Information literacy in the classroom: assessing the competency of Western Cape teachers in information literacy education

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ABSTRACT

This study investigated teachers' competency in mediating information literacy in the classroom. At the heart of the problem was teachers' own understanding of information literacy and their competency in information literacy education. The significance of the study is based on the following premises: information literacy is inferred in all the national curriculum statements; first year university students are expected to be able to learn independently from information resources, access and use information increasingly available online only, and write assignments based on research papers but their preparation at the school level appears inadequate and disparate; the education ministry has queried teachers' lack of abilities in teaching research assignments and projects, often the vehicle for information literacy; and school librarians, the traditionally accepted purveyors of information literacy education, are scarce in South Africa making teachers the default information literacy educators. Further support for the study comes from the international literature: there is continued vocalization of the importance of information literacy through its association with inquiry-based learning. In teacher education certain assumptions have been questioned such as teachers' innate abilities to mediate information literacy through their subject; and trainee teachers not needing information literacy education.

Twenty nine participants in an information literacy education course at the University of the Western Cape formed the purposive sample. A mixed methods approach combined quantitative and qualitative modes of research and data. Data collection methods and tools included a pre- and post-course questionnaire, journals, interviews and assignment artefacts. The overriding mode of inquiry for the current study was qualitative. The principal theories guiding the study are constructivism, inquiry-based learning, and the process-based approach to information seeking behaviour. The important elements of an inquiry model, that incorporate information literacy, such as process learning, asking good questions, motivation, scaffolding, mediated learning and metacognition formed the kernel of the study.

The study achieved its purpose in showing in a nuanced way that teachers, having undergone information literacy education, could teach their learners information literacy to a greater or

lesser extent using a guided inquiry project. The course intervention saw participants progressing from a limited, unclear understanding of information literacy to having a satisfactory grasp of information literacy (education). Formerly, participants presented learners with a research project accompanied sometimes with a list of instructions, but only saw the completed project at the end. The course taught participants that information literacy needs to be made explicit in the classroom. One of the biggest challenges was using web-based information. The research shows that teachers need to be conversant and comfortable in the web environment and this conversion takes time and persistent breaking down of barriers. Using a change agency continuum, the study shows the participants' varying degrees of change of beliefs from transmission teaching to using a guided inquiry approach. In comparing a (school) librarian's approach to information literacy to the teachers', the most glaring differences were teachers' initial acceptance that information literacy occurs instinctively; that libraries were storehouses of "stuff" such as books; that textbooks are adequate for research projects; and that the ethical use of information was inconsequential.

The study suggests that alternative sociological theories such as *ICT for Development* or Chatman's *Information Poverty* could better explain the historical effect of teachers' unequal access to information and the challenge of educating teachers in information literacy education in developing countries. The study recommends that all teachers receive information literacy education as part of their pre-service teacher training and that practicing teachers receive effective in-service training in mediating projects in the classroom. Teacher education policy documents need to make more explicit reference to information literacy education. The absence of the position of school librarian requires serious consideration as the lack of access to an organised, functioning school library continues to thwart literacy and information literacy.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACE	Advanced Certificate in Education
ACRL	Association of College and Research Libraries
AASL	American Association of School Librarians
ANA	Annual National Assessment
ASK	Anomalous State of Knowledge
ASLA	Australian School Library Association
C2005	Curriculum 2005
CAPS	Curriculum and Assessment Policy Statement
CAUL	Council of Australian University Librarians
CHE	Council on Higher Education (South Africa)
CHELSA	Committee for Higher Education Librarians of South Africa
CIL	Centre for Information Literacy (University of Cape Town)
CPD	Continuing Professional Development
DOE	Department of Education
EDULIS	Education Library and Information Service
FET	Further Education and Training
GDP	Gross Domestic Product
GET	General Education and Training
GLEF	George Lucas Educational Foundation
HSRC	Human Sciences Research Council

IASL	International Association of School Librarianship
ICTs	Information and Communication Technologies
IDASA	Institute for Democracy in South Africa
IFLA	International Federation of Library Associations and Institutions
IMG	Institutional Management and Governance
ISP	Information Search Process
ISTE	International Society for Technology in Education
LIASA	Library and Information Association of South Africa
LILAC	Librarians' Information Literacy Annual Conference
LIS	Library and Information Services
LitNum	Literacy and Numeracy (strategy)
LTSM	Learning Teaching Support Material
NCS	National Curriculum Statement
NEIMS	National Education Infrastructure Management Systems
NPDE	National Professional Diploma in Education
OBE	Outcomes-based Education
OELMA	Ohio Educational Library Media Association
PIRLS	Progress in International Reading Literacy Study
PLUS	Purpose Location Use Self-Evaluation (model)
SAHRC	South African Human Rights Commission
SAQMEQ	Southern and Eastern African Consortium for Monitoring Educational Quality

SAQA	South African Qualifications Authority
SCONUL	Society for College, National and University Libraries
SES	Socio-economic Status
TIMSS	Trends in International Mathematics and Science Study
UK	United Kingdom
UNESCO	United Nations Education Scientific and Cultural Organisation
USA	United States of America
UWC	University of the Western Cape
WCED	Western Cape Education Department
WSIS	World Summit on the Information Society
ZPD	Zone of Proximal Development

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CHAPTER ONE

BACKGROUND TO THE STUDY

1.1 BACKGROUND AND OUTLINE OF THE RESEARCH PROBLEM

Traditionally, information literacy has been the domain of the school librarian. In South Africa with its dearth of school libraries, school librarians are scarce. This ability to find, organise and evaluate information for decision-making and problem solving is a life skill and therefore desirable for all learners. These information literacy skills can be taught generically across the curriculum (for example, by a school librarian) and specifically within the context of a learning area (by the teacher). Teachers should be role models of information literacy and are expected to mentor and guide learners through the process of learning. The question thus arises: is information literacy being taught at schools and are teachers equipped to facilitate it? Few studies have been conducted in South Africa (Zinn 1997; Hart 1999) and worldwide (Henri 2001; Moore 2002; Williams & Wavell 2006; Probert 2009) to investigate teachers' understanding of information literacy in the classroom.

The learner who emerges from immersion in the current outcomes based curriculum is envisaged as someone who, amongst other things, thinks critically, is able to apply learning, uses information from a wide range of resources to build new knowledge, and communicates intelligently and intelligibly. These characteristics of a successful learner are most evident in three critical outcomes from the South African national curriculum statements

> *collect, organise, analyse and critically evaluate information*; *identify and solve problems and make decisions using critical and creative thinking;* and *communicate effectively using visual, symbolic or language skills in various modes* (South Africa 2002; 2009c).

These critical cross-curricular outcomes best embody the concept of information literacy in the South African curriculum. Each subject has an outcome statement epitomizing what information literacy in that subject area entails. For example, in languages, the learner should be able to "use language to think and reason, as well as to access, process and use information for learning". In

mathematics, the learner should, "through the study of data handling", develop the "skills to collect, organise, display, analyse and interpret this information". The statement makes the claim that "These competencies enable the learner to participate meaningfully in political, social and economic activities" (South Africa 2002; 2009c).

Additional motivation for investigating information literacy at the school level stems from tertiary institutions which are being confronted by the problem of students who lack information literacy. More and more universities are realizing that undergraduate students do not come prepared for tertiary level studies and do not absorb information literacy by "osmosis" (Walker 2001: 69). King's (2007) study of the University of the Western Cape's (UWC) undergraduate students' lack of readiness for academic learning adds weight to Walker's views. In recent years most tertiary institutions in South Africa have begun offering some information literacy intervention (web-based e-learning module; credit-based courses) for first year students (De Jager, Nassimbeni & Underwood 2007: 142) in an attempt to address this gap.

While ensuring that students leave university information literate is an accomplishment, training them in *how* to foster and inculcate information literacy in their learners (if they become teachers) necessitates a grounding in methodologies, such as inquiry-based learning and resource-based learning, both of which complement information literacy. Olën (1994) identified the omission of library media centres and resource-based learning in the initial training of South African teachers. Asselin (2003) conducted a study of pre-service teacher training in Canada and also found that the value of the school library programme and school librarians in the curriculum were overlooked. The cohort of teachers presently teaching in our schools seems to have great difficulty in knowing how to approach inquiry-based learning, which is learner-centred and resource-based. Evidence gleaned from teachers' portfolios from a course in information literacy education (Zinn 2008) illustrated that teachers were ill-prepared for and lacked confidence in supporting learners during the information literacy process. A Western Cape (2007) Education Department report on the quality of teaching and learning and educator development demonstrates clearly teachers' inability to use resources for learning.

In 2009, the Minister of Education, Ms Angela Motshekga, appointed a panel of experts to look into the challenges related to the implementation of the 2004 National Curriculum Statement (NCS), a revision of the former (1997) new curriculum (South Africa 2009c). The ongoing public disquiet and criticism of the 2004 curriculum led to the review. Teachers were overloaded, stressed and confused about what to teach and how to assess. Furthermore, international and national assessments repeatedly reveal that South African learners are scoring some of the lowest percentages for literacy and numeracy (Equal Education 2011; South Africa 2011c).

In the review, research projects and assignments were criticized for being 'superficial' in nature and the tasks lacking in 'educational rigor'. Learners in rural and poorer communities were disadvantaged because they lacked access to information for these projects. Often parents completed the projects for their children or projects were simply plagiarized. Far too many research projects were being set in one year. Teachers lacked the expertise in teaching learners how to conduct research projects. Projects were often poorly set with little guidance or scaffolding. Projects also required access to resources such as those in libraries and on the Internet, both of which are scarce in many schools (South Africa 2009c: 32-33).

In their final recommendation, the panel of experts acknowledges that research projects do develop the crucial skills of retrieving information, solving problems and thinking critically and creatively (South Africa 2009c:34). However, they advise that there should be no more than one project per annum per subject. The Department of Education should provide examples of projects as well as indicate how these projects should be scaffolded (South Africa 2009c: 65).

The review focused on several aspects of the implementation of the NCS, one of which was the problems related to research projects. Perhaps given the brief, the solutions offered by the review committee (reducing the number of projects and offering exemplars) do not address the underlying pedagogy of research projects. Do teachers understand the learning that takes place when children are undertaking projects? Learning using the vehicle of research projects

exemplifies information literacy but it is evident from the review that teachers have a superficial knowledge of information literacy *education*. Most research on information literacy focuses on librarians and information professionals. There seems to be a gap in the research on teachers' interpretation of information literacy. Therefore, the aim of this study is to investigate teachers' understanding of the information literacy concept and its integration with the curriculum.

1.2 INFORMATION LITERACY CONCEPTIONS AND DEBATES WITH SPECIAL REFERENCE TO THE SCHOOL ARENA

Information literacy has been variously defined by, among others, the Association of College and Research Libraries (ACRL) (2002); Kuhlthau (2004) and the Library and Information Association of South Africa (LIASA) (2004). Essentially, information literacy is

> the ability to recognise the need for information and to manage it in any context. It is the active process of locating and collecting needed information from any source, including print, human or electronic resources, selecting and evaluating the information and then using it appropriately and ethically for personal growth and for participation in society as a critical and active citizen. This would entail using information for effective decision making or problem-solving, to express personal ideas, develop arguments, refute the opinions of others, learn new things, identify the truth or factual evidence about a topic, to generate new knowledge and to be effective in applying these skills towards life-long learning (LIASA 2004).

Many terms are either used synonymously with information literacy or in association with it, for example, resource-based learning, and inquiry-based learning. **Resource-based learning** involves learners in active learning using a wide range of selected resources such as print, non-print, electronic and human resources (Saskatchewan schools 2005). **Inquiry-based learning** is learner-driven learning in which learners investigate widely and then build new understandings, meanings and knowledge. This new knowledge may be used to answer a question, to develop a solution or to support a position or point of view. The knowledge is usually presented to others

and may result in some sort of action (Alberta Learning 2004; Callison & Preddy 2006; Kuhlthau, Maniotes & Caspari 2007).

International recognition of information literacy as a life skill for the 21st century can be seen in the United Nations Educational, Scientific and Cultural Organisation (UNESCO) sponsored statements (Prague declaration 2003; Alexandria proclamation on information literacy and lifelong learning 2005) and documents (Moore 2002; Horton 2007); dedicated conferences (Librarians' Information Literacy Annual Conference (LILAC) 2005 - 2012); websites (http://www.informationliteracy.org.uk); forums (National Forum on Information Literacy); centres of information literacy at universities (Centre for Information Literacy (CIL) at the University of Cape Town) and curricula expressed as standards or outcome statements (for example the UK's Society for College, National and University Libraries (SCONUL) 1999(b) Seven Pillars of information literacy and the USA's American Association of School Librarians (AASL) 1998 standards for student learning).

Advances in technology and ICTs specifically have enabled an unprecedented growth in information. The ability to access vast amounts of information is of little value unless individuals can sift the garbage from the "gold", that is, select and use the most pertinent information for knowledge creation. ICTs have therefore precipitated information literacy (Mackenzie 1999; Bruce 2002: 2; Moore 2002). The fixation with ICT fluency often hides the information illiteracy of generation Y, the generation born between the mid-1970s to the mid-1990s (Combes 2006). In Combes's study of Australian students, they seemed more ICT adept or ICT literate[1] than information literate or information fluent[2].

[1] **ICT literacy** or information technology `fluency' focuses on a deep understanding of technology and graduated, increasingly skilled use of it (ACRL 2002).

[2] Information fluency is described by Callison and Preddy (2006) as the ability to apply the skills associated with information literacy, computer literacy and critical thinking to address and solve information problems across disciplines, across academic levels, and across information format structures.

1.3 INFORMATION LITERACY IN THE SOUTH AFRICAN CONTEXT

The change in curriculum in 1994 brought with it an optimism in South Africa to prepare the youth for a future commensurate with any first class education system. In terms of one of the founding documents of the new curriculum, learners [would] "become analytical and creative thinkers, problem solvers and effective communicators. They [would] know how to collect, gather and organise information and conduct research" (South Africa 1997: 27).The latter utterance, especially, spoke to librarians (at school and university level) who now identified in the new curriculum, explicit signals for information literacy education. Most often, information literacy is witnessed in the learner production of projects and assignments, activities that require interaction with resources beyond a textbook. For these types of information-based assignments, adequately stocked libraries are a prerequisite. Regrettably, despite the progressive education policies over the past 15 years, only about 7.7% of schools have a functioning library and 22% have computers for teaching and learning (South Africa 2009b). With a minority of schools having libraries, the public library has inadvertently become the "school library". Public librarians are not trained teachers and are not expected to be familiar with the intricacies of the curriculum. Hart (2005) calls their ability to mediate information literacy into question. For the most part, public libraries can offer access to information, but the teaching of information literacy has to rest primarily with teachers. A single public library can service up to 20 schools making it impossible for public librarians to do justice to information literacy education in any concerted way. Studies indicate that learners are flocking to public libraries to complete resource-based assignments (Hart 2005; van der Walt 2005). The question thus arises, if public libraries are overflowing with learners engaged in research projects, who is preparing and supporting learners as they proceed through the research process?

The South African Olën (1994) study and the Canadian Asselin (2003) study both point to a gap in the training of pre-service teachers in inquiry-based learning methodologies and the role of the school library programme in the curriculum. Hart (1999) and Maepa and Mhinga (2003) demonstrate in their studies that teachers' actions in projects and information-based assignments

show a lack of understanding and knowledge of inquiry-based approaches which outcomes-based education (OBE) epitomizes. Moore (1997) in New Zealand, Henri (2001) in Hong Kong and Williams and Wavell (2006) in Great Britain think that it has somehow been assumed that teachers were information literate and could therefore elicit information literacy in their learners. To date there has been minimal research internationally or locally which explicitly examines teachers' interpretation of information literacy.

Most research in Southern Africa on information literacy has focused on libraries, librarians, or students. Zinn (1997) conducted action-research in an attempt to instill information skills in learners in disadvantaged schools. Hart (1999) highlighted project work in the curriculum. Boekhorst and Britz (2004) compared information literacy in the Dutch education system with the South African OBE system. Hart (2005) and van der Walt (2005) identified public libraries as the newest zones for possible information literacy education, especially given the scarcity of school libraries. King (2007) focused on university students and Jorosi and Isaac (2008) focused on teacher librarians.

The value of this study is that it attempts to go beyond anecdote to provide evidence of teachers' conceptions of information literacy implementation in the classroom, offering new insights into a needed research area. This research explores and exposes teachers' beliefs about information literacy and compares them with their actions (actual behaviour). This study also reveals to what extent interventions such as university courses in information literacy, for example, the Advanced Certificate in Education (ACE), contribute to changing strongly held beliefs and attitudes in teachers.

1.4 ASSUMPTIONS AND LIMITATIONS

The definition of information literacy in this study encompasses ICT literacy. While information technology "fluency" means good skills' utilization of technology like computers and software,

information literacy on the other hand encompasses a broader, cognitive definition. Information literacy is an "intellectual framework" for defining an information need, locating, analysing and engaging with information. To a certain extent ICT proficiency is required, and a good search strategy, but above all, an ability to judge critically and apply concepts is imperative.

This research does not examine information literacy at the higher education level in any depth, instead it focuses on the school level.

The teachers in the study were geographically dispersed across the Western Cape region, an area of 1 219 kilometers (km) square making it difficult to observe teachers conducting the research project in their classrooms. To overcome this limitation in some way, the researcher had to rely on a combination of the journal entries, samples of learners' work which illustrated information literacy skills being implemented and assessed, the teachers' research project plans [see Appendix 1], and other bits of evidence such as bibliographies of information resources consulted, research project tools developed and used with learners, and teachers' assessment rubrics.

The point of reference for this study is the teacher: how the teacher experiences information literacy and mediates information literacy education in the classroom. The direct perspectives of public librarians with regard to school projects have been excluded unless mentioned indirectly by teachers and advisors in the interviews. Hart (2005) in her doctoral study focuses on public librarians' willingness and capabilities in mediating information literacy in particular to school-going students.

The literature abounds with examples of school settings where school librarians work collaboratively with teachers. This is not the position in the majority of South African schools.

Hence, collaboration with external agents such as public libraries and other information agents is explored.

1.5 DEFINITION OF THE TERM SCHOOL LIBRARIAN

In this study the term "school librarian" has been used to refer generically to a person with a library qualification who manages the school library programme. In the USA, Canada and Australia school librarians have a dual qualification as teachers and librarians. In the USA, school librarians are referred to as school library media specialists. In Canada and Australia they are referred to as teacher-librarians. In the United Kingdom (UK) the title used is school librarian and denotes a graduate professional who may not have a teaching qualification. Historically, South African school librarians were referred to as media teachers or teacher-librarians and they were generally dually qualified as librarians and teachers. However, there is no longer a position such as a media teacher or teacher-librarian in terms of the Occupation Specific Dispensation for teachers in South Africa. This study has adopted the generic term "school librarian" to represent all the above-mentioned terms.

1.6 RESEARCH PROBLEMS AND OBJECTIVES: KEY QUESTIONS TO BE ASKED

Outcomes-based education involves an active learning process not limited to the textbook and teacher's ideas, the proverbial chalk-and-talk approach. Active learning requires interaction with a wide variety of resources (print or digital) for information-based assignments. The ability to access and use resources (beyond the textbook) requires learners to have knowledge of different resources, information handling skills and positive attitudes to information seeking such as being persistent, attending to detail and interrogating information and sources rather than accepting them at face value (Kuhlthau 2004). The literature indicates that the school librarian is the educator most often identified as tasked with teaching generic information skills. South African public schools without libraries constitute 79.3% of the total number of schools in the country (South Africa 2007: 39). In the Western Cape only 26.7% (or 373) of schools have a stocked library. Dependency on school librarians in general to impart information literacy is therefore out

of the question. The onus thus rests on the classroom teacher. The problem of this research was to investigate whether teachers are capable of mediating information literacy in the classroom.

This study seeks to answer the following questions:

- How do teachers understand information literacy and information literacy education?
- How do teachers make their information literacy explicit in the classroom?
- At what level are teachers' web knowledge and skills?
- To what extent is information literacy successfully integrated within learning areas?
- To what extent is information literacy assessed in the curriculum?
- How do librarians, school librarians in particular, understand and conceive of information literacy?
- What are the differences and similarities between teachers' and librarians' opinions of information literacy?

1.7 PRINCIPAL THEORIES UPON WHICH THE RESEARCH PROJECT IS CONSTRUCTED

This study is framed by the information seeking behaviour (also referred to as information behaviour) approach of Kuhlthau (2004) and an inquiry-based approach to learning. The former emanates from the field of information and library science. Both Kuhlthau's Information Search Process (ISP) approach and the inquiry-based approach are grounded in the theory of constructivism and closely aligned with information literacy.

1.7.1 INFORMATION SEEKING AND USE

Information behaviour has become an umbrella term for information seeking behaviour, information seeking and use, and information need (Case 2007: 81; Stilwell 2010: 3). Case (2007: 5) defines information behaviour as encompassing

> information seeking as well as the totality of other unintentional or passive behaviors (such as glimpsing or encountering information), as well as purposive behaviors that do not involve seeking, such as actively avoiding information.

Kuhlthau's (2004) needs driven approach to information seeking behaviour echoes those of Taylor (1968), Belkin (2005) and Dervin (2005). In Kuhlthau's approach uncertainty, doubt or a gap in information propels the individual to seek information. The individual traverses six stages in the information search process which not only includes the intellectual (cognitive) and actions (physical) but also the affective (emotional) aspect. The ISP approach to information behaviour embodies a holistic approach to learning through thoughts, actions, and feelings.

The ISP approach, or rather its various interpretations and applications, is not without its detractors. Bruce (1997) is critical of some interpretations of the ISP which reduce information literacy to a set of skills steps experienced in a linear way. She labels this approach to information literacy as behaviourist. In this paradigm, the educator or librarian is controlling, directing learners along a specified path of three or six skills steps to "attain" information literacy. This teaching/learning environment is prescriptive and does not allow sufficient independent, learner-centred inquiry. The constructivist paradigm, on the other hand, focuses on higher-order thinking and problem-solving in a collaborative environment and where skills and knowledge form an integrated whole within a context (Limberg 2000). The preferred model developed by Bruce (1997) is a relational one in which people "experience" or "relate" to information literacy in a variety of ways.

Ultimately, both approaches to information literacy, the ISP (Kuhlthau 2004) and relational (Bruce 1997) models, underline "deep learning" as opposed to "surface learning". As this empirical study focuses not only on teachers' own information literacy, but also their ability to mediate information literacy in the classroom, it presupposes that teachers are metacognitively aware of how learning, especially deep learning, takes place. Cognitive constructivists postulate that people learn by creating mental models or cognitive maps. The more experienced the person

(for example, the teacher) the more extensive the network of mental structures (schemata) by which the person organises his/her perceived environment. The question arises: are teachers aware that their cognitive maps or experiences of information seeking are probably different from their learners' because a) they have more complex mental maps and b) the conceptual framework they use and were trained in may not embrace deep learning adequately? For example, Pitts (1994) found in her doctoral study of eleventh and twelfth graders that the mental models of the learners differed from the teachers' conceptual frameworks. Unless teachers become aware of this gap and intervene, learners could remain baffled by their incomplete mental models.

1.7.2 INQUIRY-BASED LEARNING

Inquiry-based learning, also referred to as "information inquiry" (Callison & Preddy 2006) or "guided inquiry" (Kuhlthau, Maniotes & Caspari 2007), is a fairly recent expression of ongoing research in the fields of information literacy, education and school librarianship in particular. Research suggests that using inquiry-based learning with learners can help them become more creative, more positive and more independent (Kühne 1995). Other academic research shows that inquiry-based learning improves learner achievement (George Lucas Educational Foundation (GLEF) 2001). Some of the research on this effect comes from studies of effective school library programmes that are centres of inquiry-based learning. A school library programme that is properly equipped and staffed can make a difference in terms of measurable gains in learner achievement. School library factors alone can account for improvements of 2% to 9% in learner achievement (Lance 2005; 2006; 2007).

For the Australian School Library Association (ASLA 2009: Statement on guided inquiry and the curriculum):

> Guided inquiry is an approach or methodology which allows students to seek and engage with a variety of ideas to increase their understanding in pursuit of knowledge and greater awareness. Guided inquiry is a planned, supervised and targeted

intervention into developing information literacy and enhancing learning. This approach or methodology to learning provides a means by which teachers are able to tailor learning experiences and opportunities, resources and processes to the needs and abilities of each student according to intended curriculum learning outcomes.

