face of information literacy was related to “finding information from appropriate sources”, and these sources include people as key sources of information. Bruce (1999) implied that for some employees, people might be a more fruitful source of information than
Tuominen et al. (2005, p.330) argued that one of the failures of information literacy standards and literature was that there had been little recognition of “how individuals interact with others and technical artefacts in their information environments”, and that working colleagues could be both a source of information but also an influence on how an individual interacted with a range of information sources.

The research carried out by Lloyd (2003, 2004 and 2006) indicated that, in many workplaces, information sources were non-textual in nature, and revealed sources of information that were not referred to in other information literacy studies. Lloyd (2006, p.575) identified three sources of information available to workers in her study of fire fighters: textual information, which took the form of documents available within the organisation; social information, which was sourced from other, generally more experienced workers in the organisation; and physical information “which is accessed through the body and is observed through the bodies of other practitioners”. The reference to physical information was a key addition to the literature of information literacy, and to the understanding of information literacy as a phenomenon in the workplace, particularly those workplaces in which workers did not depend predominantly on textual or social sources of information. Physical information, according to Lloyd (2006) allowed fire fighters not only to improve their own work performance by observing others, but also to improve their understanding of the fire fighting culture and profession. This reference to physical information is unique in the
literature on information literacy, and raises the question of whether physical information may be important in other workplaces or in educational contexts such as schools.

2.4.5 Transferring information literacy skills in the workplace

The issue of whether information literacy skills and attributes can be transferred from one context to another continues to be a source of debate in the information literacy literature. There is general agreement in the literature that transfer is desirable but there is less agreement on whether it is feasible. Smith and Martina (2004, p.329) argued that their study of bakers and apprentice bakers showed that workers in the baking industry should be taught skills in college which they could apply in the workplace, and that “All skills should be transferable across various work tasks and functions”. Irving (2006) takes a similar view and argued that information literacy skills are key workplace skills but that, rather than being acquired in the workplace itself, such skills should be taught in schools and viewed as inherently transferable.

This view of information literacy skills as being transferable is not universally accepted. Winterman and Abell (2003, p.2) argued that “many of the skills are perceived as organisational rather than transferable”, and that there was no guarantee that skills would be transferred from one context to another. Lloyd (2003, p.88) argued that there was no real evidence of the transfer of skills from the educational context to the workplace. There was an implication that such skills could be transferred across contexts and applied in different contexts, but “this
implies the ability to think critically about context-specific information problems” and many employees might lack this ability. Lloyd (2006, p.188) stated that studies of information literacy indicated that skills did not transfer from school to university, and that information literacy in the education sector would not readily transfer to the workplaces, which “have their own idiosyncrasies in terms of practices and information dissemination which inform learning about work performance”. Lloyd (2006) suggested that a potential solution to the problem of transfer from educational to workplace context might be found in collaboration between educational librarians and workplace educators such as librarians or staff developers. Whether this cooperation could engender in students an appreciation of the actual information environment and experiences with textual, social and physical information sources is open to debate.

Transfer remains an ideal rather than an actuality for information literacy between the educational and workplace contexts, and it may be that rather than concentrating on the transfer of information literacy skills and attributes from one context to another, workplace educators might attempt to build upon those skills, which are likely to be mainly related to textual information, which new employees bring from the educational context, and then extend the employees’ range of skills to domain specific information literacy skills. By examining aspects of transfer in the workplace, school based educators can identify relevant questions which might be posed in relation to transfer in the school context.

2.4.6 Conclusion
Information literacy in the workplace, as reflected in the literature, can be viewed either narrowly – as a set of skills to be learned - or more widely, as an educational, social and cultural approach to the information environment in a particular workplace context. The relevance of workplace information literacy studies to the school context include:

- The workplace information environment may be different from that in schools but similarities do exist
- The focus on non-textual information in the workplace can raise questions about non-textual information in the school context
- Questions relating to the transfer of information literacy skills in the workplace may be relevant in the school context

The next section will focus on the issue of transfer as it relates to information literacy and learning.

2.5 Transfer of learning

Academic discussion on a range of aspects of the transfer of learning has been going on for more than a century, and there remains little agreement on what constitutes the transfer of learning, or what factors contribute to successful transfer or lack of transfer in educational settings, or in the workplace. Transfer has been identified as very important within education, both at school and higher education levels, and in the workplace, in the form of training. However, what kind of transfer takes place, what environmental, cognitive or sociocultural models influence
transfer, what types of transfer exist, and whether it is possible to teach for successful transfer, remain the subject of academic debate.

This section will examine the importance of transfer and the problems identified in facilitating transfer; definitions of transfer; types of transfer; transfer failure; the importance of context and sociocultural approaches to transfer; and methods which might encourage or facilitate transfer.

2.5.1 The importance of transfer and problems in facilitating transfer

In the range of literature reviewed, there is clear agreement that both in education and in the workplace, transfer is extremely important. Haskell (2001) stated that the concept of transfer was crucial to all levels of learning. De Corte (1999, p. 555) agreed, stating that “the transfer of learned knowledge and skills is considered as a fundamental goal of education”. De Corte (1999) also noted that industry spends much on training and that transfer was important in an economic sense. Royer et al (2005, p.viii) argued that “how transfer works and how transfer can be facilitated, is a vitally important educational issue”, and Haskell (2001, p.44) stated that “In an age where we must be increasingly able to analyse and think about information, transfer ability becomes increasingly important”.

Despite the agreement on the importance of transfer, there was little agreement on how and when transfer occurs, particularly in the educational sector. Detterman’s (1993) views were quoted in a number of books and articles on the transfer of learning. Detterman’s (1993) argument was that while it appeared obvious that transfer should be the
basis for new learning and new inventions, and a way to explain aspects of cognitive processes and education, it is not. Detterman (1993) did admit that examples of near transfer (discussed below) could be found but that near transfer was not important. Detterman (1993, p.21) concluded that “significant transfer is probably rare and accounts for very little human behaviour…We generally do what we have learned to do and no more”.

Hakel and Halpern (2005, p.357) stated that “Transfer is not automatic, assured, easy or simple”, and Haskell (2001, p.23) argued that despite decades of research “transfer remains a mysterious process”. De Corte (1999, p.555) stated that there existed a wide range of views on the transfer of learning, and that “it is remarkable in this respect that scholars derive these different views from the same set of empirical data”. De Corte (1999, p.555) also argued that data on transfer was viewed from a number of different theoretical perspectives, and “even researchers with a similar or related theoretical background seem to have distinct opinions with respect to the occurrence of transfer”. Despite this lack of agreement, research on transfer continues and, as will be seen below, some researchers argue strongly that transfer is not only necessary but possible.

2.5.2 Definitions of transfer

Reviewing a range of definitions enables the reader to identify a number of perspectives taken by researchers and writers who approach transfer in different ways. Table 2.2 presents a sample of definitions.
Table 2.2 Definitions of transfer

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Detterman (1993, p.4)</td>
<td>Transfer is the degree to which a behaviour will be repeated in a new situation.</td>
</tr>
<tr>
<td>Haskell (2001, p.</td>
<td>Transfer refers to how previous learning influences current and future learning and how past or current learning is applied or adapted to similar or novel situations. [it is] a way of thinking, perceiving and processing information.</td>
</tr>
<tr>
<td>Phye (2001, p.581)</td>
<td>Problem solving transfer is a dynamic process that consists of more than automatically reconstructing knowledge from memory storage.</td>
</tr>
<tr>
<td>Lobato (2003, p.20)</td>
<td>The personal construction of similarities across activities i.e. seeing situations as the same.</td>
</tr>
<tr>
<td>Royer et al (2005, p.vii)</td>
<td>Transfer [Royer et al’s italics] is a term that describes a situation where information learned at one point in time influences performance on information encountered at a later point in time.</td>
</tr>
</tbody>
</table>

Detterman’s (1993) view was the most traditional view of transfer, emphasising repetition, whereas Haskell (2001) and Royer et al (2005) stressed the influence of prior learning or knowledge on a learner’s performance in a new situation. Phye’s (2001) definition implied influence rather than repetition. Both Haskell (2001) and Royer et al (2005) referred to information and how learners might process and act on previously acquired information in a new situation. Lobato’s (2003) definition was the one which focused most on the learner, and on a learner who did not merely use prior knowledge or information in a new situation, but as a person who constructed similarities between different learning situations. This constructivist view of the learner took a more sociocultural approach to transfer than other definitions and is very relevant to the school context of transfer.

2.5.3 Types of transfer
Table 2.3 below identifies nine types of transfer although it should be noted that Haskell (2001) identified fourteen different types of transfer.

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near</td>
<td>The learner overlooks or ignores transfer, duplicates what was learned before but with no understanding of transfer, or replicates what was learned before and shows an understanding of transfer (Fogarty and Pete 2004)</td>
</tr>
<tr>
<td></td>
<td>A person is applying what has been learned in an identical situation e.g. “steps of operation in sequence, and the sequence of steps is repeated every time the task is performed”. (Subedi 2004, p.593)</td>
</tr>
<tr>
<td></td>
<td>Occurs when what is learned in one context is applied in a similar but not the same context e.g. roller skating and ice skating or using skills in calculating size in different contexts (Haskell 2001)</td>
</tr>
<tr>
<td>Far</td>
<td>The learner can easily integrate previous ideas into her own work and relates existing knowledge to new knowledge; can take previously learned ideas, information or skills and can transfer them in the same subject or across subjects; and can be innovative by taking transferred learning into unexpected areas and changing the content of what was learned to fit his/her own needs. (Fogarty and Pete 2004)</td>
</tr>
<tr>
<td></td>
<td>Equates to applying what was learned in dissimilar situations “and involves analogy and cognition” (Subedi 2004, p.593)</td>
</tr>
<tr>
<td></td>
<td>Involves applying what was learned in one context in a completely different context and this involves “analogical reasoning” (Haskell 2001, p.30)</td>
</tr>
<tr>
<td></td>
<td>Relates to where the new situation is very different or more difficult. (Detterman 1993)</td>
</tr>
<tr>
<td></td>
<td>Occurs where there is very little similarity between the two learning situations. (Royer et al 2005)</td>
</tr>
<tr>
<td>Displacement or creative</td>
<td>What was learned is applied and this leads to more insight or understanding and “In the interaction of the newly discovered similarity between the old and the new, a new concept is created” (Haskell 2001, p.30)</td>
</tr>
<tr>
<td>Specific</td>
<td>“In specific transfer, the learner transfers the contents of learning to a new situation” (Detterman 1993, p.5)</td>
</tr>
<tr>
<td></td>
<td>Occurs “where there is a clear similarity between the stimulus complex encountered in one situation and the stimulus complex encountered in another situation”. (Royer et al 2005, p.ix – referring to Gagne)</td>
</tr>
<tr>
<td>Non-specific</td>
<td>Relates to where strategies learned in a previous situation are used in a new one e.g. if learning lists helped to memorise a poem. (Detterman 1993)</td>
</tr>
<tr>
<td></td>
<td>All learning can be viewed as a form of transfer. (Haskell 2001)</td>
</tr>
<tr>
<td></td>
<td>Relates to where situations were different but the new situation was still influenced by what was learned in the original situation. Royer et al 2005, referring to Gagne)</td>
</tr>
<tr>
<td>Vertical</td>
<td>Occurs where knowledge or skills learned in one situation can be applied so that more complex knowledge of skills can be learned in a new situation. (Royer et al 2005)</td>
</tr>
<tr>
<td>Lateral</td>
<td>Relates to learning situations that are very similar. (Royer et al 2005)</td>
</tr>
</tbody>
</table>

Table 2.3 Types of transfer
This extensive range of types of transfer reflected not only the environmental, cognitive and sociocultural perspectives on transfer, but also the extent to which researchers sought to take an overview of the key types of transfer or seek to identify particular subtypes of transfer. Fogarty and Pete (2004) for example cited near and far transfer, but referred to these also as simple and remote, and they also broke down each type into subtypes where learners showed different levels of understanding of transfer. It can also be seen from table 2.3 that there were similarities between some of the types of transfer, in that near, specific, and lateral transfer could be seen as overlapping, as can far, non-specific and displacement.

In relation to far transfer, Detterman (1993) and Royer et al (2005) referred to the dissimilarity of learning situations, whereas Subedi (2004) and Haskell (2001) argued that there was a need for learners to be engaged in the use of analogy to facilitate transfer. Fogarty and Pete (2004) and Haskell (2001), (in relation to displacement or creative transfer), identified what they regarded as the highest level of transfer, where the learner used prior knowledge to be creative.

In her sociocultural study of Asian students studying in Australia, Volet (1999) identified further types of transfer as: appropriate, ambivalent, difficult and inappropriate, where students, in attempting to fit into a new culture of study, transferred skills and attitudes into a new learning situation. Volet (1999) noted that while some aspects of transfer such as academic diligence and working in small groups were appropriate, aspects such as copying from texts were inappropriate. In identifying the
reasons for students displaying this range of transfer types, Volet (1999) stated that traditional environmental and cognitive views of transfer could not alone account for the students’ performance, and that social influences had to be taken into consideration.

2.5.4 Failure to transfer

In discussing transfer in the context of training at work, Subedi (2004, p.592) posed the question “Why do most training programs and courses fail to transfer?”, and implied that not enough attention had been paid to the complexity of transfer of training which was influenced by the trainees, those who train them, training methods and post training supervision and support. Detterman’s (1993, p.21) view was that we should not expect students in the educational sector to transfer learning, and he bluntly stated “The lesson learned from studies transfer is that, if you want people to learn something, teach it to them. Don’t teach them something else and expect them to figure out what you really want them to do”. Detterman’s (1993) view was that most studies which showed evidence of transfer involved experiments where participants were given hints or explanations in a new learning situation, which allowed them to transfer what was learned in the original situation, and that this invalidated the experiments.

Hatano and Greeno (1999, p.646) stated that studies of transfer showed that it was limited, and that a lack of transfer was due to students not fully understanding what they had learned, i.e. “Students may not have learned the relevant rule, law, or formula deeply enough to apply it
properly later”. The main reasons for evidence of transfer failure in a number of studies, according to Hatano and Greeno (1999, p.652) was that researchers had defined transfer too narrowly and set up experiments where ‘productive learning’ (transfer) was not encouraged; school culture might inhibit transfer, and students might not try to solve problems through transfer “because of their metacognitive beliefs that there is a single, legitimate procedure to solve each class of problems”; and transfer might fail because the students did not view the two learning situations as similar in the way that a teacher or researcher did. Hatano and Greeno (1999, p.647) argued that the term “productivity” was more useful in the educational setting than transfer and stated that productivity “refers to the extent to which learning in some activity has effects in subsequent activities of different kinds”.

Authors such as Royer et al (2005) argued that failure to transfer had been identified by researchers who viewed transfer too narrowly and imposed their own view of transfer on learning situations. Royer et al (2005) argued that whether full transfer took place was not relevant, and that what was relevant was what connections learners made between the two different learning situations. This approach also took into account sociocultural aspects i.e. that transfer was affected by the environment and by other people. This is very relevant to a school context where students are influenced by school staff and by other students.

2.5.5 The importance of context and sociocultural approaches to transfer
One of the key criticisms of traditional environmental and cognitive approaches to the question of whether or not the transfer of learning is likely to take place in schools, universities or the workplace, is that researchers have not taken the context of learning into account. Greeno et al (1993, p.99) argued that “learning is considered to be essentially situated, an adaptation of a person or group to features of the situation in which the learning occurs”. The authors added that knowledge was gained through knowing, and this was not something unchangeable that individuals had in all situations, but “knowing is a property that is relative to situations, an ability to interact with things and other people in various ways”. Transfer, according to Greeno et al (1993) therefore, was about how people learned to engage in one activity and how this learning affected, in a positive or negative way, how people engaged in a different activity in a different situation. Greeno et al (1993, p.102) took the view that transfer could be based on affordances, in that activities could involve personal or group aims, and they depended on aspects of the situation as well as on personal or group characteristics. The authors stated that “We call the support for particular activities created by relevant properties of the things and materials in the situation affordances” [authors’ italics]. Greeno et al (1993) argued that learners needed to be motivated and to be able to identify the constraints and affordances in the new learning situation, and that learners recognised these as similar to the affordances in the original learning situation.

Volet (1999, p.1) argued that “The importance of the person-context mutual interactions or the match between the individuals’ effectivities
and the affordances provided by the environment has been highlighted”, and that transfer could not be viewed merely as depending on cognition or metacognition. Volet’s (1999) sociocultural view of transfer identified that the learners’ motivation and emotional state, as well as the learners’ expectations of the learning environment, must be taken into consideration when considering transfer. This view is supported by Haskell (2001) who argued that while social aspects and context were viewed as important aspects of learning, they had not been recognised as important in transfer. Haskell (2001, p.137) argued that learning did not take place in a vacuum, but in a context influenced by social activities, and that “transfer of learning must be seen as a sociocultural process [as] the social situation creates a universe of meaning for us that shapes our learning, transfer and even our memory”.

The sociocultural view of transfer implies that learners are not only affected by the context in which they learn, or a subsequent learning situation but that learners, such as school students, construct their own individual and collective view of the contexts. Transfer, from this viewpoint, depends on the learners’ attitudes, motivation and representation of the original context of learning influencing their attitudes, motivation and understanding of subsequent learning situations. Transfer is therefore not merely the bringing of objective knowledge from one learning situation to another, but depends on a view of knowledge being constructed and reconstructed by learners who are influenced by and have a collective influence on, learning situations.
2.5.6 Encouraging and facilitating transfer

Despite the gloomy prognostications of some researchers about the possibility of transfer in education or the workplace, there are many views on how teachers in the school or university context might encourage or facilitate transfer among students. These views tend to be based on interpretations of research findings, but are seldom the result of actual studies carried out in the educational sector. They are worth considering and do provide support for those with an optimistic view of transfer within education.

Sternberg and Trensch (1993, p.35) argued that teachers needed to adapt their teaching strategies to enable students to “apply the information they have learned in a variety of contexts and to …find applications themselves”. Teachers also needed to assist students in organising information by structuring information for students and explaining why what is to be learned is important. Sternberg and Trensch (1993) stated that few teachers took this approach, but it was important that teachers should assist students in discriminating what information and concepts they would need in different contexts. For Sternberg and Trensch (1993, p.36), ensuring that students had a ‘mental set’ for transfer was the most important, since “the way in which academic subjects are typically isolated from each other, and from any real world use, does not encourage a mental set for transfer”.

Haskell (2001) identified eleven principles of teaching for transfer in schools, and these included the importance of students having developed
a substantial knowledge base within academic subjects. Haskell (2001) argued that providing students with general learning strategies would not be sufficient to ensure transfer. Haskell (2001, p.46) stated that motivation was another key principle for transfer, since “motivation or more specifically, a ‘spirit of transfer’ is a primary prerequisite for transfer to occur”. This was similar to Sternberg and Trensch’s (1993) mental set for transfer. Another of Haskell’s (2001, p.46) principles was that “significant transfer needs time to incubate: it tends not to occur instantaneously”, and teachers should not expect instant success with student transfer as, like expertise, transfer took time to grow.

Stark et al (2005) examined teaching approaches which might affect transfer and concluded that having a range of learning contexts and examples, which are worked out for students, might enhance transfer better than a single approach to teaching part of a subject. Teaching for transfer was viewed as important by Stark et al (1999). Hakel and Halpern (2005) reinforced this view, arguing that teaching methods that would make transfer happen included creating learning situations where students were encouraged to retrieve prior knowledge, altering the conditions in which students learn, and making learners represent information in different formats. Hakel and Halpern (2005, p. 365) concluded that “In sum, the learner’s activity determines what is learned and transferred” and teachers could influence the range and quality of learning activities which encouraged transfer.
2.5.7 Conclusion

The literature on the transfer of learning in schools, higher education and the workplace demonstrates that while there has been extensive research on transfer over the past century, and while a range of theories and models of transfer have been developed, there remains a lack of any definitive understanding of why transfer occurs or fails to occur, what exactly influences the possibility of transfer in the minds of students, and which methods of teaching in schools or universities might promote transfer amongst students. Transfer is a complex issue, and the adoption of a sociocultural view of transfer may help teachers to understand transfer better and to develop a strategy of teaching for transfer in schools.

2.6 Overall conclusion to the literature review

The research questions for the present study are:

- To what extent were year seven students likely to transfer information literacy skills across time and across subjects?

- What factors might affect the likelihood of year seven students transferring information literacy skills?

The sub-questions relate to students’ and teachers’ views on information literacy skills and transfer, including how these skills were taught, what evidence of transfer was noted, and what factors might influence the transfer of information literacy skills.
The literature review above informed this study in a number of ways. The section on information literacy in schools provided a context for the study by examining existing views on information literacy and previous research. This enabled the researcher to develop a new definition of information literacy in the school context, and to identify a clear gap in the research literature. That gap relates to the issue of the transfer of information literacy skills by students across subjects and across time in early years of the secondary school. The literature reviewed did not identify research which involved an indepth exploration of the views of students and school staff on information literacy skills, nor did it identify a detailed study of the extent to which year seven students transferred information literacy skills.

The review of information literacy in higher education provided a wider context for the present study and revealed that, while there were differences in approaches to information literacy in the higher education sector, there were also many overlaps with the schools sector. In relation to transfer, it was noted that in higher education, there is some coverage of skills transfer (or lack of it) from school to university, but it was also noted that there was little coverage of students transferring information literacy skills across subjects or time.

The literature on information literacy in the workplace informed the present study by providing evidence of research into both textual and non-textual sources of information by employees. This enabled the researcher to evaluate the findings of the present study in relation to both textual and non-textual information sources, for example whether
students gain information from each other, in the light of the evidence from workplace information literacy studies.

The review of literature on transfer did not reveal any previous research relating to secondary school students use of information literacy skills, and therefore this study may add to that literature. The transfer literature informed the present study by providing the researcher with a detailed review of types of transfer, and a range of approaches to transfer research e.g. sociocultural. In the light of the transfer literature, the researcher could focus on particular aspects of transfer such as evidence of transfer and the existence or non-existence of a culture of transfer in schools.

Overall, the researcher could use the literature review both as a base from which to work and a body of evidence on which to reflect, once the data from the present study had been collected, analysed and interpreted. The literature review also provided the researcher with an opportunity to compare the grounded theory developed in the present study with previous research.
Chapter 3: Methodology

3.1 Introduction

The aims of the study were to

a) examine and interpret the views of year seven students in these schools, on their reflections on and use of a range of information literacy skills and techniques;

b) to examine and interpret the views of year seven students in these schools, on the extent to which they transferred information literacy skills across time and across subjects; and

c) to develop a grounded theory relating to a) and b) above.’

The areas of exploration which sought to achieve the aims of the study included:

- The views of year seven students on information literacy skills and on transfer
- The views of teachers and teacher librarians on information literacy skills and on transfer
- The extent to which year seven students used the information literacy skills which were introduced to them by the teachers and teacher librarians
- The views of year seven students on how information literacy skills were taught in the schools
• The extent to which teachers and teacher librarians observed the transfer of information literacy skills in their schools

• The extent to which year seven students viewed themselves as transferrers of information literacy skills

• What teachers and teacher librarians considered to be the key factors in increasing the transfer of information literacy skills amongst year seven students

• What year seven students considered to be the key factors in increasing the transfer of information literacy skills

The use of constructivist grounded theory, which is justified below, is appropriate in this study as it allows the researcher to explore areas relating to information literacy skills and transfer in an open manner, and allows the development of theory.

This chapter seeks to describe and justify the research approach taken in relation to the extent to which year seven students transfer information literacy skills across time and subjects. The stance taken by the researcher is interpretivist, as opposed to objectivist, and within this interpretivist framework, a constructivist view is taken, both of knowledge creation and the analysis and interpretation of data. The chapter will outline the epistemological position of the researcher; examine possible approaches to qualitative research and justify the use of grounded theory; explore the development of grounded theory and explain this researcher’s constructivist grounded theory approach; outline
the use of convenience sampling to select schools and classes as research participants; describe the methods used to gather data; outline the use of constructivist grounded theory methods to analyse data; and explore aspects of reliability and validity in relation to this research.

3.2 Epistemological approach

How individuals acquire knowledge has long been the subject of speculation by philosophers, scientists and social scientists. Views of knowledge in the education field include the view that students are passive recipients of knowledge, which is handed down to them by teachers, and that knowledge exists independently of the learners who discover or acquire knowledge from these teachers or from reliable sources (e.g. books), which in turn are created by members of disciplines such as science or history (Phillips 1995). From this objectivist viewpoint, school students exist as learners in a passive way and are separated from the knowledge which exists in society. Knowledge in this view is handed down to students in a range of packages, is accepted by students, and students have little contribution to this process of knowledge acquisition.

This view of knowledge was challenged in the second half of the twentieth century by those taking a more constructivist view of knowledge. According to Phillips (1995, p.5), constructivists took the view that “human knowledge, and the criteria and methods we use in our inquiries, are all constructed” [Phillips’ italics]. A key influence on this view of knowledge was that of Berger and Luckman (1966), who argued
that knowledge was constructed socially, was interpreted by those who acquire knowledge, and that this construction of knowledge was influenced by the culture of the person or persons doing the interpretation. In the 1990s, Schwandt (1994, p.125) took the view that “Knowledge and truth are constructed or created in the mind, not discovered”. Later social constructivists confirmed these views of knowledge by arguing that knowledge was “social in origin; the individual lives in a world that is physically, socially and subjectively constructed” (Talja et al 2005, p.82).

The epistemological stance taken by this researcher is a constructivist one which views knowledge not as an external reality waiting to be discovered e.g. by school students, but as something which is constructed by individuals and groups within the social environment of the school, the home or the wider society. This stance also views discipline-related knowledge as being constructed by groups in society and that these groups have always been influenced by social, economic and political factors. Thus knowledge is not neutral and does not exist independently outside society. This view of knowledge in turn influences this researcher’s view of the conduct of educational research, which is seen here as being the constructive interpretation of data collected from a social (in this case educational) environment, where students interact with each other and with school staff, individually and in groups.
3.3 Approaches to qualitative research

There is a wide range of methods, techniques and approaches used in qualitative research and O’Donoghue and Punch (2003, p.1) argued that “qualitative research is characterised by diversity in both methodological orientation and in substantive topics of investigation”. Bogdan and Biklen (2007) stated that in educational research, qualitative research was most often viewed from a phenomenological perspective, and identified ethnomethodology, cultural studies, critical theory and institutional ethnography as key approaches. Denzin and Lincoln (2005, p. 3) argued that qualitative researchers try to “make sense of, or interpret phenomena, in terms of the meanings that people bring to them”, and in doing so, select from a range of qualitative approaches and methods which match the needs of their particular study. All authors agree that the researcher’s chosen methodology must be appropriate to the research questions being addressed.

In research related to information literacy, Bruce (1997), Limberg (2005), Bruce, Edwards and Lupton (2006) and Kirk (2004), stated that they had used phenomenography individually and collectively as the key approach to studying aspects of information and learning in schools and higher education. Tight (2004, p.218) noted that “The task of the phenomenographic researcher is, firstly, to separate out the variation in the ways that the phenomenon is experienced”, and then to identify the salient aspects of these ways e.g. the ways in which students view their own learning. Phenomenography was developed in Sweden in the 1970s and the key work of Marton and Booth (1997) is most often cited in
relation to this approach. Pang (2003, p.154) stated that
“Phenomenography is an ever changing, growing specialisation”, and
argued that recent developments in phenomenography have focused less
on the researcher’s view of variation and more on the participants’ view
of variation. Pang (2003, p.155) refers to this as “the dimensions of
variation as experienced by the experiencer”.

Kuhlthau (1989, p.21) adopted grounded theory as the methodology for
her doctoral research which led to the development of the Information
Search Process. Kuhlthau (1989) noted that the research “originated in
practice and sought to build a theory grounded in actual situations in
school library media centers”, and that practitioners were presented with
initial findings as part of the research process. Lloyd (2003, 2004 and
2006) also used grounded theory in her study of information literacy
amongst firefighters.

Qualitative researchers therefore have a range of options in selecting an
appropriate methodology for their research. The rationale for selecting
grounded theory as the basis for this research is explained in the next
section.

3.4 The development of grounded theory

Dey (2004, p.80) stated that “Thus there is no such thing as ‘grounded
theory’ if we mean by that a single, unified methodology, tightly defined
and clearly specified”, and this statement illustrated the continued
discussion around this research approach. Grounded theory as a research
method had its origins in Glaser and Strauss’ (1967) ground breaking
work *The discovery of grounded theory*, which sought to present an alternative to the predominant focus on quantitative research which permeated the research world until that time. Glaser and Strauss’ (1967) work presented a range of techniques which would allow social science researchers to derive theory from close analysis of data gathered in social settings. As Pidgeon and Henwood (2004) noted, Glaser and Strauss (1967) took an objectivist view, in which theory was discovered from data, and this implied that there were social relationships and processes which objectively existed and could be found in the data by analysis using grounded theory methods.

All research methodologies evolve and are subject to reinterpretation over time and grounded theory is no different. In the 1980s and 1990s, Strauss (1987) and Strauss and Corbin (1998) produced revised versions of grounded theory which introduced new techniques, and thus differed from the original version of grounded theory. There has been a continuing debate between Glaser, who disliked what he saw as Strauss and Corbin’s diversion from the core elements of grounded theory, and Strauss and Corbin (1998), who introduced new techniques for data analysis. Charmaz (2006, p.8) stated that Glaser argued that Strauss and Corbin’s techniques “force data and analysis into preconceived categories and, thus, contradict fundamental tenets of grounded theory”. The key differences between the later approaches of Glaser and Strauss included:

- Glaser’s view that categories must emerge from the data and his accusation that Strauss and Corbin’s approach could lead to categories being forced
• Strauss’ (Strauss and Corbin 1998) view that verification was important and that category identification might be influenced by the researcher’s previous experience but was not being forced from the data

• Glaser’s insistence that reviewing relevant literature was not a necessary prerequisite to a grounded theory approach; and Strauss and Corbin’s “interweaving the literature throughout the process of evolved grounded theory as another voice contributing to the researcher’s theoretical reconstruction”. (Mills, Bonner and Francis 2006)

• The use by Strauss and Corbin (1998) (and objected to by Glaser) of techniques such as axial coding which sought to identify relationships between codes and categories through use of a predetermined frame which included ‘elements’ such as ‘causal conditions’ and ‘consequences’.

A key feature of both Glaser’s and Strauss and Corbin’s approach to grounded theory was their objectivist view of the role of the researcher who adopted grounded theory as a method. Bryant (2003) stated that the objectivist position took the view that the researcher should be completely objective, and should approach the data uncluttered by pre-existing influences or biases arising from the researcher’s personal experience, previous research or disciplinary background. Bryant (2003, p.2) argued that this view of the objective researcher who gathered data “from which theories somehow emerge is now so severely discredited”.

Since the 1990s, researchers such as Bryant (2002 and 2003) and Charmaz (2005 and 2006), have argued for the development of constructivist grounded theory. Charmaz (2006, p.10) succinctly outlined key differences in the approach of constructivist grounded theorists and that of Glaser and Strauss, arguing that:

Glaser and Strauss talk about discovering theory as emerging from data separate from the scientific observer. Unlike their position, I assume that neither data nor theories are discovered. Rather, we are part of the world we study and the data we collect. We construct [Charmaz’s emphasis] our grounded theories
through our past and present involvements and interactions with people, perspectives and research practices.

This view supported earlier statements by Pidgeon and Henwood (2004), who argued that constructivist grounded theorists maintained the emphasis on systematic analysis of data emphasised in objectivist approaches to grounded theory, but took an essentially interpretive approach to data analysis and the development of theory.

While there were clear differences between objectivist and constructivist approaches to grounded theory in relation to the role of the researcher and the discovery or construction of theory, there existed a core set of strategies and techniques within grounded theory that were accepted by most grounded theorists. A key distinguishing feature of grounded theory was that it did not set out to test preconceived hypotheses designed by the researcher. Data was gathered using a range of methods and was analysed by firstly identifying codes which were attached to sections of the data. These codes, Charmaz (2006) noted, were the researcher’s means of interpreting what was happening in the data, rather than describing what the main topics of the data might be. Coding was used to develop two major strands of grounded theory, Charmaz (2006, p.46) argued, and these were “generalisable theoretical statements that transcend specific times and places and contextual analysis of actions and events”. Initial coding could be done word by word, line by line or incident by incident.

Focused coding followed and the researcher identified the most significant codes, which led to the construction of categories. In
constructivist grounded theory, codes and categories did not emerge from the data to be discovered by the objective researcher, as Glaser and Strauss (1967) implied, they were the result of the researcher’s interpretation of the data. Both Charmaz (2006) and Pidgeon and Henwood (2004) noted that researchers who adopt a grounded theory approach are not attempting to categorise their data into preconceived codes or categories in order to prove the relevance of these. Initial coding was followed by focused coding, which in turn led to theoretical coding, and theoretical codes helped the researcher to, according to Charmaz (2006, p.63), “move your analytical story in a theoretical direction”.

A second key feature of grounded theory, after coding, is theoretical sampling, and this technique is used by researchers to follow up the initial categorisation of data by seeking further data which will test, explore and develop categories. Pidgeon and Henwood (2004, p.629) explained theoretical sampling as “sampling data and cases on theoretical grounds and as analysis progresses, to extend the emergent theory”. Charmaz (2006) pointed out that theoretical sampling was different from sampling techniques used by other research methods e.g. sampling to reflect population distribution. Theoretical sampling also helped the researcher to exhaust or saturate categories (Glaser and Strauss 1967) to the point where no new aspects of a category could be found or no new categories were identified. However, Dey (2004) questioned the validity of the term ‘saturation’, arguing that it was not something that a researcher could prove.
A further feature of grounded theory methods was the use of memo writing which Charmaz (2006, p.72) referred to as “conversing with yourself”. Memos were mainly written by the researcher as an immediate response to the coding of data in order to develop ideas about category formulation, although this researcher used memo writing throughout the research process, including the recording of memos when reading literature, following observation sessions, and during coding and constant comparison. Memo writing was a useful way of the researcher noting down thoughts about possible interpretations of the data, and while much of the data in memo writing may be discarded, memo writing acts as a stimulus to the researcher to pursue ideas and threads, and also acts as an unofficial record of the researcher’s progression.

As the core aim of grounded theory is to develop a theory which is grounded in the data collected, as opposed to fitting data to a preconceived theory, researchers aim to develop an emergent theory which is then questioned and developed by the researcher through constant comparison of data, codes and categories. Charmaz (2005, p.517) noted that “grounded theory is a comparative method in which the researcher compares data with data, data with categories, and category with category”. Pidgeon and Henwood (2004) pointed out that although grounded theory appeared to be a linear progression of data collection and analysis, researchers using grounded theory were involved in an iterative process, where the researcher returned to earlier data to test emerging categories or to reinterpret that data in the light of subsequent categorisation.
The final stage of grounded theory is for the researcher to develop theory out of the relationship between the categories identified. Charmaz (2006) identified key differences between objectivist and constructivist theory development and argued that, while objectivists sought to develop theory to test hypotheses or to make predictions from generalised findings, constructivists sought to develop theory which is interpretive in nature. The aim of constructivist grounded theory was to develop theory which focused not merely on explaining what happens in a studied environment, but on understanding what is happening in the participants’ world. An example of this type of theory development can be seen in the work of Lloyd (2003, 2004 and 2006), where the researcher not only sought the views of fire fighters about their use of information, but also sought to understand the complexities of the range of information and concepts which the fire fighters addressed in their working lives.

The approach taken by this researcher in exploring the views of year seven students in relation to the extent to which they transferred information literacy skills, was to analyse the advantages and disadvantages of using grounded theory for this study. The researcher also compared and contrasted the differing interpretations of grounded theory as expounded mainly by Glaser and Strauss (1967), Strauss and Corbin (1998) and Charmaz (2006). Given that the researcher’s epistemological stance is a constructivist one, the choice of constructivist grounded theory as a research methodology was influenced by the researcher’s recognition that, in studying the world of year seven students, he could not be a completely neutral observer, uninfluenced by
his previous knowledge of the information literacy field and his previous research. The choice was also influenced by the researcher’s wish to explore the views of year seven students, not only in the context of issues raised in previous research, but also in the context of allowing the year seven students to express their opinions and reveal their thoughts, in order to see what kind of interpretation could be put on the students’ views. The researcher also wished to discover whether these views would or would not contradict previous research, and whether they might shed new light on aspects of information literacy and transfer in the school setting. Grounded theory was also seen as offering the researcher the opportunity to develop a theory grounded in the collected data, which other researchers and practitioners might pursue, develop or learn from.

Figure 3.1 below outlines the iterative nature of grounded theory methods as applied in this study.
Phase 1

Reading grounded theory literature → Objectivist or Constructivist grounded theory → Selecting constructivist grounded theory

Observation stage → Coding of data

Interviews with teachers and teacher librarians → Initial coding of data

Students complete questionnaires → Initial coding of data → potential category formulation

Focused coding of diary and questionnaire data → potential category formulation

Interviews with teachers (Term 4) → Initial coding of data → potential category formulation

Students complete questionnaires → initial coding of data → potential category formulation

Focused coding of diary and questionnaire data → potential category formulation

Interviews with students completed → focused coding of interview data → further potential category formulation

Revisit diary and questionnaire coding → compare with interview coding and categories → testing of potential categories

Comparison of student and staff data → testing of potential categories

Drawing up of categories and codes diagram

Phase 2

Revisit schools to interview groups of students and teachers/teacher librarians (theoretical sampling) → focused coding of data → testing and verification of categories

Development of grounded theory

Figure 3.1 – Application of grounded theory techniques
3.5 The selection of schools and year seven classes

The researcher wished to base his study in government schools as there has been a lack of in-depth studies in teacher librarianship and information literacy in these schools, whereas studies in private schools have been more dominant in the literature (e.g. Ryan and Hudson 2003). Convenience sampling (Burns 2000 and Patton 2002) was used to identify secondary schools which would be able and willing to cooperate with the research. Convenience sampling was used as it allowed flexibility in the choice of schools and classes. Informal contact was initially made with teacher librarians in the Wagga Wagga district in order to elicit interest in the research. Feedback was gained from six schools and three schools provided positive, but still informal, responses from teacher librarians on behalf of school principals and interested teachers. There was no intention in this study to select schools on a representative basis (e.g. by including schools of different sizes), other than that they were government secondary schools. The New South Wales Department of Education, Science and Training (DEST) gave permission for the study, and the three schools – School A, School B and School C – were then formally contacted and permission was gained from the school principals to undertake the research.

School A is situated in a town of 4000 people and is the only secondary school in the area. It attracts students from the two primary schools in the town and from other primary schools in the surrounding countryside. The school has 280 students and 27 teachers, including the teacher librarian who has clerical assistance for two days per week. The students come
from a mixed socioeconomic group in the town itself, and some students travel into the town from surrounding country areas. The teacher librarian teaches a programme of library-based information literacy skills lessons for year seven students and liaises with some teachers on student project work. The library is reasonably well stocked and has a small computer room.

School B is situated in a town of 6,300 people and is the only secondary school in the town. There is a specialist secondary school in a nearby village. The school attracts students from a wide surrounding area as well as from two primary schools in the town. There are 500 students and 47 teaching staff, including the teacher librarian who has 1.5 FTE (full time equivalent) clerical and technical staff. The students come from a mixed socioeconomic group and some students travel into school from surrounding country areas. The teacher librarian hosts a series of library based lessons for year seven students and liaises with some staff on student projects. The library is reasonably well stocked and there is a group of 8 computers in the library.

School C is situated in a regional city with a population of 60,000 people and is one of three state high schools. In the city, there is also a number of fee paying schools, some of which are religious based. School C has 615 students and 70 teaching staff, including the teacher librarian who has one full time clerical assistant. The school is situated in a socioeconomically disadvantaged area and has the highest number of aboriginal students in the city’s schools. The library is reasonably well
stocked and has a block of 12 computers. The teacher librarian does not teach any library based lessons relating to information literacy skills.

In each school, one year seven class was selected for the study. Year seven is the first year in secondary school and students were aged 11-12. These classes were chosen as a result of the teacher librarian in each school making contact with interested teachers, who agreed to participate in the study, thus continuing the convenience sampling i.e. classes were selected because their teachers were available and willing to participate. As with the selection of schools, there was no intention to select classes on a representative basis e.g. of subject. The criteria applied was that all classes should be year seven students of mixed ability. Year seven students were chosen for the study as these students were in the first year of secondary school, had varied experiences of information literacy skills in primary school, according to the teacher librarians, and had been given some instruction in the use of information resources while in secondary school.

Convenience sampling was also used to identify groups of students to interview. The factors which determined which students were included in the group interviews included: students’ willingness to participate and students’ availability when the researcher was in the school. Students’ availability was affected not only by their attendance or absence but by short term school rearrangement of sport, music and drama rehearsals. Given that convenience sampling (Burns 2000 and Patton 2002) was used in the study, there are limitations to the sample of classes and
students chosen e.g. it is possible that different results may have emerged if different classes had been selected; or if different teachers had been willing or available to participate in the study; or if different students were available in Phase 2. However, a grounded theory approach does not seek to generalize the findings of the study and the use of classes in three schools allows for triangulation of results. Pidgeon and Henwood (2004) define triangulation as the use of multiple data collection methods, so that the researcher can evaluate how consistent the findings might be.

The classes selected for the study from schools A, B and C are shown in Table 3.1 below and the table identifies the school, the term when the assignment was completed, the curricular area, the student task and expected outcomes. In each school, students in the study completed one assignment in term two and another assignment in term three. The assignments were research-based tasks where students were expected to select an individual topic for research, and use a range of information resources to find information, ideas and concepts relating to their topic. In school A, there were 27 students in the class. School B’s class had 25 students and School C’s class had 23 students.
<table>
<thead>
<tr>
<th>School</th>
<th>Students</th>
<th>Term 3 Subject</th>
<th>Term 3 Task</th>
<th>Term 4 Subject</th>
<th>Term 4 Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>27</td>
<td>History</td>
<td>Students were asked to write a diary of a selected character from a medieval village and demonstrate aspects of the character’s life</td>
<td>Science</td>
<td>Students were asked to design a holiday brochure for travel to a planet</td>
</tr>
<tr>
<td>School B</td>
<td>25</td>
<td>History</td>
<td>Students were asked to identify a dictator who was, in the students’ opinion the cruelest of all dictators. Students were asked to justify their choice of this dictator.</td>
<td>Modern languages</td>
<td>Students were asked to outline of an aspect of Japanese society and discuss the importance of that aspect in Japan</td>
</tr>
<tr>
<td>School C</td>
<td>23</td>
<td>History</td>
<td>Students were asked to draw up a profile of an Egyptian god and to present this profile visually as well as in a narrative form</td>
<td>English</td>
<td>Students were asked to outline a topical issue, and discuss the topic, using multimedia</td>
</tr>
</tbody>
</table>

Table 3.1 Selected classes and assignment tasks

3.6 Data collection methods

The study used four techniques to collect data. In Phase 1, the researcher used observation as the initial means of collecting data, and students in the classes in all three schools were observed working both in the classroom and in the school library. Students completed a structured diary during completion of the assignment they undertook in term two. Following the completion of the assignment done in term three, students completed a questionnaire and students were interviewed near the end of term three. Teachers and teacher librarians were interviewed, with one teacher and one teacher librarian from each school interviewed in Term

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three and one teacher from each school interviewed in Term four. In Phase 2, a group of four students was interviewed in each school and a group consisting of one teacher librarian and three teachers was interviewed in each school.

3.6.1 Piloting

As was noted in chapter 1, this study builds upon previous research (Herring and Hurst 2006), and the structured diary and questionnaire used in that research were treated as a pilot for this research. The present study builds upon the 2006 study in that it covers three schools and not one school; includes interviews with more teachers and teacher librarians; includes interviews with students; and uses constructivist grounded theory as its method. In the previous study, the diary and questionnaire were completed by year six students in a mixed ability class and students did not experience any problems with either means of data collection. Interviews with the teacher librarian and two teachers from the previous research (Herring and Hurst 2006), were treated as a pilot for the interviews with the teacher librarians and teachers in the present study. In the present study, three teacher librarians and six teachers were interviewed. In relation to pilot studies, van Teijlingen and Hundley (2001, paragraph 1) state that the advantages of a pilot study include “that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated”. For the present study, using the previous study by Herring and Hurst (2006) as a pilot can be justified in that the previous
study acted as a test about where the study might fail e.g. if the students found difficulty in completing the diaries or were unwilling to do so. The previous study also demonstrated that both the diary and the questionnaire were suitable instruments for the present study. It also reassured the researcher that, if year six students could cope with the diary and the questionnaire and provide meaningful data, then most year seven students should also cope.

The present study differs from that of Herring and Hurst (2006) in a number of ways. The present study covers three secondary schools and not one primary school. The present study incorporates a wider range of data collection methods and uses constructivist grounded theory as its methodological approach, whereas the previous study, for example, did not include interviews with students, and had a more limited methodological approach. In the previous study, there was no use of theoretical sampling. The previous study used a qualitative approach, which included elements of grounded analysis, and the instruments used in that study can be seen to meet the purposes of grounded theory in the present research.

A pilot for the student interviews was undertaken with two students in School B who were in year seven, but were not in the class being studied in that school, and no alteration to the wording of the interview questions was required. In the present study, interviews were conducted with four individual students and two groups of three students in each school during the initial data gathering period, and with one group of three students in the second data gathering period (see Figure 3.1 below). In
the Phase 1 data gathering period, one teacher librarian and two teachers in each school were interviewed and in the Phase 2 data gathering period, one group of two teachers and one teacher librarian in each school was interviewed (see Figure 3.1 below).

3.6.2 Observation

Observation was used as the initial method in order to provide the researcher with a firm grounding in the educational context of the study. Charmaz (2006, p.18) noted that it was important for the researcher to have “enough background data about persons, processes and settings”, in order for the researcher to have the ability to understand the complexities of the study’s context. Non-participant observation was used to gather this initial data. The purpose was to observe students in the classroom and in the library while they were working on their assignments. Williamson (2002) argued that observation is useful to the researcher as it can provide an initial understanding of participants’ behaviour and what is happening in the participants’ world. Powell and Connaway (2004) identified the advantages of observation as including the ability of the researcher to make a record of what is happening and to subsequently question participants about particular behaviour. The potential disadvantages of observation, according to Powell and Connaway (2004) included the possibility of the researcher missing key incidents or behaviours which occur outside the observation period, and the possible influence on participants of the observer’s presence.
3.6.3 Student diaries

Student diaries or journals have been used as a data collection method by a number of researchers who have studied aspects of information literacy in school students. Harada’s (2002) research was of particular pertinence to this study, as the main method used was a student journal to record students’ thoughts on their information search process while completing a school assignment. Harada (2002, Method, paragraph 5) noted that “The instructors created journal prompts that were open ended and encouraged both feelings and cognitive perceptions”. Harada (2002) stated that students who completed journals gained a deeper insight into the processes in which they were involved when completing assignments, in addition to the new knowledge gained during the completion of assignments. Harada’s (2002) research informed this study, although her research was different from the present study as it involved primary school students, and the students who completed the journals were given feedback by the teacher librarian at regular intervals.

Harada (2002) referred to Tallman’s (1998) study of students who were completing I-Search assignments. Tallman (1998, p. 21) noted that an I-Search assignment “requires students to describe their search stories in first person, giving students the freedom to put their own thoughts and analysis into their reports”, and that students completed a journal, which included “I think” and “I feel” prompts, for the duration of an assignment. In Tallman’s (1998, p. 23) research, the student’s journal “was to contain notes about the information students were finding as well as reflections on the research strategies they used”. Tallman (1998) noted
that some students had problems in completing journal entries and argued that the extent to which students felt ownership of a topic affected the completion of diary entries. Tallman (1998, p. 26) stated that the journals helped to “push student thinking beyond the basic knowledge and information acquisition level to thinking about ideas and solutions”.

Barranoik (2001, p. 25) sought to elicit the views of high school students on “the process of research”, and her research was relevant to the present study, as Barranoik (2001) studied students completing an assignment, sought the views of students on the assignment process, and used diaries and interviews as part of her methodology.

The student diary used in this study (See appendix 3) was, as noted above, developed by the researcher in the previous study by Herring and Hurst (2006). The diary was designed to allow students to reflect on their use of information literacy skills such as identifying purpose, formulating questions and evaluating information sources. The key benefit of a student diary is that students record their thoughts during the assignment process.

3.6.4 Questionnaires

The use of questionnaires as a method was recommended by Burns (2000), Bouma and Ling (2004) and Patton (2002), who agreed that there were a range of advantages in using questionnaires in a situation such as a school. These included the availability of respondents, ease of administration of questionnaires, and the potentially high quality of data gained from semi-structured questionnaires. The authors also warned that
poorly constructed questionnaires would be less valuable, and that where participants respond minimally to questions, the quantity and quality of data may be affected. The questionnaire used in the present study did not pose any problems to the students in any of the three schools, in that almost all students understood the questions posed, and there was no evidence of misinterpretation of the questions. As will be seen in the Results chapter, a very small minority of students appeared not to be able to understand some of the concepts behind the questions. The questions included in the questionnaire were a mix of closed, multiple choice and open questions, which allowed students the opportunity to comment fully on the topics covered (e.g. brainstorming and information retrieval).

3.6.5 Interviews

Charmaz (2006) noted that interviews were used in many grounded theory studies and argued that the advantages of using interviews as a data collection method included the gathering of rich data, the ability of the researcher to investigate the participants’ language and understandings, and the potential of interviews to develop or test identified categories. Charmaz (2006, p.27) cautioned researchers to realise that interviews were “a construction – or reconstruction of reality. Interview stories do not reproduce prior realities”, and that both interviewers and interviewees brought their own views and assumptions to the interviews. In information literacy research carried out in the school context, interviews have been used as a data collection method by Kuhlthau (2004), Barranoik (2001 and 2004), Ryan and Hudson (2003), Farmer (2005), Herring (2006) and Farmer (2005).
In the present study, the interviews (See appendix 5) with students were restricted by the availability of students on the days when the researcher was in the school and the willingness of students to be interviewed. In one school, two students identified for interview were absent on the initial interview day and also on the day when the school was revisited, so other students were interviewed. In order to gain students’ views both individually and collectively, in each school, interviews were conducted with two groups of three students in each school and with four individual students. The value of the group interviews lay in allowing students to comment on each others’ views and to discuss topics. The selection of students used convenience sampling (Burns 2000 and Patton 2002), that is, there was an attempt to include a cross section of the ability range of students in the interviews, but this was not done in any fully systematic or representative manner. In some cases, students were willing to participate in group interviews but were reluctant to be interviewed individually. There was no pressure on any students to participate in either the individual or group interviews.

The use of four techniques to collect data from students and school staff enabled the researcher not only to triangulate the results by using these methods in three different schools, but also to gather data in a sequential manner. This allowed the analysis of data following each phase of data collection, in order to develop codes and categories which would contribute to the development of grounded theory.

3.7 Data analysis methods

3.7.1 Coding and categorization process
As was noted above, the researcher used the techniques suggested by Charmaz (2006) to code the data and establish the categories. Initial coding of the data was done by examining the data (e.g. from the student diaries), which had been transcribed into Word documents, line by line. The approach taken to initial coding was not to identify keywords in the data e.g. to look for repeated terms used by students. The technique used was to follow Charmaz’s (2006) question about what was happening in the data. The identified codes were therefore related to what students were doing, but they were also an interpretation of the students’ responses. For example, codes relating to brainstorming in the student diaries, included:’ Discussing what students did not know’ and ‘Getting ideas from each other’. This approach is therefore different from examining the data for instances of the word ‘ideas’. Table 3.2 below provides examples of student diary entries and the coding allocated to these entries.

<table>
<thead>
<tr>
<th>Student diary entry on brainstorming</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking about tyrants. Helping them to get information. Sharing information to find out how evil the ruler</td>
<td>Valuing brainstorming as a means of sharing information and ideas</td>
</tr>
<tr>
<td>You get to discuss things and they help you research</td>
<td>Valuing brainstorming as an aid to information retrieval</td>
</tr>
<tr>
<td>You talk about with the group then you get the information and then you know what to write</td>
<td>Valuing brainstorming as an aid to structuring the assignment</td>
</tr>
<tr>
<td>Brainstorming can help you answer your questions later</td>
<td>Linking brainstorming with questions</td>
</tr>
</tbody>
</table>

Table 3.2: Examples of student diary entries and allocated codes
Focused coding of the data involved a revision of the original coding. For example, when students had completed the questionnaires in term four, initial coding was done on the questionnaire data and then focused coding was done on both the diary and questionnaire data. Focused coding allowed the researcher to identify significant codes which together could lead to the formation of potential categories. One of the potential categories identified at this stage related to students valuing information literacy skills but this was not confirmed as a category until all the data in Phase 1 was completed. In Phase 2, theoretical sampling was used to test the validity of the categories. Following Charmaz’s (2006) guidelines, the codes and categories were revisited until no new codes or categories were identified. Thus the final categories, used to form the grounded theory for the present study, were not confirmed until after the theoretical sampling was completed. The following sections show how the data was analysed.

3.7.2 Observation

Charmaz (2005, p.508) noted “A grounded theory approach encourages researchers to remain close to their studied worlds”. The use of observation allowed this researcher to familiarise himself with the school environment by watching and listening to what students were doing and saying during their preparatory research work for the first assignment completed in term 3, and their second assignment completed in term 4. This observation, both in the classroom and in the school library, allowed the identification of possible key areas of focus for the research, for example, whether students were actively constructing
search strategies. Observation data was revisited during later data analysis, following the use of constant comparison in grounded theory methods.

3.7.3 Interviews with teachers and teacher librarians

Interviews (See appendices 1 and 2) were carried out with the teacher librarian and the subject teacher from each school at the start of term 3 and this was followed by initial coding of these interviews. At the start of term 4, the subject teacher from each school was interviewed and initial coding was completed. There was also some comparison of data from the interviews carried out in terms 3 and 4.

3.7.4 Student diaries

After the students had completed the diaries in term 3, initial coding of the data from the diaries was completed, in order to identify potential categories, which might lead to the later development of theoretical concepts. The diary data was, like the observation data, revisited and recoded at a later stage. While the data from the student diaries proved instructive in terms of revealing significant aspects of students’ views on aspects of information literacy skills and their understanding of their information environment, whether students would transfer any of the skills from one assignment could only begin to be revealed when the students had completed the questionnaires in term 4.
3.7.5 Student questionnaires

Questionnaires were completed by students when they had completed the assignment – about half way into term 4. When the questionnaire data had been coded, data from the observation, the diaries and the questionnaires could be re-examined. It was then that questions for the interviews could be established.

3.7.6 Student interviews

Students were interviewed individually and in groups, in each school, near the end of term 4. Interviews were recorded according to the conditions of the ethical clearance given by DEST and the university (See Appendices 8 and 9). The recorded interviews were then transcribed. The data from the interviews was then analysed in order to establish firm categories and to identify potential links between the categories. In order to test the strength of the categories identified after the interview data was analysed, the researcher used constant comparison to revisit the coding and category identification done previously, when observation, diary, questionnaire and school staff interview data was previously analysed. The benefit to the researcher of this method was that aspects of categories established at a later stage could now be identified as being present in the diary or questionnaire data, although these aspects were not initially identified in the original coding.

Once all the data had been revisited a number of times and further comparison and testing of identified categories was done, the researcher
identified a level of saturation (Glaser and Strauss 1967, Charmaz 2006), in that no new categories emerged from the data.

### 3.7.7 Categories and codes diagram

In order to develop a coherent picture of the identified and tested categories, and to make progress towards the later development of a grounded theory, the researcher drew up a diagram (See Results chapter 4 below) of major and minor categories, and the codes which led to the development of these categories. This diagram then was used as a base for the researcher to use when revisiting the field. Charmaz (2006) actively urged practitioners of grounded theory to complete theoretical sampling by going back into the field, and presenting the study’s participants with the key findings, in order to test the value and validity of the categories established by the researcher.

### 3.8 Phase 2: theoretical sampling

In Phase 2, interviews were held with a group of teachers and the teacher librarian in each school. Each group consisted of the 2 teachers who had previously been interviewed and the teacher librarian who had previously been interviewed. Interviews were also held with a group of students in each school. The student group consisted of three students, all of whom had been interviewed previously either individually or as part of a group. Students were selected according to availability at the time of the interviews, thus continuing the convenience sampling used earlier in the study.
After the transcription and coding of the interviews, the researcher returned to the categories and codes diagram, but no new codes or categories were added. The diagram was then used as the principal source for developing the grounded theory, which is outlined below in the Discussion chapter.

3.9 Reliability and validity

Pidgeon and Henwood (2004) stated that criteria for evaluating qualitative research were a subject of debate. Criteria for judging the effectiveness of grounded theory studies included acceptance and validation of categories by the studied population (Pidgeon and Henwood 2004). In the present study, the population was year seven students, teachers and teacher librarians, and Phase 2 involved discussing the categories with these participants. Pidgeon and Henwood (2004) also stated that triangulation can be used as a guide to validity and reliability. This study used different sources of data (three different schools) and different methods to collect data, and the degree of similarity of findings between the three sources of data are an acceptable level of reliability.

Charmaz (2006, p.182) cites four criteria for evaluating grounded theory research –

- credibility, which includes the extent to which there is a close correlation between sufficiency of data collected and convincing development of categories and theory;
originality, which includes the extent to which the grounded theory might challenge or extend current beliefs about the studied world;

resonance, which includes the extent to which the categories presented provide an in-depth view of the studied world

usefulness, which includes the extent to which the research findings and developed theory might contribute to the wider world

These criteria are returned to in the Discussion chapter.

**Conclusion**

This chapter has outlined and sought to justify the researcher’s approach to data collection and analysis. The use of constructivist grounded theory is consistent with a constructivist epistemological stance, along with the researcher’s focus on the interpretation of data and the development of theory grounded in the results of the study. While constructivist grounded theory is one of a number of possible methods which might have been used for the present study, it is clear that the advantages of this method, including the ability to closely analyse and interpret the studied world, outweigh potential disadvantages.
Chapter 4: Results

4.1 Introduction

The aims of the study were to

a) examine and interpret the views of year seven students in these schools, on their reflections on and use of a range of information literacy skills and techniques;

b) to examine and interpret the views of year seven students in these schools, on the extent to which they transferred information literacy skills across time and across subjects; and

c) to develop a grounded theory relating to a) and b) above.’

The areas of exploration which sought to achieve the aims of the study included:

- The views of year seven students on information literacy skills and on transfer

- The views of teachers and teacher librarians on information literacy skills and on transfer

- The extent to which year seven students used the information literacy skills which were introduced to them by the teachers and teacher librarians

- The views of year seven students on how information literacy skills were taught in the schools
• The extent to which teachers and teacher librarians observed the transfer of information literacy skills in their schools

• The extent to which year seven students viewed themselves as transferrers of information literacy skills

• What teachers and teacher librarians considered to be the key factors in increasing the transfer of information literacy skills amongst year seven students

• What year seven students considered to be the key factors in increasing the transfer of information literacy skills

This chapter presents the results gained from implementing the techniques referred to in the previous chapter and from using a constructivist grounded theory approach to data analysis. The findings presented here are from Phase 1 of the data collection, which sought the views of teachers, teacher librarians and students. Using a grounded theory approach, the researcher collected and analysed data from this phase in order to establish categories which might form the basis of a grounded theory (Charmaz 2005). In Chapter Five, the results of the theoretical sampling (Phase 2), done when the researcher went back into the field to test the credibility of the categories, are presented. The findings for Phase 1 are presented in the following sections:

- Observation
- Teacher and teacher librarian interviews
- Student diaries
4.2 Observation

For each school, there were two observation visits in term three and two in term four, giving a total of 12 observations in total. The purpose of the observation was to allow the researcher to gain an understanding of the school contexts in which the study was taking place, and this included the complex relationships between the students, teachers and teacher librarian. This contributed to the study by allowing the researcher to gain an insight into the workings of the schools’ environments and also formed the basis upon which subsequent data collection could be carried out. Inevitably, there was much duplication in the observation as students worked individually or in unofficial groups on their assignments. The findings from the observation sessions are presented here under the following headings:

- Student motivation
- Student use of print and online resources

4.2.1 Student motivation

In the context of the present study, motivation was viewed in relation to how students approached the tasks they were asked to complete, and motivation was interpreted in relation to student behavior e.g. whether students showed enthusiasm for their assignment topic and their task. In all three schools, given that all classes were of mixed ability, there were
inevitably different levels of student motivation. In school A, in term 3, the researcher noted in his diary that, in the session where the teacher was introducing the assignment, on medieval village life, there appeared to be:

A dull acceptance of what was to be done. Students were neither enthusiastic nor antagonistic. It appeared that this was yet another assignment.

In school B, in a similar session in term three, students appeared to be more interested in the assignment, which asked them to identify the cruelest dictator in history. The researcher noted that this teacher’s presentation of the assignment was more lively and enthusiastic than that of the teacher in School A, and that this may have had an effect. Student motivation appeared to be lowest in School C in the term three introduction to the assignment session. The researcher noted that

This is a good presentation by the teacher on Egyptian gods but the students look bored and fairly uninterested. They listen fairly well but do not seem motivated.

In schools A and C, in these introductory sessions, student motivation appeared to improve dramatically once students were provided with a range of books which had been selected by the teacher librarian and brought to the classroom. In school C, for example, the researcher noted that “Most students seem interested and there is a buzz of conversation amongst the majority of students as they look at the books provided by the teacher”. In school A, students also appeared to be more motivated.
and this seemed to be because they were actively involved in a learning experience, as opposed to listening to the teacher. Students in school B continued to be well motivated and there were many creative discussions amongst students, who appeared to share the resources well.

In the second observation of students in term three, all classes were in the school library and students were doing further research for their assignments. In all three schools, most students worked well and used books as well as the internet to find information. In school B, where students had appeared to be most motivated in the first session, one group of boys had lost interest in the assignment. The researcher noted “The boys at the far end of the library have taken books from the library shelves but show no interest in using them, despite being encouraged to do so by the teacher and the teacher librarian”. In school C, the initial enthusiasm about the assignment noted in the classroom, appeared to have disappeared, as about half the students had to be constantly brought back on to task by the teacher. In school A, the teacher librarian encouraged students to use books mainly and to link their reading to the mind maps they had created in the classroom. The researcher noted “Linking reading with the mind map seems to be working well for most of the students although it’s clear that some students’ mind maps are very sparse”.

The benefits to the researcher from these first two observation sessions lay in the ability to watch the students as a whole class as well as individually and in small groups. Student motivation appeared to be reasonably high in all three schools although it was clear that some
students had low motivation, and a very small minority showed little or no interest at all. Observation did not provide answers as to the reasons for student motivation or lack of it, but it did provide the researcher with questions that could be followed up later. Questions noted by the researcher included “Are students only motivated by being involved?”; “Is student motivation increased by the challenge of the assignment task?”; “Is student motivation likely to be sustained as students progress with the assignment?”.