Inquiry-based learning is founded on the constructivist approach to learning. The theory of constructivism posits that people learn actively by constructing their own subjective interpretation of reality. People create personal knowledge by fusing their existing or prior knowledge with new ideas. All learning occurs within cultural and social contexts. In discussing the constructivist classroom, Brooks and Brooks (1993) suggest that the transformation of schools should encourage learning that goes beyond the rote memorization of facts. The strategies that teachers can employ to follow constructivist principles in the classroom have characteristics in common with the guiding principles of the inquiry-based approach: for example, constructivist teachers encourage learners to take the initiative and take ownership of their learning; the constructivist teacher models the behaviour of an inquirer by, amongst other things, asking thoughtful, open-ended questions and encouraging learners to engage in dialogues which may provoke opposing viewpoints; constructivist teachers allow learners time to fashion questions and responses and tease out responses by requesting elaboration (Brooks & Brooks 1993; Drayton & Falk 2001).

Teachers in this study were required to integrate and assess information literacy within different subject/learning areas. This implies that teachers are required to be cognizant of the learning environment they create which needs to foster an inquiry process. This process assists learners in coping with problems that may not have clear solutions, and/or may challenge their beliefs or understandings. The goal of inquiry-based learning is thus not fast facts or surface learning but rather deep, lasting learning that requires learner engagement and reflection (Kuhlthau, Maniotes & Caspari 2007).

Teachers' ability to design information-based assignments which stimulate curiosity and engage learners in higher order thinking rather than 'copy-and-paste' assignments, were put to the test.

Were teachers in this study aware of the zone of intervention in the inquiry process (Vygostky's 1978 zone of proximal development) in which teachers scaffold learners at critical points in the learning process?

In summary, this study is located within the theories of information seeking and constructivism. Current research in information seeking and use signal Kuhlthau's (2004) ISP approach as a valid model in understanding information literacy. Nevertheless, this study is inclusive of alternative approaches to information literacy. Inquiry-based learning with its grounding in constructivism provided the lens through which teachers' abilities to communicate information literacy in the classroom were viewed.

1.8 RESEARCH METHODOLOGY AND METHODS

In this section the participants are introduced, the approach of the study outlined, the data collection methods and tools described and the data analysis procedure sketched.

1.8.1 THE PARTICIPANTS

There were two groups of participants.

1. Teachers enrolled part-time in the ACE

The major part of the research was conducted amongst teachers enrolled part-time in the Advanced Certificate in Education: School Librarianship programme offered in the Department of Library and Information Science at the University of the Western Cape. Twenty-nine (29) teachers participating in the semester long course, *information literacy education,* formed the sample. This sample can be understood as either a purposive or convenience sample. The teachers in the sample were training to become school librarians but were still classroom teachers at the time. The researcher gathered evidence over a period of six months.

2. Chief curriculum advisors based in six WCED districts

The chief curriculum advisors based in six WCED districts were interviewed as the overseers of trainers who provide in-service education and training on various aspects of the OBE curriculum to teachers on a continual basis.

1.8.2 THE APPROACH

This study combined both qualitative and quantitative approaches. Using both qualitative and quantitative tools can help to strengthen and compensate for the weaknesses of each approach. The bulk of the study, though, was qualitative enabling a rich, textured understanding of information literacy in the school environment. The qualitative approach allowed for in-depth, detailed collection of data over a period of time and for the incorporation of insights from the early stages of data collection into tools developed later in the research process.

Using multiple sources of information facilitates methodological triangulation which in turn "enhances validity and reliability in qualitative research" (Babbie & Mouton 2001: 275). The methods drawn on to achieve triangulation, such as interviewing, survey by questionnaires, observation and document analysis, assisted the researcher in either clarifying or invalidating irrelevant influences.

1.8.3 DATA COLLECTION

Data collection methods and tools are described below.

1.8.3.1 INTERVIEWS OF DISTRICT CHIEF CURRICULUM ADVISORS

The chief curriculum advisors of six Western Cape Education Department district offices were interviewed separately in a face-to-face session. As this was a small-scale interview of six people, the researcher conducted interviews herself. The advantage of interviews over other survey methods is a high response rate (Babbie & Mouton 2001). Another advantage of the interview is that any misunderstandings can be cleared up immediately. Respondents can also be probed for more detailed answers and explanations. The aim of the interview was threefold:

1. To find out the importance of information literacy in in-service teacher training;
2. To determine the level of incorporation of information literacy in in-service teacher training; and
3. To establish curriculum leaders' views on information resources and resourcing beyond the text book.

1.8.3.2 PRE- AND POST-COURSE SELF-EFFICACY TESTS

An information literacy self-efficacy scale was distributed amongst the 29 teachers at the start of the *information literacy education* course. The Kurbanoglu, Akkoyunlu, and Umay (2006: 742) information literacy 28-item self-efficacy scale, with an alpha reliability coefficient of 0.92, was employed to measure teachers' beliefs about their information literacy. The information literacy self-efficacy scale contains eight groupings of statements related to information to determine a teacher's level of efficacy. There is a high correlation between the eight groupings and the various models of the information literacy process – that is

- defining the need for information;
- initiating the search strategy;
- locating and accessing the resources;
- assessing and comprehending information;
- interpreting, synthesizing and using information;
- communicating information; and

- evaluating the product and process.

The information literacy self-efficacy scale was again distributed amongst the 29 teachers at the end of the *information literacy education* course. The post-course test provided data informing the researcher about the course intervention's effect on teachers' self-efficacy. This post-course test also acted as a reflection tool for the teachers.

1.8.3.3 MIND MAPS

Originally, teachers' mind maps illustrating how they would solve an information-based problem formed part of the data collection. A mind map allows people to describe a topic in a nonlinear way (Buzan & Buzan 1996). Mind maps were drawn before the start of the course and then again after the course. They were to be used to highlight any significant differences in the problem-solving process between the two mind maps. The researcher decided to omit the findings from the mind maps for three reasons: 1) several mind maps were mere brainstorms and not mind maps; 2) the findings from the mind maps made no new significant contribution to understanding teachers' information literacy; and 3) the inclusion of the mind map findings made the thesis unnecessarily bulky.

1.8.3.4 OBSERVATION

Teachers were observed in a natural setting, the computer laboratory. There are different kinds of observation which extend from unstructured to 'pre-ordinate' or highly structured observation (Cohen, Manion & Morrison 2007:397). The nature of the observation was not strictly detached as the researcher, also the course facilitator, was guiding the participants as they interacted with web-based information. The monitoring was conscious but unstructured.

1.8.3.5 INTERVIEWS OF TEACHERS

Individual and small group interviews commonly accompany data collection methods of both the qualitative and quantitative variety (Fontana & Frey 2008:119). In this study the purposeful

sample of teachers were selected to meet with the researcher for a one hour discussion once the course had come to an end. The researcher prepared the questions which were intended to probe any aspects of information literacy which needed elaboration, had been missed or overlooked, or which needed to be restated. During these interviews the participating teachers used evidence (artefacts) from their assignments which demonstrated, in their opinion, their ability to integrate information literacy within a learning area. Permission to record the proceedings was sought from participants.

1.8.3.6 JOURNALS

Journal keeping promotes participant involvement and engagement in the research process and is regarded as a useful qualitative research method (Meth 2003:195). Teachers were required to keep a written journal in which they regularly described their reflections, new learning, frustrations, moments of joy and other details experienced in the course sessions and while conducting information literacy with learners. The journals provided insight into teachers' understanding and grasp of information literacy education. They also shed light on how the teachers operationalized information literacy in the classroom.

1.8.3.7 REVIEWS OF THE LITERATURE

There is a vast amount of literature on librarians' understanding and conception of information literacy which was drawn on to show where teachers' and librarians' beliefs and attitudes converge and where they diverge. The literature review is divided into five sections: defining information literacy in the 21st century; tertiary institutions' information literacy expectations of incoming high school students; teacher education and information literacy; information literacy in the school sector; and the South African education context. The greatest concentration of the review is the school sector: the role of the principal in information literacy; the centricity of information literacy in the teaching role of the school librarian; and teachers' views of information literacy.

1.8.4 DATA ANALYSIS

This essentially qualitative research approach focused on viewing experiences from the perspective of those involved. Qualitative research deals more with a process than with a quantification of data (Babbie & Mouton 2001). The objectives of qualitative design are to explore areas where no or limited information exists and/or to describe behaviours, themes or relations that are applicable to the entities analysed. The method used to analyse data obtained via a qualitative design usually centres on content analysis, which is a systematic analysis of written or verbal responses and audiovisual material (DuPlooy 2001). Qualitative data is generally coded so that themes and patterns can be identified. Cresswell (2003) suggests that data need to be reduced to themes and categories for a logical picture.

The data obtained from the information literacy self-efficacy scales questionnaire were analysed using open source statistical software, called R software version 2.13.1, producing descriptive statistics (%, frequency). Qualitative data analysis software was used to facilitate the conceptual content analysis of:

- The interview responses from the curriculum advisors;
- The interview responses from the teachers; and
- The journal writings.

Atlas.ti 5.0 which is a qualitative data analysis package that is able to work with a wide range of qualitative data, was used for this data. It allows the user to import, display, code, analyse, and query file formats such as Microsoft Office file formats (Word, Excel, PowerPoint), rtf, graphic files, html and audio-visual files.

1.8.5 REFLEXIVITY

In qualitative research the narration, the interpretation and discussion of findings embody the researcher's own perspectives. Reflexivity is being conscious of one's own social and/or

political bias in research. Power relations in human inquiry can easily distort the results (Patton 2002:64-66). The researcher was aware of her position of power as the course facilitator and as researcher. She allowed the voices of the participants to be heard, often verbatim, in Chapter five in order to convey a sense of authenticity. Through dialogue with the participants the researcher continued to question and create new understanding for herself.

While it is not uncommon for qualitative researchers to use the first person "I" form, this researcher felt uncomfortable using the first person and retained the third person in reference to herself.

1.8.6 STRUCTURE OF THE THESIS

This chapter provided a background to the research problem, sketched the theories on which the study is based, and gave a brief overview of the methodology and methods used. The next chapter, Chapter two, discusses the expansive research literature on information literacy narrowed down to a focus on information literacy at the school level and the context of education in South Africa. Chapter three examines in depth the theoretical framework of the study. Chapter four addresses the approach of the study, the participants and the data gathering instruments. In Chapter five the research findings are presented along with an initial analysis starting with the quantitative data, the questionnaires, and followed by the qualitative data, the journals and the interviews. Chapter six offers an interpretation of the findings as they relate to the research questions and the current research literature. The final chapter, Chapter seven, summarizes and concludes the study with some recommendations for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In Chapter one, the concept of information literacy was briefly introduced against the background of the research problem. Information literacy is a subject which has been explored and investigated over some 20 years. Yet, it is still a topic which is robustly contested, constantly evolving and part of the present discourse in information seeking-and-use theory. This chapter provides a critical synthesis of previous research on information literacy and the context of education in South Africa. The chapter addresses four main headings:

- Defining information literacy in the 21st century;
- Tertiary level expectations of incoming high school learners;
- Teacher education and information literacy; and
- Information literacy in schools.

2.2 DEFINING INFORMATION LITERACY IN THE 21ST CENTURY

The 21st century epitomizes an information rich world in which information proliferates in a wide variety of formats demanding flexible modes of access. At the same time, the quality of information is under scrutiny because of lax publishing control, especially of online information. The challenge for all citizens is how to deal with this flood of increasingly "unfiltered" information in a principled and law-abiding way (Bundy 2004a: 3).

The roots of the concept of information literacy are manifold. Some authors maintain that they lay in a print-based culture (Boyce 2004). Information literacy can be viewed as a "natural extension of the literacy concept in the information society" (Bruce 2002: Introduction). Literacy

changes meaning according to what society determines a literate person to be and this has happened continually over time (Leu et al. 2004). Information literacy resides in the "convergence of thinking from many developments, disciplines, sectors and areas of research" (Horton 2007: 13). The strongest origins of information literacy are, however, in the library and information services (LIS) world, with education and ICT running a close second. Information literacy is viewed by some academics (Bundy 2004a; Byrne cited in Garner 2006; Herring 2007) as the umbrella term incorporating other literacies such as ICT literacy (also referred to as ICT fluency), e-literacy, media literacy and library literacy.

McEuen (2001), Callison (2003) and Valenza (2007) place information fluency at the intersection of information literacy, computer literacy and critical thinking. For McEuen (2001), information technology is the driving force behind the new term, information fluency. This is the commonly-held belief amongst North American educators and librarians evidenced in documents such as the *Framework for 21st century learning* (2007), the new *AASL standards for the 21st century learner* (AASL 2007) and the *National education technology standards and performance indicators for teachers* (International Society for Technology in Education (ISTE) 2008). Callison (2003) argues that information fluency is the ability to negotiate different media, computer and information literacy skills in the process of developing an information strategy. The point of contention between the opposing views centres on the definition and execution of information literacy. Those who place information literacy as the overarching concept understand it as an "intellectual framework for life-long learning" (Bundy 2004b: 11). For Byrne (cited in Garner 2006: 69), information literacy is a "set of capacities, skills, behaviours and attitudes which transcends the medium of information exchange – not a property of information technologies, publications, written culture or specific disciplines". For those who place primacy on information fluency, information literacy is reduced to the mastery of a set of skills or a model within print dominated technology.

On the one hand there seems to be a case for highlighting competencies with information and digital technologies as an inability to use these technologies puts individuals at a disadvantage in

a society that increasingly demands a seamless use of multiple literacies, from text to visual to digital. Candy (in Garner 2006: 56-57) goes further in drawing a distinction between "digital" and "ICT" literacy but it appears mainly to be a difference in semantics. When one talks about ICT literacy one is referring to the use of digital technologies and the ability to make sense of or interpret a collage-like mix of images, sounds and words.

On the other hand, allowing an over emphasis on the digital technological skills detracts from the kernel of information literacy which is an intellectual framework not confined by any set of technologies. Indigenous knowledge systems are a good example relating to the latter school of thought. One is creating meanings and understandings in a context devoid of digital technology but where critical thought and having the wherewithal to inquire, access and use information for knowledge creation are equally important. In all knowledge societies over the ages knowledge has played a vital part in the socio-economic and cultural activities of the group/community.

Today, information and communication technology has undeniably changed the way in which societies are operating. We are no longer bound by geographical distance as it can be overcome with ICTs, hence the saying "the global village". New technologies offer greater possibilities for distributing, collaborating, sharing, storing and retrieving knowledge. Information literacy is a "prerequisite" and "essential enabler" for lifelong learning (Bruce 2002; Bundy 2004a: 4). While technologies can facilitate knowledge access, storage and retrieval, they cannot create new knowledge. This is a human cognitive function. For Bruce (2002: Introduction) "Information literacy education is the catalyst which will transform the information society of today into the learning society of tomorrow."

Many terms are either used synonymously with information literacy or in association with it, for example, resource-based learning, and inquiry-based learning. Resource-based learning is planned activity involving learners in active learning using a wide range of selected resources such as print, non-print, electronic and human resources. It provides an opportunity for learners

to hone cognitive and information handling skills in a learning-centred environment (Saskatchewan schools 2005).

Inquiry-based learning is a term associated with information literacy and one of the more recent buzzwords emerging from the Canadian, American (USA) and Australian literature (Alberta Learning 2004; Callison & Preddy 2006; AASL 2007; Kuhlthau, Maniotes, & Caspari 2007; ASLA 2009). Inquiry-based learning is learner-driven learning in which learners investigate widely and then build new understandings, meanings and knowledge. This new knowledge may be used to answer a question, to develop a solution or to support a position or point of view. The knowledge is usually presented to others and may result in some sort of action (Alberta Learning 2004). The 2007 AASL (USA) and 2009 ASLA (Australian) standards speak about "guided inquiry". There is a definite attempt to use the language of the teacher in the new guidelines and "inquiry" is one of those words. Both terms 'inquiry-based learning' and 'guided inquiry' are explored in greater depth under Chapter three, the theoretical framework.

The International Federation of Library Associations and Institutions (IFLA)/United Nations Education Scientific and Cultural Organisation (UNESCO) sponsored high-level colloquium on information literacy and lifelong learning held in Alexandria, Egypt in 2005 (Garner 2006:5) issued a few bold appeals on behalf of the "disenfranchised" people of the world. These include the following:

- It is time to move from "Information for All" to "Information Literacy for All."
- Information literacy abilities are essential for social inclusion in today's information-driven world.
- Information literacy and lifelong learning are of the same essence.
- Information literacy is not a technology issue but a learning issue.
- Information literacy is more than a library or education issue. It is crucial to issues of economic development, health, citizenship and quality of life.
- Information literacy is part of a continuum of literacies that includes oralcy.
- Information literacy is context specific to particular cultures and societies.

One of the principles of the World Summit on the Information Society (Garner 2006: 39) is to ensure that

> everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and people to achieve their full potential in promoting their sustainable development and improve their quality of life.

This principle is in accord with the oft repeated goal of information literacy education. While influential international bodies such as UNESCO, IFLA and the World Summit on the Information Society (WSIS) congregate to deliberate information literacy as an international issue within the context of human rights, it remains to be seen whether or not the outcomes influence national educational programmes. If one looks at the UNESCO campaigns, South Africa is represented by education in the Literacy Decade 2003-2012 campaign while the Information Literacy campaign (Information literacy 2007) which falls under the UNESCO theme of Communication and Information is represented by the LIS fraternity. In the South African context there seems to be little articulation between the two sectors and this has implications for the success of implementing information literacy in the education sector.

Notwithstanding the various concepts of information literacy, there is underlying agreement that information literacy is an attempt to create emancipated or enfranchised citizens. Information literacy therefore integrates three levels of complexity: "information emphasis (that can be defined as digital and computer literacy), knowledge emphasis (that can be defined as cognitive literacy), and learning emphasis (that can be defined as critical literacy)" (Dudziak 2006: 2). Information literacy is for knowledge building and, most importantly, social inclusion (Horton 2007).

Britz and Lor (2010) argue for information literacy to be seen as a basic human right. They argue from the premise that the right to education, the right to participate in civil society, and the right to exercise freedom of thought are enshrined in the Universal Declaration of Human Rights and

the South African constitution However, these rights can only be realized if individuals have access to the information they need to exercise these rights. Access to information, they contend, should therefore be regarded as an 'instrumental and basic human right'. Accepting and protecting the right to access information needs to go further to include enabling or empowering citizens to locate, use and evaluate information for decision-making. Information literacy skills thus form the bedrock for the 'successful exercise of the right of access to information' (Britz & Lor 2010: 16-18).

The South African national Department of Education's long term plan for basic education, *Schooling 2025*, refers to "education quality", computer literacy for all, "high quality teaching and learning materials" and access to information on computers for both teachers and learners (South Africa 2011d). This declaration by the Department of Education, which serves as a vision statement, demonstrates a commitment to developing ICTs, an essential component of an information society. The *Schooling 2025* statement endorses the right to access information but it does not address the enabling role of information literacy. It remains to be seen whether education experts understand this access to ICTs in the sense that Hart (2006) refers to, that is as but one layer of information literacy, whilst the deeper, second layer, 'the subjective sense-making processes of information literacy' (Hart 2006: Introduction), needs to be addressed equally urgently.

2.3 TERTIARY LEVEL EXPECTATIONS OF INCOMING HIGH SCHOOL STUDENTS

The focus for this section of the literature review is on students' information literacy in their transition from high (secondary) school to university, their first year as undergraduates. Recent studies from New Zealand and Australia, Scotland, the USA, and South Africa examine incoming tertiary students' information literacy and reveal some startling similarities and differences across the globe.

At the higher education level information literacy initiatives started out as user education but in the last decade or two have developed into a variety of offerings principally as a result of the influence of ICTs. These initiatives take a variety of forms such as separate courses, e-learning self-paced tuition, academic staff-librarian collaborative course-related instruction, or fully integrated degree instruction (De Jager, Nassembeni & Underwood 2007: 142; Irving & Crawford 2007; King 2007; Latham & Gross 2008).

In Australia and New Zealand, the *Australian and New Zealand information literacy framework* is heavily adapted from the Association of College and Research Libraries (ACRL) information literacy standards. Current practice in information literacy curriculum design includes a combination of "generic, parallel, integrated and embedded components". The framework does emphasize a preference for the embedded approach. The framework is expressed in terms of standards and outcomes which envision the "characteristics, attributes, processes, knowledge, skills, attitudes, beliefs" (Bundy 2004a: 7) and ambitions of an information literate person. The standards are built on generic skills, information skills, values and beliefs. The standards are responsive to the context of specific disciplines. Generic skills envisaged are

> problem solving, collaboration and teamwork, communication and critical thinking. Information skills include information seeking, information use and information technology fluency. Values and beliefs include using information wisely and ethically, social responsibility and community participation (Bundy 2004a: 7).

In Scotland, Irving and Crawford (2007) worked on an information literacy framework which bridges high school and university. They interviewed university librarians as part of their study to find out what first year students lacked. They summed up their findings in three points: 1) students do not know the origin of information; different types of information; how information is generated and how to use it; 2) students have difficulty in developing a search strategy and tend to search superficially; and 3) students have difficulty evaluating located information and using critical thinking.

In seeking the opinions of high school students, Irving and Crawford (2007) interviewed sixth form students who stated that information literacy skills were usually taught in the first two years of high school but were not practised and reviewed afterwards within the curriculum. This lack of revision resulted in patchy knowledge and usage in later years of schooling. High school students were acquiring their information skills from various people including classmates, teachers, librarians, family and friends. When students had a special interest in a subject or a teacher motivated interest in a subject, it spawned higher levels of such skills in students. Students' used mainly books and the Internet as sources of information. Google was the search engine of choice.

In the USA, information literacy has been practised and assessed in schools at least since the release of *Information power* in 1988 (AASL 1988). However, according to Latham and Gross (2008), little research has been completed that examines undergraduate students' perceptions of how they have learned information literacy and how they prefer to learn new skills. They claim that there is a

> gap in the literature on the conceptions and self-perceptions of undergraduate students about information literacy, the relationship between their self-perceptions and their actual skills and their affective experience and process when searching for information related to self-generated and imposed information seeking tasks (Latham & Gross 2008: Introduction).

This study came about because, despite information literacy instruction in schools, a large number (50%) of students enter college ill-equipped for the rigours of research. In fact, 40% were of the view that they had gaps in their research abilities while 10% felt they had significant gaps.

The Latham and Gross (2008) study used competency theory from the field of psychology for their investigation. This theory proposes that

> individuals with low skills in some knowledge domains are unlikely to be able to recognize their own deficiencies or to recognize competence in others. Such individuals

consistently rate their skills as better than average and tend not to revise their self-assessments even in the face of evidence to the contrary (Latham and Gross 2008: Research framework).

They use a phenomenological approach which seeks to formulate a relational model of information literacy. Like Bruce (1997), they examine how the students (who are the subjects) experience information literacy. Their findings demonstrate, amongst others, that in terms of information literacy, confidence is not a reliable predictor of competence. Those students who displayed incompetence tended to greatly overestimate their performance on an information literacy test. Those students who demonstrated proficiency on the information literacy test identified the school librarian more often as a source of instruction compared with the incompetent students.

In South African higher education the Council on Higher Education (CHE) identified specific graduate exit attributes and competencies for 21st century students as:

- Computer literacy;
- Knowledge reconfiguration skills;
- Information skills;
- Problem-solving;
- Teamwork;
- Networking;
- Mediation skills; and
- Social sensitivity (CHE 2004).

There was an attempt in 2004 to request that the South African Qualifications Authority (SAQA) sanction the ACRL standards, incorporating the final Council of Australian University Libraries (CAUL) standard relating to lifelong learning. This request remained in abeyance (De Jager, Nassimbeni & Underwood 2007: 160) until the Committee for Higher Education Librarians of South Africa (CHELSA) undertook the writing of a National Framework for Information

Literacy Training for the 23 South African universities (Esterhuizen & Kuhn 2010: 83). The CHE graduate attributes and competencies were seemingly unattainable or idealistic for two reasons: 1) the schooling sector in South Africa produces high school leavers, the majority of whom have not experienced libraries or ICTs. The effects can be seen in new undergraduates' disparate information literacy abilities at universities across South Africa, and documented closely in various studies (Sayed 1998; De Jager and Nassimbeni 2002; King 2007), and 2) Information literacy is context dependent (Sayed 1998; Moore 2002) and needs to be integrated and assessed within course programmes. Unless information literacy is regarded as fundamental in teaching and assessment in university courses, it will remain on the margins. The CHELSA draft guidelines on information literacy go some way to addressing the information literacy of new undergraduates with a more advanced curriculum in the wings.