When students were observed early in term four, the researcher had the benefit of having done initial coding on the student diaries, and therefore had established a number of codes, some of which related to student motivation. What emerged from the two observation sessions in term four was, in most aspects, a replica of what had happened in term three. A key difference was that the same pattern of motivation was not replicated in each of the schools. In school C, students were mostly engaged with the teacher’s presentation about the assignment, and it appeared that the reason for this was that the students were to be given an opportunity to use multimedia to present their assignment. In schools A and B, there appeared to be a mixture of levels of motivation, with some students clearly interested in the topics, while others were either disinterested or uninterested. In all three schools, in the first session observed, students were in the classroom and the teachers introduced the assignment. In school A, where students had to select a topic from Japanese culture, the teacher handed out a variety of brochures and magazines about Japanese life and most students seemed interested,
although one group of boys looked bored. In school B, where students were preparing to do a science assignment, the teacher gave the class a sheet to fill in about planets in general and students were asked to pick one particular planet. Students were then asked to use a textbook and to select from a box of books brought from the library. The students appeared to be engaged in this activity fairly well. As noted above, in school C, students appeared to be motivated and were taken to a computer room half way through the lesson.

In the second session observed in term four, students in all three schools were in the library and used both print material and websites. In school A, the science teacher and the teacher librarian split the class into two, with one group using books and the other using the computers in the library. There appeared to be a clear difference in motivation between those using the computers and those using the books. The researcher noted

The science teacher is talking to those on the computers and discussing what they have found and the students seem interested. The teacher librarian is struggling to control a group of five boys who are disruptive and show no interest in their task.

In school B, most students were using the computers in the library and working in pairs. The researcher noted “Some pairs, especially girls, appear to be motivated and enjoying searching for their topic, but some of the boys appear less motivated and the teacher has to check what is on their screens and get them back on task”. In school C, as in school A, the
class was split between those using books and those using the computers. In this session, there were two very disruptive students in School C, with whom the teacher had to deal. The researcher noted

While most students appear to be fairly well motivated, especially those at the computers where the teacher librarian is available for help, those in the main part of the library are clearly distracted by the disruptive students and few students appear to be motivated to work on their own. Some students are reading magazines not related to their task.

The observation sessions in term four did not significantly differ from those in term three in terms of student motivation and no new questions were noted by the researcher. Student comments about motivation in the diaries completed in term three, were mainly related to later stages in the assignment completion process. Thus the observation sessions in term four were of a confirmatory nature for the researcher, rather than a revelatory nature.

4.2.2 Student use of print and online resources

In the observation sessions conducted in term 3, it was clear to the researcher that, in all three schools, student use of print and online resources varied amongst students in each class. Sessions observed both in the classroom and in the library (as noted above) involved students using learning resources for their particular assignment. The researcher observed three levels of general use of resources which consisted of books and websites. At one level, a minority of students were seen to be
using these resources with some expertise. For example, in school A, the researcher noted “A few students are using the books very well and using the indexes and contents pages. They are also sharing what they find with other students at the same table”.

At the second level, students appeared to be moderately successful in using print and online resources. In school C, during the second observation session in the library, two groups of students were observed by the researcher, who noted

The students at these two tables are reading some of the material in the books they have but they appear to be flicking through the books, rather than searching systematically. They are easily distracted and don’t appear to be sharing the information they find.

In school C also, observing students using the web to search for information on their Egyptian god, it was clear to the researcher that some students made little effort to search under more than one keyword and tended to click on the first website that appeared. These students did, however, appear to read the website and either take notes or cut and paste information.

At the third level, a minority of students showed very little expertise in using either print or online resources. In school A for example, two students sitting at a table had one book each in front of them but only looked at the books when prompted to do so by the teacher. In school B, the researcher noted
One or two students appear either to have difficulty reading the books given to them by the teacher librarian – they showed no willingness to get books for themselves – or have no interest in doing any work.

In relation to online resources, in school C, the researcher observed a small number of boys using the computers to look at sporting websites and only going back to Google searches when the teacher approached.

At the end of the observation period in term three, the researcher noted the following questions about students’ use of resources:

- Why are some students better at using resources than other students e.g. is it their primary school background?
- Why are some students appearing to ignore the very specific advice they’ve been given (e.g. in schools A and B) about using books to find information?
- Why are some students so apparently poor at searching the web for information?

The researcher also noted that in all three schools, students had been encouraged to draw up a mind map in the classroom and this had taken place after the first observation session, but before the second. There appeared to be only a few students in each class who consulted their mind maps when the researcher was there (e.g. a small minority of students had their mind maps with them at the computer), but it is possible that the mind maps were used before the observed session. The researcher noted “I wonder whether students have seen the completion of
a mind map as something to be done because the teacher tells them to do it? Have they used the mind maps since then?”

4.2.3 Term four observations

The observation sessions in term four were an opportunity for the researcher to see whether students had, to any great extent, transferred any of the skills they had been taught in term three, in relation to using print and online resources. In all three schools, it appeared that there had been some improvement in students’ use of books, in that more students appeared to be in the top and middle levels referred to above. Despite this noted improvement, there was no noticeable change in the pattern of use. Use of online resources – still accessed mainly via Google searches in all three schools – appeared to follow the same pattern as in term three. In school A, for example, the researcher noted

   In this session, the teacher librarian emphasised the need for students to search using identified keywords and reminded students of her previous advice on searching. When I observed the students, however, most were still searching under one keyword, although there were a few exceptions.

At the end of the term four observation sessions, the researcher noted that, while there appeared to be no observable change in the students’ approach to online searching, it did not mean that students had not transferred some skills from term three. Questions noted by the
researcher included “Have students thought any more about searching than they did last term?”; “Do students carry their mind maps – if they have done any – in their heads?”; and “Are students engaged in any metacognitive activity in relation to their approach to resources?”.

4.2.4 Summary

Overall, the observation sessions were a very useful source of both data and questions for the researcher. While watching students cannot replicate the value of reading student diaries or interviewing students, Charmaz’s (2006, p.46) question “What is happening?” is very relevant, as observation can provide a starting point for the researcher to record what is physically happening with students. It also allows the researcher to use this as a basis for trying to find out what is mentally happening with the same students. The observation sessions provided the researcher with valuable information on student motivation, their use of learning resources and their relationships with teachers and fellow students.

4.3 Teacher and teacher librarian interviews

The list of questions asked of teachers can be found in Appendix One and questions asked of teacher librarians in Appendix Two. At the beginning of term three in 2006, one teacher and one teacher librarian from each school was interviewed and at the beginning of term four in 2006, one more teacher from each school was interviewed. This section presents an analysis of the data from these interviews – of six teachers and three teacher librarians - under the following headings:
Teachers’ views on assessment
Teachers’ assumptions about students’ information literacy skills
Teachers’ views on students’ use of information literacy skills in primary schools
Teachers’ views on transfer
Teacher librarians’ views on students’ use of information literacy skills in primary schools
Teacher librarians’ outlines of their own information literacy skills teaching
Teacher librarians’ expectations of students’ use of information literacy skills
Teacher librarians’ views on transfer

The teachers interviewed are referred to below as History teachers A, B and C – interviewed in term three, and Science teacher D, Japanese teacher E and English teacher F – interviewed in term four. The section opens with a table showing the potential categories and illustrative codes which led to the identification of these categories. The codes and categories were derived from an analysis of the data from the interviews.
<table>
<thead>
<tr>
<th>Potential Category</th>
<th>Codes from which potential categories were identified</th>
</tr>
</thead>
</table>
| 'Teachers valuing information literacy skills' | Assessing students’ use of information literacy skills  
Viewing students’ awareness of sources as being important  
Viewing the assignment as information gathering and comparison |
| 'Teachers’ assumptions in relation to students’ abilities' | Assuming that students could use a search engine effectively  
Assuming a reading level and note taking ability  
Assuming that a range of information literacy skills would be transferred from primary school  
Assuming students could construct a mind map with instruction |
| 'Teachers’ and teacher librarians’ views on students use of information literacy skills' | Having a higher expectation of students information skills than the reality  
Identifying mind mapping as a new concept for some students  
Viewing maturity as a factor in the effective use of information literacy skills  
Identifying a range of student abilities in using information literacy skills |
| 'Teachers’ and teacher librarians’ views on transfer' | Believing transfer to be a difficult concept for the students  
Believing students will transfer skills if reminded  
Expecting that students will transfer skills to later years in school  
Reflecting that teaching may not focus on transfer  
Reflecting that students might not see the benefits of transfer  
Viewing teachers as having a lack of emphasis on transfer |

Table 4.1 Potential categories from teacher and teacher librarian interviews
4.3.1 Teachers’ views on assessment

The teachers were asked to comment on how students were being assessed. The focus of this question for the researcher was to see whether teachers stressed content only or included assessment of the students’ information literacy skills. In term three, the teacher interviewed in each school was a history teacher, and although students were doing assignments on three different topics, what students were assessed on was common across the three schools. History teacher A stated “For this assignment they are being assessed on their ability to research” and this statement was supported by History teachers B and C, although each teacher provided a slightly different definition of what “research” implied. History teacher C viewed research as “How they go about finding the information that they collect… How they collect their information”, while History teacher B argued that research was “their ability to find some original pieces of information in order to find out information about people so that they could compare them”. The emphasis of all three teachers was on finding information and less on the students’ use of information. The teachers also stressed that students were being assessed on their understanding of aspects of history such as timelines.

The teacher interviews in term four were very similar to those in term three in terms of what students were being assessed on. Science teacher D stated that students were mainly assessed on how they could find relevant information on a planet and use this information to develop a travel brochure. Japanese teacher E stated “I want to see how they can
select a topic on Japanese culture and do some research on that topic - so I assess them partly on the quality of information they find and how they use it”. English teacher F emphasised the importance of students being able to research an issue, including an awareness of a range of information sources, as a key aspect of assessment. All three term four teachers linked student assessment to the range of sources students could find and how they could use these resources in their assignment.

It was clear from the interviews that teachers were assessing students not only in relation to their understanding of the subject related topic but also to the students’ use of some information literacy skills.

4.3.2 Teachers’ assumptions about students’ information literacy skills

Teachers were asked which information literacy skills they might assume students would bring to the assignment tasks and there was general agreement on some skills and some differences on other skills. Most of the teachers responded by firstly stating that they assumed that students could use a search engine, mainly Google, to find information. Japanese teacher E stated “I’d assume that they’re very good at using computers, very good at finding some information on the internet”. History teacher B stated “I thought at the very least that every one of those kids could Google and look up a book with the curriculum search engine [library OPAC]”. Science teacher D argued that, while he could assume that some students would be proficient users of the internet,
There are some students who can use the internet very competently and even to the point of knowing what are good sites and what aren’t. There are others who can’t do that and have to be given very specific instructions.

The teachers in schools A and B were confident that students could use the library reasonably well. In school C, where there was less involvement between students and the teacher librarian, History teacher C commented on the students’ lack of ability in searching in the library. English teacher F stated that “I think that our kids are a bit lacking in library research skills. I find that, not just with this particular year seven but I find in general, that these kids have a lack of understanding of how to operate in the library situation”.

Some of the teachers stated that they assumed that students would know what a mind map was and would have had previous experience of using a mind map. For example, History teacher A stated that “You would expect them to have previous experience of mind maps but you’d be surprised how they react sometimes – even those who have used a mind map before – they don’t always seem to remember what it might be for”. Other teachers disagreed and argued that it could not be assumed that students had experience of mind maps. For example, History teacher C stated: “A mind map was a new concept to them. The idea of planning - most of them had the idea right from the start that they wanted to go headlong into the project”. Japanese teacher E argued that, while most students may have had experience of mind maps, for some students “it’s just far too an advanced skill for them because of the mental stage they
are at, or the development stage they are at. It’s a maturity thing”. The reference to development was echoed by Science teacher D who stated: “you get a full range of maturity in the class and this shows up to a far greater degree in the girls, in that they tend to be a lot more [mature] but they also have better research skills”.

Teachers also referred to note taking skills and there were differences of opinion between the teachers about whether it could be assumed that student would have these skills. History teacher B’s view was that “I expected that most of them would have the ability to read and to put the information down in dot points in their own words”, and Japanese teacher E stated that “I assume that the vast majority of students in year seven will have some note taking skills but I think the quality of notes might vary. Some may be very sparse”. Other teachers did not assume that students had good note taking skills, and History teacher C stated “I expected that most of them would want to cut and paste. I wanted to try to ensure that they were reading and comprehending the information, so I gave them advice on note taking”. What was agreed by all the teachers was that note taking skills were important and that they should be reinforced.

Teachers’ assumptions on information literacy skills varied but the interviews demonstrated that teachers did make assumptions about students’ abilities. There was no evidence that these assumptions were based on anything other than opinion and, in some cases, general experience.
4.3.3 Teachers’ views on students’ use of information literacy skills in primary schools

One of the factors that clearly influenced teachers’ views on students’ information literacy skills – or lack of them – was their views on what experiences students had in primary schools. Unlike the teacher librarians (see below), teachers were not asked directly about their students’ primary school experiences, but all the teachers commented in some way on what they thought happened in primary schools. History teacher A had particularly strong views on primary school teaching and stated: “So, effective internet searching is one of those skills that we would assume they have, but perhaps it’s primary school teachers thinking that it’s a more advanced skill and not teaching it. I think that they [primary school teachers] think it’s something that’s taught in secondary”. History teacher A also argued that students were unlikely to be taught how to record their sources of information in primary schools, and that too many primary school students could “get away with cutting and pasting for assignments and not be corrected”. Science teacher D reflected a similar concern about sources, stating that “For example, even in doing referencing, they may not have been asked to do that in primary school, and you don’t often get them coming in and talking about doing referencing in the primary school”. History teacher A’s concern was about students failure to plan assignments, and stated “I don’t know if they thought it [planning their assignment] would be a waste of time, but it seemed an unnecessary step to them that they should stop to write it down. I don’t think that they’d been introduced to this idea in primary
school”. There was a general consensus amongst the teachers that students *should* have been taught more about information literacy skills in primary schools, but it was clear that teachers’ views were opinions, and not based on recent knowledge or experience of primary school teaching.

### 4.3.4 Teachers’ views on transfer

When teachers were asked about whether students were likely to transfer skills, there was general agreement that very few students would transfer skills, particularly across the curriculum. History teacher A stated “I don’t think they would be able to do it at this stage, off their own back-they would need prompting”. This view was reflected by other teachers. For example, Japanese teacher E argued that for many year seven students, transfer was a difficult concept for most students and Science teacher D stated: “Will they transfer skills on their own? The short answer has to be – no. To really develop a skill, you’ve got to do it numerous numbers of times”.

Teachers were also in agreement that most students were unaware of the need for transfer or the benefits to be derived from transfer. History teacher B explained: “I think that it’s clear that some students do transfer – I’m not sure if they’re conscious of doing any transferring. What I mean is that I don’t think they reflect on what they’re doing. They just do it”. History teacher A summed up the views of teachers, stating: “And it’s very hard to get them to do it [transfer skills] across subjects in the school. They can’t seem to take the blinkers off and look
at that”. Teachers agreed that students appeared to be unaware that they could use some information literacy skills and other subject based (e.g. science) skills in other curricular subjects.

Teachers’ responses to the question about students transferring skills included suggested strategies that teachers might adopt to counteract students’ lack of awareness of transfer. All the teachers suggested that students needed to be reminded about skills they had used previously, needed to be prompted to use certain skills, or needed to be provided with scaffold which encouraged transfer, whether conscious or not.

History teacher B stated “So I think that students need to be reminded of what they’ve done before – like recapping what they’ve learned in the previous lesson”. History teacher A gave an example, stating “If they had a view [of information literacy skills] across all different subject areas, and they had a library lesson looking at that, I reckon they would learn that”.

Teachers’ views on transfer demonstrated that teachers saw transfer as a complex issue in some respects, but it was clear that some teachers saw transfer rather narrowly. All the teachers agreed that transfer was something which should be encouraged, even if they doubted whether it would happen with most year seven students. History teacher B summed up this view and stated:

Transfer is something that everybody thinks is a good thing and from time to time in the school, it’ll come up and people talk about it – not in a formal meeting sense but, say, in the staff
room. So people agree that it’s a good thing and yes, we must do something about it – but it doesn’t seem to happen, well, not in any organised way.

4.3.5 Teacher librarians’ views on students’ use of information literacy skills in primary schools

The three teacher librarians interviewed were in agreement about most aspects of students’ use of information literacy skills in primary schools. The teacher librarians all reported similar experiences of having students coming from different primary schools, and having a range of exposure to information literacy skills teaching. The students’ experiences, according to the teacher librarians, depended mainly on whether the primary schools had teacher librarians and on the size of the primary schools. Teacher librarian C stated that “Students from the smaller schools e.g. with only one or two teachers often lack information skills as the teachers themselves have little experience of information skills”. Teacher librarian B concurred with this and added “Students from the large primary school near here do have better information skills, in general, as there’s a TL in that school and I know what she does”.

The teacher librarians also noted a variety in what students had learned at primary school and what they had remembered. Teacher librarian A stated “They come from different schools but when I pushed them about the information skills process, it was clear that they might have looked at it but not in the way that I went through it with them – the 6 steps”. Teacher librarians B and C both noted variety in students’ experiences of using the web, and teacher librarian B stated:
Some knew how to use the internet and search engines and the fact that they had to put more than just one word into the search engine, whereas others thought that putting one word in would result in everything coming from it.

4.3.6 Teacher librarians’ outlines of their own information literacy skills teaching

There was a clear difference in the roles played by teacher librarians A and B to that of teacher librarian C, in relation to teaching information literacy skills to students in the school library. Whereas teacher librarians A and B both had timetabled “library lessons” with students, teacher librarian C did not. Teacher librarians A and B used the New South Wales (NSW) model of information skills teaching (NSW, DET 2007), which consists of six steps – defining, locating, selecting, organising, presenting, assessing. Teacher librarians A and B had introduced their students to the NSW process, but it was clear from the interviews that both teacher librarians had focused their teaching mainly on aspects of finding information. Teacher librarian B stated “Well, my attempt at teaching was to locate information once they’ve determined what they want to do, including using the inquiry terminals to start with”. Teacher librarian B also worked with students on a library based project but this was not related to the curriculum. Teacher librarian A’s approach was to outline the six steps and concentrate on aspects of the process. Students were taught how to use the library OPAC and how to search for information in books, and teacher librarian A stated: “Now before they did their history assignment, we hadn’t got to searching [the web] and note taking in detail but they’d certainly had an overview of this”.

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Teacher librarian C worked with small groups of students or individual students when they came to the library with a teacher. Teacher librarian C stated that the approach taken was to help students, “At the point of need – when they’re doing something for real, in the library. So, for example, I show them how to search the OPAC for books and how to look for information in the books”. When students were searching the web in the library, teacher librarian C provided advice to students who had problems in searching.

The approach of the teacher librarians interviewed was clearly focused on teaching students how to define their information need and how to find and use library resources. There was little evidence of students being introduced to aspects of information literacy skills such as mind mapping, question formulation or note-taking. The emphasis was very much on students’ location and use of resources and particularly library resources.

### 4.3.7 Teacher librarians’ expectations of students’ use of information literacy skills

All three teacher librarians had mixed expectations of students’ ability to use information literacy skills effectively. Expectations in relation to finding information in books were higher and teacher librarian A stated:

*I think they can search for books reasonably well. They can either use the index to find out what they need, but there are quite a few students who are very lazy at reading, so they almost expect the answer to be there in front of them.*
Teacher librarian C concurred, stating “They can find books OK and if they are working well, they can use the books to good effect, for example, using indexes”. Expectations of students’ ability to use search engines effectively were lower, and teacher librarian B stated: “I think most of them can search using Google but I still don’t think that they’re good enough at selecting the sites they need to use because they just click on the first one that’s there”. Teacher librarians A and C agreed and indicated that most students used single keywords to search and few students evaluated the list of websites they found. All three teacher librarians agreed that only a small percentage of students, 15% according to teacher librarian A, were effective web searchers and users of web based information.

4.3.8 Teacher librarians’ views on transfer

The views of the teacher librarians on transfer were similar to those of the teachers who were interviewed. All three teacher librarians viewed transfer as a desirable outcome of their work with students on information literacy skills. Teacher librarians A and B both hoped that students would transfer the information literacy skills taught in the sessions they had with students in the library. Teacher librarian A stated:

I guess basically what you’re hoping for is that they’ll transfer the skills you teach them. You don’t always see it though. Because you say ‘Remember when we did that?’ and you actually have to prompt them as they won’t always think back and say that I learned this skill and maybe it’ll help me next time.

Teacher librarian B made a conscious effort to encourage transfer amongst students by referring to work they were doing in curricular
subjects, but her experience was that students needed to be reminded of skills they had been taught. Teacher librarian C doubted that students transferred skills, and stated: “Most of the students seem to forget what I’ve told them before, say about using the OPAC or using keywords when searching - they don’t make connections between one visit to the library and another”.

None of the teacher librarians were of the view that teachers encouraged transfer of information literacy skills amongst students. Teacher librarian A summed this up, stating “I don’t think that this [encouraging transfer] is something that teachers do at all and so I don’t think the students are aware that they might benefit from transferring their skills’. All three teacher librarians were of the view that it would be beneficial for teachers to encourage transfer, and teacher librarian C, reiterating the views of one of the teachers interviewed, stated

Transfer is something that comes up in the school from time to time – but in conversations only – there aren’t any school strategies that I know of which set out to encourage transfer. I suppose it’s assumed – but I don’t see much evidence of it happening.

Teacher librarians A and B were of the opinion that the key reason for most students not transferring the skills taught in the library was the students’ emphasis on doing the assignment. Teacher librarian A stated “Some students just like to get to that end product – like the whole aim is to hand in that assignment in at the end, and so they are not thinking that they are working through it step by step and that will help them to have a better end product”. Teacher librarian B concurred with this view, stating:
But they all seem to be in a hurry – get the assignment done and get on to something else. So mind mapping and formulating questions? I’m sure a lot of them think that this will get in their way – so they don’t think about it.

All three teacher librarians agreed that it was important, particularly for year seven students, that they and the teachers should remind students about the range of skills they had been taught in the library or the classroom. Teacher librarian A stated “I think they always need to be reminded – right through the school”. Teacher librarians B and C agreed, and teacher librarian C emphasised the need for him to work closely with year 11 students in particular as they appeared not to have transferred skills from the earlier years of school.

The views of the teacher librarians on transfer reflected the impression given by the teachers i.e. that while transfer was viewed as beneficial in all three schools, there was little evidence from those interviewed that transfer was actively encouraged, although the teacher librarians argued that they were the ones most likely to remind students of the skills from which they would benefit.

4.3.9 Summary

The interviews carried out with teachers and teacher librarians provided the researcher with a range of views, attitudes and assumptions amongst the school staff, and this contributed to an understanding of how school staff worked with each other and with students. The value of these interviews lay in being able to analyse aspects of information literacy and transfer from the viewpoint of teachers and teacher librarians, and this provided a basis upon which to build when analysing the data from
the student diaries, questionnaires and interviews. It also allowed the researcher to subsequently return to the staff interviews and re-analyse the data in relation to the findings from the student data.

4.4 Student diaries

Students in schools A, B and C completed a structured diary (see Appendix 3) during the period in which they were engaged in completing a history assignment. As noted in Chapter Three, the topics studied by the students were a medieval village (School A), dictators (School B) and Egyptian gods (School C).

This section provides an analysis of data from the student diaries under the following headings, which reflect the sections of the student diaries:

- Students’ views on brainstorming
- Students’ views on mind mapping
- Students’ views on formulating questions
- Students’ views on confidence
- Students’ views on information retrieval
- Students’ views on evaluating resources
- Students’ views on note taking
- Students views on writing the assignment
- Students’ evaluation of their own performance

The section opens with a table showing the potential categories and illustrative codes, which were derived from the diary data, and led to the identification of these categories.
<table>
<thead>
<tr>
<th>Potential Category</th>
<th>Codes from which potential categories were identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students making connections</td>
<td>Valuing brainstorming as a discussion session and as an aid to information retrieval</td>
</tr>
<tr>
<td></td>
<td>Valuing brainstorming as making information retrieval easier</td>
</tr>
<tr>
<td></td>
<td>Valuing the mind map as making the assignment process easier</td>
</tr>
<tr>
<td></td>
<td>Valuing the mind map as an aid to information retrieval</td>
</tr>
<tr>
<td></td>
<td>Linking questions to information retrieved in resources</td>
</tr>
<tr>
<td>Students using information literacy skills/techniques</td>
<td>Valuing question formulation as encouraging thinking</td>
</tr>
<tr>
<td></td>
<td>Applying criteria to the selection of information</td>
</tr>
<tr>
<td></td>
<td>Evaluating the source in relation to quality of information on the topic</td>
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<tr>
<td></td>
<td>Using the mind map to take notes</td>
</tr>
<tr>
<td></td>
<td>Selecting what to write on the basis of relevance and irrelevance</td>
</tr>
<tr>
<td></td>
<td>Being reflective of what was written</td>
</tr>
<tr>
<td>Not valuing/understanding</td>
<td>Not understanding the concept of brainstorming as helping the student</td>
</tr>
<tr>
<td></td>
<td>Not understand the value of the mind map</td>
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<tr>
<td></td>
<td>Not understanding the concept of evaluating sources</td>
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<tr>
<td></td>
<td>Not valuing the use of questions</td>
</tr>
<tr>
<td>Students being confident/not confident</td>
<td>Feeling confident about completing the assignment</td>
</tr>
<tr>
<td></td>
<td>Feeling unsure about the rest of the assignment</td>
</tr>
<tr>
<td></td>
<td>Feeling more confident than at the start of the assignment</td>
</tr>
<tr>
<td></td>
<td>Feeling content but including some self-criticism</td>
</tr>
</tbody>
</table>

Table 4.2 Potential categories from student diaries
4.4.1 Students’ views on brainstorming

Students were asked to comment on what they liked about brainstorming. There were no differences between the three schools in students’ responses, and coding revealed that the reasons why students valued brainstorming was related to: making the assignment easier to do; sharing ideas and information, revealing prior knowledge, and cooperation in the group. Illustrative quotes from students are given to explain these aspects.

Students in all three schools identified one benefit of brainstorming as making the assignment easier to do, and comments included: ”Because it makes it easier when it’s time to do your assignment” and “It was easy to get information on tyrants together later on and the assignment was easier to do”. These comments also show that some students were able to link brainstorming with later stages of the assignment process, and to link brainstorming with subsequent information literacy skills such as information retrieval and writing the assignment.

A major area of agreement amongst students in all three schools was that brainstorming was fruitful because students were able to share ideas and information. In school A, a student wrote that “You can share your ideas and ask your friends and everyone has different opinion”. A school C student wrote: “I liked the brainstorming in a group because if I didn’t have an idea or knew something the other people knew the answer or had the idea”.

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Students expressed satisfaction with brainstorming as it allowed them to identify or think about their own prior knowledge of their topic, or to learn about the prior knowledge of other students. Comments included: “It was inspiring and it refreshed my memory about medieval England”. Other student comments referred to: “finding what the rest knew about them [Egyptian gods]” and “We talked about things we did not know”.

Students also liked brainstorming because they enjoyed the cooperation and team working it allowed them to do. In school A, a student noted: “We helped each other to get the answers” and a school B student wrote: “If I didn’t understand something, they would help me”. A number of students referred to the help they received, the help they gave other students and to cooperation. Most students recognised value in cooperating with others.

When asked to comment on what they did not like about brainstorming, the main aspects of were: it was boring; it was hard work or difficult; and the behaviour of other students. Only one student in schools A and B found brainstorming boring, stating: “It is very boring and everyone shouts out”. In school C, six out of twenty two students found aspects of brainstorming boring and comments included: “I did not like anything about brainstorming because it was boring and I just wanted to get stuck into the work”. Thus it is clear that the majority of students did not find brainstorming boring.

For a minority of students in each school, brainstorming was seen as being hard work or difficult. In school A, two students referred to the
difficulty they had in expressing themselves, and one student noted: “It was hard to come up with words”. In school C, a student expressed a similar difficulty, stating: “That you have to talk about things you don’t know about”. A School B student stated: “There’s a lot of things you don’t know and that makes it hard work”.

The most common negative aspect of brainstorming commented on by students in the three schools was in relation to the behaviour of other students. Some students who had commented very favourably on what they liked about brainstorming, also had negative comments about other students’ behaviour. In school A, one student commented: “Well, if you have an idea and other people don’t like it, they won’t take it”. In school B, a student wrote: “You would get some silly facts. People would interrupt when we were working”. In school C, the behaviour of some students seemed to be worse, and one student stated: “I didn’t like brainstorming in a group because if you thought one thing, the group would think the opposite and an argument would begin”. As with the other negative aspects of brainstorming, student behaviour was commented on only by a minority of students.

Most students valued brainstorming as being potentially helpful with their assignment. The most common benefit of brainstorming identified by students was that it would help them when they were retrieving information for their assignment. In school A, comments included: “It will give key lookups to see what I want to put in it”. In school B, one student wrote: “It will be easier to find the right information and to find the right answers”. This shows that many students were able to recognise
and value the link between brainstorming and information retrieval, and shows that most students were able to make that connection.

A second benefit identified by students was that brainstorming provided them with viewpoints other than their own. This benefit was most noted in school B and comments included: “It gave us different viewpoints on dictators for our assignment” and “everybody had different opinions and that helps”. It can be seen here that some students could make clear connections between the views of other students, how this might help with their assignment, and that these students valued brainstorming as a source of alternative viewpoints.

Other benefits of brainstorming which students valued were that brainstorming was beneficial in that it helped them to formulate questions about their assignment topic and helped them with later stages of the assignment process such as writing. Thus the analysis of the student diary entries on brainstorming shows that most students looked favourably on brainstorming as a technique, and an emerging potential category noted by the researcher was that most students appeared to see value in brainstorming, while a minority of students appeared not to see value in brainstorming. A second emerging potential category was that most students appeared to be able to make connections between brainstorming and later stages of doing their assignment, although only a minority of students commented on the later stages of the assignment process. This could have meant that only a minority of students was capable of taking this more holistic view, or it could have meant that many students were aware of these connections but did not record them.
in their diary. These two potential categories were therefore pursued when analysing the student questionnaires, and particularly the student interviews.

4.4.2 Students' views on mind mapping

In all three schools, students were encouraged to write out a mind map for their assignment topic and students were asked to comment, in their diary entries, about how the mind map might help them with their assignment. Students were also asked to comment on whether they had made any changes to their mind map after they had retrieved information about their topic.

In relation to the potential benefits to be gained from a mind map, students in all three schools cited the following:

- The mind map as an aid to understanding the topic e.g. “It will help judge who is the cruelest tyrant and it will give us better facts. It will give us more branches on our facts”
- The mind map as an aid to question formulation e.g. “It will help me to look at the questions I need for my assignment”
- The mind map as a precursor to information retrieval e.g. “Because it’s got the things that I want to find out on the internet or in books”
- The mind map as a tool to look back to at later stages of the assignment e.g. “Well, you can look back on it and know where things are and what things are connected to”
The mind map as a note taking tool e.g. “Because as soon as I get ideas I can write them down”

A small minority (less than 10%) of students indicated that they did not think the mind map helped them, or they indicated that they did not know whether the mind map helped them. Not all students made comments in this section and it is unclear whether these students had no comment on this issue or saw no benefit from a mind map, or did not understand the concept. This only became clearer with analysis of the student questionnaires and interviews. The great majority (over 80%) of students did make positive comments about the benefits of a mind map, and the researcher noted that, as students might be seen to value brainstorming, they might also be seen to value mind mapping.

When asked about the changes they had made to their individual mind map, very few (less than 10%) students stated that they had made alterations and those who did so, indicated that they had added aspects to the mind map. For most students, no changes were made, and this could mean that students had created meaningful mind maps at the start of the assignment, or it could mean that students could have made changes to the written mind map, but chose not to.

4.4.3 Students’ views on formulating questions

In all three schools, students were encouraged to write out questions about their topic before searching for information. Students were asked to comment, in their diaries, on question formulation and use and in particular:
• How easy or difficult they found it to formulate their assignment questions
• How they thought writing questions would be an aid to information retrieval for their assignment
• How well they had used their questions when doing the assignment

4.4.3.1 Formulating questions

In relation to writing out questions for their assignment, most students commented that they found it easy to do. Interpretation of student statements was not straightforward as many students merely wrote: “It was easy” or “I found it quite easy”. Some students did qualify their statements and stated that question formulation was easy as they had prior knowledge e.g. “It was easy to write them because I know a little bit about knights”, or they used standard approaches e.g. “It was pretty easy because they were simple questions, starting with where, who, how, what, when”. Thus the diaries revealed students’ opinions about the process of formulating questions and some reasons why it might be easy, but the diaries did not reveal aspects of question formulation such as whether the students’ questions were of good or poor quality.

A minority of students stated that they found question formulation difficult and some responses were brief e.g. “It was hard”. Some of this minority of students found the process confusing, and one student wrote: “I found it hard because most of the questions go back on each other”. There was also a minority of students in each school who stated that they
did not formulate questions, but preferred to use their mind map. This was summed up by a student in school B, who wrote “I didn’t use the questions as I thought I didn’t need to as I used the mind map”.

4.4.3.2 Question formulation and information retrieval

When students were asked how question formulation might aid information retrieval, most students identified the questions as providing a basis on which to search for information and comments included: “Because you need to find information and those questions will help you because you can find answers to these questions”. Some students reflected that questions were a tool which they could use to review what they needed to do for their assignment, and comments included: “I will have something to look back on. I can change the questions any time I want”. There were no negative statements about question formulation and information retrieval, but some students in each school left this section blank, and it is possible that some students took a negative view.

4.4.3.3 How well students used their questions

Students’ reflections on how well they had used their questions during the assignment revealed that most students thought that they had used their questions well. A student in School A summed up this view, stating: “I used my questions very well because I got all the information for my assignment with my questions”. Students also found questions to be of benefit and a School B student commented: “It was very helpful to answer my own questions about my character. It made me feel
organised”. A minority of students stated that they did not use their questions, including a School A student who commented that “I didn’t really use them. I had an idea of how I was going to do it without them”; and a School B student who stated: “I didn’t use my questions much at all as I don’t think they are much help to me”.

While the diary responses showed that most students coped well with question formulation and found the use of questions to be beneficial, the researcher noted that the diary entries appeared to show that students saw value in question formulation and use, and might be likely to use questions again in future assignments. In order to find this out, data from questionnaires and interviews was later analysed and compared with the diary findings.

4.4.4 Students’ views on confidence

In the diary, students were asked to comment on two aspects relating to confidence. Following their responses on formulating questions, students were asked to comment on:

➢ How you feel about doing the rest of the assignment now

When students had done initial searching for information for their topic, they were asked to comment on:

➢ How confident you think you are that you can do a good assignment

The researcher was trying to gain an insight into students’ levels of confidence about the assignment but deliberately used the term
“confident” only at the second stage, so as not to lead students too much into an initial response.

4.4.4.1 First responses on confidence

When students were asked to comment on their feelings about completing the rest of their assignment, almost all students, in all three schools, made positive responses. A minority of students referred to confidence. In school B, one student stated “I feel confident about the topic I’m doing and I think that I will do well in the area I have chosen”. In school C, more students used the term “confident” and comments included “I feel pretty confident about doing the rest of my assignment now that I’ve seen how easy it is to get answers to my questions”.

A number of students expressed the feeling that the rest of the assignment would be easier because they had completed a mind map and questions. In school A, one student stated “I think it will be pretty easy because the questions will help”. In school C, students also used the term “easy” or “easier” when referring to the work needed to complete the assignment.

In this response, students also referred to aspects relating to confidence such as having the right information (“I feel great. It’ll be better now I have the right information”), being organised (“I think if I work hard and spread my time out on each of the tyrants, I should be OK”), and being interested in the assignment (“I feel good about doing the rest of the assignment because it is interesting”). A minority of students responded briefly, stating “OK” or “Pretty good” or “All right” but only a very
small minority expressed any misgivings about completing the assignment, with one student in school A stating “I have some concerns” but there was no elaboration about what these concerns might be.

4.4.4.1 Second responses on confidence

When asked to comment directly about levels of confidence, most students indicated that they had a good level of confidence. A number of students in each school were very confident about completing their assignment, and comments included: “Well, I think I am very confident about it”, and “I think I am really confident in doing a good assignment”. More students used the term “pretty confident”, “fairly confident” or “quite confident” in their responses. Only a small minority of students expressed misgivings, with a school A student stating “Not sure – it might be hard”, and another school A student stating “I’m not very confident”. The reasons for the levels of confidence expressed by students were similar to those in the previous responses about their feelings in relation to completing the assignment. The most common reason was that students felt confident because they had enough information to complete their assignment, and comments included: “I am quite confident that I can do a good assignment now I have the right information”. Other reasons stated by student including achieving a high grade (“It builds my confidence as you know you’ll get a good mark”), previous experience (“I’m pretty confident because this was a hard assignment and with other assignments I did pretty well”), recognising the assignment requirements (“I’m fairly confident that I’ll do a good assignment and I think I’ll do well because I understand what we need to
do”), and being diligent (“I feel very confident because I worked very hard getting all that information”).

Overall, most students expressed confidence at both stages of the assignment when they were asked to comment. Diary responses alone from students cannot reveal whether these levels of confidence were as high as they appeared.

4.4.5 Students’ views on information retrieval

In their diaries, students were asked to make comments on three aspects of information retrieval:

- How they found relevant information sources such as books or websites
- How they found the right information for their topic
- How successful they thought that they had been in finding the right information

4.4.5.1 Finding information sources

In schools A and B, the teacher librarian had selected a range of books which could be used in both the classroom and in the library but this was not the case in school C. In all three schools, students did use books which they were either given or which they found themselves on the library shelves. In school C, the teacher librarian gave students advice about the availability of books on their topic.

School library OPACs were available in all three schools and although students were encouraged to use the OPACs by all three teacher
librarians, it was mainly in school B that students commented on using the OPAC, and this was due to the teacher librarian in school B taking students to the OPAC in the library, and showing them what to look up. Students used a variety of terms for the library OPAC, such as “the search terminal computer” (school B), “the library search engine” (school B) and “the library computer” (school C). An example of a student comment on OPAC use was “First we went to the computer and looked it up. Then we went to the shelf and seen if it was the right book. Then we used it”. Only a minority of students commented on using the library OPAC.

Student responses were fairly general about how they found books to use for their assignment. Some students in schools A and B used books which had been found by other students and comments included “We found a book about knights and talked about it in our group” (School A); and “Found a book that was pretty popular between students” (School B). In school C, comments were more individually related but also very general, such as “I searched the web and read books”. A minority of students in all three schools stated that they asked the teacher librarian or teacher for help in finding books.

Students were also fairly general in their comments about finding websites. For example, while some students used a search engine (“It was easy – just typing in what you wanted to find out for your topic”), many others were less specific (“I looked at different websites”). Most students simply stated that they used “the internet” or “the web”. It might
have been expected that students would include some of the keywords they used to search but only two students in total did so.

4.4.5.2 Finding the right information

Students in all three schools were more specific when asked about finding the right information for their assignment, although most comments were again fairly general, with most students appearing to interpret the statement in relation to finding information, as opposed to the right information. Where students were specific, they referred to using the title of books e.g. “I thought the title of the books helped me and I flicked through them” (School A); book indices e.g. “Search through the book’s index and writing down notes out of them” (School C); and keywords used in searching e.g. “I Googled to find out about food and clothes” (School A). Students in school B were the only ones to refer to their assignment specification [to justify their choice of tyrant] in relation to this question. Comments included “I made sure the person I chose was a bad person”, and “Well, I went with the one with the worst things he’d done”.

4.4.5.3 Reflecting on finding the right information

Most students stated that they had been successful in finding the right information for their assignment and that they had used the right strategies. Some students expressed this fairly generally, and comments included “I thought I went all right in the assignment because I did some of the stuff myself and the information was all right” (School B); and “I
think I did pretty well at finding information because I knew where to find the information” (School C).

Some students responded by commenting on how easy it was to find information in books or on the web. Only a small minority commented that finding the right information was a difficult task. Other students choose to comment on whether it was easier to find information in books or on the web, and students were evenly divided in their comments.

Students also judged how successful they had been in relation to completing their assignment. In School A, one student commented:

*I think I went about it quite well. I went through all the books to find information on entertainers. Then when I found some information, I interpreted it to fit my character.*

In School B, referring to the chosen tyrant, comments included “I think I went pretty well especially on Vlad the Impaler as I got so many disgusting facts”.

The responses from students on their information retrieval strategies were more general than had been expected, and this may reveal a lack of vocabulary on the part of students in relation to their own search strategies.

**4.4.6 Students’ views on evaluating resources**

There was a wide range of responses from students when they were asked to comment on how they evaluated the books and websites that they used for their assignments. Responses ranged from the specific to
the general, but there was also evidence that a minority of students did not understand the request for a comment on evaluation or misinterpreted the request. Most students clearly understood what was being requested of them.

For students in all three schools, relevance to the task in hand was the main strategy for evaluating resources, and comments included: “I typed knights on the computer and I knew it was the right information because it was about what they ate, what armour they wore and what they did in war” (School A); and “I read the things we had to have in our assignment” (School C). Students in schools B and C cited other students as a source of evaluation and comments included: “I justify the information by seeing if other people have good information on the tyrant and looked to see if I was on the right track” (School B).

Students in all three schools cited strategies that they adopted to evaluate the sources they were using. In School A, one student commented “Read the first paragraph and looked at headings and pictures” and there were similar comments from other students in this school. In School B, one of the comments was “It gave a good description of the tyrant so I got the information”, and other students cited looking for headings in books and websites. In School C, students referred to a matrix on which they were asked to record sources by the teacher, and cited this matrix as an evaluation strategy, with one student commenting “I completed the source analysis sheet and I got the right information”.

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It was clear that most students used some form of evaluation in relation to the information sources they used, but there is no indication of the depth of this evaluation from the diary entries. This aspect is examined further in the analysis of the questionnaires and interviews below.

4.4.7 Students’ views on note taking

Students were asked to comment on note taking in order to find out how students approached this task in relation to their use of information sources, and also in relation to their preparation for writing their assignment. In their diaries, students were asked to comment on:

- The method used to take notes and what form their notes took
- How they organised their notes

4.4.7.1 Note taking methods

Students used a range of methods to take notes although most students in each of the three schools wrote notes, from both books and websites, on paper with a minority of students stating that they cut and pasted. Comments included: “I took the notes and just wrote them straight down” (School B), and “I took notes by looking up information in books and wrote down the parts that I needed for my work to get good marks” (School C).

Some students only used the computer to record their notes, either by typing notes directly into Word (e.g. “I wrote the notes on the computer and printed them off” School C), or by cutting and pasting (e.g. “I cut and paste them and make them colourful” School C).
In terms of the format of their notes, students used a range of methods such as listing under question headings (“I asked myself questions about my character and answered them” School A); writing detailed notes (“I put them in paragraphs and sentences” School A); using subject headings (“I put them under the name of what they were about” School B); using bullet points (“I just put down dot points and I put it in short form e.g. kill 20 mill” School B); and random listing (“Well my notes were all jumbled but I sorted it out in my own words” School C). Some students in Schools A and B used their mind maps to record their notes, and a School A student commented “I used my mind map and wrote my notes in point form”. A minority of students wrote that they did not take notes at all.

4.4.7.2 Organising notes

Students also used a range of approaches to organising their notes before writing their assignment. Students used a range of terms to express how they organised notes and these included: “list”, “put them in order”, “under headings”, “in the right order”, “highlighted them”, “sorted them”, and “on the mind map”.

For most students, organising their notes by a revised list was the most common comment, and a School A student wrote “List them down with a heading for each of them”. This combination of “list” with “heading” or “headings” was used in all three schools. A number of students referred to ordering their notes (e.g. “I try to get them in the right order” School A), but only a minority of students explained how this ordering
might be done. In School C, one student commented “Well I just put them in order from important to not important”, and a School A student wrote “Put into order what will be written first to last in my assignment”.

Some students used their mind map to organise their notes, and comments included: “I will write out all my notes. Then I will put them into a mind map. Then I’ll pick out the good stuff” (School B). Students also referred to their questions as a way of organising their notes, and a School A student stated “I organise my notes by writing down questions about my character and answering them using the information I’d found during my research”.

It is clear from an analysis of students’ note taking methods and how they organised notes, that there was no real pattern within a school or across the three schools. What this analysis reveals is how students took and organised notes, but not why they used these methods or whether they had been taught note taking at any stage. These aspects are followed up in the interview section below.

4.4.8 Students views on writing the assignment

Students were asked to comment on how they decided what they were going to write in their assignment, in order to see what strategies students might employ, and how the act of writing the assignment might or might not link in with other aspects of the assignment process.

For most students, in all three schools, selecting the most relevant information was seen as the key factor in deciding what to include, and comments included: “I look at my notes and then write the important
things” (School A), and “I picked the best bits from each of my findings and wrote them down” (School C).

Students in this category also used terms such as “most important”, “right information” and “the good stuff”. These comments were generalised and fairly superficial, as were the comments from some students who took a rather simplistic view, with comments such as “I just chose the stuff to write and then it was done” (School C).

There was more depth to other students’ comments on this topic. Some students referred to using their mind map in deciding what to write. A School B student wrote “Read them [notes] over and write them. Use my mind map”. Students also referred to using their questions, with a School A student commenting “The most important stuff from the notes and the questions”. Students also made reference to their topic as a factor in deciding what to write, and comments included: “I’d look at different aspects of my character and what my character’s daily life was like e.g. what she ate, what she did, what she wore etc” (School A). Some students were aware of improving the quality of what they were going to write as a deciding factor. For example, a School B student stated “I wrote stuff that was helpful and interesting”.

While most students were able to articulate how they decided what to write in their assignment, a small minority of students appeared to lack an understanding of this aspect, for example by repeating what they had written in the section on organising their notes.
4.4.9 Students’ evaluation of their own performance

Students were asked to comment on how good they thought their assignment was, and how they might have improved it. The aim was to allow students to reflect on their own performance and to discover what self-critical comments students might make about their own work. Most students in all three schools provided critical comments on their individual assignment, although a minority of students stated that they did not think their assignment could be improved. An example of the latter from a School A student was “I think my assignment was good and I don’t think it could be improved”. These statements appeared to be superficial or boastful. For some students, no improvement was qualified by statements that they had worked to the best of their ability, and that this was the reason why the assignment could not be improved. A School B student stated “I don’t think I could have improved it because I did the best I could”, and this showed a higher level of reflection than the previous statement by the School A student.

For most students, finding more information for their assignment was the main criticism. Some students made general statements such as “I could have improved it by having a bit more information” (School B). Other students referred to a need for more information sources and a School C student stated “I would give it 7.5 out of 10 and I could improve it with better books”.

Some students were critical of the style of their work. A School A student noted “I think my assignment is OK. I could definitely have
made it a little less long-winded but the overall result is good”. Other students criticised their own time management, and a School B student commented “I think it’s OK. I could have spent more time on it”.

The students in all three schools demonstrated a range of ability in self-reflection, but most students showed that they could be critical of their own work.

4.4.10 Summary

The student diaries gave the researcher the opportunity to analyse student views, attitudes and actions at particular times during the period in which students were completing their term three assignments. The value of the diaries lies in the potential categories established, and also in the provision of data which can be revisited and compared with subsequent data analysis.

4.5 Student questionnaires

As was noted in the methodology chapter, students completed a semi-structured questionnaire when they had completed an assignment in Term four. The purpose of the questionnaire was to obtain student responses to aspects of their use of information literacy skills in the Term four assignment. Within that overall purpose, the researcher sought to analyse the extent to which students might have transferred some of the skills which they had been encouraged to use in the Term three assignment. The questionnaire (see Appendix Four) covered many of the same areas as the student diary, and this analysis of the questionnaire
data seeks to highlight both the similarities and differences in student responses to topics (e.g. mind map, information retrieval, assignment writing). The questionnaire also sought to obtain student responses to questions on the extent to which they might have transferred skills. The analysis of the questionnaire data was therefore not a detailed examination of all student responses, as many of the responses were a repeat of what students noted in their diary. The value of the questionnaire data lay partly in affirming the analysis of the diary data, partly possibly contradicting the analysis of the diary data, and partly in seeking new insights into what students thought and what they did. The coding of the questionnaire data allowed the researcher to confirm or reject the existing potential categories and possibly to identify new potential categories.

The questionnaire data is analysed under the following headings:

- Students’ views on brainstorming
- Students’ views on mind mapping
- Students’ views on question formulation
- Students’ views on information retrieval
- Students’ views on evaluating information sources
- Students’ views on note taking and use of notes
- Students’ reflection on their assignment
- Students’ views on transfer
- Students’ advice to future year seven students

The initial total sample size was 75 students in Term 3. This was reduced to 65 in Term 4 because some students had left the schools and other
students did not complete the questionnaire because of absence. Within
the questionnaires, some students opted not to answer particular
questions. In some questions, students were given the option of choosing
more than one option. The numbers indicated below show the number of
students who responded to a question, or who selected particular options
within a question.

4.5.1 Students’ views on brainstorming

While students in each school had taken part in brainstorming sessions in
term three, none of the teachers used brainstorming as a tool for students
in term four. In the questionnaire, students were asked whether
brainstorming might have helped them with their term four assignment.
Students were given a range of possibilities, and asked to circle those
with which they agreed. Student responses indicated that they thought
that the most valuable aspect of using brainstorming would have been to
generate new ideas, followed by help in finding information, sharing
information with other students, thinking about their prior knowledge of
their topic, and helping them with their assignment later on. These
finding were broadly in line with student responses in the diaries.

Students were then asked to comment on whether they would have liked
to have done brainstorming for their project in term four, and they were
asked to comment on why they would or would not have liked to have
done brainstorming. Student responses were evenly split between those
indicating that they would have liked to have done brainstorming, and
those responding that they would not. An analysis of those students
responding positively indicated that their wish to have done brainstorming reflected the responses to the first question, i.e. students saw value in brainstorming as potentially giving them more ideas, helping them to find information and subsequently helping with their assignment. One student commented “because it would have been a good way to get ideas and remember things about the planets”. Other positive comments about brainstorming included: “because it would help you if you were having trouble”, and “because it helps you with finding information”.

Students who responded negatively had a variety of reasons for not wanting to do brainstorming. The most cited reason amongst students (6 students) was that they did not like doing brainstorming (“I don’t like doing them”). A similar number of students (5) stated that they thought that brainstorming took up too much time (“that means we would have to go through all the planets and that takes up too much time”). This aspect was followed up in the students interviews (see below), as it was not clear what students meant by “too much time”, since the brainstorming sessions done in term three only took about 20 minutes to complete. Other students (4) thought that brainstorming would not help them (“It doesn’t help you much and it’s too hard”) or (3 students) hindered their progress with the assignment (“I wouldn’t have liked to have done brainstorming because I prefer to get information, memorise it and change the wording”).
4.5.2 Students’ views on mind mapping

Students were firstly asked whether they developed a written mind map for their assignment in Term four and were also asked to explain, if they responded “no”, why they had not done so. Only 25% of students stated that they had developed a mind map for their assignment. The students who did not develop a mind map gave a variety of reasons, although some students did not give a reason. The reasons included (in rank order of the number of responses):

No need to do a mind map e.g. “because I didn’t need to” (13 students)
No time to do a mind map e.g. “no because I did not have time” (7)
Having a map in their head e.g. “because I had a mental map” (6)
Did not want to do a mind map e.g. “no – because I didn’t want to. I just wanted to find it out in the book or internet” (4)

The aspect of not having time arose again, as with brainstorming and as above, it was not clear what students meant as writing a mind map took very little time.

Students were then asked if they thought that they had a mental map (as some students had indicated this in their diaries). Most students (32) responded that they did have a mental map, compared to 23 students who did not. Students who indicated that they did have a mental map were asked whether the mental map helped them with their assignment, and were given a list from which they could select one or more responses. Most students (23) indicated that they thought a mental map would make their assignment easier to do, while an equal number (15) thought that it would help them to find information better, or to help
them with their assignment work later on. A similar number of students (14) thought that a mental map would help them make up questions for their assignment. Only three students added their own comments in the “other” category and these included: “I did what was in my head”.

Students were then asked whether they thought that it would be a good idea to write out a mind map on paper when doing assignments in the future. Of the students who responded, most students (39) indicated that they did think it was a good idea, and 17 students responded negatively. Students were also asked to give a reason for thinking that it would or would not be a good idea. Positive responses were varied, and included helping with the assignment (15), producing ideas (4), helping you to remember what you’ve done (4), finding information (3), helping with questions formulation (2) and preferring a written to a mental map (2). Some interesting comments included: “it could help you make up questions to answer some of the questions that you made up”, and “so you could make sure that’s what you wanted to do”.

Students who did not think it would be a good idea to use a written mind map also had a range of responses, and these included preferring a mental map (4 students) e.g. “no – because I can do it in my head”; fearing that it might be different from a mental map (2) e.g. “no – because it might be different from what’s in my head”; seeing no need for a written map (2); and stating that it would take up time (2) e.g. “– it takes time and I can do it in my head and I don’t need it”. One student did not want to share a written map, stating “No – other people in the group could copy it”.

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Overall, this analysis shows that for most students, concept mapping – either on paper or mental – was of value, but there was no clear commitment on the part of most students to put into practice what they had learned about concept mapping whilst completing their Term three assignment.

4.5.3 Students’ views on question formulation

Students were asked whether they wrote out questions for their assignment in term four. Results showed that, of those who responded, 32 students did not formulate written questions, and 24 students did write down questions. Students were also asked to explain why they did not write down questions, and from those who responded, reasons included:

(in rank order by number cited)

No need to have questions (5 students), Wrote notes instead (5), Did not think of it (3), Teacher provided questions (3), No time to do questions (2)

Comments included: “no – because I didn’t think I had to and didn’t think I would have time”. In relation to the teacher providing questions, none of the teachers gave actual questions to ask, but these students interpreted the assignment guidance as questions.

Students were then asked if they had mental questions, in order to find out if students had mental questions instead of, or as well as, written questions. Of those who responded, 30 students stated that they had mental questions and 25 students said that they did not. Students were given a list of options in relation to the benefits of having mental questions and could select one or more option. The results showed that
students saw the benefits as almost equally divided between making the assignment easier to do (19 students), helping to find information better (18), and helping students identify what they needed to do (17). Helping with the assignment later on was seen by four students as a benefit. None of the students identified reasons in the “other” category.

Most of the students in this study valued the use of either written or mental questions when completing the term four assignment. While this shows some evidence of transfer from term three, issues raised in the interpretation of the results are similar to those found in relation to mind maps, e.g. students’ ideas of time and these issues were explored in the interviews.

4.5.4 Students’ views on information retrieval

Students were asked how they found the right information for their term four assignment, and were given five options, including “other”, from which to select one or more. This question was phrased with an emphasis on right, as there was some misinterpretation of this issue in the student diaries. Results showed that students’ strategies, in rank order of number selected, were:

Finding a book which covered the topic (33 students)
Searching the web using topic keywords (28)
Using the school library OPAC (21)
Talking to other students and finding better information from them (10)

Only two students selected “other” and their comments were: “I found other students who told me some good websites on Japan”, and “I had
some information in my head”. The use of the OPAC was concentrated in schools B and C and, given evidence from observation and student diaries, appears to be higher than would be expected. It is possible that students, having been encouraged by the teacher librarians and teachers to use the OPAC, may have felt that this was a suitable response.

4.5.5 Students’ views on evaluating information sources

How students’ evaluated books and websites which they used for their assignment was examined in the student diaries, and the questionnaire sought to explore further students’ views on evaluating sources of information. Students were asked how they decided whether a book or website would give them the right information for their Term four assignment. Students were offered seven options, including “other” from which to select one or more options. In relation to books, students’ responses, in rank order of options selected, were:

- Looking at book titles (31 students)
- Browsing through the books (27)
- Using the books’ contents and indexes (25)
- Ignoring information that wasn’t relevant to their topic (17)
- Using keywords (12)
- Referring to their mind map or questions (7)

As there was a high emphasis by teacher librarians in Term three on using techniques such as examining titles, browsing, and using contents pages and indexes, most students appear to have followed that guidance in Term four. The lower number of students using keywords or mind
maps/questions tends to indicate that many students did not transfer these aspects information retrieval so readily.

In relation to websites, students’ responses, in rank order of options selected, were:

- Browsing through the website (27 students)
- Using keywords (24)
- Browsing the site (24)
- Looking at the title of the site (23)
- Ignoring information that wasn’t relevant to their topic (14)
- Referring to their mind map or questions (5)

Results were similar to that of using books in relation to titles and browsing, but students indicated that they used their keywords more when using websites. Even fewer students stated that they referred to their mind maps or questions when using websites.

4.5.6 Students’ views on note taking and use of notes

In the questionnaire, students were asked how they took notes and were given six options, one of which was “other”, and asked to select one or more options. Students’ responses, in rank order of options selected, were:

- Wrote sentences on paper (22 students)
- Wrote words or phrases on paper (18)
- Cut and pasted from websites (17)
- Made notes in Word for Windows (14)
- Made notes on a mind map (8)
Students also made comments in the “other” category and these included: “I used bullet points”, “I held them in my head”, “I got information and put it straight into PowerPoint”, and “I didn’t take any notes”.

Students took a variety of approaches to note taking but most students used ‘traditional’ forms by writing out notes on paper.

Students were then asked how they decided what to write in their assignment, and were given 6 options, including “other”, which related to their use of the teacher’s assignment instruction, their own notes and their questions and/or mind map. Student responses, in rank order selected, were:

- Selected the most important information from their notes (28 students)
- Used the teacher’s instructions (21)
- Used their questions (17)
- Put their notes in order of importance (11)
- Used their mind map (7)

In the “other” category, students commented: “I used the internet and memorised it and put it in my own words”, and “I used all my mental notes and memories of the planet”.

Students used their own notes in different ways when deciding on the content of their assignment, but were also influenced by the teacher’s instructions.
4.5.7 Students’ reflection on their assignment

Students were asked how well they thought that they had worked for their term 4 assignment, and were given 5 options, including “other”, from which to select one option. Student responses, in rank order selected, were:

- OK but I could have worked harder (25 students)
- Pretty well (15)
- Very well (7)
- Not very well (6)

Two students selected “other” and their comments were: “Excellent” and “I tried my hardest”.

Students appeared to take an honest appraisal of how well they had worked, and the issue of working hard/not working hard was followed up in the interviews.

4.5.8 Students’ views on transfer

Students were asked to comment on how they had used information literacy skills such as mind mapping, question formulation, information retrieval and recording sources – about which they had been taught in Term three – in their Term four assignment. Students were initially asked to respond “Yes” or “No”. If they answered ‘Yes’, they were asked to comment on what aspects of what they had learned they had used. If they answered “No”, they were asked why they had not used what they had learned. The results showed that 37 students answered positively, 14 answered negatively, 2 responded “I don’t know”, and 12 did not
respond. There was no opportunity for the researcher to find out why there had been this level of non-response to this question, e.g. whether this was linked to the “don’t know” students’ responses, or whether this showed a lack of understanding amongst some students.

The students who responded “Yes” identified a range of examples of using what they had been taught in Term three. The highest ranked example (10 students) was searching for information, and comments included: “I learned different ways to find information”, and “About using books and the computer to find what you want”. Mind mapping (9) was also cited, with a number of students linking this with other aspects e.g. “mind map, having questions and finding information”; as was question formulation (9) e.g. “Wrote out questions; took notes”, although 2 students noted that they had mental questions, with one student commenting “even though I don’t use them. I think about them in my head”. Note taking (9) was cited, but more often separately e.g. “writing down information and then picking out the facts”. Browsing for information in books (4) and using keywords (3) were also cited. Only one student referred to planning the assignment, commenting “looking in the book, writing down brief sentences and knowing how to plan it”.

Most of the students who responded “No” did not add a comment. Of those who did, three students clearly misunderstood the question, commenting that “the assignment was different”, “the information was new” and “all we had to do was search for people”. Two students cited lack of time ("I didn’t have enough time"), and personal preference (“because I like doing an assignment my way”).

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In terms of transfer of information literacy skills, the questionnaire showed that there was some evidence of transfer in relation to some aspects, and that students had thought about what they had learned in the previous term. The issue of students not understanding questions relating to transfer – or perhaps the concept of transfer – was followed up in the interviews.

4.5.9 Students’ advice to future year seven students

Students were asked to indicate what advice they would give to the year seven class which followed them in the school at the end of the year. Students were given a list of nine options from which to choose one or more. The results, in rank order of selection, were:

- Write out a mind map to get keywords for their topic (34 students)
- Write out their questions (26)
- Look at their questions and mind map before writing their assignment (25)
- Use their keywords when looking at a website (25)
- Use their keywords when using books (23)
- Write out notes on paper (23)
- Search the catalogue in the library (22)
- Use their keywords when searching the web (e.g. using Google) (22)
- Cut and paste information (10)

Students were selective in their choices, with only 4 students selecting all options, and this may indicate that students were not expressing an expected view of what advice they might give. It was also clear that some students advised next year’s students to do what they themselves
had not done in year seven, and this aspect was followed up in the interviews.

Students were finally asked if they had one more piece of advice for next year’s year seven in relation to getting a good mark for their assignment. There was a very wide range of advice given by the students and comments were brought together under the following headings, listed in rank order of the number of students who responded:

- Work hard (14 students) e.g. “That you should study hard and take your time in your assignment”
- Find relevant information (11) e.g. “Look at your information and use all different resources”
- Be well organised (9) e.g. “Keep all your information together and if you use Word, save all your information”
- Behave (8) e.g. “don’t muck around like I did”
- Follow the teacher’s instructions (5) e.g. “Do your work and listen to the teacher and work hard”
- Take time to do the work (4) e.g. “Make sure it is neat and don’t rush it”

There was also some perceptive advice from individual students such as:

“I would tell them to write down all relevant information and look for interesting facts and always think of the reader of your work”, and “do it your own way to get information and use it, as everyone learns differently”.

Students’ advice to their near peers indicated a range of individual perspectives. An interesting issue, followed up in the interviews, was whether students believed in thinking about aspects such as working hard, being organised and not rushing their work in theory, but in practice, did not transfer what they had been taught in term 3 about
information literacy skills and the ways of thinking that accompany such skills.