The context for King's (2007) study at the University of the Western Cape, South Africa, is vastly different from the Scottish or the American study mentioned above. The South African circumstances are typified by a lack of libraries, school libraries in particular and a lack of access to information skills instruction before university. Unlike the Scottish and American studies, the vast majority of students in King's study do not speak English at home, but it is the language of academia. King aimed to find out about incoming (first year) students' experiences with libraries and ICTs; their information skills competencies and proficiencies; and whether or not the undergraduate Arts Information Literacy course addresses the gaps in the students' information literacy. First year Arts students completed a pre- and post-course questionnaire. The findings reveal that only 16% of incoming students had used the web to find information; only 23.2% had access to a school library with 10.4% having received some form of information literacy instruction. The 20.7% who were members of a public library used it mainly for photocopying.

On the information literacy questions the students in the pre-course test scored abysmally low, indicating the necessity for a formal information literacy intervention programme. Seventy one percent (71%) had no computer access before coming to UWC. In the information literacy test section, the majority of students did not know what a bibliography was claiming that it was a list of addresses or phone numbers. Only 25% understood that websites generally provide the most

up to date information compared to books, journals and encyclopaedias. About 21% of students understood that a local online catalogue would provide access to the immediate library's material but not that of the entire country. Students did not know that the call number was used to locate books on the library shelf. At least 85% had not been exposed to databases and thought they could find a journal article in a catalogue. One question asks students where they will start when given a research topic they knew little or nothing about. Many opted for a book on the subject or to ask the librarian. Very few opted for a dictionary to look up unknown terms. This lack of knowledge about the search process has implications for independent learning at university level. When asked to decide on the most reliable source of information on HIV/AIDS statistics, students chose such information sources as police stations, government statistics, and daily newspapers over an independent research institute such as the Medical Research Council (MRC). Even after the course, only a third of students opted for the MRC. This indicates that critical thinking skills cannot be easily addressed through a course as it requires a knowledge base – here for example, the knowledge that the government's stand on HIV/AIDS was an internationally contested one at that time.

To identify students' knowledge about plagiarism, four different scenarios were described from which students had to identify which were considered plagiarism or not. Students in general had difficulty before as well as after the course. Students had difficulty distinguishing a book from a journal as an information source in a catalogue, even after the course. At school level students are not exposed to the concept of journals. For the most part, they may know about the concept of popular periodicals such as the *National Geographic* from the public library. The high percentage of students who did not understand the idea of key words, synonyms and subject categories on a catalogue entry was high both before and after the course. King states (2007:145) that students "do not understand controlled vocabulary, how to do a subject heading search or how to choose subject headings from given lists." Students had difficulty distinguishing between the article title and the journal title even after the course. In terms of locating a full text article in a journal, 49% were convinced even after the course that Google would be a better source than electronic journals accessed via the University Library's website.

Evaluating information on the web was still a challenge for the vast majority (96%) even after the course.

Despite the contexts being different between the Irving and Crawford (2007) and King (2007) studies, there is overlap in some of the findings. Both identify search strategy difficulties, Google being the search engine of choice and the information tool of choice notwithstanding exposure to other types of information sources, and the lack of critical thinking abilities.

2.4 TEACHER EDUCATION AND INFORMATION LITERACY

In the fore-going section, the literature details the unpreparedness of high school learners for tertiary education, in particular in terms of information literacy. In this section, teacher education comes under the spotlight, both initial teacher education and continuing teacher education. Fullan (1993), the doyen of research into the teaching profession, provides valuable insights into change agency and schools as learning organisations. His ideas resonate with those of Henri, Hay and Oberg (2002) and Henri and Oberg (2005) in their research into the principal's role in the information literate school community. Cuban, Kirkpatrick and Peck (2001) contribute to the discussion on changing approaches to teaching in the era of computers and the Internet.

2.4.1 TEACHERS, PROFESSIONALISM AND CHANGE

Teachers often purport to choose teaching as a profession so that they can make improvements in children's lives. Improvements imply change and teachers need both motivation and support to bring about change. According to Fullan, teachers need four core capacities for building change, viz. "personal vision-building, inquiry, mastery and collaboration". These capacities are interwoven and they support each other reciprocally (Fullan 1993: 4). It is incumbent upon the education faculty to foster these in initial teacher education and for schools to promote them as part of continuing professional education. Often change is foisted upon teachers from above – top down hierarchical change. Yet, the path to organisational change is personal purpose.

Teachers have to own the change and make it part of their personal vision otherwise the end product is superficial restructuring and not reculturing (Fullan 1993: 9). A capacity for inquiry is about questioning and revitalization. In order to sustain their personal purpose, teachers have to be in an environment which influences and stimulates their desire for lifelong learning. It is not enough that teachers espouse lifelong learning without practising it themselves, as learners can easily detect shamming. The capacity for mastery in information literacy speaks to deep understanding and enacting new ideas. The odd workshop here and there does not foster meaningful change. What are needed are well-thought, thorough, sustained programmes. In learning organisations inquiry-oriented individuals tend to collaborate effectively. If people are not questioning individuals, the collaboration is reduced to mere "form" and not "content" (Fullan 1993: 4-5). If restructuring does not affect the teaching-learning core, then it is not reculturing.

Fullan's ideas about teaching and change still ring true today as will be demonstrated in the discussions later on in the chapter.

Cuban, Kirkpatrick and Peck (2001) examine change in the context of using computers in schools. During the first decade (1990s) of computers in schools in the USA, the emphasis was on the rollout of computers. By 1999, the national average had reached one computer for every six children (2001: 819). By 1998, 44% of classrooms were connected to the Internet. Despite these advances in access to ICTs, the percentage of teachers utilizing them remained low (Cuban 2001). It seems that teachers would not readily change their approaches to teaching to include technology. Teacher-centred approaches still predominated and teachers blamed a lack of time, technology failure (hardware or server failures and crashes, slow response times in Internet usage and so on) and the structure of the school day for the lack of ICT integration. It seems that although the schools in the Cuban Kirkpatrick and Peck (2001: 819-823) study had ample access (above 80%) to computers and the Internet both at school and at home, the usage and integration with subjects at school was low. While these schools were technology-rich they were not necessarily information and ICT literacy rich, a point which Henri, Hay and Oberg (2002) make

in the discussion later in this chapter under the subheading, school principals and information literacy, 2.5.1.

2.4.2 PRE-SERVICE TEACHER EDUCATION AND INFORMATION LITERACY

The studies of Moreillon (2008) and Emmons et al. (2009) in the USA, Asselin and Lee (2002), Asselin (2003; 2004; 2005), and Branch (2004) in Canada, Moore (2002) and Bruce (2002) at the Prague Meeting of Experts, and Fredericks (1993) and Olën (1994) in South Africa provide evidence of a few research-based attempts to include information literacy training in initial teacher education. Duke and Ward (2009) provide a summative review of the literature on teacher education and information literacy education.

Beyond the library world, the information literacy concept is fuzzy (Whelan 2003). In the school education sector in England (Shenton 2007: 10), New Zealand (Probert 2009) and South Africa (Zinn 2002) it is a term scarcely heard in official documentation. Often it is used synonymously to mean information technology skills (Williams & Wavell 2006) or library skills (Lloyd 2003). While there has been a marked increase in information literacy offerings at tertiary level, that is, ensuring that all students become information literate, teacher education candidates are not necessarily being persuaded to incorporate information literacy into their subject teaching. Branch in her study of pre-service teachers' information literacy understandings recognized that being information literate does not mean that one has developed an approach of how to teach it through a subject. "We do not expect that people who are good in science and math will inherently understand the strategies and methods appropriate for teaching others to be good in science and math" (Branch 2004: 44).

In teacher education there has been an assumption that trainee teachers know how to do research (Asselin and Lee 2002). This faulty approach has spilled over into schools where teachers assume that they can give learners research projects with little or no guidance and support.

Reporting on a three-year study, Asselin and Lee set out to integrate information literacy into the literacy curriculum of an initial teacher education programme in Canada. Their motivation for the integration was based on the false assumption that students in this programme, as graduates, should be able to access and synthesize information and communicate findings and therefore have a method for mediating these skills and knowledge in the classroom, but the reality showed differently. Teachers were not working collaboratively with school librarians because they had not been exposed to their role and knowledge whilst at teacher training institutions. Students in the programme showed marked improvements in their understanding and application of information literacy by working collaboratively with teacher librarians in a practicum in schools and observing how teachers and teacher librarians scaffold children's learning through the process of a research assignment (Asselin & Lee 2002: 11, 15-16).

Asselin claims that despite the prevalence of information literacy outcomes in the Canadian curricula, teacher education programmes at initial teacher education and in-service levels pay little attention to information literacy education. In her studies she found that teachers were not provided with explicit instruction on how to develop children's information literacy. She found it "alarming" that teacher educators in faculties of education disregard the role the school library plays in the information literacy of students (Asselin 2003: 16). As in South Africa, Canadian educational documents lay claim to preparing school learners for lifelong learning. Paraphrasing Fullan (1993), Asselin and Lee (2002: 10) remind schools that it is their "moral imperative" to develop students' intellectual capital or abilities to use information technologies to communicate and create knowledge.

In North American teacher education the relationship between teacher and student is highlighted and not the collaboration amongst teachers in designing learning activities, assessment and so on (Hartzell 2002). With the shortage of teachers identified, the USA National Education Administration (NEA) sought to train a new breed of teachers ensconced in collaborative philosophies in their training (Moreillon 2008). Studies on collaboration, have however, not focused on how pre-service teachers' exposure to classroom-*library* collaboration impacts on their first years of teaching. Moreillon (2008) participated in teacher-training courses in which

she set out to explicitly advance the idea of teacher-school librarian collaboration. In her case study, after a stint of practice teaching the teachers completed a questionnaire in which only one out of the 15 students mentioned the principal advocating collaboration between teachers and school librarian. For many of these teacher trainees it was an eye-opener to experience firsthand that school library-teacher collaboration was rare and almost unheard of. In the state of Arizona there is no mandate to employ professionally trained teacher librarians. The attitude of these teachers to the library assistants (clerks) is one of disdain. They are not seen as equals as they are deemed ignorant of the curriculum. The study showed that, even if pre-service teachers are exposed to teacher-librarian collaboration, unless this is reinforced in schools it will remain a pipe dream.

Emmons et al. (2009: 143-144) comment that there is a dearth of research in pre-service teacher education and information literacy. Their study focused on special education and the "effectiveness of infusing information literacy skills throughout the coursework of an undergraduate teacher preparation programme". They reported statistically significant improvement in information literacy knowledge from the pre-test to the post-test. In order for teachers to become reflective practitioners, they need to be information literate (Emmons, et al. 2009: 149).

Both Moore (2002) and Bruce (2002) make an appeal at the Information Literacy Meeting of Experts in Prague for initial teacher education to incorporate information literacy education. Teacher educators need to understand that information literacy is not remedial education but "actualizing ways of learning" (Bruce 2002: Teacher …). Subject content is not the key goal any more but the ability to learn how to learn is. This kind of learning involves a process approach. According to Bruce (2002: Critical components of an information literacy program), the four critical components of an information literacy programme are:

1. Resources to facilitate the learning of specific skills, for example web-based information skills enhancement packages and other point of need, or self-paced instruction.
2. Curriculum that provides the opportunity to learn specific skills, either early in a course or at point of need, (from self-paced packages, peers, lecturers, librarians) [integrated].
3. Curriculum that requires engagement in learning activities that require ongoing interaction with the information environment [embedded].
4. Curriculum that provides opportunities for reflection and documentation of learning about effective information practices [embedded].

Duke and Ward (2009) provide what they call a meta-synthesis (a qualitative methodology that uses both qualitative and quantitative studies as sources of data), of the empirical and non-empirical literature on information literacy in teacher education in the USA, Australia, Canada, New Zealand, Taiwan, and the United Kingdom (UK). They build on the 2003 Johnson and O'English annotated review of the literature on information literacy and teacher education. Since the year 2000, there has been a growing interest in information literacy by teacher educators (Duke & Ward 2009: 253). Duke and Ward identify five themes which emerged from the literature they surveyed:

1. Teachers need to be information literate if they are to promote democratic practices amongst their students. Citizens who are not information literate are frequently unable to access knowledge and resources. In order for teachers to share ideas about social justice and human rights, they themselves need to be aware of hidden practices in society that can undermine democracy, for example, being able to identify propaganda.
2. Many teachers are not taught how to make information literacy explicit in the classroom. The teacher education programmes where teachers are expected to model constructivist, inquiry-based approaches are few and far between.

3. Pre-service teachers are seldom exposed to collaborative teaching models in fieldwork experiences where they are required to work as a team with a school librarian. The effective integration of information literacy in the subject teaching areas requires teacher-and-librarian collaboration. However, these innovative practices are the exception rather than the rule.
4. In the information age it is expected that teachers are able to use ICTs to integrate technology into their subject areas. Moreover, their information literacy needs to extend to proficiency in Internet usage, usually the domain of the school librarian. At teacher education level the faculty librarian and teacher educator could model technology integration and information effectively. Again, an example seldom practised.
5. Since the year 2000, information literacy standards for students and teachers have been adopted in countries like USA, Canada, New Zealand and Australia. University librarians and teacher educators could "use these standards to prepare information literate teachers" (Duke & Ward 2009: 254).

The recently published report on Australia's school libraries and teacher librarians advocates very strongly for pre-service teacher education to include a unit related to school libraries and information literacy (Australia [Commonwealth]. Parliament … 2011: 77).

In South Africa, studies that deal specifically with the role of the library and the teaching role of the school librarian in teacher education are those of Fredericks (1993) and Olën (1994). Fredericks in his 1993 doctoral study insists that initial teacher training should include an awareness of the role of the teacher-librarian and that of the library in the curriculum otherwise we risk rendering librarians and libraries invisible in education. In Olën's forward thinking 1994 doctoral study she examined the role of the library in pre-service teachers education at colleges of education in the then Transvaal (now called Gauteng). She noted that the school library programme stood on the periphery and was not integrated with the curriculum. She viewed this finding as one of the deterrents to the development of an effective information literacy

programme in a school. The findings of Fredericks (1993) and Olën (1994) echo Bruce's (2002) and Moore's (2002) call for information literacy to be embedded in initial teacher education.

In more recent times, the only South African study dealing with recent initial teacher education research which could be traced for the current study reflects a tangential theme to the international research. Kruss (2009) observed that certain teacher training programmes were focusing on problem-based learning, constructivist and learner-centred approaches without building the subject knowledge of the student teachers. One cannot teach a subject if the content knowledge is weak. Constructivism is bound to fail in these contexts. Taylor (2001; 2007) and Baxen and Green (1998) reiterate Kruss's findings that South African teachers have poor subject knowledge. This lack impacts on the extent to which they can implement constructivist learning techniques. Political leaders, in their well-meaning attempt to bring about changes in education in South Africa, overlooked crucial obstacles: teacher unpreparedness for change, the lack of a professional culture amongst teachers, the dysfunctional state of many schools, poverty, and a fragmented implementation plan. The South African education context will be dealt with in more detail later in the chapter.

2.4.3 IN-SERVICE TEACHER EDUCATION AND INFORMATION LITERACY

While there are a handful of studies depicting teachers' information literacy capabilities (Moore 1997; Hart 1999; Henri 2001; Maepa & Mhinga 2003; Williams & Wavell 2006), the Williams and Coles (2007) study sought to understand how and if teachers use research-related information for their own professional development. All teachers are supposed to be reflective practitioners or researchers (in most countries including South Africa it is considered one of the teacher competencies). This implies that teachers are able to search for information, critically evaluate it and integrate evidence from research in order to develop and revitalize their professional practice. This is equivalent to Fullan's (1993) inquiry capacity for building substantial change in education. Teachers need to keep pace with constant change in the information society. Teachers are required to engage with newly emerging knowledge to inform

their changing practice. This is referred to as evidence-based practice (Williams & Coles 2007: 186).

Williams and Coles (2007: 185) surveyed 312 teachers and 78 head teachers in a cross section of schools in Scotland, England and Wales. The survey gathered background data on more general attitudes towards research, as well as data on information access and confidence in finding and using general and research information. The surveys were augmented by vignette interviews for qualitative evidence on information strategies and experiences.

The Williams and Coles (2007: 187) research was unique among impact studies of educational research on teachers because it examined teachers' "confidence and behaviours in finding, evaluating and using information inputs from research", in essence their information literacy. Previous research noted that doing research does not seem to be a problem in education. It is *using* research evidence or implementing findings that seems to be lacking.

Since the increased presence of the Internet in the 1990s in Britain, teachers have greater access to information. Until this study it was not clear to what extent teachers have developed the range of skills, knowledge and attitudes to enable them to feel confident in their use of information, particularly research information (Williams & Coles 2007: 188).

The findings of Williams and Coles suggest that teachers rely on informal sources and/or more general sources of information rather than the research literature. Teachers claimed lack of time and access as barriers. But given the dropping of these barriers, it alone will not necessarily motivate teachers. The researchers stress that the need is not only for the development of a research culture and ethos (see Fullan's (1993) four interwoven core capacities for effecting reculturing under the sub-heading, teachers, professionalism and change, 2.4.1) but also an information culture and ethos (Williams & Coles 2007: 202-203).

Teachers felt less confident about using information than finding information. It is precisely this ability to engage with information to create new understanding or knowledge that teachers need to be developing in learners. If teachers themselves lack confidence, they will not be effective developers of these skills and strategies in learners information processing. Teachers in larger schools were found to be more confident in information literacy than teachers from smaller schools, many representing the primary and nursery sector (Williams & Coles 2007: 194).

Respondents in the study rarely spoke of using libraries of any sort unless they were actively involved in further study and then often found it difficult to locate information because they were overwhelmed by the vast amount of information (Williams & Coles 2007: 196).

Survey questionnaires reported high levels of confidence amongst respondents which did not tally with responses in group interviews or group exercises. The latter revealed a number of issues and limitations (Williams & Coles 2007: 196) and this insight demonstrates that the use of questionnaires alone can lead to misleading results. The current study uses a questionnaire as well as interviews, journals, and evidence from assessed assignments to avoid the pitfalls of use of a single instrument. The strength of mixed methods research rests on the triangulation of data.

In the UK, there is a focus on generic information technology skills for teachers rather than regarding ICTs as a tool for accessing and using information in personal and professional development. In their final recommendation, the authors propose that there should be a greater emphasis on information literacy within initial teacher education coupled with reinforcement within continuing professional development (CPD) to cope with changes if more sustained implementation is to be influenced (Williams & Coles 2007: 198).

Williams and Coles (2007) provide us with keen insights into British teachers' reflective practice especially in relation to research-oriented information. Their findings reflect to what extent teachers are themselves information literate.

In South Africa Zinn's (2000: 50-51) study engaged with teachers in so-called disadvantaged schools in developing communities. It highlighted the obstacles to information literacy which included English as non-mother tongue language for the majority of developing communities and information resources largely in English. The web-based environment is presently dominated by English (the language of commerce and academia in South Africa) and findings of a study by Fourie and Krauss (2010) on language and the web are expected to make interesting reading for those concerned about language and access to the Internet in the context of understanding the digital divide debate. Their study on information literacy with an emphasis on developing ICT literacy, is based on the training of teachers from poorer communities (townships) near Pretoria. Fourie and Krauss use a framework called ICT for Development (ICT4D) stating that teachers from developing communities face special challenges which may include difficulty in accessing hardware (computers), Internet access limitations and other constraints such as sustainability of ICT projects. While their article focused on the planning of the training, the results of the study, when published, should reduce the dearth of research on in-service teacher training in information literacy in a developing context (Fourie & Krauss 2010: 108-109;116).

The newly revised national qualifications framework for teacher education qualifications (South Africa 2011b) stipulates the basic competencies of a beginner teacher. Several of these competencies imply information literacy. For example:

- Beginner teachers need to be knowledgeable about the curriculum, their own subject in particular, and be able to use available resources appropriately to plan and design suitable learning programmes. Teacher educators need to build into the curriculum opportunities for pre-service teachers to locate resources and use them for designing lessons.

- Beginner teachers require highly developed literacy, numeracy and information technology (IT) skills. These skills, especially IT skills, are what Hart (2006) and Britz and Lor (2010) regard as but one (basic) layer of information literacy in the information age.
- Beginner teachers must be able to assess learners in reliable and varied ways, as well as being able to use the results of assessment to improve teaching and learning. This competency allows teachers to include research projects, one of the most accepted routes to teaching information literacy in schools, in their teaching.
- Beginner teachers must be able to reflect critically, in theoretically informed ways and in conjunction with their professional community of colleagues on their own practice in order to constantly improve it and adapt it to evolving circumstances.

2.5 INFORMATION LITERACY IN SCHOOLS

The previous section investigated studies on information literacy in pre-service teacher education and in-service teacher education. The following review of the literature discusses information literacy in the school context under these broad headings: the role of the principal in fostering information literacy; school librarians and their understanding of information literacy; evidence of information literacy practices in the classroom; teachers' views of information literacy; and the South African education context with examples of specific information literacy studies. While an attempt was made to devise exclusive category headings, some studies could fit equally well under different headings.

2.5.1 SCHOOL PRINCIPALS AND INFORMATION LITERACY

Fullan (in Hara 2006: 519) argues that teachers are able to change more confidently to a new system under supportive conditions because teachers would feel productive and rewarded from the change. Fullan (1993), in explaining his four core capacities for building change in schools, recommends working in an environment in which collaboration is fostered and supported. Teachers' motivations are greatly influenced by their principal's educational philosophy both

positively and negatively. In this section two major international studies on the role of the principal in influencing an information literate school will be addressed. These studies will be reinforced by Hartzell (1997; 2002), himself a former librarian and former school principal, and by a recent study by Church (2008). This section will be concluded with reference to South African studies.

The largest international study to date on the role of principals and school libraries involved six countries - Canada, Australia, South Korea, Japan, Scotland and Finland. This international study sought to examine the relationship between the principal and the school librarian in the implementation of the library's instructional programme, essentially the information literacy programme (Henri, Hay and Oberg 2002). Previous studies had concentrated on the principal's leadership role in areas such as reading and ICTs but not the library's instructional programme. In 1995 Henri created the term "information literate school community" to emphasize the school as a learning community. The concept of an information literate learning community embodies the school librarian as actively teaching and collaborating with colleagues in an environment that acknowledges information literacy. Although many school librarians teach information skills, if such skills are not adopted by the teachers as well, the school cannot be termed an information literate school. Starting with qualitative studies in Australia and Canada, Henri and Oberg (2005) decided to expand the study to compare results from across the globe. The study used three instruments: the first dealt with demographics, the second with perceptions and beliefs, and the third had open-ended questions meant for additional qualitative responses (Henri, Hay & Oberg 2002: 21-27). Instruments one and two were analysed using SPSS and instrument three was analysed using NUDIST*QSR software which facilitates content analysis of qualitative data (Henri, Hay & Oberg 2002: 31-33).

One of the goals of the international study was to provide a broad idea of the nature of information literate schools in the study. Introducing ICTs into a school does not create an information literate school. Information literacy should not be an "add-on to an existing culture" (Henri, Hay, & Oberg 2002: 88-89). The introduction of ICTs into schools is often considered a

panacea for all the woes in education. More often than not, teachers continue to teach using old paradigms and no revised enculturation takes place: that means teachers' beliefs and attitudes to teaching and learning have not transformed (Cuban 2001). Information literate schools are fundamentally different from traditional schools. The core elements of an information literate school have been converted into a rubric by Henri (Henri, Hay & Oberg 2002: 90) with four level measures – emerging, developing, proficient, and advanced. The indicators are 1) the existence of an information policy; 2) an ICT plan is in place; 3) authentic assessment enables the development of integrated information skills; 4) school-wide appreciation of the role of the school librarian; 5) learning contexts are varied and available in a variety of formats; 6) information skills are taught and learned in context and across the curriculum; 7) mechanisms are in place for supporting the professional development of teachers for information literacy. This rubric is one of several tools available to appraise a school's capacity to be a learning community.