4.5.10 Categories and sub-categories

Analysis of the student questionnaires and further analysis of the student diaries enabled the researcher to revise the categories and sub-categories, and Table 4.3 indicates the researcher’s view of categories and some of sub-categories and codes at this stage of the research.
<table>
<thead>
<tr>
<th>Potential Category</th>
<th>Sub-categories</th>
<th>Codes from which potential categories were identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking and making connections</td>
<td>➢ Valuing the links between mind mapping/question formulation with later stages;</td>
<td>Valuing question formulation as an aid to exploring the topic&lt;br&gt;Valuing mind maps in relation to selection for inclusion in the assignment&lt;br&gt;Valuing questions as an aid to thinking</td>
</tr>
<tr>
<td></td>
<td>➢ learning from experience e.g. of question formulation; thinking about the task holistically</td>
<td></td>
</tr>
<tr>
<td>Engaging with the topic</td>
<td>➢ being influenced by motivation; ➢ engaging because of understanding or ability;</td>
<td>Being engaged after developing the mind map&lt;br&gt;Being engaged after formulating questions&lt;br&gt;Being engaged through understanding&lt;br&gt;Engaging more with more information found&lt;br&gt;Valuing engagement with the topic</td>
</tr>
<tr>
<td></td>
<td>➢ engaging more when gaining information and confidence</td>
<td></td>
</tr>
<tr>
<td>Applying information literacy skills</td>
<td>➢ Thinking about information need; ➢ developing a search strategy; ➢ evaluating information sources; ➢ evaluating information within sources; ➢ note taking – being selective</td>
<td>Analysing the topic re information need&lt;br&gt;Valuing the use of keywords&lt;br&gt;Evaluating information on the website re quality of information and relevance to topic&lt;br&gt;Evaluating the ease of use of a website&lt;br&gt;Understanding the link between note taking and writing</td>
</tr>
<tr>
<td>Not valuing information literacy skills</td>
<td>➢ Not valuing brainstorming – time factor ➢ Not valuing the mind map as an aid to information retrieval ➢ Not valuing information gained – time factor</td>
<td>Not valuing brainstorming – seeing it as taking too much time&lt;br&gt;Not valuing a mind map – valuing going straight to information resources&lt;br&gt;Not valuing what was learned – focusing on time</td>
</tr>
<tr>
<td>Transfer – student views</td>
<td>➢ Predicting transfer&lt;br&gt; ➢ Valuing transfer&lt;br&gt; ➢ Not valuing transfer&lt;br&gt; ➢ Not understanding the concept of transfer&lt;br&gt; ➢ Advising other students</td>
<td>Predicting transfer in terms of using a mind map&lt;br&gt;Seeing value in transfer&lt;br&gt;Not understanding the concept of transfer&lt;br&gt;Encouraging other students to transfer</td>
</tr>
</tbody>
</table>

Table 4.3: Potential categories from student questionnaires and revision of student diary coding
4.5.11 Summary

The student questionnaires provided the researcher with the opportunity to examine student views, attitudes and actions after the completion of their Term four assignment. The questionnaire data built upon the diary data, and allowed the researcher to examine whether students had built upon the information literacy skills they had been taught in Term three. In particular, it allowed the researcher to see whether students had transferred skills and techniques from Term three. It also allowed the researcher to identify issues which were not clear from the student questionnaires.

The student questionnaires proved to be a valuable source of information for the researcher in that they:

- Confirmed some of what students wrote in the diaries
- Contradicted some of what students wrote in the diaries
- Confirmed some potential categories and sub-categories
- Revealed new potential categories
- Provided the researcher with areas on which to focus in the interviews

4.6 Student interviews

Interviews were carried out in each school with two groups of students and with four individual students. The students were selected by the teacher on the basis of availability and willingness to participate. The teachers attempted to have a range of abilities – as they perceived them –
in each group, but this was not always possible as the least articulate
students in each school were unwilling to take part in the interviews.
Individual interviewees were also selected by the teacher, in consultation
with the researcher, and were selected on the basis of availability and
willingness to participate.

The researcher drew up a list of questions to be posed to students in
groups and individually in the three schools. These were discussed with
supervisors, and then piloted in School B with two students who were
not in the class being studied. The list of questions for the group and
individual interviews can be found in Appendix Five. This section
presents an analysis of the group interviews with students, and individual
interviews with students. It is organised by the topic areas of the
questions, with group interview results presented first, and any
differences or additions that occurred in the individual interviews
presented second. The topic areas to be analysed are:

- Sharing information - brainstorming
- Mind mapping and question formulation
- Student confidence
- Finding relevant information
- Writing the assignment
- Aspects of transfer
- Advice to future students
4.6.1 Sharing information – brainstorming

The intention here was to elicit students’ views on the benefits of sharing information and whether they saw that as important. The initial question was related to brainstorming and how students might have shared information during these sessions. It was interesting, however, that four out of the six groups of students – without prompting from the researcher – returned to the topic of sharing information when they were asked what they talked to other students about.

There was agreement amongst students that brainstorming did encourage the sharing of information, and particularly in areas such as prior knowledge (“We talked about all the stuff that we knew already”), including sources of prior knowledge (“I’d seen some of that in books and on TV and in museums and that, sometimes”). Students also discussed areas of their topic (“we talked about the Lady of the Manor and what she does and stuff like that”), gaps in their individual knowledge (“I gave [student’s name] stuff that he didn’t know and he gave me stuff that I didn’t know”). A student in school A summed up the feelings of students about the benefits of brainstorming, stating “I think it’s a good idea to share information because you get more information for your assignment, and it’s sort of working as a team”. Some groups of students referred to the Term four assignment where they were not asked to do brainstorming by the teacher, and there was disagreement amongst students about this. In school B, one group of students stated that they would have liked to have done brainstorming (“It would have been good to do brainstorming for the Japanese”), while
another group disagreed (“It wouldn’t have been good to brainstorm for the Japanese assignment – not really because we’re all doing different subjects”).

Students – both individually and in groups – saw brainstorming as a source of sharing information and this sharing was valued by students. When students were asked later in the interviews about what they talked to other students about, there was less conviction about the desirability of sharing information generally, and students made clear distinctions between sharing with all other students and sharing with selected students. The following dialogue amongst a group in School A illustrates this point.

[First student] In our group, we tried to share what we found most of the time but not always. It’s good to share but only sometimes. [Second student] Yeah only sometimes. [Third student] Yeah that’s right because some people might copy yours even if they only got a little bit. [First student] Yes – they might copy the whole thing so you have to be careful. [Second student] Yeah – I wouldn’t want anyone to copy all that I found because I did the work. So it’s no good if we get all the information and they just copy it

Some of the individual interviewees were more relaxed about sharing information, and a School C student commented “So, as long as they didn’t copy what I’d done altogether, I don’t mind sharing my information”. Students generally agreed that sharing information was a positive aspect of doing assignments, but that there were limits to the extent of sharing.
4.6.2 Mind mapping and question formulation

In the interviews, students were very positive about their use of mind maps and questions, both in groups and individually, and the interviews closely reflected what students had indicated in their questionnaires. Students at this stage of the interview were asked about how they had used mind maps and questions, and whether they thought these tools might be of use. They were not asked, at this stage, whether they had applied these tools in Term four, having been required to use them in Term three. The interviews then reflected students’ views on mind maps and question formulation, but not necessarily their practice.

Students identified the value of mind maps in relation to finding information. A School C student commented “Well, it [mind map] helps if you put a keyword down and you go to the library and you find it out in a book or in the internet and you just write it down”. Another benefit identified more clearly in the interviews than in the diaries or questionnaires, was the ability to check what had been done, and several students commented on this. A school B student stated “It helps you to be organised, so you can work through one, then another one” Students also pointed to the use of the mind map later in the assignment process, e.g. “Before I wrote my history assignment, I went back to my mind map to check that I’d got what I needed and that I’d got enough stuff there” (School C student).

One student in School B had a very individual approach to developing his mind map, stating:
In my mind map, I had 4 tyrants and I set up 4 questions that I would ask of each of them. So for each question, I would give them a score out of 10 from worst to best. It was more definite than words – even if I did use words, I would still try to work out which ones were better than others. It’s probably because I have like a kind of mathematical mind, you know, I like to do things that way. I know it’s my way – I don’t know about other people. It displays your ideas and you have your information in one place and it organises it into categories and like, when you go to use Google, you can take the words and ideas from it.

This very articulate student also summed up some of the value of mind mapping identified by other students.

In two of the School C groups and in one of the School B groups, there was one student who was either unable to articulate what s/he thought about mind maps or did not understand the possible uses of a mind map. These students commented either “I don’t know” or “I’m not sure”. Thus not all students are able to see benefits from mind maps.

There was a similar response in relation to question formulation with value seen in relation to gaps in knowledge (“You can write down questions about what you don’t know, so you can put that into your project”); the Term four assignment (“You had to ask yourself about how people would survive and what kind of houses they’d need on the planet. So you had to ask yourself [student emphasis] these questions”); information retrieval (“The questions are good because then you know what to look for, and you can go back to the questions when you’ve looked up information and see if you need more information or sometimes you get new questions to ask”). As was the case with the questionnaires, some students preferred mental questions, and one School B student commented “Writing questions is OK and it can be
like, similar to a mind map but I prefer to have questions in my head, like, to go along with my mind map”. For a school A student, question formulation was an important new strategy, stating “Questions I think is the best thing to do for an assignment. I’ve never used questions before because in primary school. The teachers gave us questions and we had to write down the answers. So it’s good to have your own questions”. The students referred to above who appeared to lack understanding about mind maps, gave similar responses in relation to questions and, for example, one School C student stated “I don’t know what you mean”.

The results show that most of the students interviewed saw value in using mind maps and questions, and this reflected the questionnaire data. There was also evidence of a lack of understanding on the part of some students.

4.6.3 Student confidence

In the interviews, the researcher wished to follow up on issues relating to student confidence which had emerged following analysis of the student diaries. Most students had expressed feelings of being at least fairly confident when completing the Term three assignment, and the researcher wished to explore this issue now that students had completed their Term four assignment. Students were initially asked – in groups and individually – about their own confidence. After the interviews in School A, where in both groups, two of the individual students talked about other students, with no prompting from the researcher, students in the
two other schools were asked to comment on their own confidence and that of other students.

In some respects, the results from the interviews on confidence echoed the results of the diaries, with most students claiming to be fairly confident, but more reservations were expressed in the interviews. Most students stated that they were confident but not always at the start of the assignment. A School A student summed up the feelings of many students interviewed, stating:

Ahm – well, when you start an assignment, you don’t know very much about it and maybe you’re not that confident, but when you write all the questions and get all the information and stuff, you get a little bit more confident because then you actually know some stuff about it and that makes you feel more confident.

Other students stated that confidence depended on the extent to which they were interested in their subject, and a School B student summed this up, stating:

Depending on the subject – if it’s something that I like, like history, I feel pretty confident but if it’s mathematics or something, then I usually get a bit… yeah, not as confident. It’s also if you know a lot about the subject – that makes you more confident.

Those students who expressed doubts about their confidence gave some reasons for not feeling confident at the start of a project, e.g. “I was a bit nervous. I thought ‘Oh what if I can’t get it finished in time’ or could I get the right information?” (School C student).

Students had a range of views on other students in their class and, while most acknowledged that many students were quite confident, almost all students referred to students whom they thought lacked confidence.
Examples of references to students lacking confidence included from group 2 in School C:

[First student] Yeah – some students are not confident – yeah, because they don’t know enough about the subject. [Second student interrupts] Or they’re too busy mucking around and aren’t interested. [Third student] – It’s mixed. Some are confident and interested but others can’t be bothered or they’re not sure if they can do it or not.

Students’ views on the motivation (or otherwise) of other students was also referred to later in the interviews, and is discussed below. The findings relating to confidence reflected previously stated views by students, but views of other students’ confidence were an added bonus to the research.

4.6.4 Finding relevant information

For most of the students interviewed, finding information for their assignment was not a problem, and most agreed that finding relevant information was also mostly unproblematic, although students pointed out that information retrieval could often take more time than they anticipated. Students were asked to explain how they found the information and ideas they needed for their assignments when using books and websites.

In terms of searching for information, students mainly referred to searching within books, but searching for and within websites. Despite the claims in the questionnaires about the use of the library catalogue, none of the students interviewed referred to the OPAC, but it may be possible that these students were not a representative sample of OPAC users. In all three schools, students referred to using keywords, both to
search for information in books, (“Well, in books, you think about what you want to find and you use your keywords - you go like to the index” School A). Students stated that they used keywords when searching for information, and almost all students who cited a search engine, named Google although one student cited Dogpile. The students interviewed mostly appeared to be aware of the importance of searching under more than one keyword e.g.:

[First student] If you only put in one word, it’s not really a good idea as it might not come up with the right information or the right websites. If you only put in tyrants – well, anything can come up because it’s all around the world. [Second student] You need to put in more than one word if you really want to get good results. (School C).

The less articulate students in the School C groups tended to use a one word approach e.g. “You just put your topic into Google and that’s all you need”.

The students interviewed were mostly articulate about evaluating websites, and students in School A were particularly aware of a range of website evaluation criteria – more than students in the other 2 schools. Students cited aspects such as reliability (“You also have to think about if you can trust the information and maybe check it with other websites you look at” School A); and language level (“A couple of websites were really useful but some were a bit – too much writing and that – I think they were written for older people than me” School A).

Students also discussed their strategies for identifying relevant information in a website and, in particular, skimming and scanning skills – although the students tended to use these terms interchangeably. A
School C student explained “You read through it and think about whether it’s got to do with your questions – because sometimes it looks like it will be good, but then it turns out to be something different”.

The students interviewed appeared to have improved their searching techniques from the time when they had filled in the diaries – three months earlier - and from the examples provided by the students, it was clear that most of these students took a thoughtful approach to information retrieval, but whether this evidence implies a general improvement across the classes is open to question.

4.6.5 Writing the assignment

Students were asked to explain how they took notes and what form their notes took. Students were then asked to discuss how they selected what to put into their assignment. The intention here was to identify the range of note taking styles, and also to explore the extent to which students could connect with earlier stages of their assignment, such as mind mapping and question formulation.

Students’ responses to the question about the form of their notes reflected what they had written in their diaries and questionnaires mainly. Thus students used different styles such as headings and bullet points (“Just the headings – what the different notes are about, like accommodation and you know, the planet itself and the rings. So I just note down pieces of information under the headings” School B). Other students were less structured and a School B student commented “Oh – all over the place. I write things down when I find them and sort it out later. I can understand
them but I don’t know if anyone else would”. Students differed in their opinions of using cutting and pasting, with some students stating that they would cut and paste and rephrase later (“I copy and paste most of the time when I use a website and then it goes in my own words” School C). Two students from school B were adamant about not cutting and pasting as this might constitute plagiarism, and one student commented “Well, cutting and pasting might be illegal, like plagiarism, and I find it easier if I put it in my own words – and I can edit that”. It was not clear from the interviews how the students who cut and pasted put the information into their own words, but it was clear from the one School C student who commented on this (“I just copy the little sentences and type in between the words to change them and put them in my own words”), that plagiarism may not have been adequately understood.

The responses of students when asked about how they decided what to include in their assignments focused on a range of issues. In terms of the methods used by students to select what to include or exclude, some students mentioned using highlighters or red pens to identify key information, while others noted either ticking some notes or scoring out others. Students also stated that they used both written and mental notes, and one School B student stated “I organise my notes around activities and facts and information but I do this in my head, I don’t write down anything extra on my notes. It’s in my head.”

Most students emphasised including what was seen as important, i.e. that related to their topic. One school A student stated “You look at the information you’ve got and you have to think about what fits with your
topic”, and another in the group added “Yeah – what the teacher wants”. Some students stressed that making their assignment interesting and taking the reader into account was important, and a School B student commented “I decide what I think might be the most important stuff to use, and most enjoyable for other people to read and that”. Most students were aware of the need to be selective, and this was illustrated by one School C student who commented “So I leave out the ones that are less important – you can’t put everything in and you can run out of space”.

Of the students interviewed, about one third referred to using their mind map or questions in order to decide what to include in their assignment, and comments included: “it’s like what’s on your mind map – right? And you use that and that helps you look at your notes, do you know what I mean?”.

A small minority of students interviewed appeared to have less understanding of organising notes or being selective. As noted above, these students were much less articulate than their fellow students. One student stated “I just put in what I’ve cut and pasted” (School C) and another stated “You just put in what you’ve got” (School B).

Overall, students appeared to have a good understanding of being selective in terms of relevance to their topic, and in thinking about the structure of their assignment in relation to their notes. In terms of students making connections between the skills and techniques that they used, it might have been expected that more students would have made reference to the mind map at this part of the interview.
4.6.6 Aspects of transfer

Students were asked what they had learned about doing assignments in year seven, and whether they were likely to transfer the skills and ways of thinking about their assignment into year eight. Students were then asked whether their year eight teachers should *remind* them about skills such as mind mapping and question formulation, or whether the teachers should *insist* on them using such skills. The intention was to test the extent to which students were likely to independently transfer skills.

Students’ responses to what they learned about doing assignments in year seven were varied. More than half of the students pointed to the fact they had learned new skills such as mind mapping and question formulation e.g. “Yeah – we learned lots. Like doing mind maps. We did mind maps because the teacher told us to. We never thought of it and like, write sentences, write questions out. We’ve never written out questions before” (School A).

Students in all three schools referred back to their primary school experiences to illustrate what they had learned, and a School C student stated “You have to do most of your assignments here in school whereas like in year six [primary school], you could do them at home and get your mum to help you. So you’re more independent in high school”.

Students also identified improvement in the way they approached their assignment tasks, and one School A student argued that “You’ve got to learn to be prepared to delve quite deep for your information and you’ve got to learn to really show enthusiasm for your work, otherwise you’re
not really looked upon as being promising”. Two or more students in
each school referred to an improvement in the organisation of their work,
and this is illustrated by a School A student who comment “like how we
put it all together now and organise it. In primary school, we just used to
write it out any old way but now it’s more organised”.

Cognitive aspects such as thinking more about their approach to
assignments, and affective aspects such as having more confidence, also
featured in student responses. A School B student argued that “I like
doing the mind maps. They help you to do well and they make you
actually more confident with your assignment and because you know a
bit more with your mind map”.

Not all students claimed to have learned about improving their
assignment work. Responses from some of the students who appeared to
lack understanding of what was being asked, tended to be short, such as
“I didn’t learn much” (School A) and “I’m not sure” (School C).

Students were then asked about whether teachers in year eight should
remind them of the information literacy skills they had been taught in
year seven, or whether teachers should insist on them using, for example,
mind maps and/or questions. Students were asked to comment as a group
or individually, but students in School A, where the first interviews took
place, without prompting, also talked about other students in the class,
and the researcher added this aspect to the questions asked in Schools B
and C.
Most students were confident that they would transfer skills such as mind mapping, question formulation, effective searching and writing a structured assignment, and comments included: “No – they don’t need to remind me because when I do another assignment, I’ll just remember back to here, and I’ll do what we were taught his time” (School A). On the other hand, none of the students interviewed were confident that some other students in the class would transfer the skills, without being either reminded or being told what to do. Opinions differed but most students argued that some students in their class would only use these skills if told to do so. Students who favoured reminding students made comments such as “I think it would be good to get a reminder. I don’t think the teachers should tell us that we must have a mind map or questions. We should have a choice” (School B). Comments from those arguing that some students would not transfer skills and therefore needed to be told, were varied and included:

Some people – mainly boys – they just want to get into the work right away, so they rush into it. So it would better for them to be told by the teacher to have a mind map – to slow them down.

As with the question on what they had learned about assignments in year seven, some students found the concept of transfer difficult, and appeared not to understand what was being asked about what teachers might do. Two of the students in group two in School B appeared puzzled, and stated that it was the teacher’s choice about reminding or telling students. In group one in School C, a student stated “I’m not sure what you mean here” and was helped out by the other students.
When interviewed about aspects of transfer, students clearly distinguished between what they thought they would do as individuals, and how teachers might remind them of information literacy skills, and between other students in the class, some of whom were seen as unlikely to engage in transfer, and who would need to be told to use the information literacy skills in year eight. It is not clear whether other students in the classes, if interviewed, might have a different view of themselves or indeed, of the students who were interviewed. However, the consistent responses of the students who were interviewed suggest that transfer appeared to be unlikely, at least for a proportion of the students in each class.

4.6.7 Advice to future students

Students were asked to comment about what the following year seven needed to be taught about using books and websites – a more specific question than that posed in the questionnaire. The responses showed that most students were capable of linking aspects such as mind mapping and question formulation to the use of books and websites, while other students either made general comments about using resources or gave vague answers.

A common recommendation for the following year seven was to be organised, and students in each school used this word in their responses. Comments included: “Teachers should tell the students how to get organised with their information and like, how to go about assignments – like mind maps – how to do a mind map and how to use it for getting the
right information” (School C). Being organised was often linked to using a mind map or questions, information retrieval and note taking, and this was illustrated by a School C student who commented “I reckon they should tell them to use their mind map, and write down questions, then get as much information as they can and read it and then make as many dot points as they can”.

Another common word used by the students was ‘keywords’, particularly in the context of searching within books or websites, and sometimes linked to the mind map or questions. Comments included: “Some students just waste time when they’re on the internet, they just look for anything and they don’t use keywords – but it’s important that they learn to do this”. This point was allied to other comments on effective searching, with students emphasising that the following year seven should be aware of not spending too much time on web searching. For example, a School C student commented:

If you’re on the internet, you can get sidetracked with a lot of other stuff. So they need to stick to their task – and not waste time searching for anything – but search for what they need, like use their keywords.

The student from School B referred to above as emphasising how he had developed his own model of doing assignment, recommended that all students be encouraged to do this and commented:

Students should learn how to build up their own strategies and learn how to write down the important information and stuff. I think that the mind map would be the ideal one for the teachers to tell students about because most students can use that and improve their assignments.
While the advice given to the following year seven was similar to that in the questionnaires, in the interviews, students were more explicit about the importance of their successors being taught not only to search for information effectively using search engines, but also to search effectively within the resources. Students also articulated the importance of linking the mind map to effective searching.

4.6.8 Summary

For the researcher, the student interviews provided an opportunity to explore students’ views, attitudes and actions in more depth, and also to ask students about aspects of the diary and questionnaire data which was open to interpretation. While students in some areas confirmed what had been written in the diaries and questionnaires, in most areas, students added insights to what had been written. In particular, students revealed opinions about other students and about teachers that they had not done before. The student interview data also allowed the researcher to revise and add to the potential categories which had been developed, and to arrive at a more definitive list of categories and sub-categories.

4.7 Development of categories

Following the analysis of the data from the interviews in Phase 1, the researcher reviewed the existing potential categories (as seen in Tables 4.1-4.3 above) by revisiting the data, and coding from the teacher and teacher librarian interviews, the student diaries, student questionnaires and student interviews. The detailed analysis of coding and potential categories continued until the researcher developed no new categories.
from the data. In discussions with supervisors, the researcher produced
draft diagrams of categories and sub-categories, and then developed
Table 4.4 below, which identifies two major categories – valuing
information literacy skills and culture of transfer. In Table 4.4, each
major category is split into subcategories and for each subcategory, a list
of facets and example codes is provided. It was on Table 4.4 that the
phase 2 interviews with students and teachers were based. Table 4.4.
shows that the two major categories consisted of:

Valuing information literacy skills: Thinking and making connections;
Being engaged; Using information literacy skills and techniques;
Awareness of the information environment; Aspects of information
literacy demonstrated by students; and Not valuing/not understanding
information literacy concepts, skills and techniques

Culture of transfer: Students’ beliefs about transfer; Evidence of transfer
– students; and Teachers’ beliefs about transfer

The two categories are unpacked in Table 4.4. below.

The following chapter focuses on phase 2 in which the researcher
engaged in theoretical sampling (Charmaz 2006) and the approach to
theoretical sampling is explained at the start of the next chapter.
Table 4.4 Major category 1: Valuing information literacy skills – categories 1-4

<table>
<thead>
<tr>
<th>Category</th>
<th>Facets (and example codes) include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Thinking and making connections</td>
<td>Defining need (Discussing the topic)</td>
</tr>
<tr>
<td></td>
<td>Reflecting on existing knowledge (Being aware of prior learning)</td>
</tr>
<tr>
<td></td>
<td>valuing the links between mind mapping/questions formulation with later stages (Valuing learning about mind maps and questions)</td>
</tr>
<tr>
<td></td>
<td>linking mind map to decisions on inclusion/rejection (Valuing mind maps in relation to selection for inclusion in the assignment)</td>
</tr>
<tr>
<td></td>
<td>thinking about the task holistically (Valuing questions as an aid to thinking)</td>
</tr>
<tr>
<td>2) Being engaged</td>
<td>influenced by their independence of thought (Acknowledging his own way of thinking)</td>
</tr>
<tr>
<td></td>
<td>influenced by motivation (Viewing confidence as dependent on motivation or interest)</td>
</tr>
<tr>
<td></td>
<td>influenced by understanding or ability (Relating subject understanding to use of information literacy skills)</td>
</tr>
<tr>
<td></td>
<td>influenced by prior knowledge (Discussing prior knowledge and recent learning)</td>
</tr>
<tr>
<td></td>
<td>influenced by gaining information and confidence (Relating confidence to finding information and ideas)</td>
</tr>
<tr>
<td></td>
<td>influenced by effective use of their information environment (Being aware of a range of information sources)</td>
</tr>
<tr>
<td>3) Using IL skills and techniques</td>
<td>Thinking about information need (Discussing the topic and sharing information about it)</td>
</tr>
<tr>
<td></td>
<td>developing a search strategy (Recognising the importance of teaching year seven how to think about searching for information)</td>
</tr>
<tr>
<td></td>
<td>evaluating information sources (Evaluating the content of sites and selecting the relevant sites)</td>
</tr>
<tr>
<td></td>
<td>evaluating information within sources (Evaluating information on the website regarding quality of information and relevance to topic)</td>
</tr>
<tr>
<td></td>
<td>note taking – being selective and avoiding plagiarism (Being aware of relevance and using his own words)</td>
</tr>
<tr>
<td></td>
<td>selecting/rejecting information and ideas for the written assignment (Understanding the link between note taking and writing)</td>
</tr>
<tr>
<td></td>
<td>reflecting on recommended strategies (Evaluating the use of question formulation)</td>
</tr>
<tr>
<td></td>
<td>reflecting on individual strategies (Viewing mental mind mapping as a personal strategy)</td>
</tr>
<tr>
<td>4) Awareness of the information environment</td>
<td>prior knowledge or learning (Being aware of other sources of prior learning)</td>
</tr>
<tr>
<td></td>
<td>memory e.g. mental maps (self-created) (being aware of the value of the mental mind map)</td>
</tr>
<tr>
<td></td>
<td>information retrieval tools e.g. OPAC, search engine (Using the OPAC to find information)</td>
</tr>
<tr>
<td></td>
<td>teachers and TLs; other students (Sharing information with other students)</td>
</tr>
<tr>
<td></td>
<td>books and web (Advising future students to use indexes in books and advanced search in Google)</td>
</tr>
<tr>
<td></td>
<td>mind maps and questions – self-created (Valuing the written mind map as an individual resource)</td>
</tr>
<tr>
<td></td>
<td>student notes – self created (Being aware of notes as an information resource)</td>
</tr>
<tr>
<td></td>
<td>teacher’s specification (Using the specification as a guide to writing)</td>
</tr>
</tbody>
</table>
Table 4.4 Major category 1: Valuing information literacy skills – categories 5 and 6

<table>
<thead>
<tr>
<th>5) Aspects of information literacy demonstrated by students. Facets (and example codes) include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Engaging actively and positively in brainstorming (Valuing brainstorming as a learning experience)</td>
</tr>
<tr>
<td>➢ Thinking about the value and use of a mind map and questions (Viewing the mind map and questions as a basis of knowing what to write)</td>
</tr>
<tr>
<td>➢ Teachers acknowledging the need to teach information retrieval and evaluation (Recognising the importance of teaching year seven how to think about searching for information and evaluate what they find)</td>
</tr>
<tr>
<td>➢ Thinking about the value of effective searching (Seeing the value in learning how do searching more effectively)</td>
</tr>
<tr>
<td>➢ Reflecting on one’s own individual model of being information literate (Learning about how to think about his own style)</td>
</tr>
<tr>
<td>6) Not valuing/ not understanding information literacy concepts, skills and techniques. Facets include:</td>
</tr>
<tr>
<td>➢ Not valuing brainstorming as an information literacy tool (Not valuing brainstorming – seeing it as a taking up too much time)</td>
</tr>
<tr>
<td>➢ Not using information literacy tools unless told to do so (Not valuing teachers instructing students to have a mind map or questions)</td>
</tr>
<tr>
<td>➢ Not understanding the potential use of a mind map (Not valuing the future use of mind maps)</td>
</tr>
<tr>
<td>➢ Not valuing question formulation as a precursor to information retrieval (Not understanding the purpose of questions)</td>
</tr>
<tr>
<td>➢ Not valuing information retrieval or information evaluation (Not understanding the reasons for information evaluation (Not understanding the concept of evaluating information)</td>
</tr>
<tr>
<td>➢ Lacking the ability to effectively judge criteria for inclusion in the written assignment (Lacking judgment on inclusion or rejection</td>
</tr>
</tbody>
</table>
1) Students’ beliefs about transfer. Facets (and example codes) include:

- Motivation to transfer (Seeing the benefits of transfer in the future)
- Predicting transfer (Predicting transfer in terms of using a mind map)
- Valuing transfer (Seeing value in transfer)
- Not valuing transfer (Seeing no benefits in transfer)
- Not understanding the concept of transfer (Lacking understanding of transfer as a concept)
- Attitudes to other students re transfer (Viewing other students as needing to be told to use mind map or questions as they would not pay attention)
- Advising other students (Encouraging future students to transfer)
- Teachers and transfer (Seeing a need for constant reinforcement of transfer)

2) Evidence of transfer – students. Facets (and example codes) include:

- Thinking about transfer as a concept (Seeing value in transfer for all students)
- Mind map (Transferring mind mapping)
- Question formulation (Transferring written or mental question formulation)
- Searching/information retrieval (Transferring the use of keywords when using information resources)
- Note taking (Transferring notes in bullet point form)
- Selection/rejection of information/ideas (Transferring what was learned about rejection)
- Writing: structure/organisation (Transferring ideas about structure)
- Lack of transfer (Not transferring – compartmentalising assignments)

3) Teachers’ views of transfer. Facets (and example codes) include:

- Transfer as a difficult concept for year seven (Viewing transfer as a problematic concept for some year seven students)
- Transfer assumptions (Assuming note taking skills would be transferred from primary school)
- Need for reinforcement (Identifying a need for reinforcement by teachers)
- Transfer expectations to upper school (Expecting that students will transfer skills to later years in school)
- Other teachers and transfer (Lacking knowledge of what other teachers do re transfer)
- Lack of emphasis on transfer (Identifying the lack of a culture of transfer)

<table>
<thead>
<tr>
<th>Table 4.4 Major category 2: Culture of transfer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Students’ beliefs about transfer. Facets (and example codes) include:</td>
</tr>
<tr>
<td>2) Evidence of transfer – students. Facets (and example codes) include:</td>
</tr>
<tr>
<td>3) Teachers’ views of transfer. Facets (and example codes) include:</td>
</tr>
<tr>
<td>➢ Motivation to transfer (Seeing the benefits of transfer in the future)</td>
</tr>
<tr>
<td>➢ Predicting transfer (Predicting transfer in terms of using a mind map)</td>
</tr>
<tr>
<td>➢ Valuing transfer (Seeing value in transfer)</td>
</tr>
<tr>
<td>➢ Not valuing transfer (Seeing no benefits in transfer)</td>
</tr>
<tr>
<td>➢ Not understanding the concept of transfer (Lacking understanding of transfer as a concept)</td>
</tr>
<tr>
<td>➢ Attitudes to other students re transfer (Viewing other students as needing to be told to use mind map or questions as they would not pay attention)</td>
</tr>
<tr>
<td>➢ Advising other students (Encouraging future students to transfer)</td>
</tr>
<tr>
<td>➢ Teachers and transfer (Seeing a need for constant reinforcement of transfer)</td>
</tr>
<tr>
<td>➢ Thinking about transfer as a concept (Seeing value in transfer for all students)</td>
</tr>
<tr>
<td>➢ Mind map (Transferring mind mapping)</td>
</tr>
<tr>
<td>➢ Question formulation (Transferring written or mental question formulation)</td>
</tr>
<tr>
<td>➢ Searching/information retrieval (Transferring the use of keywords when using information resources)</td>
</tr>
<tr>
<td>➢ Note taking (Transferring notes in bullet point form)</td>
</tr>
<tr>
<td>➢ Selection/rejection of information/ideas (Transferring what was learned about rejection)</td>
</tr>
<tr>
<td>➢ Writing: structure/organisation (Transferring ideas about structure)</td>
</tr>
<tr>
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</tr>
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<tr>
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</tr>
<tr>
<td>➢ Other teachers and transfer (Lacking knowledge of what other teachers do re transfer)</td>
</tr>
<tr>
<td>➢ Lack of emphasis on transfer (Identifying the lack of a culture of transfer)</td>
</tr>
</tbody>
</table>
Chapter 5: Theoretical sampling

5.1 Introduction

Charmaz (2005, p.102) explained that “Theoretical sampling implies starting with data, constructing tentative ideas about the data, then examining these ideas through further empirical enquiry”. Having constructed the theoretical categories table seen at the end of the previous chapter, the researcher wished to engage in theoretical sampling by returning to the field i.e. the teachers and the students, in order to test the strength of the categories. In order to check the credibility of the theoretical categories, and to discover whether these categories might need revision or whether new categories might emerge, the researcher went back to the three schools and interviewed groups of teachers/teacher librarians and students. For these interviews, a new set of questions was developed. The interview questions for teachers can be seen in Appendix six and the questions for students in Appendix seven. The questions were related to the two main categories of Valuing Information Literacy Skills and Culture of Transfer. The questions sought to explore whether teachers and students would acknowledge the credibility of the theoretical categories or not, and whether the interviews might result in the revision of existing categories or the addition of new categories. For example, would teachers and students recognise the aspects of students valuing/not valuing information literacy skills as identified by the researcher?
On the visits to the schools, the researcher presented the teachers with table 4.4 on pages 230-232, and briefly outlined the findings of the first phase. The teachers were then asked the questions. The students were not shown the diagram as it was thought that it might be too complex for some students, and might make them less likely to discuss the issues. The researcher briefly outlined the findings at the start of the student interviews and expanded on questions where appropriate, in order to further explain the findings to the students.

This chapter presents an analysis of the interviews which were carried out in the three schools. The analysis of the teacher interviews are presented first, followed by the student interviews. When the theoretical sampling interviews took place, the students were in year 8.

5.2 Teacher interviews

The analysis of the teachers’ responses is presented under the following headings:

- Definitions of information literacy
- Making connections and engagement
- Information environment
- Not valuing information literacy
- Subject knowledge
- Transfer
These headings were formed from the questions posed to the teachers and, as outlined above, the questions derived from the theoretical categories developed by the researcher.

5.2.1 Definitions of information literacy

Teachers in each school were firstly asked to define information literacy in the context of their school. While there was a variety of responses to this question, most of the respondents saw information literacy in terms of skills, and particularly in terms of being able to search for information, use a variety of resources, find information within these sources and relate this to the task in which they were engaged. Comments included: “I would see it as the skills to be able to sort information, to look at where that information comes from, to locate it, to be able to make sense of it and to relate it to a task” (Teacher School B); “Skills and process. It’s the process of finding information and skills involved with each part of the process” (Teacher librarian School A); and “I think it’s research with different types of resources” (Teacher School C).

Only one teacher out of those interviewed argued that information literacy might be more than skills or techniques used in the school. This School B teacher argued that

I would consider it to be relating to whether a student can find what is relevant to their goals at the time – their short term goal and how they can acquire it, which includes a long term goal i.e. that it is something that they can apply in the future to other situations also, so that it becomes relevant to them immediately but also as a life skill.
One School C teacher’s definition referred to effective research and application to a problem, but also included “making connections” as part of information literacy. All three teacher librarians in the study had a similar, skills oriented view of information literacy.

5.2.2 Making connections and engagement

Teachers were asked whether they thought that their year seven students could make connections between different information literacy skills used when doing assignments. There was a unanimous response from the interviewees that not all students could make connections, and they differed only in the extent to which they believed a higher or lower percentage of students made connections. The teacher librarian in School B argued that “Most were middle of the road but there were a few at the top that did it naturally and it came through but the bulk of them needed support”, and this was confirmed by other interviewees. A teacher in School C stated that “A few make connections easily and want to do it. Some can’t and others, I’m afraid, can’t be bothered”. The teachers and teacher librarian all reflected this aspect of distinguishing between being able to make connections and being prepared to do so, although this was not strictly part of the question initially asked by the researcher. It was agreed in all groups that students might make connections, but only if they were reminded to do so.

The groups were then asked what might influence the extent to which students were engaged when reflecting on and using their information
literacy skills, although as can be seen from the previous paragraph, the teachers and teacher librarians had already touched on this aspect, and some followed up on what they had said previously. The respondents were almost equally split between those who thought that it was the teacher who had most influence on engagement, and those who thought that it was the students who had most influence. Those arguing that the teacher was the key element included a School B teacher who argued that:

And teacher expectations – if you make the teaching explicit – what you’re doing and why you’re doing it and if you’re a teacher that they understand is going to get them to do things that are different, then they’ll have a bit of a go.

Two teachers in School C argued that making assignments relevant and including differentiation was crucial to engagement, and one teacher commented “First of all, it’s got to be significant – whether they recognise that the thing they’re being asked to do or learn or construct has some real relevance to them all of them”.

Those arguing that it was the students themselves who were crucial to engagement included all three teacher librarians, and the School B teacher librarian stated “Those students who are curious and interested in information transfer will pick that up and the next students will follow – as maybe they don’t know what else to do or they find it easier – but it can engage them”. The teacher librarian in School A saw engagement as part of a wider scenario, arguing:

I think it’s a bit of a bigger picture that – if it’s not instantaneous and if they don’t get that gratification for it instantaneously,
they’re not entertained by it instantly, then what’s the point? So they see it as a waste of time.

This viewpoint was repeated by one of the School B teachers, who stated that students often saw techniques such as mind mapping as time consuming, as it got in the way of going straight to Google.

5.2.3 Information environment

The interviewees were asked about the extent to which they thought their year seven student were aware of their information environment. There were mixed views amongst the respondents, and most took the term “information environment” to mean print and electronic sources within the school. Two teachers, one from school B and one from School C, took a wider view. The school C teacher stated “I think students will – if you encourage them – think about where they get their information – for example from each other but otherwise, they have a restricted view and it’s often restricted to Google”. The School B teacher argued that students often think that books may be more difficult – and more academic – than websites, although this is mostly not the case and she stated:

A lot of students find books scary because basically they don’t read very well, but in fact, when they go on a screen, they read as effectively as they would on a page. It’s just what they associate books with.

Most of the interviewees discussed using books and the web in the library, or using the web in a school PC room or at home, but there was a consensus that students had a very narrow view of their information environment, unless they were introduced to wider elements. It was interesting that none of the teacher librarians mentioned the OPAC as
part of the information environment, and that few of these interviewees discussed other students or the teacher as part of the information environment. This may mean that most of the teachers and teacher librarians in the interview groups had a different view of what constitutes an information environment from that given by the researcher in his introduction to the interviews.

5.2.4 Not valuing information literacy

The groups were asked to comment on findings that some students did not value information literacy, either because they did not understand some of the concepts or they saw some skills or techniques as a hindrance. Some of the respondents had touched on this area earlier in the interviews, and repeated their views, but many expanded on what they had said. All the groups agreed that some students – a small minority in each class – struggled with some of the concepts underlying information literacy skills, and particularly reflecting on some of the skills they had been taught. The School B teacher librarian gave an example and stated:

But they’ve also got to learn that the information that is there may not be correct. Trying to instill that into them is very difficult and maybe that’s a skill or more abstract thinking for somebody at the age of 12 or 13 and they haven’t actually worked that out for themselves or perhaps they don’t have the mental skills to be able to say whether it’s fact or opinion.

A School B teacher concurred, stating that for some students, trying to understand that a concept map was more than just a group of keywords was very difficult, and argued “We tend to assume that they all understand this kind of thing – but they don’t”. A School C teacher
argued that in groups, students often showed a lack of understanding, but that “I work a lot with one on one students and I would disagree with that [lack of understanding], as I find that students understand more than you think – but they lack the motivation or the skills to show it”. When questioned by another member of the group, this teacher did agree that some students did not understand some concepts.

The groups also made more explicit comments about students not valuing information literacy, because they saw skills such as concept mapping and question formulation as an interference in the completion of their assignment. A School A teacher gave an example from his own teaching in science, stating:

> When they did the planets assignment, they didn’t have to do a mind map if they didn’t want to and some students I could see were writing questions, which I thought was good and that would substitute for the mind map but when I asked some of the rest of them about a mind map, they told me that it took too much time! I told them that it took no time at all but they were clearly in such a rush to get it out of the way, that they rejected the idea. I think it’s a cultural thing amongst some of them – everything has to be quick.

A School B teacher stated succinctly “They are very product oriented”, and the School B teacher librarian agreed, but argued “What’s ironic is when they are told to do some things – like writing out questions – most of them enjoy the challenge but they revert to type if they’re not told”.

There was agreement that some students did take on board aspects of information literacy such as mind mapping, and a School A teacher made this distinction “These students are challenged by what they’re doing i.e. the task, and I think they also see things like using a mind map as a guide
to structuring their assignment as a challenge also – but others clearly don’t”.

5.2.5 Subject knowledge

The groups were asked whether students who used their information literacy skills well were more likely to learn more from the sources they used, and there was agreement amongst all groups that this was the case. Two of the teacher librarians – from School A and B – were adamant that there was a correlation between high achievement in subject assignments and effective use of information literacy skills. The teacher librarian from School A commented:

Yes I think they definitely do because if they have better understanding of what they’re looking for and they appreciate that using their questions when they find the right information, they will understand that there’s a process there and they are more likely to understand and learn from what they find – and more likely to do well.

There was also agreement amongst teachers and a School B history teacher related this to her subject, commenting:

Certainly in history, because history is about sources and cross checking and referencing and using the evidence and several sources will give you the evidence. You don’t just rely on one piece of evidence. So to get the information that’s relevant to you, you need to put in the stuff that’s relevant to your historical question. So research is very important and so for my subject area, yes, they will learn more about their topic if they use their skills well.

A School C teacher argued that because so much information was now visual, students who could apply their information literacy skills, especially evaluative skills, were more likely to learn more from visual information sources about their topic, and she gave an example from the
visual arts, where visual interpretation was vital. Another School C teacher emphasised the application of evaluation skills, commenting “They’re more likely to learn if they think about what they find and if they find something that’s different to what they think or what their parents think or somebody else thinks”.

5.2.6 Transfer

The groups were asked to state what they understood by the concept of transfer, and all the respondents, with the exception of the teacher librarians in Schools A and C, stated that transfer related to both skills and to knowledge. A School B teacher defined transfer as “Being able to use a skill or a concept and bringing it across to another area” and her colleague expanded on this, arguing:

> When they first develop a skill and they’re able to apply it to other situations and bring with it what they learned the first time and the next time, so that they actually build up a broader knowledge bank and an understanding of how they can use that information to get new information and build on it.

The teacher librarian in School B suggested that transfer happened not only when students used a skill or knowledge in another situation, but when students were able to adapt what they had learned for a new situation.

The School A science teacher gave an example of where students might transfer knowledge across subjects, such as from physical education to science but also argued that a range of skills “and in particular research skills, like how to evaluate what you find on a website”, could be transferred to good effect. Two of the School C teachers argued that
transfer could be seen in a wider context, both within and outside school and one teacher commented:

I would understand it to mean the ability of the student to find what is learned or explored in one KLA [Key Learning Area] being relevant in another KLA and to make leaps and connections between concepts and processes that’s being taught in the KLA and then, applying that to situations in the real world.

The teacher librarians in Schools A and C both took transfer to apply to skills, and focused on what they expected students to have learned about information literacy skills. The teacher librarian in School A, who had an extensive programme of library based lessons based on teaching students to use an information skills model, expressed the view that, while transfer of skills was to be expected and hoped for, there was little evidence of actual transfer. She gave an example:

You know, we’re talking about keywords and they’re typing in whole questions into the search box and they’re not transferring that. We can still be out here underlining keywords and saying ‘right, when you go into the computer room, type in keywords’ and you go in there and they’ve got the whole question in – even from a short passage of time and space, they’re not doing that.

This teacher librarian had referred earlier to some students benefiting from using their information literacy skills, and was presumably not talking about all her students. It was clear that this was a source of frustration. The teacher librarian in School C, who did not have an information skills programme based in the library, but focused on one to one “instruction” (the term used) provided a similar viewpoint, indicating that few students appeared to transfer what had been taught. Neither teacher librarian gave a definition of transfer, but it was clear that they had a skills-based focus.
The interviewees were then asked whether they thought that there was a culture of transfer in the school. There were differences in the responses provided amongst the different groups in relation to the existence of a culture of transfer. The School A group were adamant that it did not exist, and the School B group thought that there might be elements of a transfer culture, but that this was implicit rather than explicit. The teachers in the School C group argued that, within two areas, history and English, there was some evidence of a culture of transfer but were unsure about the rest of the school.

The School B teachers and the teacher librarian were agreed that, while transfer was seen as beneficial – and perhaps expected in the school – there was no evidence of a culture of transfer. On this topic, there was an extended discussion, part of which included:

[First teacher, who is acting deputy principal] No. Categorically not! It’s very hard to look at. It’s something that the principal and I are trying so hard to look at, so that other members of staff could analyse each other’s curriculum and find cross curriculum content, cross curriculum skills. To actually provide some meaningful projects for our kids, so that they can study timelines in history at the same time as they are studying timelines in mathematics. It doesn’t happen. We all go our own way. [Second teacher] Yes – teachers believe in transfer but it’s not happening. [Teacher librarian] It’s talked about from time to time – usually at the start of the year? [First teacher] Here’s a case in point. We had a linkages meeting between HSIE [Human Society and Its Environment] teacher in the primary school and us. They started to talk about the topic areas and they were saying that they do arctic regions and ooh, we do arctic regions. [Second teacher] Clash! [First teacher] And it was like.. [Second teacher] You can’t do it .. [First teacher] So it was like why can’t we broaden it, why can’t we build on what’s already been done? Why can’t we build on this to this? But here is the topic and this is how we teach it and that’s how it’s always been taught. Now that comes from experienced staff and experienced staff need to talk to less experienced staff and both need to embrace the fact that the kids
coming from primary school bring on board a whole range of
different skills and we have to give them a few new ones.

In School A, the teacher librarian argued that, if there was a culture of
transfer in the school, there would be more evidence from the students.

One of the School A teachers argued that there might be aspects of a
culture of transfer, stating:

Going back to your question about a culture of transfer – transfer
in this school is something that’s more assumed than something
that we actually discuss. You become aware of things that you
notice that they’re bringing from other areas but I don’t go and
give feedback to other teachers.

A second School A teacher was less certain and argued that:

Yes, it’s something we talk about now and again – although not
for a while now, I think – and if you asked the teachers if it
[transfer] was a good thing, they’d all agree – and they might
even argue that it happened – but they’d have little evidence of it.
I don’t remember any real cross departmental discussion – maybe
on a one to one, perhaps.

The discussion in School C focused mainly on the two areas represented,
which were history and English. It was agreed that there was, as one
teacher explained “A feeling of sharing, cooperation maybe? Mm,
culture of transfer? I’m not sure”. The teacher librarian stated that there
was little evidence of transfer being discussed across the school, and that
it was not a topic discussed at staff meeting or during in-service days in
the school. Another School C teacher disagreed, stating:

The other thing is that there’s a focus on literacy in the school
which is across the school. So teachers across the board are
teaching literacy and there is an expectation that some transfer
will come out of this, especially in the area of reading i.e. that it’s
not just us English teachers who are encouraging the kids to read
as much as possible. But, yes, a lot of it is informal – there’s a
literacy strategy but I don’t think the word “transfer” is used very
much in that context.
It was clear from these group interviews with teachers and teacher librarians that all the participants were in favour of having a culture of transfer, if that was possible, but they agreed that, in reality, there was very little evidence that a culture of transfer existed in any of the three schools.

5.3 Student interviews

The analysis of the student interviews is presented under the following headings:

- Making connections
- Thinking about information retrieval
- Engaging students
- Creating information
- Valuing information literacy
- Transfer

The headings were formed from the interview questions which in turn were developed from the theoretical categories developed by the researcher. As was noted above, in each school, a group of four students was interviewed.

5.3.1 Making connections

Students were asked to comment on whether they thought that some students made connections between information literacy skills, and some students did not make these connections. In all three schools, the students were agreed that not all students made connections, and most students
distinguished between three groups of their fellow students – a) Students who did make connections, b) Students who did not make connections because they were not motivated to do so, and c) Students who did not make connections as they did not understand how the connections might be made. All of the students, with the exception of one student in School C, stated that they themselves did make connections, and while this might be expected in interviews such as this, it was clear to the researcher that these students clearly understood the concept of linking different information literacy skills and techniques, such as mind mapping and assignment structuring. The student in School C appeared to be confused about the meaning of making connections.

Students argued that some students in each class made connections and comments included: “Well, some students do but probably not all students” (School A), and “For some people, you’re like organised and you want to look back into it – like your mind map because you think it’s useful” (School C). A School B student argued that some students had their own methods, and did make connections, but might not choose to use what the teachers suggested, such as a mind map.

The students identified a group of other students in each class, who appeared to understand the potential benefits of making connections, but were unwilling to put this into practice. The School A group illustrated this point:

[First student] Yes, like, they just like see it as a piece of work but they don’t use it later on. They don’t make a connection. Other people probably would but not them. [Second student] Yeah, there’s some people in the class and they’re just like – they
just write it down and think that, well, at least they’ve got something there. [Third student] Yeah but there’s also some people that might just not want to do it or they might think that it’s a waste of time. [First student] Some of them can’t be bothered.

The other two groups took a similar view, and one School C student used a similar phrase as the first student above, stating “Some just can’t be bothered to make the connections.” Students gave opinions on why some students failed to make connections, and used words like “lazy” and “not interested” to describe some of their fellow students. A School B student stated “Some of them don’t care and they want everything made easy for them”.

The third group identified by the students was those who did not appear to understand the concept of making connections. The student in School C, who was the least responsive of all the students, appeared to fall into this category, and stated, in response to her fellow students, “Well, it is difficult sometimes, you know. Not everybody sees it as easy”. The other School C students implied that they did not mean to include that student in their categorisation of students who did not understand, but this appeared to be more out of politeness than conviction. One of the School C students argued that “Yeah, there are some students who just haven’t got it”, while a School B student stated “Some people just don’t understand – it just doesn’t click”.

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5.3.2 Thinking about information retrieval

The students argued that some of their fellow students were adept at thinking about information retrieval in order to get the most relevant information, and one School B student summed this up, stating:

Well, if you don’t think about it, you won’t get what you need, will you? Some students are really good at this and find it really easy to get the right information but sometimes it can be hard – but, like if you think about it and don’t rush it, you’ll get there.

All three groups argued that there were some students – there was no attempt to identify numbers of students – who did not approach information retrieval with sufficient thought or planning. This is illustrated by two School C students who discussed this:

[First student] Yeah, some do but there are some that just want to get it over and done with, so they don’t think about getting the best information. They just plagiarise and take stuff off the internet and write it into their assignments. [Second student] Yeah, I agree – they just take things from books and stuff and want to get it over and done with quickly. [First student] Yeah and get on with other things – like, not work. [Second student] Yeah, maybe some of them - they think about getting the best information but they don’t go through with it because they think it’s going to be harder.

Other students in the groups concurred with this view, and used phrases such as “they rush in”, or “they want to get it over quickly”, and agreed with the School C group above that this led to some students to selecting the first websites which appeared when they did a search.

5.3.3 Engaging students

Students were asked to comment on how they thought some students might become more interested in using the information literacy skills introduced to them in year seven. The students were agreed, perhaps
unsurprisingly, that it was the teachers' responsibility to engage students in using information literacy skills, and thinking about how to use these skills. There were two themes to the discussions, one of which focused on making some elements compulsory, and the School B students were most in favour of this, as this sequence illustrates:

[First student] I’d probably make them do a mind map because it isn’t always the best way but it’s better than just writing down the first things you find [Second student] And you’ve got things to come back to with the map and you can link everything up from the mind map. [Third student] A mind map would be a good idea. Also, you can write down notes in paragraphs under topic headings for each thing [First student] Yeah and write notes on each thing and then select the important bits. So I think making them do it would be a good idea [Second student] Mm – I reckon that’s right.

The second theme which emerged was related to teachers giving the students more interesting assignments. It was clear that the students interviewed saw this is as the key element in engaging students, and motivating them to use information literacy skills more effectively. The students implied that a more constructivist approach to assignments would engage students more, and this is illustrated by a School C student who stated “I think that if you had a subject and put more variety into it and find something that students like better. So you’re asking them to do something that they want to do”. This was echoed by a School A student who suggested “Students will be more interested in doing assignments on subjects that they are interested in. It should be easy for teachers to get to know what their students are interested in doing”, and the other students in the group agreed.
5.3.4 Creating information

Students were asked about whether they thought they created information in the school. Students from Schools A and C responded fairly briefly, stating that they did create new information in the form of their assignments, but they agreed that they did not think that their teachers valued their assignments as new information. One School A student commented “It’s just another assignment for them [the teachers] and I suppose it’s funny – it’s like some of our class thinking the same and not bothering”.

Students in School B were more expressive about this topic, and saw new information being created in different forms, as this sequence illustrates:

[First student] Sometimes I have like things that are in my mind and it’s the way I want to think about what I’m doing – that’s new. [Second student] Yeah, like a mind map in your head. [First student] Yeah, you get your notes and you go over them and then you put it all together. So your assignment is yours [Third student] Yeah, you created it and that’s new and no one else has written that [Second student] Yeah, teachers are trying to get us to do that – to create new information and they seem to like us doing that.

There were comments from students that some students in their class might be made more aware of this creativity by teachers, as they might respond more positively. The students interviewed agreed that they did not think that many students in their class saw the writing of assignments as creating new information.
5.3.5 Valuing information literacy

Students were asked about whether they thought students in their classes valued the information literacy skills they had been taught. Students generally agreed that there were differences in their classes, and that these differences tended to fall into the same categories as discussed above in relation to making connections. In School B, the discussion started off fairly negatively:

[First student] Like, some students are a bit lazy. [Second student] And I think that some students think that they are never going to use that information again, so they don’t follow it through – what the teachers want them to do, like thinking about the topic clearly. [First student] Yeah, they don’t think that it’ll be of any use later in life. [Second student] Yeah, they don’t think like that.

The third student in the group interrupted: “Yeah but some students do [student emphasis] explore more than what the teacher wants – like, you find it interesting, so you want [student emphasis] to find out more. You can get really involved in finding out more about it”. The other students agreed that this was the case. A similar discussion took place amongst the School A students, one of whom argued that valuing information literacy was a precursor to being interested in a topic, but she also stated that having an interesting topic could also be a precursor to valuing information literacy. In School C, two students referred to using the skills outside the school – as the School B student did above.
5.3.6 Transfer

Students were firstly asked what skills they had brought from Year seven into Year eight. In all three groups, students listed a number of skills, summed up by a School A student, who stated:

Well, you bring what you’ve learned about the subjects in like English and stuff but you also bring things like how to go about doing an assignment better, like finding better information or like, a mind map or questions and stuff. You learn to be more organised – well, I did anyway.

Some students were more specific, and one School B student referred to learning about how he developed his own individual approach to using information literacy skills, commenting: “The teachers gave us different ways to try and we just sorted it out for ourselves – the way that works better for us. So, yeah, we tried out the ways and if we like it, we’ll use it”. In School C, in particular, students argued that while they had brought a range of knowledge and skills from year seven to year eight, and recognised that they had done so, some students in their class did not reflect on what they might have brought from year seven.

The two School C students discussed this, and referred to wanting teachers to remind students of what they might have brought from year seven:

[First student] Teachers should remind some people about this. I think that sometimes, the teachers pay a bit more attention to the students that are actually going to take it in, rather than the ones that aren’t going to do anything. [Second student] Yeah, not the ones who muck about the whole lesson. [First student] Well, yeah, sometimes the teachers tell us what we might do and what we might use but don’t tell all the students why it might be good to do these things. You kind of work that out for yourself. [Second student] There are certain teachers that explain why but certain teachers who don’t.
Students were then asked how teachers might get more of their class to transfer the information literacy skills they had been taught. In Schools A and B, students gave the impression that they thought that teachers could take positive steps to achieve this. The students in School C were much more sceptical about teachers achieving this, particularly because of disruptions in the class. In School A, the students stressed that teachers did not remind students about the skills they had used in year seven, and one student commented “Like they could draw a mind map on the board and say ‘Remember you did this [mind mapping] in year seven in science’ if they’re doing science in year 8. But it doesn’t happen. The teachers don’t do it.” A second School A concurred, stating “So they need to say, in year seven for the planets you had questions, and you searched the internet, like properly telling them – like explaining it them again”. The students argued that, while teachers reminded students about subject knowledge, they did not remind students about information literacy skills, and this was summed up by the third School A student, who stated “So if you could do revision on what we’re talking about [information literacy skills], just like we get revision after we’ve done certain things in maths – so you could get revision after we’ve done an assignment.”

Students in School B focused on two issues – paying more attention to weaker students and making assignments more interesting. Two of the students emphasised the need for teachers to pay more attention to weaker students, thus reflecting some of the comments from School C above, and commented:
[First student] I think they should spend more time with the kids who don’t know how to do it and less time with the kids who do know how to do it. [Second student] Yeah - So pay more attention to these kids and give them different ways of trying things – like taking notes – so they can choose for themselves. [First student] That’s right. So the teachers can explain to them how to do it and explain to them where it’s going to take them now and later in life.

The third student argued that teachers need to think more about the assignments they gave to students, and that teachers should “offer more variety in the questions so that you can branch out into things that you like”. The other students agreed and the first student linked subject interest with information literacy skills, commenting “So more students will be interested in the subject and they’re like, more likely to pay attention to minds maps and stuff”, and this point was restated by one of the other students.

In School C, the students interviewed were much more sceptical about the ability of teachers to get more students to use their information literacy skills. The most articulate student in the group summed this up, stating:

Well, yeah, the teachers could make it more interesting, like getting us to choose our own topic and allowing some people to do more on what they already know about – that sort of stuff. The teachers don’t really remind us about what we’ve done before but you have to understand that a lot of people in our class can’t be bothered and the teachers have to spend a lot of time sorting out the ones who muck about – and pretend to act dumb in class because they think it’s funny.

When the students were asked if this applied to most students in the class, the group replied that it applied to perhaps half of the class, but that this affected the behaviour of others in the class. A second student commented “We come to school because we have to – and people know
this”. The previous student interrupted “Yeah, most of the kids, well, they get it [the assignment] done, get a mark and then you can do stuff with your friends. It’s only year seven after all”. When asked to explain what “It’s only year seven” meant, the two students continued:

[First student] We use years 7,8 and 9 for fun. [Second student] Yeah – because in year 10, then you have to study, to work hard. [First student] Yeah, from year 10, you have to put more effort in and that’s when you’ll use, you know, stuff like mind maps and questions. [Second student] Yeah, it’ll be like for real then, not like now.

This more sceptical view of how students view school life was not referred to by students in schools A and B.

5.3.7 Summary

The interviews carried out to check the credibility of the researcher’s theoretical categories showed that both school staff and students recognised the categories as relevant to their learning and teaching contexts. While no new categories emerged from the analysis of the Phase two interview data, there was a greater emphasis by students on identifying what they observed to be the behaviour and characteristics of some of their fellow students, than was the case in the Phase one interviews. There was agreement amongst teachers, teacher librarians and students, that some students lacked motivation to effectively use information literacy skills, while other students appeared to lack an understanding of the value of such skills.

In relation to transfer, there was little evidence of any school wide culture of transfer amongst teachers and teacher librarians, and students noted that transfer did not appear to be high on their teachers’ agenda.
There was evidence that some transfer did happen in relation to information literacy skills, but it was clear from both students and staff that only some students engaged in transfer across time and across subjects.

5.3.8 Conclusion

The Phase two interviews with teachers, teacher librarians and students thus reinforced the theoretical categories developed by the researcher from the Phase one data, and confirmed that the categories and sub-categories developed in Phase one were credible and relevant. It was also important that no new categories or sub-categories were identified from the interviews, as this would have necessitated a further review of the categories. The researcher reviewed the sub-categories of major category one – valuing information literacy skills – and refined the number of sub-categories. The data from Phase 2 indicated that the original sub-categories of ‘Using information literacy skills and techniques’, and ‘Aspects of information literacy demonstrated by students”, could be incorporated into other sub-categories. Table 5.1 shows the revised categories and sub-categories.

<table>
<thead>
<tr>
<th>Major category</th>
<th>Sub-categories</th>
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<tbody>
<tr>
<td>Valuing information literacy skills</td>
<td>Thinking and making connections</td>
</tr>
<tr>
<td></td>
<td>Being engaged</td>
</tr>
<tr>
<td></td>
<td>Awareness of the information environment</td>
</tr>
<tr>
<td></td>
<td>Not valuing/not understanding information literacy concepts, skills</td>
</tr>
</tbody>
</table>

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Table 5.1: Revised categories and sub-categories

<table>
<thead>
<tr>
<th>Culture of transfer</th>
<th>Students beliefs about transfer</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Evidence of transfer – students</td>
</tr>
<tr>
<td></td>
<td>Teachers’ views of transfer</td>
</tr>
</tbody>
</table>

The analysis of the data and the identification of major categories and sub-categories, form the basis of the grounded theory developed by the researcher, and this is outlined in the Discussion chapter which follows. The results from the teacher and teacher librarian interviews, the student diaries, questionnaires and interviews in Phase one, and the interviews completed in Phase two, raise many issues to be discussed in the next chapter, and the detailed analysis of the data, in this chapter and in the previous chapter, forms the basis for that discussion.
Chapter 6: Discussion: Conceptualisation of grounded theory

6.1 Introduction

This chapter will present the grounded theory developed by the researcher and will analyse how the theory was developed. Elements of the theory will be discussed, and related to the literature on information literacy in schools, higher education and the workplace, and to transfer. This chapter also presents the researcher’s claim to new knowledge i.e. what this study contributes to, and adds to, both researchers’ and practitioners’ knowledge in the areas of information literacy and transfer in the secondary school context. The grounded theory was developed by the researcher’s constructivist interpretation of the major and sub categories, which were formed from the data analysis (Chapter four) and the theoretical sampling (Chapter five). In this chapter, the researcher will firstly discuss the elements of each major category, and examine the implications thereof, and will also relate the present study to the existing literature on information literacy, and on transfer in schools. This will lead to a series of theoretical statements, and these statements will form the grounded theory. This will be followed by a discussion of the researcher’s claim to new knowledge.
6.2 Major category 1: Valuing information literacy skills

As was noted above, this major category was developed from the analysis of data in Phase one. The credibility of this category was confirmed in the Phase two theoretical sampling, and the sub-categories were revised following theoretical sampling. In this section, an overview of the category is presented, followed by a discussion of the sub-categories, and then the grounded theory which was developed in relation to this category.

6.2.1 Valuing information literacy skills: an overview

This category emerged from every source of data analysed by the researcher – the student diaries, student questionnaires, student interviews and from teacher and teacher librarian interviews – in Phases one and two of the study. The researcher defines “value” in this context as meaning that many students were able to recognise the significance and benefits of these skills, and that this was not merely a utilitarian approach on the students’ part. Students did recognise how they could use skills such as question formulation, information retrieval and note taking for a practical end i.e. producing an assignment. It would be possible for students to take this approach without necessarily seeing value in these skills. However, students saw value in information literacy skills in relation to how they thought about their approach not only to their assignment, but also to their own learning, and how they interpreted the use of such skills by other students. As will be seen below, students
also made interpretations about the non-use of such skills, and the lack of understanding of such skills, by some students in their class.