Important learning arose from the international study:

- Information literate schools are schools where the community builds knowledge.
- Changing a school's structure and culture requires discussion and deep consideration.
- It requires a needs-driven approach to change from traditional to alternative schools.
- Teacher transformation is a prerequisite for information literate schools because they need to (re)consider the nature of learning and how to change their teaching to support it.
- Changing teaching practice fundamentally is best achieved through staff's own collaborative reflections on the need for change, how they proceed and the foreseeable outcomes of the change. Top down change seldom works.
- Assessment should move away from quantitative to qualitative forms of assessment if deep learning and knowledge construction are to be valued.

- A precondition for assessment changes has to be changes in teachers' beliefs "about what counts as evidence for learning".
- The principal plays a pivotal role in a school community and, if an active supporter of inquiry-based learning, partners the school librarian in moving the school towards a learning community.
- School librarians can influence the principals by informing them about information literacy issues.
- School librarians also have the power to convince principals about their ICT expertise and to influence policy on a holistic approach to information services (as opposed to separating the library and IT services).
- Flexible scheduling offers better opportunities (than fixed scheduling) for teachers and school librarians to collaborate on inquiry-based learning activities (Henri, Hay & Oberg 2002: 89-92).

There is a high correlation between these authors' findings and Fullan's (1993) core building blocks for changing the school into a learning community.

Henri and Oberg (2005) build on their previous study (Hay, Henri & Oberg 1999; Henri, Hay & Oberg 2002) to provide substantial evidence for a key role for the principal in establishing the information literate school community. Henri (2005: 12) defines an information literate school community as "a school community that places a high priority (policy, benchmarking, funding, and evaluation) on the pursuit of teacher and student mastery of the processes of becoming informed".

In essence, the information literate school community describes a school community that places a significant priority on transforming information into knowledge and in turning knowledge into information. The members of this community search for meaning and application of knowledge and must, therefore, be equipped to deal with information as raw material, as a partial construction, and as an end product. The search for meaning is important at both the corporate and individual level. At the corporate level, policy and culture must work together to ensure that

the focus of the school is on learning and that information literacy is appropriately supported as the key enabler of learning. At the individual level both students and teachers must be encouraged to monitor the attainment of information literacy (Henri 2005: 12).

Central to their studies is the role of the school library (also referred to as the school library media centre) and school librarian (also referred to as the teacher librarian in the literature) in the success of an information literate school. The professional and research literature focuses on the partnership between the school librarian and principal in the development and implementation of the school library programme. Henri and Oberg (2005: 80-81) identified four roles for the principal's support:

1. as a supervisor working directly with teachers;
2. as a model demonstrating personal commitment;
3. as a manager enabling the programme; and
4. as a mentor providing visibility/importance.

Successful principal-school librarian partnerships, interpreted as bolstering an information literate school community, can be seen in, for example, the provision of time allowed for teacher-school librarian consultative collaborations, adequate funding for library material and administrative staff, support for flexible scheduling, that is, a needs-based programme for library utilization based on curricula needs versus a fixed scheduling programme in which classes are assigned a particular day and time in the school timetable, and the advocacy of whole school information literacy implementation (Hay, Henri & Oberg 1999; Hartzell 2002: 83-4; Henri & Oberg 2005: 82-85).

Hartzell (1997; 2002), provides some salient points about why school libraries often do not feature in the planning of many schools in the USA. Most principals (aged 50+) attended schools in which libraries were absent. This point is raised by the South African studies of Radebe

(1997), Maepa and Mhinga (2003) and Hart (2005). There were also those schools in which the librarians limited themselves to their traditional roles. In the case of these principals it is easy to see why school libraries were overlooked in the quest for an information literate school environment. Computer rooms with Internet access and CD-ROMs were often confidently/smugly voiced as alternatives/unequivocal options to school libraries.

In the USA school principals are required to study to become school administrators. Often omitted from their education and training is the importance of the role of school libraries (Hartzell 1997, 2002). This omission often breeds either negative attitudes towards the school library programme or renders school libraries irrelevant. Coupled with a lack of national or state policy on the role of school libraries in the curriculum, when school libraries do exist, they are visible only on the periphery of the curriculum as a support service rather than integral to the curriculum. As Henri and Lee (2005) argue below, school libraries are more than about the number of books per learner. School libraries are about the ability of the school librarian to mediate information literacy.

> Schools that perceive information as an object are likely to focus on information infrastructure such as libraries and computer labs. Such a view often articulates the ratio of information to students – one computer per student, one book per student – and will likely assess learning through quantitative measures such as tests and examinations while schools that focus on information as a process are likely to focus on evidence that students are becoming informed and equate an information literate teacher as one who has mastered the processes of becoming informed.

Church (2008) set out to examine elementary school principals' perceptions of the school librarian as a teacher (their instructional role). The state of Virginia, where the study took place, requires a dual qualification for school librarians, that is, a teacher and a librarian qualification. Church identified that even by 2008 the standards in educational leadership (a programme for the education of principals) and the federal government overlooked the teaching role of the school librarian. Although the response rate to a survey was low (13%), certain findings are revealing.

When asked about the source of their perceptions of the instructional role of the school librarian, only 1.8% acknowledged their principals' preparation course. This finding resonates with Hartzell's. Most perceptions (about 92%) were shaped by their interactions with school librarians either during their years as principals or teachers. In the Church study 90% of principals endorse the role of the school librarian as a staff developer, a teacher of information retrieval and the ethical use of information. More than 85% of respondents support collaboration between teacher and school librarian at the individual and grade level. But while they support co-planning and co-teaching, only 73% endorse the school librarian evaluating student work. The literature (van Deusen & Tallman 1994; Moore 1997; Henri, Hay & Oberg 2002; Hartzell 2002; Hara 2006: 522) supports the view that school principals should be the driving force behind school library success. The success of the teaching role of the school librarian depends on the principals' visions of themselves as the curriculum leaders. If principals strongly advocated collaboration the more likely it is to happen. Contrary to these viewpoints, the principals in the Church study expected the school librarian to initiate the collaboration.

The attitude of the principal towards the school library programme played a significant role in the success or not of implementing a programme in Radebe's (1997) South African study of professionally trained teacher librarians. In her study 61% of respondents mentioned that their principals' attitudes were negative and in these schools no libraries were established. In Dubazana's (2008) case study of school library integration into the curriculum in South Africa, the principal played a positive role in the establishment of the school library programme. Later on in this chapter, under the South African education sub-heading, the opportunities and challenges to the training of school librarians will be dealt with. The leadership role of the principal plays a key part in the successful implementation of the school library programme, particularly in South Africa where functioning school libraries are so scarce.

2.5.2 SCHOOL LIBRARIANS AND INFORMATION LITERACY

Research on school librarians and school libraries has moved beyond statistics about collection size, number of books issued, staffing, and other types of outputs to school library outcomes evident in the school library's tangible contributions to the school's learning goals (Todd 2002). In fact Loertscher (2008) claims that since 2002 the literature has been more focused on social networking and technology than information literacy. Nevertheless, information literacy remains a current topic in the literature (Markless & Streatfield 2007; Herring 2007; Todd & Gordon 2010; Ladbrook & Probert 2011). The school librarian's teaching role has been central to the connection between the curriculum and the library at least since the days of *Information Power* (1988). At the heart of the instructional role has been information literacy, expounded through various information literacy models and standards over the years.

2.5.2.1 INFORMATION LITERACY MODELS AT THE SCHOOL LEVEL

While Kuhlthau's (2004) ISP model is theory-based, several models of information literacy emerged from the practical experiences of librarians. Popular models were those of Gawith (1987; 1988; 1991) in New Zealand, Stripling and Pitts (1988) and Eisenberg and Berkowitz (Big Six™: 1990) in the USA and Marland (1990) in the UK. Common to these models are a set of steps or stages that learners proceed through to complete a task or to solve an information-based problem. The models vary from three to nine steps but generally include defining the task/problem (preparing and planning), locating information, engaging with information (processing), organising and creating, communicating and reflecting (evaluating).

These steps or stages are further refined for grade and phase levels (primary, intermediate, and secondary school years) and developed into a curriculum. Thus developed Australia's *Learning for the future* model (2001), the Ryan and Capra commercial ILPO (information literacy programmes) grade level organisers (2001), and the Canadian information studies curriculum for schools (Alberta learning 2004). These models and curricula emerged essentially amongst

librarians and seemed to not impact on the school world except in an inconsistent way (Moore 2002). A similar fate overtook school library standards which will be explored next.

2.5.2.2 SCHOOL LIBRARY STANDARDS

Over the past decades, the school library world has been influenced and led by the American Association of School Librarians (AASL) standards for school libraries. From the 1980s with the standard, *Information power – guidelines for school library media programs* (AASL 1988), the emphasis on the instructional role of the school librarian has been asserted. It was understood that school librarians needed to be seen as part of the teaching staff implementing the curriculum in order to be fully accepted in the school environment. To this end the standards produced in the 1990s *Information literacy standards for student learning 1998* (AASL 1998a) and *Information power: building partnerships for learning* (AASL 1998b) spoke directly to the curriculum. From the late 1980s and strongly in the 1990s information literacy became a much vaunted concept within the LIS world (Bawden 2001: 219). The school library standards, it must be said, have always been a reaction to a report or policy issued in response to an educational crisis or issue rather than a distinct LIS occurrence. For example, in the 1980s in the USA the *Nation at risk* report (in Craver 1990:10) pointed to a 40% functional illiteracy rate. This report prompted responses from school librarians for change. In the USA, a 1989 ALA recommendation that information literacy be included in teacher education had not been acted upon by 1998. Even a body such as the National Forum on Information Literacy (NFIL) with over 65 national bodies affiliated, could not persuade the teacher education sector on the merits of information literacy education (Carr 1998). Duke and Ward (2009: 247) echo these sentiments referring to the ACRL making no inroads into teacher education. Perhaps this non-acceptance was the impetus for the 1998 *Information literacy standards for student learning* written in the familiar (to teachers) standards language of content subjects. These 1998 standards set out the information skills required of each student very clearly. An information literate student was one who could locate, access, evaluate and use information from a variety of sources.

The IFLA School Library Guidelines (Saetre & Willars 2002: 16) produced information literacy guidelines with the following outcomes:

> Information literate students should be competent independent learners. They should be aware of their information needs and actively engage in the world of ideas. They should display confidence in their ability to solve problems and know what is relevant information. They should be able to manage technology tools to access information and to communicate. They should be able to operate comfortably in situations where there are multiple answers, as well as those with no answers. They should hold high standards in their work and create quality products. Information literate students should be flexible, able to adapt to change and able to function both individually and in groups.

The 2007 *Framework for the 21st century learner* (Partnership for 21st century skills 2007) was the trigger for the AASL's *Standards for the 21st century learner* (AASL 2007). In this sense it situates school LIS within its educational milieu. These new learning standards are much wider in scope than those they replace. They emphasize in addition to a research process, the building of attitudes/dispositions, work ethic, and reading skill. The standards are also centered in the ideals of inquiry as opposed to the emphasis on direct teaching (Loertscher 2008). Partnership for 21st century learning skills (2007) is the basis for the intellectual and policy foundation of skills framework for the century. This white paper sets forth the position of the Partnership in a very persuasive manner. The Partnership, of which AASL is a member, stresses three core skill sets surrounding content knowledge: life and career skills, learning and innovation skills, and information media and technology skills (Loertscher 2008).

2.5.2.3 LARGE-SCALE STUDIES OF THE IMPACT OF SCHOOL LIBRARIES

Since the first large-scale study by Lance in 1993 in Colorado which examined the relationship between the school library and academic achievement, replica studies have been conducted across at least 14 states in the USA, in Ontario, Canada, and in Queensland and Victoria, Australia with the same positive results (Lance 2005; 2006; 2007; People for education 2006;

Scholastic 2008; Todd & Gordon 2010; Australia [Commonwealth]. Parliament…2011). The studies show an unequivocal and positive correlation between school libraries and students' standardized test scores. Using regression analysis to exclude variables such as socio-economic levels, these studies pinpoint the finding that students, at schools where there is a team of school library personnel headed by a credentialed, fulltime school librarian, a library collection which is large and current, a well-funded library programme, networked online resources, where access to the library is flexible, and where students frequently receive information literacy instruction, test performances are consistently higher than at schools with no or inadequate library programmes.

2.5.2.4 COLLABORATION BETWEEN SCHOOL LIBRARIANS AND TEACHERS

Much of the school librarianship literature from North America and Australia fosters the notion that the teacher with subject knowledge and the librarian with information literacy working together on a guided inquiry project with learners make an ideal team. Haycock (2007: 26) quoting Montiel-Overall defines collaboration in the school library world as

> a trusting, working relationship between two or more equal participants involved in shared thinking, shared planning and shared creation of integrated instruction. Through a shared vision and shared objectives, student learning opportunities are created that integrate subject content and information literacy by co-planning, co-implementing, and co-evaluating students' progress throughout the instructional process in order to improve student learning in all areas of the curriculum.

Haycock (2007: 32), a longtime advocate of collaborative programme planning, accedes that collaboration is not easy. Amongst other things, he suggests that what is needed is a school librarian trained in collaboration, a shared vision for teaching and learning in the school community, mutual trust and respect amongst staff members, and opportunities for collaboration under the skilled leadership of the principal.

Todd (2008: 55) agrees that the literature may advocate collaboration between teacher and librarian as ideal for effecting student achievement but it is a complex partnership. Mentioned previously, Hartzell (2002) and Church (2008) found little or no mention of school librarians in the training of school principals. Equally, Moreillon (2008) and Duke and Ward (2009) in their studies on teacher training relate that collaboration practices between teachers and librarians are seldom or never promoted. Montiel-Overall and Jones (2011) explore the teacher-school librarian collaboration from the teachers' perspective unlike much of the school librarianship literature which focuses on the librarian. They uncover that teachers perceive the collaboration to be more of the traditional type in which librarians are expected to locate and present resources. Teachers seldom expect collaboration to take the form of sharing teaching and assessment activities (Montiel-Overall & Jones 2011: 68). The dissonance between teachers' perceptions and those of librarians towards collaboration may stem from several factors: teachers not being exposed to collaboration in their pre-service education and training; working in a school environment unsupportive of collaborative endeavours, teachers being unfamiliar with the teaching role of the school librarian (Duke & Ward 2009: 254; Montiel-Overall & Jones 2011: 70).

2.5.2.5 HOW FAR HAS INFORMATION LITERACY BROUGHT LIBRARIANS?

The way in which information literacy is portrayed in the school librarianship literature has been challenged by authors such as Todd (2002) and Loertscher (2008). Todd (2002) argues that the role of the school librarian could never be restricted to merely developing a range of information literacy competencies. The school librarian galvanizes the library programme to engage students in turning information into knowledge, to instill a zest for lifelong learning by giving them the skills to succeed in a 21st century ICT world. Loertscher (2008: 42-43) asks some provocative questions about information literacy and the school librarian in his review of 20 years of research. At the same time, studies by authors such as Moore (2002), Asselin, Kymes and Lam (2007), Markless and Streatfield (2007), Probert (2009), and Montiel-Overall and Jones (2011) provide some answers or alternative points of view.

- Do school librarians "own" information literacy? School librarians do seem to have usurped information literacy and created a niche for themselves in schools. It seems that there is no consensus in the school library world on this matter. There exists a wide variety of practice. In countries where school librarians are scarce, information literacy is not well developed in schools (Moore 2002: Probert 2009).

- When this profession grabbed information literacy or process learning as its domain, the trend was to leave content learning to the classroom teacher and process learning to the teacher-librarian. Has this trend been a healthy or isolating factor in the learning community of the school? The Asselin, Kymes and Lam (2007) study of the collaboration between librarian and teacher exposed a teacher who abdicated responsibility for any information literacy teaching. In the mind of the teacher, that was the librarian's function. In the Montiel-Overall and Jones (2011) study it seems that many teachers are not really aware of the teaching role of the librarian.

- Is the research process such as portrayed in the Big Six™, the central element of the contribution of the teacher-librarian to the curriculum, or is there a broader mission to teach other literacies such as media literacy, technology literacy, critical thinking, creativity, and reading skill in addition to other emerging literacies? This question implies that the information research process is purely mechanistic skills and not an intellectual framework.

- Should a progression of information literacy skills be taught at each grade level and assessed as one would teach a math or science course culminating in a standardized test? Markless and Streatfield (2007) are critical of the opinion that information literacy should have its own curriculum. They call it misguided.

2.5.3 EVIDENCE OF INFORMATION LITERACY IN THE CLASSROOM

For Todd (2002) the destination is not an information literate student but rather, the development of a knowledgeable and knowing person who is able to engage effectively with a rich and complex information world, and is able to develop new understandings, insights and ideas. Six studies inform this thread of the information literacy debate: that of Zinn (1997), Limberg (2000), Merchant and Hepworth (2002), Herring (2007), Asselin, Kymes and Lam (2007), and Shenton and Fitzgibbons (2010).

Zinn (1997) in South Africa undertook an action research study implementing information literacy at a high school with limited library stock (about 1.5 books per learner). At the time of the study, computers in schools were mainly used for computer literacy and there was no Internet access. There was much hope for change in education as the ruling party had admitted in the policy framework for education that school libraries had been neglected. This neglect had affected the literacy and information literacy levels of the majority of the population (African National Congress 1994: 84). In the new draft curriculum (South Africa 1994b) reference was made to "independent and critical thought, the capacity to question, enquire and reason, to weigh evidence and form judgments, to achieve understanding, and to recognise the provisional and incomplete nature of most human knowledge", turns of phrase widely used in information literacy. The provisional core teaching programme (South Africa 1994a) for information skills seemed to add credence to the library sector's belief that school libraries were on the national agenda, information skills being the traditional domain of the school librarian (Hart & Zinn 2007: 89).

Zinn (1997) worked collaboratively with three subject teachers in Geography, Physics and English to implement a resource-based learning approach to research projects. Although the school had a school library, school librarian and library periods, these played a negligible part in the study for a few reasons. The library had inadequate stock; the school librarian was perceived negatively by the staff and learners as she played the traditional role of gatekeeper very strongly;

and the designated, fixed library periods did not lend themselves to integrating information literacy skills into subject-based research projects. The library and librarian were literally bypassed much of the time. This circumvention of the library relegated it to the bottom of Loertscher's taxonomy (2002) despite having a fair infrastructure in place, a qualified school librarian and designated library periods. The school librarian willingly allowed Zinn to adopt the role of the librarian in situ for the duration of the study with the learners and teachers.

All the learners who participated in the study had previous experience of research projects. Projects were generally for subject enrichment and did not contribute to assessment. Teachers pretended they were for marks but their lack of support for learners resulted in a cycle of repeated disappointments. The perception amongst learners was that projects which were typed as opposed to hand-written, decorated with pictures and fancy borders, often received higher marks. A quarter of the learners expressed outright that teachers did not make it clear what they expected in terms of presentation of the final product. More importantly, teachers left learners to their own devices once they had given learners an instruction about their project. There was an expectation that projects "taught independent learning" and that the learning would happen "naturally" or organically. Because projects were for enrichment and not part of any assessment, teachers gave little thought to the underlying pedagogy of resource-based learning. Thus, the need to scaffold learning and use a problem-solving or information skills model to teach learners how to go about doing a research project was not evident to teachers, an experience Moore (1997) also had in her study.

Zinn (1997) broke up the research tasks into manageable steps. Learners were taught how to brainstorm, develop concept maps, locate information, conduct interviews, take notes, synthesize and present findings. Learners were assessed formatively during the process of the project and provided with feedback, just-in-time skills lessons, and interventions which could contribute to the successful end product. Besides a questionnaire which learners completed, invaluable evidence came from learners' diaries and class discussion.

The effect on their views of information was profound. For the first time learners identified themselves as the first sources of information (from the brainstorming activities). For some, the skill of interviewing was new. Normally, geography projects were predominantly practical exercises or model building. Now they had to regard people, experts in their field, as sources of information. Learners were opened up to a wide range of information sources never considered before: museums, exhibitions, parastatal government departments, map bureaus, advertising companies, comics and cartoons - to name just a few (Zinn 1997).

The effect on the learning process was significant too. Learners expressed the following views:

- Learning in a non-threatening, participatory learning environment was enjoyable;
- The learning process was continually monitored and assessed, not like before where projects are simply copied or completed the day before due date;
- The new information literacy skills approach can be applied and transferred to projects in other subjects;
- The time framework for the project referred to daily was useful for time management of the project; and
- It was some comfort to hear that the feelings of anxiety and confusion (as referred to in Kuhlthau's first ISP model 1993), which learners experienced until they had formulated a focus, was normal (Zinn 1997).

The effect on their self-image was positive too. For example, finding that brainstorming boosted self-esteem because learners felt that they knew something about a topic. Previously, new topics always made them feel inadequate. Learners felt a greater sense of self-control with the project because they could dictate the learning pace and were active participants. In traditional subject lessons teachers rushed to complete content and dominated the lessons. Learners expressed excitement at learning a new approach to research projects. They said it inspired them to learn. They recommended that all subject teachers should pay attention to this new method of teaching research projects (Zinn 1997).

Limberg's (2000) study explores how 25 high school seniors seek and use information to understand the possible impact, for Sweden, of becoming a member of the European Union (EU). She uses a phenomenographic method, designed to investigate variation in people's ways of experiencing phenomena in the world. Limberg (2000) came to the conclusion in her study that the students were experiencing information seeking and use in three major ways: 1) fact-finding; 2) balancing information in order to make correct choices; and 3) scrutinizing and analysing. The variation in information seeking and use interacted closely with variation in learning outcomes.

The fact-finding students experienced information seeking and use as finding the "right answer". These students viewed information containing persuasive arguments too complex for their "right answer" goal. They could not decide on the effects/outcomes of Sweden's inclusion in the EU because there were not sufficient "facts". Inadequate learning outcomes are associated with a fast, fact finding approach to information seeking and use. The second variation in information seeking and use related to finding enough information to make the right choice. These students also understood information seeking and use as looking for the answers to questions and could not handle contentious viewpoints on the subject. Their search for objectivity led them to describe the Swedish incorporation into the EU mainly in terms of economic advantage and disadvantage. The third group of students experienced information seeking and use as scrutinizing and analysing. These students approached their information sources critically and understood that different or opposing viewpoints needed to be interpreted and assimilated into their own interpretation of issues. Significant learning outcomes are associated with deep learning approaches. These students considered several facets of the Sweden-EU membership including political, moral and economic issues (Limberg 2000).

Merchant and Hepworth (2002) employ qualitative research methods to capture attitudes and ethnographic data of teachers and students at two secondary schools in the UK. Merchant and

Hepworth (2002: 83) conducted a study at two secondary schools in the UK using qualitative research methods to capture attitudes and ethnographic data. They observed 10 teachers and 40 students from year seven to eleven in the classroom. Second observations were conducted of students' behaviour in the school library and computing facilities. Students were interviewed in their different year groups. To establish their information literacy, the authors used Doyle's (1994) definition of an information literate person, Marland's (1990) nine steps information literacy model and Bruce's (1997) conceptions of information literacy as a benchmark. This part of the review will focus only on the findings relating to the students in the classroom. The findings related to the teachers will be dealt with under the next heading.

In their findings with the students, some of the important points mentioned were:

- Students did not specify any process for information searching.
- To carry out research, students mentioned resources such as encyclopaedias and books, but most students preferred the Internet. While some students could discern the value of different information sources, others favoured the Internet for its quick results and vast quantity of information. The Internet was considered much more "fun" than turning pages in a book.
- Students had great difficulty analysing and synthesizing the information found. They spent too much time locating and too little synthesizing. They resorted to copying and pasting especially when language was difficult. Finding too much information and then not being able to synthesize was a common problem.
- Students seemed be able to verify reliability of sources through various evaluation means.
- Students thought they had to solve their information problem in a unique way. It confounds them that people have different points of view. They do not know how to judge when the information is enough. Hart (1999), Limberg (2000), Kuhlthau (2004) also refer to this narrow view of problem solving in looking for the "right answer".

- Students were not given enough assistance when it came to engaging with the information and synthesizing information from different sources. They were not involved in the first step of the information process, defining the need, which usually assists with motivation to undertake the research (Merchant & Hepworth 2002: 84-85).