Those students who did value information literacy skills expressed their notions of value in a variety of ways. For example, when students cited what they had learned in year seven in the Phase two interviews, students in all three schools referred to the benefits they saw in being taught what they regarded as new skills. These students reflected on their primary school experiences, where for example, teachers provided them with assignment questions. The students expressed value in terms of the benefits to them in learning how to formulate their own questions, and some students indicated that question formulation had increased their confidence and motivation.

Students’ interpretation of value can also be seen in their statements on concept mapping. The students who valued concept mapping did so not only on the basis that a concept map might help them to find information – the utilitarian approach referred to by Limberg (2005) – but that it engaged them in thinking about the value of either a written concept map or a mental map. Some students commented in both the questionnaires and interviews that they had a preference for a mental map, as this suited their own approach to learning and this can be seen as students engaging in higher order thinking (Fitzgerald 1999, Moore 2002). These students distinguished between the strategy recommended by their teacher and teacher librarian – the written concept map – and their own personal strategy – the mental map.
The concept of value can also be seen in students’ views about prior learning. While most students acknowledged, in their diaries and questionnaires, that brainstorming had helped them to reflect on prior learning, and that they valued brainstorming for this reason, some students took this further. These students recognised that they could use prior learning as a basis for new learning, in particular when they used books and websites, as learning resources, whereas other students valued the reflection on prior learning in brainstorming mainly as the basis for defining their topic for their assignment.

Students also saw value in information literacy skills not only for themselves but also for other students in their class, and for future year seven students. When students were asked what they would encourage future year seven students to do, most students stated that future students should use the information literacy skills which they had been taught. When the data from the questionnaires and interviews was analysed, the researcher found that the students in the present study saw value for future students in relation to the future students’ learning, and not just in relation to assignment completion.

The views of teachers and teacher librarians confirmed the evidence from students that some students did value information literacy skills, and some of the staff linked value to both understanding and motivation to learn. The teachers and teacher librarians viewed the concept of value more in terms of how the students did or did not use the skills, rather than viewing value in the wider context of learning, as some students clearly did. Teachers and teacher librarians tended to discuss value from
a teacher-centred perspective, e.g. that students would value information literacy skills if teachers reminded them to use the skills.

This concept of students valuing information literacy skills appears to be missing from much of the literature on information literacy in schools. Kuhlthau’s (2004) research focuses on information seeking, and while there is an emphasis on the affective aspects of students’ actions, this is concentrated on the information seeking process itself and not on whether students valued information literacy skills. Harada’s (2002) study of upper elementary students (one year younger than students in this study) explored students’ comments on aspects of assignment completion, but focused on how students appeared to improve their understanding and application of information literacy skills. There is no consideration of the extent to which students valued the skills they were taught.

Barranoik’s (2001 and 2004) studies sought the views of students, and while there is evidence of students increasing their understanding of aspects of information literacy skills, there is no consideration of whether students valued the skills. Ryan and Hudson’s (2003) more extensive study of year seven students does provide evidence of students’ improvement in their understanding and application of skills such as brainstorming, location and selection of information but, as with Barranoik’s (2001 and 2004) studies, the extent to which students valued information literacy skills, in the same way as some students in the present study did, is not considered.
Theoretical statement 1: Some students value information literacy skills in terms of personal benefits and in relation to their own learning, as well as seeing a utilitarian value in these skills. These students value information literacy skills as they reflect on, make connection between, and use these skills effectively. Such students are engaged not only with subject learning but with the value they see in using information literacy skills. These students are keenly aware of their information environment which is not limited to digital and print resources.

Some of the elements of theoretical statement 1 are discussed below, where the 4 sub-categories of major category 1 are analysed from a theoretical perspective.

6.2.2 Thinking, making connections and using information literacy skills

In Chapter two above, it was suggested that information literacy in the school context may be seen as a reflective ability and as a practice. If some students are seen as more information literate than others, then one of the key criteria for identifying them as more information literate may be the extent to which these students engage in critical and reflective thinking. In this study, the evidence showed that most of the year seven students who participated were capable of thinking about why and how they used information literacy skills, at least to some extent. What was clear, particularly from student interviews, was that while most students were capable of thinking about information literacy skills, only a minority of students were likely to do so without prompting by the teacher or teacher librarian. The reasons for this appear to be complex. Some students were clearly engaged in critical thinking not only about what skills they practiced or how they used these skills, but why they used the skills. Students in this category reflected on the skills they could use in relation not just to an immediate assignment but to their own
personal approach to learning. Examples from the data include students who argued that question formulation was an aid to their own thinking about what information they needed to find – the utilitarian approach – but these students also argued that question formulation helped them to think about the parameters of their topic, what they needed to learn about their topic and how they might structure their arguments in their assignment – a personal, reflective approach. As will be seen below, these students were more likely to transfer skills.

The data from the student diaries, questionnaires and interviews showed that a second group of students were engaged in thinking about information literacy skills, but this engagement was often more pragmatic and less critical or reflective. Some students in this group, for example, saw benefits in the use of question formulation as an aid to information retrieval, which they viewed as the next step in the assignment process, but they had a limited view of further benefits of question formulation. Thus this utilitarian approach to information literacy skills meant that these students’ thinking was limited. There was also evidence that students in this group used a received practice approach to information literacy skills, i.e. they would use certain skills if told to do so by the teacher and/or teacher librarian, but were unlikely to use such skills in the future unless they were prompted to do so or told to do so. The data showed that some students had a particular view of the concept of needing to use skills, and the statement “I didn’t need to do a mind map” did not mean that they had no use for a concept map, but that they were not required to use a concept map by the teacher. This received
practice approach amongst students was commented on by the more critical and reflective students in the interviews, and also by the teachers and teacher librarians. There was also a view amongst the more critical and reflective students, and some of the teachers and teacher librarians, that this second group of students was capable of thinking more about their use of information literacy skills but that they lacked the motivation to do so. The implication of this, from the critical and reflective group of students’ point of view, was that more interesting assignments would encourage the second group of students to think more critically about their use of information literacy skills.

The third group of students – a small minority from the evidence of this study – was not engaged in critical or reflective thinking about information literacy skills, because it appeared that they lacked a clear understanding of the concepts which lay behind activities such as brainstorming, concept mapping or question formulation. This group of students lacked a fundamental understanding of why they should use information literacy skills, because they did not understand the skills per se. The responses of these students in the diaries and questionnaires were mostly very short, and often repeated the wording provided e.g. when asked what they liked about brainstorming, students responded only that they liked or did not like brainstorming. In the interviews, very few of this type of student agreed to participate, and those who did often seemed confused about the meaning of questions.

In the information literacy literature, aspects of thinking are widely discussed. As early as 1960, Henne (1960, p. 76) referred to the
desirability of teaching students to be “thinking people” and Davies (1969) argued that what were then called “study skills” should be classed as thinking skills. In the 1980s, Irving (1985, p.3), a key proponent of study skills, argued that information skills were “related to ways of thinking”. Moore (2002) argued that information literacy was a means of developing critical thinking skills amongst students. Research studies by Kuhlthau (2004), Barranoik (2004), Ryan and Hudson (2003) and Herring (2006) discuss aspects of students’ reflecting on the skills they use and the critical and reflective group of students referred to above fall into the same category as those students identified by Wolf (2003) who demonstrated metacognitive attributes. The present study takes a more focused view of the ways in which different groups of students think about and reflect on their actual or potential practice of information literacy skills, and this is not done in previous school based research studies. Some of the students in the present study take a metacognitive view of their use of information literacy skills in relation to their own learning. In the wider schools related literature, issues relating to metacognition in the school context were discussed by Zimmerman (1990), Keene and Zimmerman (1997), and Eva-Wood (2008) and Michalsky, Mevarech and Haibi (2009) focused on subject related issues of metacognition. In higher education, Marcum (2002) questions claims that information literacy includes critical thinking, and Bruce (2004) argues the case for developing students who are reflective about their own learning. In the workplace context, Lloyd (2006) emphasizes the
importance of people’s need to engage in thinking about their information environment.

One aspect of students’ use of information literacy skills that is not discussed directly in the literature is the ability of students to make connections between their use of different skills. This can be viewed in two ways. It can be seen in the ability of students to make connections e.g. between concept mapping and information retrieval, that is, a short term connection which may have been pointed out to students by the teacher and/or teacher librarian. In this case, students may be seen to make connections because they have been taught to do so. It can also be seen in the ability of some students to make longer term connections, e.g. between mind mapping and structuring the assignment, and viewing the assignment task holistically. Thus students are not merely following instructions, but are actively and critically reflecting on the potential use of different skills. These students can be seen as taking a proactive approach to their use of information literacy skills and to their own learning, as the evidence from the present study shows that they make unprompted connections between a range of skills. As discussed above, these students see value in making these connections. The students in this category also take a critical view of what skills they will select to use.

One of the findings of the present study is that students who take a proactive approach argued, in the interviews, that taking such an approach would benefit other students, who might then become more motivated and more interested in the assignment topics. The proactive
students added that other students might be unlikely to make longer term connections without prompting from the teachers and teacher librarians. As with aspects of critical and reflective thinking discussed above, the group of students who did not understand the concepts behind information literacy skills, appeared unable not only to make connections between different skills, but also appeared unable to understand why these connections might be made. Thus while more active teaching in relation to making connections may improve the performance of the more passive group of students, teachers and teacher librarians appear to face a more difficult task in developing an understanding of making connections amongst the third group of students.

The final element of this subcategory relates to students’ use of information literacy skills. It has been noted that most students in this study showed themselves capable of using a range of information literacy skills, when they were prompted or told to do so by the teacher and/or teacher librarian. Most students could also see value in using these skills and most students recommended that future year seven students make constructive use of the skills. Similar views of students’ use of information literacy skills are seen in the research studies of Kuhlthau (2004), Barranoik (2004), Ryan and Hudson (2003) and Herring (2006). What also emerged from the present study, but is not focused upon in the above studies, was that some students were adapting what they had been taught to their own learning styles, and this was particularly the case in relation to concept mapping and question formulation. All students had been encouraged to physically draw up a
concept map, and to write down questions for their term three assignment, but in term four, many students stated in their questionnaires that they preferred to have mental maps, and to retain the questions in their head. In this case, students can be seen to be adaptive in their approach to the use of information literacy skills, but this raises the question of the extent to which students’ adaptation is effective. Also, in the interviews, some of the more reflective students were of the opinion that other, in their view less motivated, students would benefit more from writing down maps and questions.

In relation to students’ use of information literacy skills, there was evidence that teachers and teacher librarians viewed the use of skills as valuable, beneficial and, for some students, linked to more effective learning. There was little evidence that teachers and teacher librarians encouraged students to view the use of these skills as a way of developing a personal approach to completing assignments and to learning. Only two students identified the development of a personal strategy as being a beneficial outcome of being taught the value of using skills and making connections. Woolls and Loertscher (2002), in commenting on information literacy models, make the point that one of the weaknesses of such models is that students do not own such models. Given that many students in this study appeared to take a received practice approach to their use of information literacy skills, it may be that the lack of emphasis by teachers and teacher librarians on the development of a personal information literacy strategy by students, restricts the likelihood of students thinking about developing such a
strategy. It was clear that some students were selective in their use of certain skills e.g. students identified different personal methods of note taking, but there was little evidence of students thinking holistically about making choices about which skills to use or how to develop a personal strategy.

Theoretical statement 2: Some students take a metacognitive view of their use of information literacy skills, and are capable of making connections between a range of skills. These students are proactive and take a more personal and reflective approach. Other students take a more received practice and passive approach and, while they make short term connections between skills, are unlikely to be reflective without prompting from the teacher or teacher librarian. A small minority of students do not understand the concepts behind information literacy skills, do not make connections, and make little use of information literacy skills.

6.2.3 Being engaged

If students are to value information literacy skills and to demonstrate attributes of information literate students which are found in the literature (Doyle 1994; Langford 1998; AASL/AECT 1998; Abilock 2004; Herring and Tarter 2007), then one of the key elements will be the extent to which students are engaged. In the context of the present study, being engaged has a number of facets. Firstly, students need to be engaged with what they are learning and with the assignment which they are asked to do. It was clear from the data that both teachers and students saw this engagement with learning as important. Secondly, students need to be engaged with information literacy skills, and the present study shows that this does not merely mean that students follow the teacher’s instructions – e.g. to draw up a mind map or formulate questions – but that students need to be engaged with the reasons why teachers are
encouraging them to use such skills, and to be engaged in self-reflection on their use of skills (Wolf 2003). As with elements of thinking discussed above, teachers, teacher librarians and students were viewed as identifying three categories of students – the engaged: those that were engaged of their own volition; the disengaged: those that might become engaged with instructions or reminders; and the unengaged: those who lacked the capacity to become engaged, because they did not understand the reasons why they should become engaged with their own subject learning or with information literacy skills. Thirdly, students need to be motivated (Bruce 1997, Kuhlthau 2004, Kuhlthau et al 2007), either through self-motivation or by teachers and teacher librarians, if they are to be engaged. Students in the present study expressed a range of views on both the different levels of student motivation, but also on ways in which teachers could increase student motivation which, the students argued, would lead to greater engagement. Fourthly, students cited confidence as an element of engagement and some students argued that, as they grew in confidence about an assignment (Kuhlthau 2004), they were more likely to become engaged with the topic but also with their use of information literacy skills.

Engaging students is an element which is considered by a number of information literacy studies. Kuhlthau (1989 and 2004) noted that students’ confidence waxed and waned at different stages of the assignment completion process. Research evidence (Stripling 1995, Kuhlthau 1993, Herring, Tarter and Naylor 2002) showed that, in some instances, the use of scaffolding, such as an information literacy model,
encouraged students to be more engaged with what they were learning, and this was confirmed by Wolf’s (2003) study of students using the Big Six model.

The issue of engaging students raises questions about how students might become more engaged, and what factors might influence this engagement. This study showed that there was no agreement amongst teaching staff about whether students or teachers could mostly influence the extent of engagement. All three teacher librarians and some teachers argued that lack of engagement was due mainly to many students’ attitudes to school work, while other teachers saw it as the teacher’s responsibility to engage students in what they were learning, and in the assignments set. Unsurprisingly, students saw encouraging engagement as the role of teachers. As noted above, engagement is a complex issue but, in terms of assignments, some teachers and most students argued that teachers needed to make assignments more interesting if they were to engage students. In the UK, the Enquiring Minds research project (Morgan and Williamson 2008) sought the views of teachers and students about how a more constructivist approach to student learning, including the revision of assignments set for students, could lead to greater engagement on the part of students in their assignments. The results showed that where teachers took a greater interest in what might motivate students to learn, and where there was more dialogue between students and teachers, students were much more likely to be engaged with their learning, and to take a more positive approach to assignment completion. Barranoik (2004) found that students’ use of information
literacy skills improved when they were given options in terms of their choice of assignment.

A final aspect of engagement which emerged in this study but was not found in the literature by the researcher, was some students’ concept of time. In the student questionnaires, there were comments from some students which indicated that they did not draw up a concept map or formulate questions, because they did not have time to do so, or that it took too much time. In the interviews, students explained that, in this context, “time” was not to be taken literally, e.g. students did not think that a concept map would take a long time to prepare, but that some students took the view that an assignment must be completed as quickly as possible, and that anything which interrupted this headlong rush to completion was seen as an obstacle. This implies that if some students view information literacy skills not as learning enhancing scaffolds, but as obstacles, then there is little chance of these students being engaged either with the potential usefulness of the skills or with the assignment topic. This reinforces the point that if students do not see the rationale behind using information literacy skills, they are much less likely to be engaged. It can also be argued that, while having more student-centred assignments can engage students more with the assignment topic, if the students are not engaged with, and therefore do not value information literacy skills, engagement with the topic itself may not enhance the students’ learning.

Theoretical statement 3: Some well motivated students have the facility to become engaged with their own learning, with assignment topics, and with information literacy skills. Some students lack this motivation but have the
potential to become engaged with their own learning, with assignment topics and with information literacy skills. Where teachers and teacher librarians take a more student-centred approach to assignments, students are likely to become more engaged, and this engagement will be enhanced where these students are not only taught information literacy skills, but also taught about the rationale for using such skills. A minority of students lack an understanding of engagement with their own learning, and with information literacy skills, and are likely to need individual attention.

6.2.4 Awareness of the information environment

School students have, in some senses, a restricted information environment when using learning resources in schools, in that, while they do have access to books in the school library and the classroom, and to the web in the school library and ICT classrooms, their time to use these resources may be restricted, and their knowledge of how to effectively exploit these learning resources may be limited. The extent to which students were aware of their information environment in this study varied, but it was clear that those students who had a greater awareness of the extent and potential usefulness of their information environment, were more likely to be engaged with and to value information literacy skills. It was clear from the present study that students, if encouraged to explore the extent of their information environment, were able to take a wider view of the parameters of that environment. Thus students, in the interviews, showed that they were aware of prior learning, written and mental maps, written and mental questions, information retrieval tools in print and digital formats, books, the web, their own notes, other students, and teachers and teacher librarians, as being part of their information environment. The extent to which all students valued all aspects of this information environment is very questionable. For example, even some
of the articulate and self-motivated students in the interviews did not appear to value the creative elements of their own work, in that they tended to put little value on what they themselves had created in the form of concept maps, questions, notes and their assignment. These students did not appear to have been stimulated by teachers or teacher librarians to think about their wider information environment, or to value what they created and some students indicated that they thought that some teachers saw little value in this either. There is little discussion of students’ awareness of their information environment in the literature relating to schools. Studies such as Wolf (2003) and Ryan and Hudson (2003) outlined a range of sources used by students, but did not examine students’ awareness of their information environment. In workplace studies, both Lloyd (2003, 2004 and 2006) and Tuominen et al (2005) stress the importance of people’s need to be aware of their information environment.

Where students were more personally involved in what they had created, such as their own notes, or sources of information they had discovered, students appeared to see more value. In general, students agreed with the concept of sharing information, and most students enjoyed and could see benefits from brainstorming. When students discussed what they talked to other students about, attitudes to sharing were less positive. It was clear that students regarded their peers as sources of information, and therefore part of their information environment, but the extent to which they valued their peers differed. In the present study, some students were clearly unwilling to share information with some of their peers, whom
they regard either as lazy, in that they relied on others to do their work, or untrustworthy, in that they might copy notes verbatim and claim this as their own work. Students can thus be seen to value brainstorming as a means of widening their information environment – gaining ideas and information from other students - but they can also be seen to narrow the potential information environment of other students whom they mistrust, by refusing to share information and sources of information with some of their peers. There appears to be no discussion of this issue in the literature reviewed by the researcher.

Theoretical statement 4: Most students have a restricted view of their information environment, and there is little stimulation from teachers and teachers to make students more aware of their information environment. If students were encouraged to recognise more sources of information in the school environment, in particular the information they create, then students may be more engaged with their information environment, information literacy skills and their own learning. Teachers and teacher librarians can benefit from discussing students’ attitudes to sharing information.

6.2.5 Not valuing/not understanding information literacy concepts, skills and techniques

In the other sub-categories above, it was noted that a small minority of students appeared not to value information literacy skills, because they lacked an understanding of how such skills might be useful, and how they might relate to their own personal learning. These students had been introduced to techniques such as brainstorming and concept mapping and skills such as information retrieval, evaluation of sources and information, and note taking, in the same way as other students. It became clear that these students lacked a fundamental understanding of
why they were being taught these techniques and skills, as well as how they might put them into practice. Students starting from this point may be seen as the unengaged. They differ from other students noted above who understood the purpose and potential of information literacy skills, and freely engaged with these skills. They also differ from those students noted above as the disengaged, who understood the rationale behind the skills they were taught, but did not put the skills into practice unless told/reminded to do so. Another way of viewing the unengaged students is to see them as non-participants in the teaching and learning associated with information literacy skills. Thus the engaged students may be seen as voluntary participants and the disengaged students may be seen as involuntary participants, but participants nonetheless. The small minority of students who were unengaged appeared to participate in the assignment completion process i.e. they chose a topic, found information and wrote an assignment. However, they did not participate in a conscious way as students who had some understanding of information literacy skills and who were able, either voluntarily or involuntarily, to put these skills into practice.

The reasons for this small group’s lack of engagement and participation are likely to be complex, and may relate to problems which individual students have with aspects of learning such as reading and comprehension. In the teacher interviews, some teachers identified maturity as a factor in students’ lack of engagement, while others cited lack of ability. When the majority of students viewed this unengaged, non-participating minority, they referred to the minority group’s lack of
understanding of why information literacy skills might be useful. While teachers and teacher librarians recognise this minority of students, the evidence from the present study showed that these staff members demonstrated an acceptance that such a minority existed, but gave little indication as to how these students might be helped. The researcher’s observation showed that students in this unengaged category were given some individual attention by teachers and teacher librarians, but that some of this attention was the result of misbehaviour by some of these students. It was also clear from the observation that teachers and teacher librarians lacked the time to devote attention to individual students, because of pressures to complete elements of the curriculum. It may also be that some of the unengaged minority students are mainly seen as students with discipline problems, rather than as students who lack understanding.

In the information literacy literature, there are very few examples of any reference to the unengaged, non-participant group of students identified here. A number of studies (ACRL 2003, Williams and Wavell 2006, O’Sullivan and Scott 2000) refer to a lack of understanding about information literacy on the part of teachers. Williams and Wavell (2006) made reference to students who lacked understanding of information literacy skills, but this was only in the context of teachers’ views of information literacy. Herring (2006) makes reference to some students showing a lack of understanding of part of the PLUS model.

Theoretical statement 5: Teachers and teacher librarians cannot assume that all students will value and understand information literacy concepts, skills and techniques. A minority of students may act as unengaged, non-
participants, in that their failure to understand the potential benefits of information literacy skills will mean that they will not apply such skills, even when prompted or told to by the teacher or teacher librarian.

6.3 Major category 2: culture of transfer

Two elements of this major category were identified. The first related to the extent to which students, teachers and teacher librarians valued transfer, as both a concept and as a potential practice. The second element related to whether there was a culture of transfer in the schools in the present study. The concept of a culture of transfer, in a school context, can be interpreted in different ways. Much of the school related literature on transfer (e.g. Haskell 2001) focuses on the transfer of subject learning, and not on learning skills, or the context in which the skills are practised. In the context of the present study, examining the concept of a culture of transfer in relation to information literacy skills needs to be done through a sociocultural lens (Volet 1999 and Haskell 2001). This view implies that, while teachers’, teacher librarians’ and students’ understanding of transfer is important, it is not, in itself enough to ensure that transfer will take place. The sociocultural view in this study takes into account the whole learning, teaching and social contexts of the school, and how each of these contexts has a bearing on the likelihood of students transferring or not transferring information literacy skills. This author argues that a culture of transfer, in relation to information literacy skills, will exist in schools where there is both formal and informal discussion of the issue of transfer i.e. where there is not only a school wide policy on transfer, but where there is a belief
amongst students, teachers and teacher librarians, that transfer is important.

From the evidence in the present study, the existence or non-existence of a culture of transfer of information literacy skills across subjects and across time, will depend on: teachers’ and teacher librarians’ attitudes to transfer, and assumptions about transfer; teachers’ and teacher librarians’ awareness of transfer outside their own area of expertise or teaching; teachers’ and teacher librarians’ practices in relation to transfer; students’ attitudes to transfer; students’ expectations about transfer; and students’ individual and collective practices in relation to transfer. The wider influences upon these aspects of the existence or non-existence of a culture of transfer will include how teachers and teacher librarians communicate with each other; how teachers and teacher librarians communicate with students and vice versa; teaching styles of teachers and teacher librarians; and learning styles of students.

It was clear that there was no culture of transfer in any of the three schools in relation to information literacy skills, but it was also clear that both staff and students viewed a culture of transfer as not only desirable, but also necessary, if transfer was to become a more widespread practice amongst students. The establishment of a culture of transfer in relation to information literacy skills will require changes in both the attitudes and the practices of staff and students in these schools. The following sections seek to explain the sub-categories identified within the major category of Culture of Transfer, and to discuss how a culture of transfer might be established in the schools.
Theoretical statement 6: Extensive transfer of information literacy skills amongst year seven students in the three schools in the present study is unlikely to happen unless a culture of transfer can be established. A culture of transfer is only likely to be created by changes in the overall school culture, which include staff and student attitudes to transfer, as a concept and as a practice.

6.3.1 Students’ beliefs about transfer

Students in all three schools showed a belief in the principle of transferring information literacy skills, and urged future year seven students to use these skills. In practice, as demonstrated by the student questionnaires and interviews, only a few students appeared to have transferred many of the skills they were taught. As with aspects of value discussed above, the students fell into three groups. A minority of students – the actual transferrers – both believed in the value of transfer, and put this into practice. These students were motivated to transfer because they saw the benefits of transfer in the future, such as later in their school career. The actual transferrers provided evidence of not only transferring skills from one term to another and one subject to another, but of adapting skills to suit their own learning style, e.g. using a concept map in both terms three and four but preferring a mental map in term four.

The majority of students – identified by the researcher as the propositional transferrers – believed in transfer in principle i.e. as a proposition, and urged future students to transfer skills. Despite this, they appeared to be reluctant to put transfer of skills into practice, or to do so
only in a limited way. The reasons for this reluctance appear to include a lack of motivation on the part of these students (Qualifications and Curriculum Authority 2009), and this was identified by some of the transferrer students in the interviews, but also in the teacher and teacher librarian interviews. The propositional students also appeared to take a received practice view of transfer, in that they were only likely to transfer a range of information literacy skills if prompted or told to do so by the teacher or teacher librarian. This appears to reflect a wider attitude to learning amongst the propositional transferrer students. This attitude means that students will do what they are instructed to do, but believe that, if they are not instructed to do something by the teacher, then they need not do it. As was noted above, some students wrote in their questionnaires that they did not need to use a concept map, and the interviews revealed that “did not need to” actually meant “was not told to”.

It was clear that the propositional transferrers understood the concept of transfer and some of the potential benefits of transfer but, for some of these students, transfer of skills did not take place because of some students’ concept of time as noted above. If propositional students view the transfer of techniques and skills such as concept mapping or evaluation of sources as interfering with their rush to completion (as identified by Rankin (1999) and by both staff and some students in the interviews), then transfer is unlikely to take place. From a sociocultural perspective, students’ overall attitude to assignments – that they must be completed quickly – is likely to be a more dominant factor than their
propositional belief in the value of transfer, when they are completing assignments.

As above, e.g. in relation to valuing information literacy skills, a third group of students was identified as having a different attitude to transfer. This small minority of students are non-transferrers, as they lack an understanding of the value of transfer, and this is based on their lack of understanding of the potential value of information literacy skills. For these students, transfer is a difficult concept as they lack a basis for any belief in the value of transfer. In the student interviews, the transferrers identified this minority of students as lacking the ability either to use or transfer information literacy skills. In the staff interviews, lack of ability and lack of maturity were identified. They key difference between the non-transferrers and the propositional transferrers in this study appeared to be that, while propositional students might transfer skills if reminded or told to do so, non-transferrers were unlikely to transfer – even if prompted to do so - because of a lack of understanding.

In the transfer literature, Haskell (2001), Detterman (1993) and Royer et al (2005) argued that transfer is unlikely to take place in most learning situations unless there are very specific instructions to learners. Hatano and Greeno (1999) cited school culture as an inhibiting factor, and the lack of a culture of transfer in schools in the present study clearly inhibits the extent to which students will transfer information literacy skills. Greeno et al (1993) referred to affordances in learning situations, and that affordances can include personal or group characteristics. Greeno et al (1993, p. 102) defined affordances as “.. the support for particular
activities created by relevant properties of things and materials in the situation”. In this study, affordances which have an effect on students’ transfer or non-transfer may include personal characteristics, for example, as how individual students view the value of information literacy skills. Affordances may also include the extent to which students are encouraged by teachers and teacher librarians to think about transfer in different learning situations. Volet’s (1999) sociocultural view of transfer is supported by the findings of this study in that the students’ motivation and expectations of the learning environment (e.g. taking a received practice view of assignment completion), affect the likelihood of transfer. Sternberg and Trensch (1993) argued that students must have a mental set for transfer, if transfer is to occur, and that this mental set, (as exhibited by students in the present study) includes motivation, the students’ beliefs about learning situations, and teachers’ encouragement of students to think about transfer.

Theoretical statement seven: Students’ beliefs about transfer are important as these beliefs are one factor in determining whether students will transfer information literacy skills. If students value transfer and are encouraged to value transfer by teachers and teacher librarians, they are more likely to transfer. Most students will need to be prompted to transfer skills and a minority of students will not transfer as they lack understanding of transfer as a concept.

6.3.2 Evidence of transfer

There was some evidence of transfer amongst students in the present study, particularly amongst the transferrer group of students. and to a lesser extent amongst the propositional transferrers. In the student questionnaires, there was conflicting data in relation to transfer,
associated with how students applied what had been taught in the
previous term. While some students clearly stated that they had used
skills (e.g. information retrieval and note taking) which they had gained
previously, other students were more vague about transfer, especially in
relation to aspects such as concept mapping and question formulation.
For example, some students stated that they had mental questions or
mental maps, as opposed to the written questions and concept maps they
had in term three. This may imply transfer if the students applied the
mental questions and maps in the same way as they had in term three, but
it does not necessarily follow that students used the mental questions and
maps effectively. Thus any transfer in this respect may be very
superficial, and it could be argued that some students, such as those in
the propositional group, transferred the idea of concept mapping or
question formulation, but did not transfer the application of either.

In the transfer literature, many types of transfer are identified. Fogarty
and Pete (2004), Subedi (2004) and Detterman (1993) identified near and
far transfer as the most common types identified. Near transfer relates to
transfer in similar situations, whereas far transfer relates to dissimilar
situations. In this study, there appears to be evidence of near transfer
amongst some students, particularly those who fall into the propositional
group. The transferrer group may be seen to show some evidence of far
transfer, in that they appear to be able to reflect on their own transfer,
and incorporate transfer into their own learning styles. However, given
that transfer in this study was examined in two similar situations, i.e. the
completion of assignments in terms three and four, it may be argued that
only near transfer could be identified. The researcher would argue that the transferrer group of students appeared to be able to not only reflect on past transfer, but to situate this transfer in future learning situations, such as in later school years, and that this group of students does demonstrate aspects of far transfer. Fogarty and Pete (2004) refer to transfer across subjects, which was accomplished by some students in the present study, as far transfer. Volet (1999) suggested that other types of transfer (in relation to learning) may be considered, and these include appropriate, ambivalent, difficult and inappropriate. In this study, the transferrer group’s transfer of information literacy skills was clearly appropriate to the learning situation, as it met the expectations of both students and teachers. Ambivalent transfer (Volet 1999) – where there is no agreement on whether aspects of transfer may be seen as appropriate – in the present study may be seen in the skills which students brought from primary school. Some students saw these skills as appropriate but some of the teachers and teacher librarians were sceptical about whether students had transferred the right kind of skills e.g. in information retrieval. Difficult transfer – where all concerned agree that transfer is difficult – can clearly be seen in the present study by the non-transferrer group’s struggle to understand transfer, and the teachers’ views that for some students, transfer is too difficult a concept. Inappropriate transfer (Volet 1999) – where what is learned in one learning situation is not acceptable in another situation – can be seen in the views of teacher librarians in particular, who commented negatively on the manner of teaching information literacy skills in some primary schools, from where
the students in year seven had come. To Volet’s (1999) list may be added theoretical transfer, which in this study was demonstrated by the propositional group of students, who believed in transfer in theory, but were reluctant to put transfer into practice without being prompted by a teacher or teacher librarian. As was stated above, this may also be seen as involuntary transfer.

**Theoretical statement 8:** If students take a superficial view of transfer, then only near transfer is likely to occur. Where students take a more reflective view of transfer, it is possible that far transfer may occur. Evidence of transfer is only likely to emerge where students are conscious of the need to transfer and the value of transfer.

### 6.3.3 Teachers’ views of transfer

In the initial interviews with teachers and teacher librarians, positive views were expressed about the potential value of transfer, but it was agreed that there was little evidence of the transfer of information literacy skills in any of the schools, apart from amongst a small minority of students. Some of the staff interviewed identified that there may have been some evidence of students transferring some knowledge and skills from primary school, but those who did express this view regarded any transfer as unconscious and possibly accidental. In the second round of interviews with staff, views on transfer had not changed. The teachers and teacher librarians appeared to take a similar view as the propositional transferrer students, i.e. that they saw transfer as having value in principle, but that they did not take steps to ensure that transfer might take place. Some of the staff viewed transfer as a difficult concept for many of their year seven students, and this may have influenced their
practice, as if teachers viewed transfer as too difficult for students, they might be reluctant to try to encourage students to transfer skills.

The teachers and teacher librarians interviewed in this study argued that they saw little evidence of the transfer of information literacy skills amongst most students, and the teacher librarians were more adamant about a lack of transfer than the teachers. It was clear from staff interviews in all three schools, that there were expectations and assumptions about transfer of skills, despite the lack of evidence of transfer. The lack of a culture of transfer (Haskell 2001) in these schools may mean that teachers in particular paid little attention to transfer, apart from general assumptions and expectations, and that this would not encourage them to look for evidence of transfer. This, in turn, would not encourage them to prompt or remind students about information literacy skills. Thus the expectations and assumptions of teachers and teacher librarians about transfer appear to be based not on practice, but on a view that transfer is an inevitable consequence of teaching. This study did not investigate the reasons for teachers and teacher librarians having these views on transfer, but Stark et al (2005) and Hakel and Halpern (2005) imply that teaching styles in school may lead teachers to assumptions and expectations about transfer, and that teachers need to re-examine approaches to teaching if transfer is to happen.

One of the reasons for a lack of emphasis by teachers in particular on transfer appeared to be a lack of knowledge amongst teachers of what information literacy skills might or might not have been taught by their teaching colleagues. The lack of a culture of transfer in these schools
meant that, as teachers stated, only informal discussions ever took place about skills in different parts of the curriculum. From a sociocultural perspective, the overall organisation of the school may have had an effect on this lack of knowledge amongst teachers. The compartmentalisation of schools, according to Howson (1986) and Driscoll and Frost (1999), often led to a lack of communication across different departments. In the context of the present study, it appeared that compartmentalisation in the schools had a detrimental effect on the likelihood of the transfer of information literacy skills by students.

In addition to this, the teacher librarians, who are often cited as having an overview of the school curriculum (AASL/AECT 1998, ASLA 2004), argued that, while they hoped that students would transfer information literacy skills across subjects, they saw little evidence of transfer. One reason for this lack of transfer may be the teaching approach taken by teacher librarians. Hakel and Halpern (2005) suggested that teaching styles would affect how teachers viewed transfer. In the case of the two teacher librarians who taught a programme of lessons on information literacy skills to year seven students, it was clear that the approach to teaching was to teach a range of skills to students with an expectation of transfer, but without an emphasis on transfer in the teaching itself. As it became clear from this study that most students were unlikely to transfer skills of their own accord, the lack of emphasis on transfer by teacher librarians may have reinforced the views of the propositional transferrers. Kennewell, Parkinson and Tanner (2000) identified strategies for teachers which would encourage transfer amongst students.
These strategies include alerting students to possible areas of transfer. It was also clear that none of the teacher librarians had regular discussions with teaching staff about transfer or about how information literacy skills might be reinforced in the classroom. Where such discussion did take place, it was informal.

As was noted above, there was no culture of transfer in these schools, and this absence of a culture of transfer was acknowledged by both staff and students. The views of the teachers and teacher librarians show that the issue of transfer clearly lacked status in these schools. This lack of status appears to be caused by the absence of any formal recognition of transfer. Both teachers and teacher librarians noted occasional informal conversations about transfer and one teacher, an acting deputy principal, acknowledged a lack of policy on transfer. Thus a restricting factor on the development of transfer in these schools is a lack of a whole school policy on transfer. Eisner and Day (2004) identified a need for a policy on teaching specifically for transfer in arts subjects, but no such policies existed in the schools in the present study. This lack of policy is paralleled in the teacher librarianship literature where the lack of a whole school policy on information literacy skills is often cited as a limiting factor in the development of information literacy in schools (Moore 1997, Roberts 2005).

**Theoretical statement 9:** The manner in which teachers and teacher librarians view transfer will affect the development of transfer in a school. The lack of school policy on transfer and the subsequent lack of status of transfer in a school will have a detrimental effect on teachers’, teacher librarians’ and students’ attitudes to transfer. Developing a culture of transfer in a school may provide a solution to these problematical issues.
From the above, it can be seen that the schools examined here lacked a culture of transfer because of a series of interrelated factors, including lack of a policy on transfer, lack of status of transfer, lack of commitment to transfer by teachers, teacher librarians and most students, and a superficial knowledge and recognition of the value of transfer on the part of school staff. If a culture of transfer is to exist in these schools, then these negative factors would have to be overcome.

6.4 Claim to knowledge

In developing a grounded theory on information literacy and transfer in secondary schools, this is a ground breaking study in the field of teacher librarianship, as for the first time, it has brought together, analysed and synthesised the views of teachers, teacher librarians and students on information literacy skills. This study has brought new insights for teachers and teacher librarians by identifying three groups of students who have different attitudes to and different practices in information literacy skills. In identifying two major categories – valuing information literacy skills and culture of transfer – the researcher has added to the knowledge of both academics and practitioners, by providing an original focus on the teaching of information literacy skills in schools, and on the potential for the development of these skills in schools. In developing a grounded theory, the researcher has provided a basis on which academics and practitioners in the fields of teacher librarianship and education can critically examine the development of information literacy in schools,
including the teaching of information literacy skills, and critically evaluate issues relating to transfer in schools. In identifying the development of a culture of transfer in relation to information literacy skills as a key element in the development of information literacy in schools, the present study provides school management, teachers and teacher librarians with a new insight into the potential development of transfer in schools.

The present study adds to the research literature, by taking a more in-depth view of how the issue of transfer relates to the teaching of information literacy skills in schools. It provides a new focus on transfer which has been largely absent from the existing research literature relating to schools. The present study also extends the scope of information literacy research by presenting a grounded theory of information literacy and transfer in schools. This theory adds to the research literature, by providing practitioners with a theory on which to develop practice, and providing researchers with a theory which might be tested or developed in future research.
Chapter 7: Conclusions and recommendations

7.1 Conclusions

The conclusions reached by the researcher at the end of this study can be categorized in terms of teachers’ and teacher librarians’ attitudes, student attitudes, school culture, and general reflections on information literacy. This is followed by a restatement of the grounded theory.

7.1.1 Teachers’ and teacher librarians’ attitudes

The present study has shown that, in the schools which participated, there was recognition, by both teachers and teacher librarians, that information literacy skills were an important feature in the development of year seven students as effective learners. This recognition of importance was not always translated into the reflection on, or use of, these skills by students. The present study shows that teachers and teacher librarians can make greater contributions to encourage students to think about information literacy skills, as well as putting such skills into practice. The researcher found that teachers and teacher librarians had more individual, as opposed to collective, views on what constituted information literacy, what information literacy skills should be taught in the classroom and/or school library, and how these skills might be reinforced. Teachers and teacher librarians agreed, in principle, that there was a connection between students’ reflection on, and use of, information literacy skills and subject learning, but there was no collective agreement on how this connection could be established regularly in more than a minority of students. If teachers and teacher
librarians in these schools wish to translate their principled support for information literacy development in their schools, then they need to reflect on the present practices of teaching information literacy skills, and encourage students to not merely learn such skills, but to reflect on them.

Teachers and teacher librarians recognised the researchers’ identification of three groups of students, but appeared to accept the existence of these groups as a mainly unchanging reality of school life. There was little indication of any collective strategy which would make the second group of students more engaged with information literacy skills and their own learning. Individually, the teachers and teacher librarians showed a desire for improvement and an interest in potential learning and teaching strategies which might bring about improvement in student performance. If teachers are to develop a greater range of engaged students, then an agreed school wide strategy on information literacy may be the first step in having more engaged students.

Teachers and teacher librarians all recognised that informal discussions about the transfer of learning and information literacy skills by students, had taken place in their schools, and there was agreement that transfer was a key element of secondary education. Despite these discussions and beliefs, it was clear that little collective action had taken place in relation to transfer in these schools. There was some evidence of individual staff encouraging transfer but, for most staff, transfer appeared to be based on assumptions and hope, rather than on any evidence base. If teachers’ and teacher librarians’ beliefs about the transfer of information literacy skills
are to be translated into action, then the development of a school wide strategy on encouraging transfer amongst students is needed.

The present study has shown that, in the participant schools, there was no shortage of enthusiasm for and belief in information literacy skills, and that the potential exists for much greater coordination of the teaching of these skills, and the development of information literacy attributes amongst students.

7.1.2 Student attitudes

Two of the three groups of students identified in this study showed an equal belief in the potential value of information literacy skills as their teachers had. Only one of these groups, however, showed belief in the actual value of these skills. Students who were engaged, motivated, and who took a metacognitive view of their own learning, showed a clear understanding of the value of information literacy skills, and a willingness to use the skills for present and future purposes. The second group understood the potential value but were less engaged, less motivated and tended to rely on teachers and teacher librarians to tell them to use information literacy skills. The second group was also adamant that future year seven students should value information literacy skills and should put them into practice. The third group of students, a small minority, lacked understanding of the concepts behind information literacy skills and saw little value in them. If more students are to be engaged and motivated users of, and reflectors on, information literacy skills, then students need to be made more aware not only of what skills
they learn, but also why they should learn these skills, and how such skills might benefit their learning.

In relation to transfer, most students – like their teachers and teacher librarians – agreed that transfer was, in principle, of value. It was also clear that transfer was not something which students were encouraged to do by their teachers and teacher librarians. While some students showed evidence of transferring knowledge and skills in an independent fashion, most students took the view that transfer was the responsibility of their teachers and teacher librarians, from whom they expected reminders or instructions in relation to transferring information literacy skills. A minority of students appeared to lack any understanding of the concept of transfer and any appreciation of the possible benefits of transfer. If more students are to be independent transferrers of information literacy skills, these students will have to be convinced of the value of transferring skills, and will have to be less reliant on teachers and teacher librarians reminding them about transfer.

7.1.3 School culture

Some of the key findings of this study are clearly related to aspects of the cultures of these three schools. In relation to information literacy skills, beliefs amongst staff and students about information literacy skills and the transfer of these skills, indicated that staff and students mostly recognised skills and transfer, and identified value in skills and transfer. However, the prevailing culture appeared to be that no action needed to be taken to put these beliefs into practice. It may be concluded that a lack
of leadership and strategy in relation to information literacy and transfer in these schools, means that the prevailing culture is unlikely to change, without active leadership and strategy development.

As noted in the previous chapter, these schools lacked a culture of transfer which means that, in these schools, transfer of learning or skills was not seen as a high priority by either teachers and teacher librarians, or by senior school management. This aspect was also reflected by students who, perhaps as a result of teacher and teacher librarian attitudes to transfer, put little priority on transferring information literacy skills, either independently or as a result of teacher encouragement. If these schools are to develop a culture of transfer, then steps to promote a culture of transfer amongst the whole school community need to be taken. This is only likely to happen with formal (as opposed to the present informal) recognition of the importance of transfer to student learning.

7.1.4 Information literacy

From the literature review and from the analysis of the findings of this study, the researcher concludes that information literacy in secondary schools, in relation to the year seven students studied, may be best defined as a critical and reflective ability, and as a practice. Thus, while information literacy skills can and should be taught to students, it is important that students are made aware of the importance of taking a critical and reflective view when practising these skills. It is also
important that teachers and teacher librarians view information as more
than a set of skills or as a process.

7.1.5 Restatement of grounded theory

The grounded theory developed by the researcher is presented here as a
whole.

Theoretical statement 1: Some students value information literacy skills in
terms of personal benefits and in relation to their own learning, as well as
seeing a utilitarian value in these skills. These students value information
literacy skills as they reflect on, make connection between, and use these skills
effectively. Such students are engaged not only with subject learning but with
the value they see in using information literacy skills. These students are keenly
aware of their information environment which is not limited to digital and print
resources.

Theoretical statement 2: Some students take a metacognitive view of their use
of information literacy skills, and are capable of making connections between a
range of skills. These students are proactive and take a more personal and
reflective approach. Other students take a more received practice and passive
approach and, while they make short term connections between skills, are
unlikely to be reflective without prompting from the teacher or teacher
librarian. A small minority of students do not understand the concepts behind
information literacy skills, do not make connections, and make little use of
information literacy skills.

Theoretical statement 3: Some well motivated students have the facility to
become engaged with their own learning, with assignment topics, and with
information literacy skills. Some students lack this motivation but have the
potential to become engaged with their own learning, with assignment topics
and with information literacy skills. Where teachers and teacher librarians take
a more student-centred approach to assignments, students are likely to become
more engaged, and this engagement will be enhanced where these students are
not only taught information literacy skills, but also taught about the rationale
for using such skills. A minority of students lack an understanding of
engagement with their own learning, and with information literacy skills, and
are likely to need individual attention.

Theoretical statement 4: Most students have a restricted view of their
information environment, and there is little stimulation from teachers and
teachers to make students more aware of their information environment. If
students were encouraged to recognise more sources of information in the
school environment, in particular the information they create, then students may
be more engaged with their information environment, information literacy skills
and their own learning. Teachers and teacher librarians can benefit from discussing students’ attitudes to sharing information.

Theoretical statement 5: Teachers and teacher librarians cannot assume that all students will value and understand information literacy concepts, skills and techniques. A minority of students may act as unengaged, non-participants, in that their failure to understand the potential benefits of information literacy skills will mean that they will not apply such skills, even when prompted or told to by the teacher or teacher librarian.

Theoretical statement 6: Extensive transfer of information literacy skills amongst year seven students in the three schools in the present study is unlikely to happen unless a culture of transfer can be established. A culture of transfer is only likely to be created by changes in the overall school culture, which include staff and student attitudes to transfer, as a concept and as a practice.

Theoretical statement 7: Students’ beliefs about transfer are important as these beliefs are one factor in determining whether students will transfer information literacy skills. If students value transfer and are encouraged to value transfer by teachers and teacher librarians, they are more likely to transfer. Most students will need to be prompted to transfer skills and a minority of students will not transfer as they lack understanding of transfer as a concept.

Theoretical statement 8: If students take a superficial view of transfer, then only near transfer is likely to occur. Where students take a more reflective view of transfer, it is possible that far transfer may occur. Evidence of transfer is only likely to emerge where students are conscious of the need to transfer and the value of transfer.

Theoretical statement 9: The manner in which teachers and teacher librarians view transfer will affect the development of transfer in a school. The lack of school policy on transfer and the subsequent lack of status of transfer in a school will have a detrimental effect on teachers’, teacher librarians’ and students’ attitudes to transfer. Developing a culture of transfer in a school may provide a solution to these problematical issues.

The theoretical statements above can be seen to relate closely to the aims and areas of exploration of the thesis.

7.2 Recommendations

Recommendations are made firstly for the three schools which participated in the study. Recommendations are then made for senior management, teachers and teacher librarians in schools and for future research. These recommendations are not meant to imply any
generalisability of the findings of this study. Instead, these recommendations are intended to highlight actions which these groups might consider in relation to information literacy in schools, and to the transfer of information literacy skills.

7.2.1 Schools

The three schools in the study are recommended to:

a) Review the teaching of information literacy skills across the curriculum

b) Raise the profile of information literacy within the school culture

c) Encourage the development of a culture of transfer amongst teaching staff

d) Consult students about approaches to the teaching of information literacy skills

e) Develop school wide strategies on teaching information literacy skills and the transfer of learning and skills across the curriculum

7.2.2 Senior management in schools

Senior management in schools is recommended to:

a) Consider raising the profile of information literacy skills across the curriculum

b) Consider developing a strategy for teaching information literacy skills across the curriculum
c) Consider the potential benefits of developing a culture of transfer, of learning and of skills, in the school

7.2.3 Teachers

Teachers in schools are recommended to:

a) Seek a greater understanding of information literacy and the teaching of information literacy skills in schools

b) Liaise with teacher librarians to teach and reinforce information literacy skills in the classroom as well as in the library

c) Seek a greater understanding of the value of encouraging students to transfer learning and information literacy skills across the curriculum

7.2.4 Teacher librarians

Teacher librarians are recommended to:

a) Consider revising the way they teach information literacy skills in schools

b) Seek ways of teaching students to reflect on the use of information literacy skills in addition to using such skills

c) Recognise that not all students will understand the rationale behind the teaching of information literacy skills

d) Liaise with other school staff in encouraging the reinforcement of information literacy skills across the curriculum
e) Discuss the value of the transfer of learning and information literacy skills across the curriculum with other school staff

7.2.5 Future research

As a direct follow up to this research, it is recommended that future research includes:

a) Further studies of year 7 students’ practice in relation to information literacy skills and transfer e.g. in urban and independent schools

b) Where possible, studies which include interviews with students who have difficulty in understanding concepts related to information literacy and transfer

c) Further studies of teachers’ and teacher librarians’ knowledge of, and views on, information literacy and transfer in schools

It is also recommended that future research includes:

a) Projects which examine the transfer of information literacy skills across years seven to twelve in secondary/high schools

b) Projects which examine the transfer of information literacy skills from primary to secondary/high schools

c) Projects which examine the creation of a culture of transfer in both primary and secondary/high schools

7.3 Overall conclusion

The research presented in this thesis will provide further insight into the development of information literacy in schools, and will also provide the basis for further research. While there has been extensive research relating to information literacy in schools in a number of different
countries, there remains scope for further research into the areas noted above.
References


Herring, J. (1978) *Teaching library skills in schools*. Windsor, Berks: NFER.


http://www.scrollac.uk/resources/s1/williams_paper.pdf


Appendices

Appendix 1: Teacher interviews – list of questions

1. What are the students being assessed on?

2. What skills can you assume that the students have before they do their assignment – planning searching writing etc?

3. To what extent would you expect these students to bring information literacy skills from primary school?

4. How does the range of reading abilities in your year seven class affect students when they are finding and using resources such as books and websites?

5. How much feedback do you give your students?

6. When you assess students, what credit do you give for students’ use of information literacy skills e.g. mind mapping, finding information etc?

7. To what extent do you think students will transfer their information skills to other history assignments or to other subjects?

8. Is transfer a difficult concept for the students?
Appendix 2 – Teacher librarian interviews – list of questions

1. What range of information literacy skills do you think this class brought from primary school?

2. What information literacy skills had the students been taught before their history assignment?

3. To what extent was mind mapping and writing questions new to this group of students?

4. How good are students at writing questions?

5. How effectively would you expect the students to be able to search books for an assignment?

6. When students search on Google, what would you expect them to be able to do?

7. Have you discussed the teaching of information literacy skills with other teachers?

8. Do you expect the students to transfer their information literacy skills to other assignments?

9. Students further up the school – are they transferring?
Appendix 3 – Student diary (condensed version)

XXX High School

Medieval research assignment– Student Diary

Please fill in your diary pages in the classroom or school library during lesson time. Please fill in your diary as directed by Mrs A or Ms B.

This diary belongs to:

Name: __________________________________________

Class: __________________________________________

When you are writing your diary, please make sure that you write at least THREE sentences for each entry. Your sentences should not be too short. Try to write about what you think you’ve learned or how you’ve gone about each part of the assignment. You will receive a mark for your diary as part of your overall assignment mark and the dairy will be worth 10 marks out of 50. You should try to write neatly and in good English. Mrs A and Ms B will give you some practice in writing a diary.

Medieval research assignment – Student Diary Page 1

Brainstorming and doing a mind map

Please write some notes on:

What you liked about brainstorming with your group

What you did not like about brainstorming with your group

How you think brainstorming will help you with your medieval research assignment

How you think having a mind map will help you with your medieval research assignment

Medieval research assignment – Student Diary Page 2

Writing your questions

Please write some notes on:

How easy or difficult you found it to write out your assignment questions
How you think writing questions for your assignment might help you when you look for information for your assignment

How you feel about doing the rest of the assignment now

**Medieval research assignment – Student Diary Page 3**

Review of possible sources (books, websites etc)

Please write some notes on:

How you went about finding the right information sources (books, CD-ROMs, websites) for your assignment

How you decided whether the book or website would give you the right information for your assignment

What you talked to other students about finding information for your assignment

**Medieval research assignment – Student Diary Page 4**

Revised mind map

Please write some notes on:

What changes you made to your initial mind map and why you made these changes

How confident you think you are that you can now do a good assignment

**Medieval research assignment – Student Diary Page 5**

Finding and evaluating sources and note taking

Please write some notes on:

How you went about finding the right information for your assignment

How you evaluated the sources (e.g. books or websites) and the information in them to make sure you had the right information for your assignment

How you took notes (e.g. wrote notes in your notebook or cut and paste) and what your notes look like (e.g. a list of sentences with headings or a mind map with keywords or something different)

**Medieval research assignment – Student Diary Page 6**

Writing your assignment

Please write some notes on:
How you organise your notes before you start to write your assignment

How you decide what you are going to write in your assignment

How you feel about your assignment now that you’ve written it

**Medieval research assignment – Student Diary Page 7**

Looking back on doing your assignment

Please write some notes on:

How well you think you went about finding the right information for your medieval research assignment

How well you think you used your questions in doing your medieval research assignment

How good you think your assignment is and how you could have improved it
Appendix 4 – Student questionnaire

Questionnaire for students at XXX High School (Condensed version)

Please fill in the questionnaire as best you can. In some cases, you will be asked to circle a letter (e.g. a. b. or c.) or to write a sentence or two on what you did during your science assignment. You are asked to put your name on the questionnaire but the results of the questionnaire will be anonymous and your name will not be used in any publications relating to this research.

James Herring

Name: ___________________________ Class: _____________

1. In your medieval society assignment, you did brainstorming but not for your science assignment. Do you think that brainstorming for the science assignment would have: (Please circle all that you agree with)
   a) Helped you to find out information
   b) Helped you to get new ideas
   c) Helped you to share information with others
   d) Helped you to think about what you already knew about the solar system
   e) Helped you with your assignment work later on

2. Would you have liked to have done brainstorming for the science assignment? (Please circle)
   Yes   No

   If Yes, why would you have liked to do brainstorming?

   If No, why would you not like to have done brainstorming?

3. Did you write out a mind map for your science assignment? (Please circle)
   Yes   No

   If No, please explain why you did not write out a mind map

4. Do you think that you had a mental mind map (i.e. one in your head)? (Please circle) Yes   No

   If Yes, do you think the mental mind map: (Please circle all that you agree with)
   a) Helped you to find information better
   b) Made your assignment easier to do
c) Helped you make up questions to answer for your assignment
d) Helped you with your assignment work later on
e) Other – please explain

5. When you do assignments in the future, do you think that it would be a good idea to write your mind map on paper? (Please circle) Yes  No

If Yes, why do you think it would be a good idea?

If No, why do you think that it would not be a good idea?

6. Did you write out questions for your science assignment? (Please circle) Yes  No

If No, please explain why you did not write out your questions

7. Do you think that you had mental questions (i.e. in your head)? (Please circle) Yes  No

If Yes, do you think your mental questions:

a) Helped you to find information better
b) Made your assignment easier to do
c) Helped you identify what you needed to do
d) Helped you with your assignment work later on
e) Other – please explain

8. How did you find the right information for your science assignment? (Please circle all that you agree with)

a) I used the catalogue (computer) in the library
b) I found a book with which covered my topic
c) I searched the web using the keywords from my topic
d) I talked to other students and found better information
e) Other (please explain)

9. How did you decide whether a book would give you the right information for your science assignment? (Please circle all that you agree with)

a) I looked at the title of the book
b) I used the contents page or the index in the book
c) I browsed through the book
d) I used my keywords to look for the right information
e) I looked at my mind map or my questions
f) I ignored information that wasn’t to do with my topic
g) Other (please explain)

10. How did you decide whether a website would give you the right information for your science assignment? (Please circle all that you agree with)

a) I looked at the title of the website
b) I looked at the pictures on the website
c) I used my keywords to look for the right information
d) I browsed through the website
e) I looked at my mind map or my questions
f) I ignored information that wasn’t to do with my topic
g) Other (please explain)

11. How did you take notes for your science assignment? (Please circle all that you agree with)

a) I wrote words or phrases on paper or in my notebook
b) I wrote sentences on paper or in my notebook
c) I wrote my notes in Word
d) I cut and pasted from websites
e) I did a mind map
f) Other (please explain)

12. How did you decide what you were going to write in your science assignment? (Please circle all that you agree with)

a) I looked at the notes which the teacher gave me
b) I used my questions
c) I used my mind map
d) I put my notes in order of importance
e) I selected the most important information from my notes
f) Other (please explain)

13. How well do you think you worked for your science assignment? (Please circle ONE)

a) Very well
b) Pretty well
c) OK but I could have worked harder
d) Not very well – I should have done more
e) Other (please explain)

14. When you did your medieval assignment last term, you learned about doing a mind map, writing out questions, finding information in books and websites and recording where you had found information. Do you think that you used what you had learned last term for your science assignment this term? (Please circle) Yes No

If Yes, what aspects of what you learned did you use?

If No, why did you not use what you had learned?

15. If you were talking to next year’s Year Seven at your school, what advice would you give them on doing a project like your medieval project or your science project, so that they could get a good mark? (Please circle all that you agree with)
a) I would tell them to write out a mind map to get keywords for their topic
b) I would tell them to write out their questions
c) I would tell them to search the catalogue in the library
d) I would tell them to use their keywords when using books
e) I would tell them to use their keywords when searching the web (e.g. using Google)
f) I would tell them to use their keywords when looking at a website
g) I would tell them to write out notes on paper
h) I would tell them to cut and paste information
i) I would tell them to look at their questions and mind map before writing their assignment

16. Please write down in your own words ONE more thing that you’d tell next year’s Year Seven about doing assignments, so that they could get a good mark.

Thank you very much for completing this questionnaire.
Appendix 5 – Student interviews

1. **Sharing information**

Tell me about how you think students share information and ideas when they do brainstorming.

2. **Reflecting on prior knowledge**

Tell me about whether you think students in brainstorming get to think about what they already know about their topic.

3. **Having an overview**

Tell me about whether you think brainstorming and having a mind map will help students in doing the rest of their assignment.

4. **Thinking about questions**

Tell me about the questions you write down or think about when you’re about to look for information for your assignment in books or websites.

5. **Feeling confident**

Tell me about how you feel when you have to do research for an assignment e.g. are you always confident or are you unsure sometimes?

6. **Finding the best information**

Tell me about what you do when you are looking for information or ideas in books and websites e.g. how you know whether what you’re reading is what you need.

7. **Talking to other students**

Tell me about the kinds of things you talk to other students about when you’re doing your research e.g. in the library - things to do with your assignment.

8. **Taking notes**

Tell me about how you take notes and why you like taking notes in this way.

9. **Accepting and rejecting**

Tell me about how you decide what to include in your assignment before you hand it in e.g. what you put in and what you leave out.

10. **Conceptualising transfer**

Tell me about whether you think you’ll use what you learned about doing research for your assignments next year, when you’re in year 8 e.g. will you use a mind map if the teacher doesn’t ask you to?
11. **Independent thinking or conformity**

Tell me whether teachers need to remind you (or other students) of how to do your assignments well every time you do an assignment.

12. **Thinking about their needs**

Tell me about what you think year seven students need to be taught by teachers or the teacher librarian about using books and websites. E.g. What do year seven students need to know about this?
Appendix 6 - Theoretical sampling – questions for teacher and teacher librarian groups

Preliminary question: How would you define information literacy in the school context?

1. To what extent do you think your year seven students make connections when using information literacy skills/techniques e.g. linking question formulation to writing the assignment?

2. To what extent do you think your year seven students are capable of reflecting upon their use of information literacy skills and techniques?

3. What influences the extent to which your year seven students are engaged with the information literacy/research/assignment process?

4. Tell me about what information literacy skills/techniques you think your year seven students use.

5. To what extent do you think your year seven students are able to think about their information environment and how to make effective use of it?

6. My research shows that some students do not value the information literacy concepts, skills and techniques because they a) do not understand the concepts or b) lack motivation or c) view techniques e.g. mind mapping as a waste of time. To what extent do you agree with these findings?

7. To what extent do you think that teaching year seven students information literacy concepts, skills and techniques will enhance students’ subject knowledge or make them more independent learners?

8. What do you understand by the concept of transfer in the school context?

9. Do you think that there is a culture of transfer in this school in relation to information literacy development?

9. What would be the best way of ensuring that a culture of transfer did develop in the school?
Appendix 7 – Theoretical sampling – questions for students

1. Do you think that students in your class make connections (e.g. using the mind map when starting to write the assignment) when they are doing a research assignment?

2. Do students in your class think about the best way to find and use information for their assignments or do they just get on and do the assignment?

3. What makes students in your class interested in using their information or research skills when doing an assignment?

4. Where do students in your class get information from when they’re doing an assignment?

5. Do students in your class create their own information?

6. Some students in your class don’t appear to value what they’re taught about things like exploring their topic, thinking about how to select the right information, or organising their assignment well. Why do you think this happens?

7. Do you think that students in your class learn more about their subjects – like history or science – if they use things like a mind map or having questions?

8. Do you think that students in your class have transferred some of the skills learned in year seven into year eight?

9. How do you think teachers could get students to transfer skills from one year to another?
Appendix 8 – Charles Sturt University Ethics Permission

Dear James,

Thanks for forwarding the requested extra information to the EHRC re: your application entitled “A critical evaluation of the extend to which year 7 students transfer information skills across curricular subject areas and the implication of this for the teaching of information skills in schools by teachers and teacher librarians”

I am pleased to advise that the Standing Committee has approved the proposal and issued a Protocol Number 2006/089. I will forward a letter today confirming approval.

I hope all goes well with your research.

Best wishes,

Administrative Officer
Department of the Academic Secretary
Charles Sturt University
Panorama Ave
Bathurst 2795
Ph: 02 633 84628
Fax: 02 633 84194
www.csu.edu.au

The Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS) Provider Number is 00005F for Charles Sturt University and the Charles Sturt University Language Centre.
Appendix 9 – New South Wales DEST permission
Mr James Herring  
School of Information Studies  
Charles Sturt University  
Locked Bag 675  
Wagga Wagga 2678

Dear Mr Herring

SERAP Number: 06.254

I refer to your application to conduct a research project in NSW government schools entitled *A critical evaluation of the extent to which year 7 students transfer information skills across curricular subject areas and the implication of this for the teaching of information skills in schools by teachers and teacher librarians*. I am pleased to inform you that your application has been approved. You may now contact the Principals of the nominated schools to seek their participation.

This approval will remain valid until 28 April 2007.

This approval covers the following researchers and research assistants to enter schools for the purposes of this research:

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<tr>
<th>Name</th>
<th>Approval expires</th>
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<tr>
<td>James Herring</td>
<td>6 April 2007</td>
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You should include a copy of this letter with the documents you send to schools.

I draw your attention to the following requirements for all researchers in NSW government schools:

- School Principals have the right to withdraw the school from the study at any time. The approval of the Principal for the specific method of gathering information for the school must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.

When your study is completed please forward your report marked to General Manager, Planning and Innovation, Department of Education and Training, GPO Box 33, Sydney, NSW 2001.

Yours sincerely

Dr Christine Ewan  
General Manager, Planning and Innovation  
24 May 06