Herring (2007) conducted a qualitative, action research study in a UK high school into teachers' and students' views on information literacy skills. In particular, Herring examined the usefulness of the *Purpose Location Use Self-evaluation* (PLUS) information literacy model for second year high school students. The context was a project in sound technology in physics. Herring (2007) used a purposive sample of students, teachers and the school librarian and collected data using questionnaires, group and individual interviews. The educators' (teachers and the school librarian) comments on the PLUS model are instructive and are summarized: 1) an information literacy model is useful for middle and lower ability students with above-average students approaching a research project with an insightful, critical attitude of almost innate meta-cognition; 2) the role of the school librarian is not about teaching an information literacy model for its own sake using rigid templates, but to show how elements of a model can be usefully adapted to create connections or hooks for students to approach resource-based learning more critically; 3) teachers commented that the model was an enabling tool as it evoked students' "thinking and analytical skills"; 4) the model made students aware of the variety of information sources. In the past, only the good students consulted sources broadly; 5) students were also selecting the most relevant sources which showed students were judging the sources for their worth; and 6) The PLUS model had been used for a few years in the school and teachers could now see the fruits/benefits after "four or five projects" but particularly by the final year of schooling.

In Canada, Asselin, Kymes and Lam (2007), using a case study method, observed a Grade 9 social studies class, their teacher and the teacher-librarian as they progressed through a research project which used a WebQuest. The two major questions that steered their study were: 1) how is

information literacy curriculum and instruction shaped by curriculum documents and practices? and 2) how does information literacy instruction support learning the new literacies of the Internet? This was a progressive school that used their own school model of information literacy and where the teachers and teacher-librarian worked collaboratively on research-based units of work. Information literacy was fittingly being developed within the context of subject knowledge and not as an abstract, stand-alone activity. As it turned out, the teacher allowed the teacher-librarian to steer the learning and, in a sense, abdicated responsibility for the teaching of the knowledge content. The teacher did not fully understand his own role in the collaboration. It appears that the teacher's interpretation of information literacy did not include knowledge building within his subject. The students regarded their research activity as fact finding and product driven. There did not appear to be space for mulling over ideas and articulating anxieties as common elements of the information literacy process.

A WebQuest formed the basis for the research project. WebQuests were first initiated by Bernie Dodge in 1995 (Dodge 2007) as inquiry-based lessons in which students use the web for independent learning. This was a typical WebQuest consisting of lists of relevant resources, an introduction to the inquiry, description of the final project, description of each step and activities that lead to the final project, rubrics for assessment and teachers' resources. WebQuests are intended to foster inquiry learning but their fairly tight structure militates against it.

WebQuests are considered part and parcel of web 1.0. Web 1.0 refers to the web when it was a collection of static websites, with little or no interactive content, and applications were also generally proprietary (Techopedia 2012). They played an important role in moving online learning through research projects. These days there are new learning environments such as wikis, blogs and social networking sites which promote collaboration, inquiry and knowledge building, the underlying principles of information literacy.

Shenton and Fitzgibbons (2010: 170) put forward the argument that for learners to remain motivated and participate successfully in research assignments, the assignment topics should be authentic. In most instances topics are 'imposed' and connected to the subject-curriculum in schools. There is a need for learners to 'take ownership' of their projects and teachers need to find a variety of ways for this to happen: for example, incorporating more authenticity into projects. They advocate allowing learners more self-directed choices and the freedom to express different ways they accomplish research tasks without teachers dictating a 'proper' way. Like the Small (Small & Arnone 2000; Small, Shanahan & Stasak 2010) studies, Shenton and Fitzgibbons (2010) identify motivation and the ability to empathize with learners, to listen and respond in a way that learners do not feel threatened.

In summary, all six studies were selected for review for this current study because they are grounded in subject specific projects in which teachers in particular are actively involved. Commonalities or overlap in findings occur.

2.5.4 TEACHERS' VIEWS OF INFORMATION LITERACY

Many studies have focused on learners' information literacy and their shortcomings. Other international research highlights teacher-librarian collaboration. There are few studies concentrating on teachers themselves without the presence of professional, fulltime school librarians. The assumption has been that teachers are not only information literate themselves but also that they know how to mediate information literacy, or that they have a method for teaching information literacy. Studies are now emerging questioning this assumption. In New Zealand, researchers Moore (1997), Probert (2009) and Slyfield (2001) have questioned whether teachers are making information literacy explicit. While the literature has highlighted information literacy education as the domain of the librarian, what happens in schools where school librarians are the exception rather than the norm or where schools depend on public libraries for school projects? The implications of these authors' studies have a direct bearing on South African schools, the vast majority of which have no school libraries. Merchant and Hepworth (2002) and Williams and Wavell (2006) provide perspectives from the UK while Henri (2001) in Hong Kong offers

invaluable clues into teachers' own information literacy. These studies are examined in the following sections.

2.5.4.1 NEW ZEALAND STUDIES

Moore (1997) conducted her study at four suburban primary schools in New Zealand. As happened in South Africa, New Zealand's teacher-librarian posts were eradicated in the early 1990s. There are thus no government funded librarian posts in schools but, unlike South Africa, 95% of schools do have a resourced school library. Despite the presence of school libraries, however, teachers devoted more energy to curriculum change matters than information searching and problem solving matters. Some of the findings related to implementing information problem solving in the classroom are telling:

- A contradiction arose when on the one hand teachers thought that 'skills would emerge naturally as children worked with a variety of resources' while stating later that information literacy skills need to be explicitly taught.
- The statement 'the school library is central to learning in this school' received a rather low rating (about 52%) from three of the four schools. The teachers at these three schools felt that teaching would not be compromised if the school library were closed.
- Teachers (70% on average at three schools) always or often expected children to be able to evaluate information, generally accepted as a difficult cognitive skill, although teachers themselves admitted to having difficulty knowing how to teach this skill.
- Most teachers were not entirely convinced that learners could find information within resources, or record and organise information.
- While a low percentage (about 50%) of teachers expected learners to be able to use computerized library catalogues and to find sources independently, 78% declared that, for children, using "computer information is sometimes better than using books".

- It is generally accepted that the aim of resource-based projects is to foster information skills and independent learning. The results from one school revealed that resource-based learning at the primary school level may emphasize social skills such as co-operation in group work more than the development of cognitive skills.
- It was expected by 73% of staff at all schools that learners are able to find information independently across different information resources despite the fact that these skills were not being scaffolded by teachers.
- Teachers were not providing learners with clear assessment criteria for resource-based projects at the start of the project.
- Teachers at all four schools did not feel handicapped by not knowing the spread of information sources to which children were exposed (Moore 1997: online).

Teachers in the Moore study understood and endorsed information skills as the route to lifelong learning, but they were not "operationalising" this in their classroom activities. Unless teachers develop a sound understanding of the role of the school library and information literacy in the education of children, libraries and librarians will remain marginalised.

In 2001 Slyfield reported on a national survey of New Zealand primary and secondary schools. She sought to find out schools' priorities regarding further development of information literacy. In her findings, more than half the respondents mentioned four factors which they claim limit the effective teaching of information literacy. They are:

- Time to fit information skills into the curriculum (83% secondary; 73% primary);
- Teachers' own competence in information literacy (83% secondary; 69% primary);
- Teachers' lack of knowledge of how to teach information skills (84% secondary; 60% primary); and
- Teachers' understanding of the importance of information literacy as a life skill (71% secondary; 57% primary) (Slyfield 2001: 177).

These high figures for the limiting factors are an indictment of a schooling system which withdrew the reimbursement of the position of school librarians in the early 1990s (Probert 2009: 25). School librarians were usually considered the ones to teach information literacy and Slyfield (2001: 179) recommended a definite need for ongoing professional development.

The main thrust of Probert's (2009) research is the apparent lack of information literacy pedagogical practices amongst classroom teachers. In her study she questions whether teachers are making information literacy skills explicit. Her predecessors, like Slyfield (2001) and Moore (1997; 2002), discovered that the teachers were not familiar with the concept of information literacy and most were not explicitly teaching information literacy skills. The recently revised New Zealand curriculum 2007 (cited in Probert 2009) emphasizes lifelong learning and lists the attributes of lifelong learners which are akin to information literacy. As in SA the actual words "information literacy" appear most overtly in documentation associated with e-education, e-learning or digital literacy. The New Zealand curriculum also implies, rather than states explicitly, student competency in information literacy (Probert 2009: 25).

The New Zealand National Education Monitoring Project (Probert 2009: 26) suggested that the "principles and goals of information literacy were not widely understood, supported or practiced by teachers". Testing students over a number of years, the last in 2005, revealed that students were not able to describe a strategy for conducting school research projects and that they could not engage critically with Internet-based information. Students were also of the opinion that teachers were not enskilling them for research projects, so they ended up producing projects that lacked critical thought and insight.

Probert's (2009) study included 148 teachers from three neighbouring schools. She used mixed methods: a questionnaire, interviews, worksheet templates, policies and departmental planning documents in an attempt to achieve triangulation. The questionnaire consisted of three parts: 1) demographic information including a statement to be completed starting "An information literate

person is someone who….”; 2) Lickert scale questions intending to uncover participants’ attitudes and beliefs about information literacy development; and 3) open ended questions about any information literacy model used as well as Lickert scale questions about frequency of using information literacy skills.

Her findings resonate with those of Slyfield (2001) eight years before. Two thirds of respondents had only a limited or little understanding of information literacy. Those with little understanding taught Mathematics, Science, Technology, Health and Physical Education. Those with limited or good understanding taught English, Languages and Social Studies. Other authors (Merchant & Hepworth 2002: 83; Herring 2007) remark on this point stating that the nature of the curricula of English, History and Social Studies seem to lend themselves to inquiry and information-based assignments. There was a high incidence of conflating information literacy skills with computers or ICTs (Probert 2009: 28). Williams and Coles (2007:198) suggest that government concentration on ICTs influences teachers’ perceptions. Teachers also connected information literacy with literacy or with reading (Probert 2009: 31).

The majority of the teachers answering Probert’s (2009) questionnaire did not use an information processing model. Although some could name a model they purported to have used, few could describe the stages of the model. In one school there was a diagram of a model in each classroom but teachers had not entrenched it in their teaching. Probert’s study suggests that teachers had been exposed to the concept before. But, as Fullan (1993) and Henri, Hay and Oberg (2002) maintain, the transformation of teachers into advocates of information literacy will be inhibited when a top-down approach is adopted, preventing teachers the time and space to make new ideas their own, or when support in the school environment is missing.

Teachers did not teach website evaluation (nor did they think to make it explicit), nor did they teach students how to take notes (Probert 2009: 28). Teachers took it for granted that information literacy skills were taught by someone else either in a previous class or by another school. There

was also the assumption that 'skills would be developed naturally'. The idea that information literacy skills happen by osmosis (Walker 2001; Merchant & Hepworth 2002; Moore 2002; Williams & Wavell 2006) is a common thread in the literature on teachers and the teaching of information literacy.

Students who are explicitly taught the ethical use of information (also how to avoid plagiarism, copyright transgressions and so on) through a framework or a model have been shown to be more accomplished than those not provided with such guidance. Without guidance, students resort more often than not to copy and paste (Moore 2002; Kuhlthau, Maniotes & Caspari 2007; Probert 2009: 25).

2.5.4.2 UK STUDIES

In Merchant and Hepworth's (2002: 83) study mentioned previously, at two secondary schools in the UK, 10 teachers were observed in the classroom as they conducted information-based assignments. Thereafter, they were individually interviewed. The authors judged teachers' information literacy using a variety of routes: 1) by their use of libraries, computers and their own information resources; 2) during the interviews teachers described the ways in which they prepared themselves for teaching a new topic. These responses were considered in assessing their information literacy; 3) their definition and traits of an information literate person; and 4) teachers' views about mediating specific information literacy skills and competencies such as identifying a need and evaluating.

Teachers' responses to using information resources varied: from every day to once a month; for a variety of purposes such as fact checking, staying current, or finding relevant websites at the level of students. But they were all aware of a variety of information sources. Teachers' responses to how they prepared for a new topic were resonant of the information search process in that they would first seek "clarification" of the topic, that is, the task decision/definition. They

would use textbooks and other printed books to establish a framework, and then consult newspapers, magazines, television programmes and the Internet for "filling in the gaps", for example, currency, making it interesting for students. These responses reveal that teachers have a good idea of different sources and what it means to be information literate. The majority of the teachers had a clear idea of both the physical access to information use and the intellectual access (Merchant & Hepworth 2002: 83).

Only one teacher said that one cannot keep "spoon-feeding" students, especially at the year 10, 11 levels. Lacking were any descriptions related to attitudes to use. Hints of attitudes came through in teachers talking about students' motivation to find out more, awareness of variety of resources for learners, searching a variety of sources and having the determination and imagination to try a different route if stuck (Merchant & Hepworth 2002: 83).

The teachers rarely commented on the strategies for evaluating different ways of finding information nor did they mention appraising the information itself. No ISP model was being used which would have assisted students in identifying their weaknesses at specific stages in the process. Students were struggling with the engaging stage because they were not given strategies for interrogating information. There did not seem to be an emphasis on integrating what is known with what is unknown (new knowledge). Students were provided with the "big picture" of the research assignment but not the individual steps. Teachers were not providing formative, continuous assessment, only summative assessment of the end product. The emphasis seemed to be on location skills and finishing the task. The *learning process*, starting with task definition to ending with reflecting on the process and product, was not taken into account (Merchant & Hepworth 2002: 86).

In discussing their findings, Merchant and Hepworth (2002: 87) are of the opinion that the nature of the research tasks perpetuates a "passive" approach as opposed to an active, critical approach to information. For example, asking students to recount the biographies of famous people. These

kinds of topics lend themselves to copied and pasted assignments and do not elicit higher order thinking skills. They also find it puzzling that those information literate teachers are not able to mediate information literacy with their students. They lack a conscious understanding of the skills the concept comprises. This is an obstacle in the development of students' information literacy.

In their recommendations they state: 1) provide in-service training and guidance for teachers in information literacy skills; 2) there needs to be more emphasis on "research ability" in assessment in different syllabi; 3) emphasise information literacy in initial teacher education; 4) set problem-based tasks and allow time for learners to identify problems; and 5) include student reflection in assignments; 6) guide students more on criteria to evaluate information (Merchant & Hepworth 2002: 88).

The Williams and Wavell (2006) study looks at teachers' experience of information literacy in the classroom and compares them to existing models of information literacy. The study was focused on how teachers themselves view learning activities in the curriculum which require consultation of information resources. The purpose of the study was to find out: 1) how teachers conceptualise information literacy and issues relating to its integration into the curriculum; 2) how information literacy is interpreted by teachers in relation to the learning tasks they design, monitor and assess; 3) whether teachers' conceptions and understanding of information literacy change after a period of reflection and discussion with colleagues; and 4) how teachers' and information professionals' understanding and interpretation of information literacy compare (Williams & Wavell 2006: 199).

The participants in the study were teachers from secondary schools in the UK who represented a wide cross-section of subjects. The study, like that of Limberg (2000), takes a broadly phenomenographic approach. During a first set of interviews and group discussions, teachers' initial conceptions of the term information literacy were gathered. Teachers then observed and

made notes of their students working with information. A second set of group discussions with the same teachers gathered additional views and conceptions after a period of reflection (Williams & Wavell 2006: 201). The findings were delineated according to six conceptions of information literacy: 1) finding information; 2) linguistic understanding; 3) making meaning; 4) skills; 5) critical awareness of sources; and 6) independent learning.

The "finding information conception" – at the initial discussion most teachers had never heard the term information literacy before. The discussion at this point revolved strongly around finding information. For teachers this is a controllable activity because it is equated with sending them to the library or the Internet to collect information. No thought is given to the underlying knowledge and skills needed to undertake this activity. Teachers see projects as naturally motivational and for them it is easy to accomplish. Students, on the other hand, may find it complex and intimidating (Williams & Wavell 2006: 204).

Linguistic understanding conception – teachers expressed this conception as basic comprehension of textual or verbal information, including reading and listening skills. Teachers expected students to be able to follow instructions for a particular activity, and to use general knowledge and prior experiences in similar activities. Teachers expected students to have the appropriate vocabulary and ability to comprehend, which they saw as a prerequisite for meaning making. In terms of the learning element teachers felt they had "little control over teaching it or helping students to develop it" (Williams & Wavell 2006: 204).

Making meaning – the teachers' conception was expressed as a cognitive process and skills such as summarising, synthesising, interpreting, and decision-making. These processes and skills are subject-based and teachers claimed that some students were better prepared than others due to their educational background. Most teachers were at a loss as to how to help students make the link between prior knowledge and new knowledge. A few teachers, by the second discussion

session, had reflected on the obstacles and were using their ideas about constructivism to apply different pedagogical strategies (Williams & Wavell 2006: 205).

Skills conception – teachers viewed research projects as the application of a "wide variety of skills, techniques and strategies required for handling information, including traditional library and information skills and more cognitive skills" such as summarizing, integrating, synthesizing, writing coherent answers, appreciation of bias" which were "required for making meaning and evaluating and reflecting on decisions". Teachers admitted that students needed a wide variety of skills to execute a research project but they did not view information literacy education as essential teaching in their particular subjects. As far as teachers were concerned, developing information literacy was not in their ambit. They simply wanted students to be *using* information literacy skills (Williams & Wavell 2006: 205).

Critical awareness of sources conception – teachers, particularly History and English teachers, focused on the need to "evaluate sources, recognise bias in sources, determine the quality of the information and check the authority of a website" (Williams & Wavell 2006: 205).

Independent learning conception – this was a strong theme pushed by the teachers. They viewed research projects as the pathway to developing independent learners. To be an independent learner required the ability to apply skills and strategies confidently with less reliance on the teacher. It also implies mastery of the different skills sets (Williams & Wavell 2006: 206).

In discussing their findings and making connections between information literacy and learning, Williams and Wavell (2006: 207) indicate that teachers concede the following: information literacy comes more naturally to some students than to others. Such students are generally more "motivated to learn, read proficiently, have enquiring minds, good general knowledge, get support from home and achieve the appropriate developmental stage earlier"; although they assumed that students could find and use information, they also realised that there are students

who lack information search and use skills; they themselves are not confident in their ability to influence information literacy.

At the same time, teachers seem uncompromising in their approach to research projects. They accept that information literacy exists within their subject in the curriculum but many express the view that it is a cross-curricular skills building activity separate from their subject. They do not see it as a way of learning and teaching in their own subjects. Some teachers have begun to realise that the information handling abilities they assumed their learners to have are absent, yet few teachers have resorted to delving into their own mediation practices when giving information-based tasks. Many teachers said that lack of time and pressing curriculum constraints affected their teaching and gave this as a reason why they did not intervene directly (mediate) in developing and monitoring skills. Teachers are not prepared to try inculcating information literacy skills if it impacts on examination grades negatively. They are reluctant to deviate from the examination-oriented curriculum. Teachers want to develop lifelong learners but were curtailed by curriculum demands. For lifelong learning, teachers need to give time for reflection, development of cognitive, higher order thinking skills, and inculcation of behaviour that is questioning, with a healthy dose of scepticism, and a desire to create new knowledge. There seems to be a tension between curriculum, learning and outcomes (Williams & Wavell 2006: 208).

An objective of the Williams and Wavell study was to compare teachers' and information professionals' understanding and interpretation of information literacy. They sought to do this comparison using the different models of information literacy of each group. There was some overlap with as well as differences in comparison to information literacy frameworks. Both teachers and information professionals agree that locating information and critically evaluating information sources are important, except that teachers call the latter linguistic understanding and subject content knowledge.

Teachers in the study understood and expressed similarities with information professionals with regard to lifelong learning. However, there were some facets of information literacy models not mentioned by teachers. These include information organisation and management. Teachers only made a reference to note-making but did not extend further into organisation and management (Williams & Wavell 2006: 208).

The differences in approach to information literacy between the teachers and librarians seem greater than the similarities. Information need, generally considered step one in information literacy frameworks, was not addressed in the way information professionals do. Teachers usually give the tasks, and the focus for students is on listening to and understanding instructions, whether oral or written, linguistic understanding. There does not seem to be a necessity to interpret the task in terms of information need. Teachers in the study were unaware of the complexity and range of search and cognitive skills students required to undertake a research project. This realisation only came during the second set of discussions when teachers were itemising the different skills. Teachers seemed to understand the frameworks as linear presentations instead of cyclical, iterative process. They also did not consider motivation (the affective) as playing a crucial role in information literacy. Evaluation or reflection, an iterative process in several models, did not feature with teachers as it was considered time consuming. The ethical use of information was viewed narrowly by teachers in terms of avoiding plagiarism (copy and paste) rather than linked to the wider values in society regarding the way information is used and viewed. Teachers saw knowledge building as separate from information literacy. Teachers placed more emphasis on comprehending the texts and making links between new knowledge and the subject syllabus content. At the same time they mentioned that the subject syllabus did not really extend the students or build depth of knowledge (Williams & Wavell 2006: 208).

Teachers thought of information literacy as a matter of process and skills rather than as outcomes, that is, knowledge building and dissemination and saw no, or little, link to problem solving or learning. Time was the teachers' main obstacle in the current curriculum. Teachers did

not see information literacy linked to subject knowledge. This gap in their understanding is possibly one of the reasons why students may leave school not information literate. The lack of information literacy has dire consequences for building students who are lifelong learners or learning for academic achievement. While teachers viewed lifelong learning as a main outcome related to information literacy, their understanding, design and management of research projects counters this idea of independent learning. Teachers need to be setting research activities requiring interaction with information that is more cognitively stimulating (Williams & Wavell 2006: 209).

Williams and Wavell (2006: 209) conclude that there are "varying agendas, priorities and understandings" in the school context. They recommend there should be a shared understanding of information literacy between teacher and librarian:

> This shared understanding of information literacy needs to take account of the priorities and different, sometimes conflicting, agendas of students, teachers and librarians, as well as national educational and curricular objectives.

If there is no shared understanding, it will limit information literacy development or continue an understanding of information literacy as processes and skills alone. They felt that the information literacy frameworks lacked depth or did not project the complexity of the needed skills and aptitudes. They recommend that school librarians should refrain from using any one model of information literacy especially as information literacy may be differently conceived by teachers. It should be emphasised that information literacy is about learning and not "mechanistic skills development".

2.5.4.3 HONG KONG STUDY

Henri's (2001: 120) study set out to determine the extent of teachers' own information literacy when faced with an information task. It analyses how Hong Kong teachers (and teachers in charge of libraries) think, their levels of confidence about undertaking information tasks and their cognitive and affective practice. Henri claims it has been assumed all along that teachers are

information literate role models. He calls into question their ability to create an information literate environment, essentially a learning environment in which lifelong skills and attributes are developed and refined.

For the theoretical framework he uses Kuhlthau's (1993 revised in 2004) information search process (ISP) model; a self-efficacy scale developed by Schwarzer and Jerusalem (1995); Bloom's Taxonomy of the Cognitive Domain (Bloom et al. 1956), and de Bono's (1987) Six Thinking Hats. Data gathering tools included a questionnaire, self-efficacy rating, diaries, drafts, thinking logs and think-aloud protocols. The participants were part of a university course in information literacy education. The information task was a research-based assignment (Henri 2001: 121-123).

In his findings he describes how teachers did not "instinctively" use an information processing model like Kuhlthau's (2004). Instead of formulating a focus from the key readings, they proceeded through the recommended references numerically. They could not distinguish between relevant and pertinent information. The result was teachers wasted time and ended up with too much information. While teachers were experiencing Kuhlthau's cycle of feelings, they only identified and understood this as normal when they got to read Kuhlthau's work (Henri 2001: 124).

Many teachers simply sat down and wrote, concentrating on what they thought the lecturer wanted. Some did not formulate their own focus and others were not sure whether or not they had achieved this. Amongst them were teachers who thought there was a magical single source that would provide the answer – "the silver bullet". Few teachers understood that the task at hand was about gathering evidence to support an argument rather than a single solution to be found (Henri 2001: 125).

The teachers were found to use more higher order thinking skills than senior secondary students. Using Bloom et al.'s (1956) taxonomy to map mental models, the teachers' models appeared less metacognitive when mapped against de Bono's (1987) Thinking Hats model. Bloom's model shows teachers spending more time on comprehending and evaluating material and the evaluation of the writing process than on analysis and synthesis (application). Analysis and synthesis are important in developing unique viewpoints. Teachers spent a lot more time in De Bono's Blue Hat (metacognition), followed by the Red Hat (emotional). Henri claims that De Bono's model "distinguishes between higher order thinking and metacognitive thinking". So while teachers did not seem to be analysing and synthesising, they were reflecting or thinking about their thinking. Teachers' affective state (Red Hat) correlates well with Kuhlthau's (2004) model in which individuals' feelings go through a succession of changes from start to finish of the task (Henri 2001: 125-126).

The self-efficacy rating revealed that teachers had more confidence in doing information tasks using older rather than newer technologies. When compared to teachers' practice, teachers revealed that they were not as aware of the complexities of the information process as they thought. When it came to self assessment and in practice, teachers seemed to lack confidence in their abilities to decide on the success of their information task. In other words, teachers could not say emphatically whether or not their task would be successful.

2.6 SOUTH AFRICAN EDUCATION CONTEXT

Discrepancies inherited as a result of apartheid, apparent in school infrastructure, access to human and learning resources, access to quality education and differentiated funding for schools along racial lines, have been well documented in the literature (Jansen & Taylor 2003; Fiske & Ladd 2004; Taylor, Fleisch & Schindler 2008). The focus for this section is on developments in education since 1994, especially as they pertain to the quality of education. Morrow (2007: 203-204) asserts that the term "quality" is a "loaded word". He suggests that quality education should best be understood in terms of "access to the modern world". He states that we cannot talk about

quality in education without referring to literacy and numeracy. He makes a final, crucial link between those learners who cannot independently learn from reading by the time they reach high school and tertiary levels and their undeniable disadvantage in the classroom and society at large. The Equal Education (2011: 6-17) movement is founded on the slogan of quality education to which they connect their school library campaign, a campaign advocating for a stocked, staffed and fully funded school library. They make the unequivocal link between literacy and information literacy and effective school library programmes.

It appears that the state of education in South Africa is unhealthy. On almost a daily basis the news media lament the state of South Africa's education. Inflammatory, disparaging headlines such as "The damage schools do to children" (Macfarlane 2011: 15); "In a worse state than we think" (Saunders 2011: 42); "ANA [Annual National Assessment] results disturbing" (Holtzman & Dwane 2011) convey the message that all is not well in education. While the popular focus is on the Grade 12 end of schooling results, the dismal state of learning and teaching in the lower grades has been exposed in the ANA (South Africa 2011c) results. These results served to confirm earlier international studies which South African learners participated in such as the Trends in International Mathematics and Science Study (TIMSS) 2003 in which Grade 8 learners were tested in Mathematics and Science; the Progress in International Reading Literacy Study (PIRLS) 2005 in which Grade 5s were tested for literacy, and the Southern and Eastern African Consortium for Monitoring Educational Quality (SAQMEQ) studies of 2001 and 2007 in which Grade 6s were tested in Language and Mathematics (LIS Transformation Charter 2009: 74; South Africa 2011c: 10; Equal Education 2011: 5). These results showed that South African children, especially those in rural and poor communities, perform well below the expected levels (South Africa 2011c: 30). The state expenditure on education is 20%, the largest single item in the budget. Yet, South African children have performed consistently worse than those from countries with much lower GDPs (Taylor 2007; Equal Education 2011: 5).

Since the introduction of the new curriculum in 1997, there have been a number of local, South African studies which sought to expose and explain the education conundrum – that is, besides

the annual literacy and numeracy studies. The various studies point repeatedly to the same or similar challenges in education in South Africa:

- If you live in a poor, rural community your chances of succeeding at school are low (Fiske & Ladd 2004; South African Human Rights Commission (SAHRC) 2006: 18; Taylor 2007: 4; Taylor, Fleisch & Schindler 2008: 41);
- The quality of education learners experience is unequal resulting in disadvantage based on social class and race (Fiske & Ladd 2004; SAHRC 2006: 39);
- The language of learning in the classroom needs to be bolstered in the home environment but this is not happening. Children are not learning to read even in their home language (Taylor 2007: 4; Taylor, Fleisch & Schindler 2008: 43);
- Poor teacher attendance, chronic lateness and unpreparedness to teach in class are major factors influencing learning outcomes (SAHRC 2006: 42; Taylor 2007: 4-5; Taylor, Fleisch & Schindler 2008: 50);
- Good school management practices have been found wanting. This affects aspects such as leadership in the curriculum, textbook utilisation, general management and time management (Chisholm 2005; Taylor 2007: 16; Hoadley & Ward 2009: 49-50);
- Teacher knowledge of their subject is generally inadequate (Taylor, Fleisch & Schindler 2008: 50; Hoadley & Ward 2009: 59-60);
- Teachers have a negative attitude to the profession. Teachers are passive and suffer from a victim mentality or 'dependency culture': for example displayed in not taking responsibility for their own professional development (Muller & Roberts 2000: 33; Jansen & Taylor 2003: 43; Taylor 2010: 2).
- "Teachers have a limited understanding of the benefits of information literacy and reading, due in large part to the training received. A utilitarian emphasis on reading skills does not do justice to the myriad benefits of a reading culture in schools" (Du Toit 2009).

In determining solutions to these seemingly insurmountable problems, the government has tried various solutions mainly based on poverty levels, according to a quintile system (Wildeman 2008), which did not succeed (Muller & Roberts 2000: 18; Taylor 2007: 13). Both Muller and

Roberts (2000) and Taylor (2007) identify three types of schools: Type one is classified as failing schools; type two as moderately effective; and type three as generally effective schools. Type one schools are those for whom no amount of funds and rewards will make a difference. These are usually the lowest quintile schools level one and two. To date, most of the government interventions have been in the poorest schools, many of which are type one, and have been ineffective in bringing about change (Muller & Roberts 2000: 32; Taylor 2007: 17-18; Taylor, Fleisch & Schindler 2008: 56).

2.6.1 WESTERN CAPE PROVINCE

The Western Cape Province, the region for the current study, has a population of 5.3 million or 10.5% of the total for South Africa (estimated to be 50.59 million by Statistics South Africa 2011). The land area is 1 219km square or 10.4% of South Africa (South Africa Info 2011). The most common home languages in the Western Cape are Afrikaans (55.3%), English (19.3%), and isiXhosa (23.7%) (Statistics South Africa 2011). There are 1 455 public ordinary schools of which 1073 schools or 73.85% have no libraries (no physical space, library material or librarian). Three hundred and eighty (380) or 26.15% of schools have a stocked library (Equal Education 2011:23). In the Western Cape, there are 959 714 learners in public ordinary schools and 31 870 teachers (South Africa 2010: 1).

The Western Cape Province attained the best results on the Annual National Assessment (ANA) 2011. The 'best', that is, compared to the other provinces. The ANA tested children in literacy and numeracy in the Foundation Phase (Grades 1-3) and Language and Mathematics in the Intermediate Phase (Grades 4-6). Of the Grade 3s in the Western Cape, 46% were reading at the requisite level, meaning that 54% or the majority was below par. The national mean for Grade 3 literacy success (that is reading scores of 50% or higher) is 31% of learners (South Africa 2011c: 30). According to a previous national systemic evaluation report, 39.5% of Western Cape Grade 3 learners in 2004 could read at the appropriate level (Western Cape 2005). This implies that learners in the Foundation Phase in the Western Cape have improved their scores. However, the

scores for Grade 6s achievement in 2011 (a score of 50% or more) are lower than for Grade 3s, standing at 35% for the province and 30% for the nation. This shows a decline from 37% of the national average in the 2004 Grade 6 systemic evaluation (Western Cape 2005). The consequences of low literacy levels have a distinct impact on the information literacy abilities of learners. Once learners have learned to read, the expectation, by the time they reach the Intermediate Phase (Grade 4-6), is that they can now use their reading abilities to learn.

The QuidsUp project (2008-2010), a national education initiative aimed at improving the quality of learning and teaching in the lowest quintile schools, marked an injection of library-based material into 120 of the neediest schools in the Western Cape. About 71% of the teachers who participated in the current study are at schools which were identified to receive these library resources. Exactly how or whether the resources are being utilized in these schools will go some way towards the discussion about "how resources are used to leverage quality" (Bodenstein 2008: 7).

It is heartening to note that different drivers in education are putting school library provision back on the agenda. For example, the systemic evaluation of Grade 6 learners in which access to information was seen as a significant factor associated with learner achievement (Western Cape 2005: 101-102). The recommendations of the Grade 6 systemic study prioritise school libraries, trained school library personnel, well-stocked libraries and pre-service educator training in school library management (Western Cape 2005: 118; Zinn 2006). The second study goes a step further than planning "resource centres and libraries" at each school to include ICT literacy as well (Western Cape 2006a: 41; Zinn 2006). The SAHRC (2006: 42), as part of infrastructure recommendations, proposed a library in each school, along with toilets, electricity, water and fences. The LIS Transformation Charter (2009) argues for school library development based on the underlying principles that 1) the curriculum requires access to a variety of well-managed learning resources; 2) global competitiveness demands that learners exiting schooling be information literate (this includes ICT literacy or fluency). Information literacy is the traditional domain of school librarians, implying that school libraries are more than a "place". The school

library is more a learning commons; 3) school library services develop literacy because they focus on encouraging a love for reading; and 4) school LIS is a "force for social cohesion". The library provides a safe place for learners after hours to interact, explore themselves and the "wider world" (LIS Transformation 2009: 74).

2.6.2 STUDIES ON INFORMATION LITERACY IN THE SOUTHERN AFRICAN SCHOOL CONTEXT

Some of the earlier writing in Chapter two included South African information literacy studies. For example, King's (2007) study of incoming students to the University of the Western Cape was dealt with in some detail as this is the university where the current study takes place. Under the teacher training sub-heading (2.4), the research of South Africans Fredericks (1993), Olën (1994), and Fourie and Krauss (2010) are discussed. Radebe's (1997) and Dubazana's (Dubazana & Karlsson 2006) perceptions about the role of the principal in information literacy development form part of the international discussion on principals and the information literate school community (2.5.1). Zinn's (1997) action research study is juxtaposed with other worldwide research under the sub-heading, evidence of information literacy in the classroom, 2.5.3.

In this section the Southern African research agenda on information literacy at the school level is further explored. A Botswanan study (Jorosi & Isaac 2008) identified in the literature warrants mention here, while the rest are South African. To conclude the South African discussion, the opportunities and challenges for information literacy education will be explored.

Jorosi and Isaac (2008) maintain that Botswana has an advanced schooling system in which all high schools have a library, librarian, books and technology. Not all librarians are professionally trained but they are teachers. Primary schools do not have libraries. In their study, most school librarians had a dual teaching and library qualification. Their varied conceptions of information

literacy confirmed information literacy as a multifaceted concept with no "universal" definition. Thirty teacher librarians or teachers responsible for the library were interviewed. Their findings reveal that mainly location skills, search skills and library rules were being taught, with synthesizing, citing, mini-research assignments being taught in less than 50% of the sample. While 100% of the teacher librarians saw it as their job to teach and integrate information literacy skills, 70% expected teachers also to be teaching information literacy skills. Information literacy skills were imparted during library orientation at the beginning of the year or traditional library training, through school projects, during English period library class visits and during "baby-sitting" periods when teachers were not available. The challenges to information literacy development that the respondents identified are: no centralized government office to offer best practice to emulate; an exam-oriented curriculum and emphasis on textbook learning; and reduced budgets. Other challenges which they proffered were the lack of teacher and administrative support, resistance to collaboration, and lack of knowledge. No mention was made by respondents of critical thinking skills or the use of information technology.

Jorosi and Isaac (2008) claim that very little research about information literacy at the school level has been completed on the Southern African continent. There may be a gap in some Southern African countries but in South Africa the topic has been on the research agenda for at least 15 years (Olën 1994; Zinn 1997; 2000; 2002; 2006; Hart 1999; 2005; Maepa & Mhinga 2003; Boekhorst & Britz 2004; van der Walt 2005; and Hart & Zinn 2007). The South African studies are reviewed next.

The Baxen and Green study (1998), although not addressing information literacy per se, set out to find out how teachers in primary schools use learning support material (LSM). The study took place in selected provinces in primary school classrooms. The findings have some important overlaps with information literacy education studies locally and internationally. The teachers in this study assumed that learners could use learning material, like charts, without mediation (Baxen & Green 1998: 59). Teachers assumed that providing access was enough. Williams and

Wavell (2006) reported a similar finding with their teachers. Teachers had not given thought to the complex skills and knowledge required for accessing information within different texts.

The Baxen and Green (1998: 81) study identified that teachers were themselves using resources as they liked to be in control. The teachers were effectively using resource-based teaching methods but not resource-based learning methods as they were not allowing learners to interact with resources. Teachers found it difficult to "let go" and allow learners to find out for themselves from resources. Teachers were emphasizing the "right" answers when alternative forms of questioning and answering could have been adopted. In the Limberg (2000); Henri (2001) and Merchant and Hepworth (2002) studies, the quest for the "right answer" or single solution underlies a superficial approach to learning.

Most teachers in the Baxen and Green (1998: 84) study used LSM to support their teaching rather than student learning. Teachers viewed knowledge as "external, fixed and beyond their control". The idea of knowledge as a social construct and constantly changing was alien to teachers. They were not sufficiently confident or competent to implement learner-centred approaches. The authors recommend a need for in-service training to improve teachers' knowledge of the subjects they teach. Teachers' poor knowledge base in the subjects they teach has been repeatedly documented by South African educational researchers such as Taylor (2007; 2010), Morrow (2007) and Hoadley and Ward (2009).

Hart (1999) conducted an ethnographic field study of a Grade 7 class as they undertook projects. This was an urban primary school in an indigent coloured neighbourhood. The questions that framed this case study were 1) how are students learning in doing projects? 2) How do teachers manage project work? 3) Do teachers possess the attributes of information literacy? Her curiosity centred on how teachers in disadvantaged communities, lacking in resources like libraries and laboratories, undertake research project work. To this end she conducted participant observation in History and Science class projects. Research project work is often mentioned in the

international research literature as a vehicle to information literacy (Limberg 2000 and 2005a; Williams & Wavell 2006; Asselin, Kymes & Lam 2007; Herring 2007). This research was conducted at a time in South Africa's educational history when the new outcomes-based approach had just been mooted.

The science project on animals consisted of group work in which students used a textbook or two from which to copy verbatim notes under designated headings. The emphasis seemed to be on the presentations or the end product and not the formative nature of continuous assessment whose intention is to provide feedback for improved learning. In the history project worksheets based on the chapters in the textbook were drawn up with blank spaces for students to fill in answers. Because the sentences were copied exactly from the textbook, the children simply identified sentences and filled in the gap. No interpretive or critical thinking skills were required.

What became clear to Hart (1999) was that teachers' attitudes to their students ultimately determine what they practise in class. From interviews with teachers it became apparent that teachers were not convinced of the discovery approach of projects as they were not in control of the class. The teachers had evolved to the resource-based *teaching* level not the resource-based *learning* level. They were more convinced of the need for setting up a teachers' resource centre with a variety of textbooks for pretty worksheets (lots of pictures) than a library for the students to interact with a variety of resources. As in the Baxen and Green (1998: 81) study of LSM use in primary schools, teachers were not comfortable with allowing students to interact with resources.

The socio-economic context of grinding poverty, gangsterism, and unemployment leads these teachers to believe that "their" students are not capable of discovery or inquiry-based learning and therefore they dismiss or water down the curriculum to suit their students. This situation is indicative of the self-fulfilling prophecy. The teachers don't believe that their students will aspire

to become professional people such as doctors or lawyers and they therefore teach the students as if they are all underachievers (Hart 1999).

Teachers see students as the proverbial "empty vessels" needing to be filled. Their view of information is that of "facts" that they "pour" into students' "heads". Teachers' belief about learning is linked to their attitude to information. In terms of teachers' own information literacy, they make little use of resources like libraries, EDULIS (the education library service for teachers), or the environmental centre at UWC which is close by. Teachers don't use resources either inside or outside the school because it means changing their belief structure about how to teach (Hart 1999). Their conceptions of learning do not include going beyond the text book. The WCED (Western Cape 2007) report argues similarly that teachers seem unable to use resources for learning.

Since the new curriculum was introduced in South Africa in 1997, the number of research projects increased dramatically. It is common knowledge that teachers were not trained in resource-based learning methodologies in their teacher training years. Periodic workshop training sessions have been a dismal failure (Bodenstein 2008: 9). Hart's (1999) findings are unambiguous in declaring that the South African teachers in her study are not able to mediate information literacy using the vehicle of projects. Teachers were not persuaded to the philosophy of independent learning, that is, the children can construct their own learning. This view is coloured by their perceptions of their surroundings, their education, and their own history.

In September 1999, Czerniewicz produced a report on information literacy in the Western Cape for the Adamastor Trust's INFOLIT Project. The study was based on the first C2005 documents which expressed more explicitly than later versions, information literacy outcomes' statements (Czerniewicz 1999: 14). The report emerged at a time when the first national policy framework for school library standards (South Africa 1998) was tabled and which embodied, as one of the roles of the teacher librarian, the teaching of information literacy. The report was exploratory and

skewed towards ICTs. It did provide the first baseline study which featured ICTs as a part of information literacy in South Africa. Future references to information literacy would arise most strongly within the ICT field rather than school education purely. Boekhorst and Britz (2004) are of the same mind when they argue in their comparison of the Dutch and South African education systems that information literacy has been captured most convincingly in the ICT curriculum. The ICT face of information literacy (Bruce 1997) is more in evidence as a result of minimal school libraries in South Africa.

Czerniewicz (1999) foresaw that information literacy would be developed most advantageously in the Further Education and Training (FET) sector, where subjects such as computer technology and information technology may be chosen. In the White paper on e-Education (South Africa 2004) information literacy has infiltrated the language of ICT in transforming ICT *literacy* into an ICT *capability* concept or what is internationally referred to as *information fluency*. E-Education is thus defined as the ability to apply ICT skills to access, analyse, evaluate, integrate, present and communicate information; create knowledge and new information by adapting, applying, designing, inventing and authoring information; enhance teaching and learning through communication and collaboration by using ICTs; and function in a knowledge society by using appropriate technology and mastering communication and collaboration skills.

Hart's (2006) study questioned to what extent South African (the Mpumalanga province in particular) public libraries and librarians were ready (capable and willing) to build a sustainable information literacy education programme. The need for Hart's study in 2006 and the current study is based on the reality that in South Africa only 7.7 % of schools have a stocked, fully functioning library (South Africa 2009b) and a curriculum that demands project work (South Africa 2009c).

In the Mpumalanga study only one respondent of 57 indicated that information literacy education had been part of a library degree. Hart (2006: 175-176) discusses the findings as views which she says encompass respondents' "opinions, attitudes, beliefs, perceptions and conceptions". The

Mpumalanga librarians interviewed described the information literacy "training" for schools as once-off library orientation visits at the beginning of the school year. Public librarians relate that the new curriculum has been the cause of children flocking to the library as there are few school libraries to provide the resources. In describing their understanding of an information literate person, public librarians overlooked the aspect of "assessing information".

They see information as a "utility" that can be "fetched or given". They do not view information cognitively, but rather as a source. This is equivalent to Bruce's (1999) first level or circle and Kuhlthau's (1993) and Limberg's (2005a) looking for the "right" answer. Respondents also saw information literacy as equivalent to book education which focused on sources of information (Hart 2006: 177).

The fact that a great majority (44 of 57) in Hart's (2006) study associate information literacy with ICTs, may influence the adoption of information literacy by public librarians. Those in ICT poor areas may feel it not worthwhile to teach if they don't have the ICTs. Those in ICT rich environments may assume that teaching the ICTs alone will suffice. All the Mpumalanga public librarians agreed that information literacy is for lifelong learning. They identified lifelong learning closely with libraries and skills. The lifelong learning aspect of information literacy seems to be a common denominator between teachers and librarians (see Merchant & Hepworth 2002; Williams & Wavell 2006).

When asked to describe how they would solve an information-based problem, most public librarians focused on the "deciding where to go and finding relevant information". Few mention the synthesis, organising and presenting stage. Most often public librarians see their job as done once the material has been photocopied and given to the learner (Hart 2006: 178). In Hart's (2011) study of dual-use school community libraries, the librarians again identified themselves as "givers of information" rather than as teachers.

Public librarians seem to be caught between the demands of their immediate customers (school children and their projects) and their more traditional roles (Hart 2006: 181). The Mpumalanga study conveys the strong impression that public libraries are not yet ready for the information literacy education role.

Maepa and Mhinga (2003) and Hart (2005) report on public libraries and their attempts to develop a cooperative relationship with schools. Both report that the attitudes of teachers towards public libraries betray a lack of understanding of the role that libraries play in education. In Hart's (2011) study of dual-use school community libraries in a remote, rural area of South Africa, she identified the same undervaluing of the community (public) librarian by the educators. These dual-use libraries were physically located on the school premises, and yet teachers did not collaborate with the librarians on projects. While the librarians were invited to social gatherings, they were excluded from curriculum meetings. It is clear that the educators do not understand the mission of a school library and do not exploit the potential collaboration between the two professions. While these dual-use libraries have stepped into the gap of 92% of schools without library services, their potential offerings, such as information literacy education, have been wasted.

2.6.3 OPPORTUNITIES AND CHALLENGES FOR INFORMATION LITERACY EDUCATION IN SOUTH AFRICA

The natural home for information literacy education appears to be associated with the professionally trained school librarian. In South Africa there are three universities, out of 23 countrywide, training school librarians: two are in KwaZulu-Natal Province (University of KwaZulu-Natal and University of Zululand) and one is in the Western Cape Province (University of the Western Cape). The qualification is called an Advanced Certificate in Education (ACE) School Library Development and Management in KwaZulu-Natal and ACE School Librarianship in the Western Cape. Entry to the ACE is an approved three year education qualification (Hoskins 2006: 59). Teachers have been offered bursaries by the respective

provincial education departments to complete the ACE at KwaZulu-Natal universities since 2004 and in the Western Cape since 2008. Approximately 100 school librarians have graduated via the bursary route from the UWC and about 800 from the KwaZulu-Natal universities.

Information literacy education is addressed in both ACE qualifications. In 2004 LIASA's School Libraries and Youth Services Interest Group (SLYSIG) produced the Information Literacy Guidelines Grade R – 12. The information literacy guidelines were SLYSIG's attempt at making explicit the information literacy outcomes for each learning area in the National Curriculum Statement (2002).

Whilst the prospect for training school librarians exists in two of South Africa's nine provinces, the biggest challenges to the advancement of school librarianship is the lack of a national school library office, the lack of policy for school libraries and the lack of a specialist position for school librarians in schools (Hart & Zinn 2007; Du Toit 2009; Dubazana & Hoskins 2011). In March 2012 the national Department of Basic Education published school library guidelines (South Africa 2012) after attempts over the past 15 years to have a national school library policy with standards approved failed. The guidelines do not have the same clout as a policy and implementation plan. In addition, there is no national central office to ensure the coordination of school library actions such as advocating for a ring-fenced budget in the provinces.

While the Minster of Basic Education's, Ms Motshekga's school library guidelines are perceived as a peace-offering in the eyes of the school librarianship profession, a new challenge has arisen in education and training where the ACE is being phased out and only those teachers with a four-year teaching degree may be admitted to a future-developed Diploma in School Librarianship (South Africa 2011b). Most primary school teachers have a three-year teaching qualification implying that they may not have the opportunity to become professionally trained school librarians.

2.7 CONCLUSION

The focal point of the literature review has been information literacy in the school setting and amongst its constituents – teachers, principals, school librarians, and learners. The studies reviewed provide a backdrop to information literacy in the classroom, the setting for the current study. The literature addressing the education and training of teachers and principals and the extent to which they are exposed to information literacy was also surveyed. The review touched on research conducted on information literacy amongst first year university students as it provides some insight into the preparedness of high school learners for independent learning. The literature concerning school librarians and information literacy is important because it forms the basis for comparison with the teachers' views on information literature in Chapter six (6.8). The final section of the review provides a South African context in preparation for the current study. The next chapter provides the theoretical framework for the study.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 INTRODUCTION

Bates (2005: 2) defines theory as a "system of assumptions, principles, and relationships posited to explain a specified set of phenomena". More commonly, Bates continues, the "core meaning of theory centers around the idea of a developed understanding, an explanation, for some phenomenon". Models assist in the development of theory but, more often than not, there is no clear distinction between a theory and a model of the same phenomenon (Bates 2005: 3). A metatheory from both education and LIS is constructivism (Bates 2005: 10-11; Gredler 2005: 81). But all theories, including those related to teaching and learning, go through periods of popularity and then may fade when no longer in vogue. For example, Skinner's (Tobias 2009: 336-337) behaviourist theory was popular in the 1950s and even the 1960s but waned when the cognitive paradigm took root in the 1970s. Likewise, constructivism has been criticized in more recent times from both within South Africa (Muller & Roberts 2000; Taylor 2001; Young 2008) and abroad (Young 2008; Tobias 2009; Duffy 2009). These criticisms appear to be confined to the field of education and exclude the LIS research encountered.

In embarking on this chapter, the researcher starts by describing what constructivism means as opposed to behaviourism. The constructivist debate within the South African education context is tackled next. The penultimate discussion centres on inquiry-based learning – its characteristics, models, and relationship to information literacy – and what the sceptics are arguing. Finally, the information seeking and use theory epitomized in the ISP will be considered.

3.2 THE POLARITY BETWEEN CONSTRUCTIVISM AND BEHAVIOURISM

Constructivism is based on the theory that human beings construct or build their own knowledge or understanding. People learn, make meaning or create new understandings by building on their previously constructed learning. Constructivism is geared towards lifelong learning and more

cognitively complex outcomes. In contrast, the behaviourist theory of learning implies that learning is 'delivered' or 'transmitted' making 'received' knowledge a central concept. Learners in the behaviourist context are therefore seen as passive, empty vessels waiting to be filled with knowledge. Behaviourism is considered positivistic in nature and learners learn through 'external motivation' and reinforcement or reward (von Glaserfeld 2005: 8-9). Behaviourism therefore assumes that 1) learning can be controlled by external reinforcement and the result is a change in behaviour; 2) observable behaviour rather than internal learning is important; and 3) behaviour is best explained through the simplest learning tasks (Gredler 2005: 28-29; Callison & Preddy 2006: 431).

Constructivism as a learning theory is still considered by some as an emergent, alternative approach to understanding learning (Shephard 2001: 1073; Callison & Preddy 2006: 334). The emergent nature of constructivism means that it is not a homogenous concept. The evolution of constructivism has given rise to various forms of or emphases in constructivism (Mayer 2009: 198). For example, Von Glaserfeld is considered part of the "radical constructivist" leaning (Shephard 2001: 1073), while Piaget's version of constructivism, according to Shephard (2001: 1075), is viewed as ignoring social processes and concentrating instead on individual stages of development. Rather than single out all the discrepancies amongst the different versions of constructivism, this researcher prefers to concentrate on interpretations of constructivism that underpin information literacy. As Richardson and Placier (2001: 913) and Von Glaserfeld (2005: 33) contend, constructivism is a theory of learning which needs to be unpacked and enacted in the classroom. It is not a description of teaching. It is the application of constructivism in the classroom that this researcher wishes to understand. Before the researcher embarks on a discussion of the constructivist classroom, the contestation of constructivism within the South African context will be addressed.

3.3 A BRIEF CRITIQUE OF OUTCOMES-BASED EDUCATION IN SOUTH AFRICA: THE CONTENT-KNOWLEDGE DEBATE

In the 1990s education in South Africa underwent drastic changes. These changes were briefly described in Chapter one, the background to the study and in Chapter two, the literature review. Looking back now, in hindsight, we can begin to identify the flaws that arose during the 1990s and start to rectify them. In the context of post-apartheid South Africa, many ideas that hinted at the past were disposed of. Ideas related to authority, hierarchy and teaching-centredness were rejected, with the result that subject-based syllabi were also rejected along with textbooks (Bodenstein 2008: 8; Young 2008: 112). For the school LIS world a learner-centred curriculum not a text book driven one implied access to resources such as in a library, and research-based assignments implied information literacy (Hart & Zinn 2007: 89). For librarians, especially those working in educational environments, the changes were welcomed as the projected vision was one of developing school libraries to support literacy and resource-based learning amongst the 80% plus of neglected schools. What the cohort of LIS professionals, enthusiastic about educational changes, did not realize was the extent of the damage to education that apartheid obscured.

In South Africa, the constructivist concept of socially constructed knowledge was taken to its extreme by creating a curriculum which specified little or no content. For many a South African teacher who had poor subject knowledge, teaching in socially strife-ridden contexts of poverty, under-resourced schools and large class sizes, the result was total confusion and exasperation (Taylor 2001: 2; Taylor, Fleisch & Schindler 2008: 41; Young 2008: 110). Teachers had tremendous difficulty translating a radically new curriculum into teaching practice in the classroom (Morrow 2007: 58). As Young (2008: 204) asserts, a new language of "facilitation, group work and teaching as a conversation" became fashionable. The conversations were often facile and guided by dubious intentions. Teachers became educators or rather facilitators, individual learning was negatively associated with rote learning and the teacher as 'sage on the stage' delivering content was frowned upon as not being in the spirit of democratically constructing knowledge. The "role of curriculum as enabling learners to develop their thinking

through an engagement with specialist bodies of knowledge, that are not available to them in their everyday lives," was opposed in favour of a curriculum that pandered to an extreme type of constructivism devoid of a knowledge base (Young 2008: 10).

The backlash to this ultra-constructivist approach to education gave rise to the Revised National Curriculum Statement (RNCS) in 2002 which stipulated the knowledge content for each subject, subject sequence and progression frameworks; and less of an emphasis on the generic and constructivism (Hoadley 2009: 60). Having a good textbook to support subject teaching was back in favour.

There is a tension within constructivism between the idea of knowledge as "given" by subject specialists and the idea that *all* knowledge is socially constructed so there is "no knowledge beyond our perceptions" (Young 2008: 201). "Social constructivists were right to emphasize the socio-historical character of knowledge (and therefore the curriculum) as against the prevalent view of its 'givenness'. Their flaws were in not spelling out the limits of the theory. The theory remained largely rhetorical" (Young 2008: 205). According to Young (2008: 202), we should not reject the social characteristic of knowledge or the curriculum outright simply because it is associated with a particular political persuasion. In the researcher's understanding of Young's idea of knowledge in the curriculum, while knowledge is socially constructed at the same time there is knowledge which can stand apart from the context in which it arose, for example, Chinese students have to understand Boyle's law even though Boyle was an elitist Englishman (Young 2008: 192-193). The value of formal knowledge in the curriculum is the conceptual frameworks which it makes available and which are difficult to acquire from everyday knowledge. As Morrow (2007: 63) says:

> the job of teachers is to foster that kind of learning that systematically advances the understanding of learners so that they can achieve organising insights into the world as it is. Teaching is to be distinguished from exposure to the atomized stream of information and images that circulate around the webs of the contemporary world. It is an attempt to enable the learners to order the constant flow of impressions and to

> appreciate and understand at a deeper level the torrent of fleeting images and information that is characteristic of the modern world. Professional teaching aims systematically to develop the conceptual frameworks that render the world less opaque.

The researcher agrees with the idea that a body of knowledge exists which could form the basis for a school curriculum. The use of subject-based textbooks and subject syllabi as guidelines are sound pathways to implementing basic schooling. This research, however, wishes to understand how children learn when their cognitive capacities are extended or challenged beyond the textbook. These challenges are present in research-based projects which form part of the present curriculum. An inquiry-based approach, supported by the ISP theory of information literacy and overlapping with several other information literacy models, provides a well-documented learning process to find out what happens when children are engaging in research projects. This brings the study to the next section on inquiry-based learning.

3.4 INQUIRY-BASED LEARNING

Inquiry-based learning, also referred to as "guided inquiry" (Kuhlthau, Maniotes & Caspari 2007) or "information inquiry" (Callison & Preddy 2006), is a fairly recent expression of ongoing research in the fields of information literacy, education and school librarianship in particular. Research suggests that using inquiry-based learning with learners can help them become more creative, more positive and more independent (Kühne 1995). Other academic research shows that inquiry-based learning improves learner achievement (GLEF 2001). Some of the research on this effect comes from studies of effective school library programmes that are centres of inquiry-based learning. A school library programme that is properly equipped and staffed can make a difference in terms of measurable gains in learner achievement. School library factors alone can account for improvements of 2% to 9% in learner achievement (Lance 2007). For the Australian School Library Association (2009: Statement on guided inquiry)

> Guided inquiry is an approach or methodology which allows students to seek and engage with a variety of ideas to increase their understanding in pursuit of knowledge and greater awareness. Guided inquiry is a planned, supervised and targeted intervention into developing information literacy and enhancing learning. This approach or methodology to learning provides a means by which teachers are able to tailor

learning experiences and opportunities, resources and processes to the needs and abilities of each student according to intended curriculum learning outcomes.

Inquiry learning is founded on the constructivist approach to learning. The theory of constructivism posits that people learn actively by constructing their own subjective interpretation of reality. People create personal knowledge by fusing their existing or prior knowledge with new ideas. All learning occurs within cultural and social contexts. In discussing the constructivist classroom, Brooks and Brooks (1993) suggest that the "strength of school reform" lies in "merging learning and understanding beyond facts and rote memorization". The strategies that teachers can employ to follow constructivist principles in the classroom have characteristics in common with the guiding principles of the inquiry-based approach: for example, constructivist teachers encourage learners to take the initiative and take ownership of their learning; the constructivist teacher models the behaviour of an inquirer by, amongst other things, asking thoughtful, open-ended questions and encouraging learners to engage in dialogues which may provoke opposing viewpoints; constructivist teachers allow learners time to fashion questions and responses and tease out responses by requesting elaboration (Brooks & Brooks 1993; Drayton & Falk 2001).

There are several models of both information inquiry and information literacy. Models are useful because they illustrate to us in a non-linear way the connections between inter-related concepts. The food pyramid is a good example of a model which helps us to understand and remember easily the ratio of carbohydrates, fats and proteins in the diet (Harvard School of Public Health 2011). The tabulated models below (see Table one) were selected because they have all been used in practice in schools (McKenzie 1999; Kuhlthau 2004, 2010; Alberta Learning 2004; Eisenberg, Lowe & Spitzer 2004). Of these models only Kuhlthau's is theory-based. The Alberta Inquiry model uses the theory of Kuhlthau's (2004) ISP to develop an approach which incorporates the ICT changes of the 21st century and uses terminology familiar to teachers (Alberta Learning 2004: 3,8). McKenzie's Research Cycle model (1997) and the Big6™ are examples of models developed from practice. The Big6™ model and its offspring the Big3 (the latter intended for junior primary level) has been readily adopted by both teachers and learners

because of its user-friendly pithiness (Callison & Preddy 2006: 44). These models evolved in the school library world out of previous library and information location skills models. What are the important elements of an inquiry model that incorporates information literacy? These are process learning, asking good questions, motivation, scaffolding, and metacognition. By no means are these the only elements but they are the ones the researcher wishes to highlight.

Table 1: The intersection of the Inquiry Model with information literacy models (based on McKenzie 1997; Kuhlthau 2004: 81-84; Eisenberg, Lowe & Spitzer 2004: 87; Alberta Learning 2004)

Information Search Process (ISP) - Kuhlthau	**Alberta Inquiry Model**	**Research Cycle - McKenzie**	**Big6 Information problem Solving – Eisenberg and Berkowitz**
Initiation Recognise a need for information **Selection** Deciding on a topic for research	**Planning** *Identify a topic area for inquiry *Identify possible information sources * Identify audience and presentation format *Establish evaluation criteria *Outline a plan for inquiry	**Questioning** Clarify and map out the dimensions of the essential question being explored	**Task definition** *What is the problem? * What information is needed to solve the problem? – concept mapping and asking questions
Exploration Searching for information from general to specific	**Retrieving** *Develop an information retrieval plan *Locate and collect resources *Select relevant information *Evaluate information * Review and revise the plan for Inquiry	**Planning** Think strategically about the best ways to find and organise pertinent and reliable information	**Information seeking strategies** *Determine the range of sources and prioritize
Formulation Formulating a focus after	**Processing** *Establish a focus for inquiry	**Gathering** Proceed to satisfying	**Locating and accessing information**

extensive searching about the topic	*Choose pertinent information *Record information *Make connections and inferences *Review and revise the plan for inquiry	information sites swiftly and efficiently	* Locate sources * Find information in each source
Collection Information is gathered and organised keeping the focus in mind	**Creating** *Organise information *Create a product *Think about the audience *Revise and edit *Review and revise plan for inquiry	**Sorting and** **Sifting** Move towards more systematic scanning and organising of data already collected.	**Using information** *Engage with information *Extract information
Presentation Organised information is ready to be shared with others	**Sharing** *Communicate with the audience *Present new understandings * Demonstrate appropriate audience behaviour	**Synthesizing** Looking for patterns or some kind of picture	**Synthesis** *Organise information * Present information
Evaluation	**Evaluating** *Evaluate the product *Evaluate the inquiry process and inquiry plan *Review and revise personal inquiry model *Transfer learning to new situations/beyond school	**Evaluating** Ask if they need more research before reporting	**Evaluation** *Judge the product * Judge the process

3.4.1 PROCESS LEARNING

Many of the information literacy and information inquiry models are referred to as process models. Process models focus the inquiry on more than just location and end product. The information inquiry process moves learners away from 'simply collecting and compiling information to please teachers; rather, they become involved in thinking *processes* that require extensive exploration of ideas and formulation of thoughts before developing their own deep understanding of their topics and presenting it' (Kuhlthau, Heinström & Todd 2008). In defining

information inquiry Callison & Preddy (2006: 4) refer to it as "those teaching and learning *processes* that combine inquiry strategies to seek answers to questions, raise new questions, and further question the content from the wide array of information accessed". In this sense then, process learning is about engaging with texts irrespective of format, extracting the most pertinent of evidence to support an argument. Process learning goes beyond "fact finding" and presenting superficial, pretty but hollow end products.

Educational critics of process learning argue that learning via the constructivist way, of which the process approach is one, is considerably more time consuming than being taught explicitly or directly (Tobias 2009: 344-345). One should examine the cost-benefit issue of the different approaches, the critics insist. Constructivists agree that process learning appears to consume more time than direct teaching because the emphasis in most curricula is on examinations and 'getting through the syllabus content'. Process learning seems to be geared for a different purpose like lifelong learning.

LIS critics of the process models refer to them as 'linear skills steps to mastery'. The representation of two of the models, one as a cycle or spiral (McKenzie 1997) and one as a jigsaw puzzle (Alberta learning 2004), refutes the linearity claim (see Figures 1 and 2 on page 102). Lowe and Eisenberg (2005: 66) claim that the Big6 model is not intended as a "linear, step-by-step…lockstep strategy". The Big6 model offers flexibility and 'encourages a variety of alternative strategies such as jumping around, branching off, or looping back'. The fact that the models show a beginning and an end assists users of the model to conceptualise a route, but to see it as a linear one way model, is to misinterpret the complexity of information literacy.

The charge that these models encourage a focus on skills only and the assumption that some level of mastery of skills makes one information literate, in the researcher's understanding, is a misconstruction by some practitioners. Common sense tells the researcher that, although many people take ballet lessons, not all become prima ballerinas. We may know and be able to perform

the routines and techniques of ballet but being a good dancer is more than simply perfecting the technical skills. The classic Kuhlthau (2004) ISP theory incorporates feelings, thoughts and actions in explaining information literacy. In a new school-based study reported on in 2008, Kuhlthau, Heinström and Todd confirmed the validity of the information search process model as useful for explaining the interactions between knowledge construction and feelings. The Alberta information inquiry model "calls for an awareness: 1) of the complexity of learning from information; 2) that learning from information is not routine or standardized tasks; and 3) that it involves the affective as well as the cognitive domain" (Alberta Learning 2004: 80).

3.4.2 ASKING GOOD QUESTIONS

Questioning is a fundamental element of both information literacy and inquiry (Youth learn 2010). The ability to ask and pose different types of questions in different contexts is at the heart of information literacy. In McKenzie's Research Cycle (1997) learners are continually revising their questions. To McKenzie (1996) the question is the answer. If you ask children to find five facts about mosquitoes, they can easily locate one information source and jot down the answers.

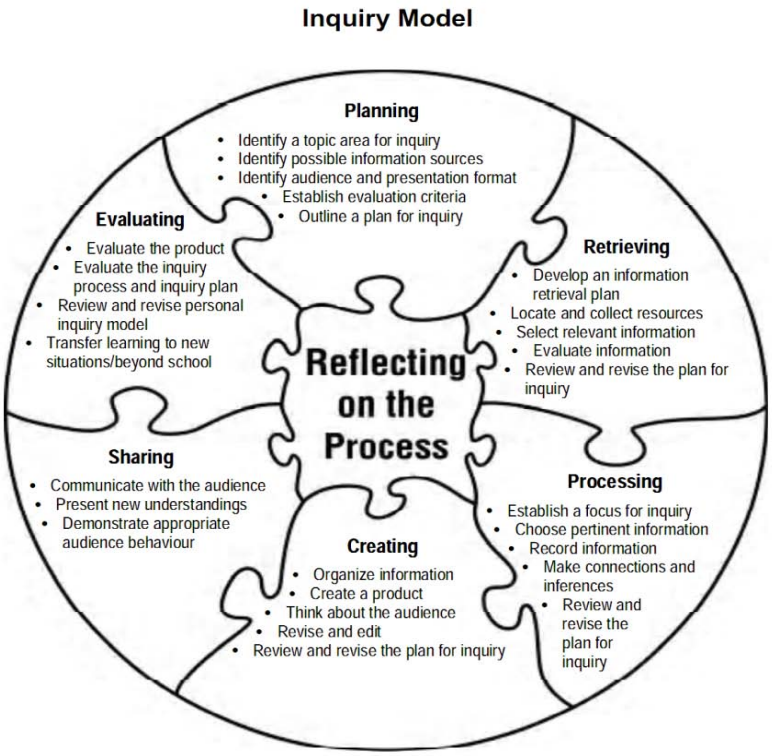


Figure 1: Alberta Learning Inquiry Model (2004:10)

Figure 2: McKenzie's Research Cycle (1997: The research cycle)

However, framing an essential question takes a learner beyond 'copy and paste' to think, analyse and synthesize – referred to in Bloom's (1956) taxonomy as higher order thinking. Questioning is linked to curiosity and forms one of the attributes of an information literate person (Doyle 1994). In defining information inquiry the ability to 'formulate questions' is important amongst other things (Alberta learning 2004: 1). Questions that start with 'how' and 'why' require learners to take pertinent information and fashion a persuasive argument.

Sceptics of discovery approaches claim that teachers need to have higher levels of knowledge and ability than is generally found in most classrooms (Tobias 2009: 345). Constructivist teaching requires 'lengthy learning engagements and a lot more work' in preparation and implementation (Duffy 2009: 362). These researchers claim that the average teacher in North America is not ready and does not have the abilities to implement inquiry-based approaches in the classroom (Duffy 2009: 363; Tobias 2009: 345). Yet, the LIS field is awash with research evidence of alternative approaches to direct teaching or what is referred to as the 'acquisition' model (Duffy 2009: 358). The Lance (2005; 2006; 2007) school library impact studies in different USA states and the Todd, Kuhlthau and Ohio Educational Library Media Association (2004) study in Ohio of student learning through libraries are testaments of knowledge creation in a constructivist way.

The researcher agrees with some of the critics (Duffy 2009; Tobias 2009) that a compromise or a middle ground between constructivist and direct teaching approaches is pragmatic within the school environment. We have to take into account the way that teachers themselves were taught when at school (usually the direct teaching method). Even having been through teacher training that encouraged constructivism does not guarantee a constructivist teacher. Holt-Reynolds (2000: 21-32) reported in a study of a newly qualified teacher who had been taught constructivist techniques such as group work and discussion during teacher training but who failed to understand her role as using these strategies to build new learning. She allowed her learners to talk and discuss but did not pull together the threads of discussion, nor did she intervene and correct ideas when they were wrong. Similar accusations have been leveled against teachers in

South Africa for whom group work had become an empty "free for all" - free of content and learning direction (Young 2008: 191). Workshops and professional development may change the teaching beliefs of some teachers but not all. This does not mean that we should reject constructivism out of hand. If information literacy is conceived as a lifelong learning goal, then effort should be made to understand how best to implement it in the school years.

3.4.3 MOTIVATION FOR A CONSTRUCTIVIST APPROACH

Critics of constructivism admit that the stimulus for learning is seldom discussed in the literature dealing with direct teaching (Duffy 2009: 357). For constructivist approaches what stimulates learning is key to understanding the difference between deep and surface learning. When people have a personal interest in a topic, they are more intrinsically motivated to learn. Motivation and feelings are tightly connected. When learners are disaffected they don't learn. They need to be in an environment which promotes the joy of learning new things, where they are acknowledged, where they are stimulated to learn not only for marks or external rewards, but for the intrinsic gratification of accomplishing a difficult but doable task. Constructivist approaches encourage active learning through projects linked to the real world. Active learning requires learners to use higher order thinking skills when they are engaged in constructing new knowledge. In active learning, because there is an emphasis on collaboration, discussion, consultation and authentic learning, what is learned is retained far longer and there is a greater likelihood of transfer of learning (Callison & Preddy 2006: 335).

What role can the teacher play in advancing motivation in children? Small (Small & Arnone 2000; Small, Shanahan & Stasak 2010) is one of the chief proponents of the expectancy-value theory of motivation. It is a theory that has been successfully applied in classrooms. Expectancy value theory states that a person will only make some effort to do a task if two motivations are in place.

Value - a person must be able to identify something of personal interest or meaning in achieving the task;

Expectancy for success - a person must have the expectation of being able to accomplish the task successfully.

Teachers can help learners see the value of information literacy by incorporating the skills, attitudes and values associated with information literacy in knowledge construction most often occurring during research projects. In the New York schools' study (Small, Shanahan & Stasak 2010), school librarians kept learners motivated in a variety of ways: by offering high quality information resources that learners can use for a specific research topic; by teaching them about plagiarism using *The Simpsons* cartoon (Fox Interactive & Twentieth Century-Fox Corporation 1996) to which the children could immediately relate and started asking questions; and to teach Boolean logic by using hula hoops. Learners were taught a difficult cognitive concept which they physically enacted using the hoops. Research assignments should be challenging but not out of reach otherwise learners end up frustrated and disheartened. Younger learners are more resilient at trying despite failure whereas older learners have learned to associate failure with the lack of ability. It is important for the teacher to believe that learners will succeed. Learners can easily perceive if the teacher does not have faith in their capabilities. The self-fulfilling prophecy comes into play here: if the educator expects learners to succeed, learners will live up to their expectations. The opposite is also true.

3.4.4 SCAFFOLDING

The scaffolding metaphor is closely linked to Vygotsky's idea of the Zone of Proximal Development (ZPD) (Callison & Preddy 2006: 525). Vygotsky understood that learning takes place in a social setting in which a more experienced and knowledgeable person (this could be a teacher, parent, or mentor) mediates more complex thinking. The ZPD is the distance between a learner's ability to solve a problem independently and the ability to perform the task under adult mentorship or in collaboration with more advanced peers (McKechnie 2005: 373-374). Von Glaserfeld (2005: 25) says that in constructivism, the ZPD should not be equated with mere "modeling". When an expert helps a novice the scaffolding should rather be seen as "raising" the stakes. The expert does this by 1) "focusing on the learner's conceptions; 2) extending or

challenging the conception; 3) refocusing by encouraging clarification; and 4) redirecting by offering new possibilities for consideration". The more knowledgeable person acts more like a mediator coaxing the learner into and beyond the ZPD.

The Alberta Inquiry model itself is viewed as a scaffold for teaching information inquiry (Alberta Learning 2004: 8). Each phase of this process model offers skills and strategies that are required to be explicitly taught with examples of application in different subjects. The intention is never to separate the skills from the subject content. By guiding inquiry using the model teachers and school librarians can offer just-in-time interventions to assist learners in their knowledge construction.

3.4.5 MEDIATION

Mediation in cognition education is a "way of teaching and interacting that provides learners with new knowledge and at the same time explicitly draws attention to strategies for acquiring and using this knowledge" (Western Cape 2001: 11). Mediated learning has at its base Vygotsky's (1978: 131) ZPD. A mediated learning experience occurs when the teacher intentionally creates an opportunity for learners to make new knowledge their own. The teacher creates a learning environment which encourages thinking and the acquiring of good learning habits and positive attitudes. The shared experience between mediator (the teacher) and learner should be meaningful so as to pique interest. A final important aspect of mediation is the transfer of thinking processes. The mediator provides the learner with other scenarios where the new learning can be applied in slightly different ways (Western Cape 2001: 13).

The researcher expected teachers in the study to "mediate" information literacy rather than "teach" information literacy where to teach is too often associated with "telling" or "instructing". Teachers had to explicitly draw learners' attention to how they are learning and thinking.

3.4.6 METACOGNITION

A definition of metacognition in its simplest form is thinking about your thought processes. Metacognitive strategies advance learner's self-regulation and contribute to the development of independent learning. In the inquiry model metacognition is integrally linked to the cognitive *and* the affective domains (Alberta Learning 2004: 11). Metacognition is thus extended to include *thinking about your emotions* (Alberta Learning 2004: 81). At the heart of the Alberta Inquiry model is *reflecting on the process* throughout the different phases (planning, retrieving, processing, creating, sharing and evaluating). A metacognitive disposition incorporates, amongst other things, the ability to manage time, to restrict information searching to the most pertinent rather than the most relevant, to consider opposing viewpoints, and emotional intelligence which accepts that learning can involve complex moods of uncertainty, frustration and doubt.

3.4.7 INQUIRY AND THE STUDY

Teachers in this study were required to integrate and assess information literacy within different subject/learning areas. This implies that teachers needed to be cognizant of the learning environment they create which needs to foster an inquiry process that assists learners in coping with problems that may not have clear solutions, or challenge their beliefs or understandings. The goal of inquiry is not fast facts or surface learning but rather deep, lasting learning that requires learners' engagement and reflection (Kuhlthau, Maniotes & Caspari 2007).

Teachers' ability, to design information-based assignments which stimulate curiosity and engage learners in higher order thinking rather than 'copy-and-paste' assignments, were put to the test. Are teachers in this study aware of the zone of intervention in the inquiry process (Vygostky's zone of proximal development) in which teachers scaffold learners at critical points in the learning process?

3.5 INFORMATION SEEKING AND USE THEORY

Information seeking is behaviour "that occurs when an individual senses a problematic situation of information gap, in which his or her internal knowledge and beliefs, and model of the environment, fail to suggest a path towards satisfaction of his or her goals" (Case 2007: 333). Information seeking and use theory has been well documented in the literature. The research of Taylor (1968), Kuhlthau (2004), Belkin (2005) and Dervin (2005) forms the backdrop to the needs driven approach to information seeking.

Belkin (2005) emphasized the notion of anomaly and uncertainty in information seeking. For Belkin, the basic motivator of information seeking is an "anomalous state of knowledge" (ASK). An ASK exists when a person recognizes that there is an anomaly (a gap or uncertainty) in their state of knowledge regarding a situation or topic. Similarly, for Taylor (1968) reducing uncertainty is a great motivator for information seeking. Dervin's (2005) contribution to the information seeking theory lies in her idea of sense-making. When we are seeking information we are trying to make sense of the world. In sense making, emotions are as important as cognitions. When people search for information they resolve not only their uncertainty (cognition) but also their anxiety (emotion).

Kuhlthau's (2004) approach to information seeking uses several aspects of the above-mentioned authors' depictions of information seeking behaviour. In her longitudinal study of secondary school learners, she identified that learners experienced a series of stages of thoughts (Taylor 1968 and Belkin 2005), feelings (Dervin 2005 and Kelly in Butler 2009) and actions. Kuhlthau's user-centred approach as opposed to a systems approach recognized that in complex information seeking the affective (feelings and emotions) experience is as integral to knowledge creation as the cognitive (thoughts) and physical (actions). Through her research she found that when individuals were confronted with a task requiring deep understanding, feelings of uncertainty increased in the process of information seeking, before diminishing with focus formulation and construction in later stages (Kuhlthau 2004).

The Information Search Process (ISP) model (Figure 3) Kuhlthau developed in the 1980s and refined in the 1990s continues to be used to examine theoretical concepts within information science, librarianship and in work and every-day life information seeking. Within the digital environment the ISP has been shown to be equally relevant and valid (Bilal 2002; Branch 2004; Heinström 2006). In this study the ISP model is an appropriate means to understanding teachers' information literacy as it addresses information seeking behaviour holistically through thoughts, actions and feelings.

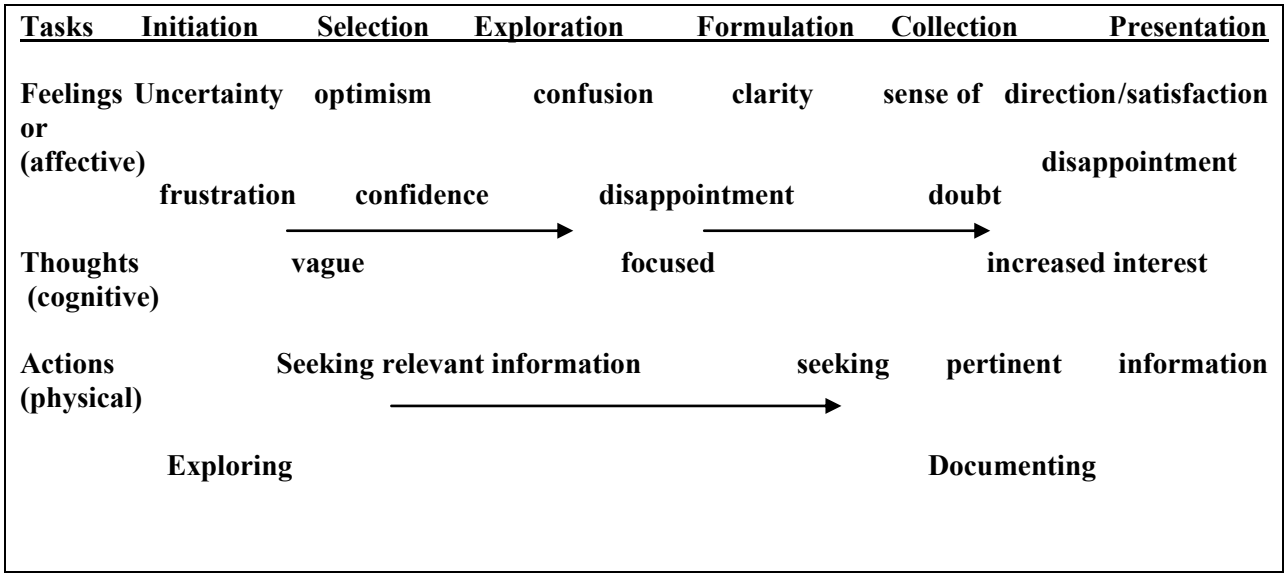


Figure 3: Model of the Information Search Process (Kuhlthau, Heinström & Todd 2008)

The process-based approach studies phenomenological *perspectives* of information literacy but it is not a phenomenographic approach. Phenomenography is a theory of variation. It emerged in the late 1970s and early 1980s amongst a group of educational researchers at the University of Göteberg, Sweden. It sought to explain empirically the differing ways people experience or perceive various phenomena in the world. It uses a qualitative research approach and interviewing is its main method of collecting data (Marton 1994). A phenomenographic approach to understanding and explaining information literacy was first devised by Bruce (1997) and adopted later by authors such as Limberg (2000; 2005b). They provide a framework for 'combining studies of individuals' information behaviour with collective patterns of information

seeking and use' (Limberg 2005b: 280). This information literacy model is referred to as a relational model.

Constructivist approaches are evident in both the process and the relational models. The constructivist paradigm focuses on higher-order thinking and problem-solving in a collaborative environment and where skills and knowledge form an integrated whole within a context (Limberg 2000). As demonstrated under the extensive explanations of "inquiry", the process-based approach has at times been dumbed down or diluted literally to "six skills steps to mastery". The researcher has shown that the process-based approach can promote "deep learning" as opposed to "surface learning". The process approach does not inherently encourage "fast facts".

3.6 CONCLUSION

Notwithstanding the reactions to constructivism, this chapter sets forth why constructivism is the underlying theory of choice, and why a processed-based approach to information literacy and information seeking and use were chosen as the lens through which to understand and explain the study.

Current research in information seeking and use signal Kuhlthau's (2004) ISP approach as a valid model in understanding information literacy. Constructivism as evidenced in inquiry-based learning will provide the framework for understanding teachers' abilities to mediate information literacy in the classroom.

The next chapter, Chapter four, introduces the research design and methods used in this study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter contextualises the methodological options chosen for the present study. The concept *research* is defined within the social sciences before the debates around terminological variations in the literature regarding methodology, methods, design and paradigm are discussed. This study uses a mixed methods approach but with a stronger emphasis on qualitative research. The strengths and weaknesses of mixed methods are considered. This is followed by an examination of qualitative inquiry and the question of judging rigour and quality of the research process under the headings triangulation, validity and reliability. Although quantitative inquiry plays a smaller role in this study, it is addressed with its attendant validity and reliability measures. The latter part of this chapter deals with the data collection methods and tools used in the current study, namely interviews, journals, mind maps, observation, and the pre- and post-course questionnaire. Finally, the participants in the study and the artefacts from their assignments are described.

4.2 DEFINING RESEARCH

Various influential academic researchers have defined the concept of research in different but overlapping ways. Gorman and Clayton (2005: 2) define research as

> An inquiry process that has clearly defined parameters and has as its aim the: discovery or creation of knowledge, or theory building; testing, confirmation, revision, refutation of knowledge and theory; and/or investigation of a problem for local decision making.

Neuman (2006: 2) defines social research as a "collection of methods and methodologies that researchers apply systematically to produce scientifically based knowledge about the social world".

The rationale for research is characterized by its systematic, meticulous nature of inquiry utilizing reputable research methods for knowledge progress and development. The social researcher aims to understand people and their environment by examining holistic phenomena such as intentions, experiences, attitudes and culture (Johnson & Onwuegbuzie 2004: 15). The present research undertaken is empirical because it is based on data collected in a methodical, systematic way.

4.3 TERMINOLOGY CONFUSION: RESEARCH METHODOLOGY, METHODS, DESIGN AND PARADIGM

The terms 'research methodology' and 'research methods' are often treated identically in the literature (Wilson 2002; Pickard & Dixon 2004; Neuman 2006: 2), yet they are distinct but related. Pickard and Dixon (2004) define methodology as "the fundamental or regulative principles" which guide the research process. Neuman (2006: 2) views research methodology as an umbrella term that encompasses methods. For Neuman (2006: 2) "methodology is understanding the social-organisational context, philosophical assumptions, ethical principles, and political issues of the enterprise of social researchers who use method". A methodology does not necessarily indicate a certain method. Methods are the general tactics employed to manage the data with respect to the underlying questions of the study and may include sets of particular research techniques and procedures for gathering and analysing data, and reporting results (Pickard & Dixon 2004; Neuman 2006: 2).

The literature also espouses an interchange between the terms research methodology and design. Babbie and Mouton (2001: 75) advise that research methodology should not be mistaken for the research design. Cohen, Manion and Morrison (2007: 47) claim that methodology describes "approaches to, kinds and paradigms of research". The concept *research design* is expressed and understood variously by different authors to mean plan, method or approach. Cresswell (2008: 59-60) defines research design as those particular procedures involved in the last three steps of the research process: data collection, data analysis, and report writing. His understanding of

research design can be equated to research methods. Thus, amongst his different research designs he identifies ethnographic designs, action research designs and mixed methods designs, of which the latter will be dealt with under the next heading.

Patton (2002: 40) calls qualitative inquiry a *design strategy*. Gorman and Clayton (2005: 4-9) refer to the terms quantitative and qualitative as *modes of inquiry*. The strongest separation of research approaches tends to be between quantitative and qualitative approaches (Denzin & Lincoln 2005; Neuman 2006: 13). Guba and Lincoln (1988) advocate that the two approaches or paradigms are distinct and researchers should refrain from mixing the two methodologies. Their position is considered traditionalist or purist. Supporters of a more compatibilist position contend that the research question should decide the research design or plan and methods adopted (Patton 2002: 247-8; Johnson & Onwuegbuzie 2004: 15; Gorman & Clayton 2005: 12). Wilson (nd) advocates that we should avoid the qualitative versus quantitative debate and focus instead on the 'extent to which structure is present in the design of the research instruments'. If a mixed methods approach suits the type of question best, it is a more pragmatic path to follow than to try to remain inflexibly pure (Flick 2009: 32).

4.4 MIXED METHODS

The approach in this study is to use mixed methods. The latter has been defined as the "class of research where the researcher mixes or combines quantitative and qualitative techniques, methods, approaches, concepts or language into a single study" (Johnson & Onwuegbuzie 2004: 17). It is also referred to as the third research movement following the quantitative and qualitative movements. Often referred to as a pragmatist approach, it combines quantitative and qualitative research (Flick 2009: 32). The decision to use a variety of approaches in addressing the research question is to show that flexibility is desirable and possible when choosing to carry out research. The researcher should not be constrained by dogmatic approaches to conducting research. The research question and theoretical framework should determine the research methods chosen to obtain the best evidence to support the results. Irrespective of the design

chosen, all research uses empirical investigations to answer the research question. Each methodology has built-in precautions for reliability and validity or trustworthiness and credibility (in social science research) (Peräkylä 2004: 283).

Johnson and Onwuegbuzie (2004: 22) consider five rationales for conducting mixed methods research:

1. Triangulation - seeking corroboration and convergence of results from different methods and designs studying the same phenomenon;
2. Complementarity – seeking elaboration, enhancement, illustration, and clarification of results from one method with results from the other method;
3. Initiation – discovering paradoxes and contradictions that lead to a reframing of the research question;
4. Development – using the findings from one method to help inform the other method; and
5. Expansion – seeking to expand the breadth and range of research by using different inquiry components.

In the current study quantitative and qualitative modes of research and data are combined. The extent to which the five above-mentioned rationales will be met unfolds in the discussion and interpretation chapter (Chapter six). The strengths of the mixed research approach appear to outweigh the weaknesses. For example, the questionnaire in the current study is treated complementarily to the mind maps and interviews as explanations and meanings are sought in the numerical measures (of the questionnaire results). The mind maps are analysed using some numerical weightings. The broad array of research questions can be more holistically covered if not confined to a single method or approach. In the current study, the research question related to the value and significance of the intervention (the course attended) can be reliably measured by the responses in the pre-and post-course questionnaire. At the same time, interview responses about the course intervention can be triangulated with the questionnaire data in an illuminative

way. Thus, what may be considered a weakness in one method can be overcome by using the strengths of an additional method.

The principal drawback of mixed methods in this researcher's view relates to the complexity of the mixing. For this reason the questionnaire, which forms part of the quantitative mode of inquiry, will be presented separately but analysed as a component of holistic thinking/a holistic approach. The overriding mode of inquiry for the current study is qualitative which is open to combining methods and will be discussed next.

4.5 QUALITATIVE INQUIRY

Gorman and Clayton (2005: 3) define qualitative research as follows:

> Qualitative research is a process of enquiry that draws data from the context in which events occur, in an attempt to describe these occurrences, as a means of determining the process in which events are embedded and the perspectives of those participating in the events, using induction to derive possible explanations based on observed phenomena.

The qualitative mode of inquiry incorporates particular design strategies or features. Purposive sampling is one such distinctive feature (Patton 2002: 45-46; Gorman & Clayton 2005: 128). Teachers from the ACE School Librarianship programme were invited to assist the researcher in gaining insights into the information literacy phenomenon. This kind of sampling is not aimed at generalising from the study's sample of teachers to the general population of teachers, either in the Western Cape or South Africa. The sample is small comprising 0.01% of teachers in South African and 0.13% of Western Cape teachers in public ordinary schools (South Africa 2009a). The main thrust for the qualitative researcher is to carry out an in-depth inquiry into and an understanding of the phenomenon – here teachers' information literacy. Although the researcher cannot generalise from them, she is able to learn from them. The teachers in the sample have provided her with rich, illuminative insights about the phenomenon, information literacy.

The qualitative researcher is sensitive to context. This implies that the researcher makes physical

contact with the people being studied, goes into the field, and refrains from being "remote or detached" from events (Gorman & Clayton 2005: 4). In this way the researcher is "exposed to both the external (observable behaviour) and internal states (worldview, opinions, values, attitudes and symbolic constructs) of the people under study" (Patton 2002: 48). The researcher is seeking to understand the social world through the eyes of the participants. She engages with the participants in situations which she understands to be in flux. The Information Literacy Education course, for example, has to be contextualised against an ever-changing education backdrop. The Information Literacy Education course should not be seen as an intervention to be equated to a "measured dose of fertilizer for crops" (Patton 2002: 54). The full outcomes of the course are not intended to be immediately measurable. Each person takes something different from the course. Their application and results may differ depending on experience, the classroom culture, the teacher's willingness to try something new and so on.

Qualitative inquiry is context-bound and divorcing it from this context will distort reality (Patton 2002: 63; Neuman 2006: 158). The researcher is part of the social world (reality) being researched and needs to be mindful of her own biases and preferences she brings to the research process. Referred to as *reflexivity* in the literature, it means researchers should acknowledge their own cultural, social, linguistic and ideological perspectives in a critical self-reflective way (Patton 2002: 65; Cohen, Manion & Morrison 2007: 171; Luttrell 2010: 3).

The qualitative researcher's ability to be close yet unbiased is referred to as "empathic neutrality" (Patton 2002: 50). Neutrality means being non-judgemental and "empathic neutrality" veers towards a middle path between being too involved, which can impair reasoning and being too distant, which can decrease understanding. Empathy is different from sympathy. It combines cognitive understanding with the affective. Empathic neutrality is important as qualitative inquiry methods used such as in-depth interviewing and detailed descriptions have been applied.

Qualitative researchers use "logic in practice" which is considered far harder to learn because it is not readily learned from textbooks. It is acquired through being mentored by experts who have

wisdom in respective social research fields. Qualitative research uses inductive reasoning. Induction is also called the "bottom-up" approach because it starts with empirical evidence and works towards more abstract concepts. For the qualitative researcher the "context, description, process and participant perspectives are analysed in a meaningful and coherent way" (Gorman & Clayton 2005: 7; Neuman 2006: 60 & 151-152).

Qualitative data captures the milieu of the inquiry in story-like descriptions. In qualitative reporting the views of the respondents' are related in their own words. Qualitative data consists largely of quotations, observations, interviews and excerpts from documents (Patton 2002: 47; Cohen, Manion & Morrison 2007: 170-171).

Within the qualitative mode of inquiry there are several theoretical traditions or orientations such as ethnography, phenomenology and constructivism. The constructivist orientation or paradigm provides the theoretical framework for this mainly qualitative study. It is viewed as a 'major example of interpretivist thought and plays an important role in contemporary paradigm debates (Greene 2010: 67-70). Constructivism was extensively discussed in Chapter three.

4.5.1 TRIANGULATION, VALIDITY AND RELIABILITY

Every research method has its limitations making multiple methods a practical option. Triangulation is viewed as a means to strengthening a study by combining methods. Triangulation can include using several kinds of methods or data, or even using both qualitative and quantitative approaches (Patton 2002: 247). There are, however, detractors to this methodological openness. Patton (2002: 253), Johnson and Onwuegbuzie (2004: 17) and Neuman (2006: 149-150) make a case for a pragmatic mixing of methods and philosophies. Patton (2002: 253) maintains that "the extent to which a qualitative approach is inductive or deductive varies along a continuum". Many research questions are best and fully answered through mixed research solutions.

Triangulation lore states that it is better to look at something from several angles than only from one angle. There appears to be different types of triangulation: for example, *data triangulation* (using a variety of data sources in a study); *theory triangulation* (using multiple theoretical perspectives in planning the research or when interpreting data; *methods triangulation* (using multiple methods to study a problem such as interviews, questionnaires, and document analysis); and *methodological triangulation* (mixing qualitative and quantitative styles of research and data) (Gorman & Clayton 1997: 32-33; Patton 2002: 247; Neuman 2006: 149-150).

Measuring the same phenomena, here information literacy and information literacy education, in multiple ways is one route to cross-validating information. Not only does the current study use multiple methods (interviews, journals, artefacts from an assignment) strongly associated with the qualitative mode of inquiry, it also uses a closed-ended questionnaire which resorts to more of a quantitative approach. The same people who completed the questionnaire were then interviewed. Their answers to both data collection methods are compared to each other and referred to each other in the analysis and interpretation stages. In this study the quantitative and qualitative methods act to complement each other erasing the weaknesses or 'blind spots' associated with a single method (Flick 2009: 26-27).

4.5.1.1 VALIDITY AND RELIABILITY

In qualitative research it is often the researcher who acts as the 'instrument' or data gatherer and this aspect of the approach makes reliability difficult to gauge. Some qualitative researchers steer away from the use of the terms validity and reliability altogether because of their close association with quantitative measures (Neuman 2006: 194). Reliability means consistency and dependability. But for qualitative researchers who acknowledge and value change, they accept that the outcomes of a study are unique for that context. Qualitative researchers weave a complex tapestry of evidence to create trust in their readers. How do they build trustworthiness? They are frank about their personal involvement and prejudices. They employ vigorous data gathering procedures. To this end, they keep vast quantities of detailed notes and collect multiple forms of data to cross-check evidence. They spend an adequate period of time in the field and convey this

expressly in their reporting. Crucial to qualitative writing is how the analysis is presented and whether or not the researcher can identify and convey the patterns observed and provide a nuanced depiction of events, context, and complexities (Cresswell 1998: 20-21; Patton 2002: 60, 553; Gorman & Clayton 2005:24; Neuman 2006: 152-153).

"Validity is a property of knowledge not methods" (Patton 2002: 587). Thus, one needs to separate a validity claim from the tools one uses to gain that knowledge. To be valid means to be truthful. However, qualitative researchers do not look for one version of the truth. They build validity upon reliability and seek to convey a sense of credibility or plausibility in their findings (Neuman 2006: 197). How do they build credibility? Truthfulness for qualitative researchers is equated more closely with authenticity. To be authentic implies a "reflexive consciousness about one's own perspective, appreciation for the perspective of others" (Patton 2002: 546) and being fair and honest in depicting a "balanced account of social life from the viewpoint of someone who lives it every day" (Neuman 2006: 195). The qualitative researcher builds up plausible arguments. The readers of these arguments understand that the data and claims made are not exclusive nor are they the only version possible. Qualitative researchers have to write convincingly to persuade the reader that the evidence they are presenting is valid and authentic. The triangulation of data from several different sources contributes towards validity. There should be a "conscious and deliberate inclusion of data that might not support the thesis. There should be a preparedness to entertain alternative explanations of phenomena observed even if these alternatives are later discounted" (Gorman & Clayton 2005: 25-26). The researcher aggregates the various data in a logical way to show connections amongst the data analysed and the results described.

4.6 QUANTITATIVE INQUIRY

In social and educational research both quantitative and qualitative inquiry use systematic methods to collect and analyse empirical data. The researcher of this study has indicated the choice of a mixed methods approach which includes methods associated with qualitative

research such as interviews, journals, and mind maps and methods associated with quantitative research, namely a closed-ended questionnaire.

As previously described, qualitative data in the form of conversations and emotions require different collection strategies from data in the form of numbers (quantitative data). Most quantitative researchers apply 'reconstructed logic' and follow a linear research path. Reconstructed logic is "research based on reorganizing, standardizing, and codifying research knowledge and practices into explicit rules, formal procedures, and techniques" (Neuman 2006: 151). Quantitative researchers usually start with assumptions (hypotheses and/or questions) and then look for data to support or refute these assumptions (Gorman & Clayton 2005: 10; Neuman 2006: 59). This is referred to as deductive reasoning. Quantitative researchers look for patterns in events, for normative behaviour. What is the rigour associated with quantitative inquiry? It is the reliability and validity found in their measuring instruments that collect data.

4.6.1 VALIDITY AND RELIABILITY

Both qualitative and quantitative research regard reliability and validity as central in measurement but they are interpreted differently in each approach. As mentioned before under the qualitative research heading, the terms reliability and validity arose out of quantitative measurement. In quantitative research, the term reliability is synonymous with "dependability, consistency and replicability over time, over instruments and over groups of respondents. It is concerned with precision and accuracy" (Cohen, Manion & Morrison 2007: 146). According to Cresswell (2008: 169), quantitative researchers can use one or more of five available procedures to determine an instrument's reliability:

1. *Test-retest reliability,* also referred to by Cohen, Manion and Morrison (2007: 146) as reliability through stability. The same version of an instrument is administered twice at different time intervals to each participant in the study;

2. *Alternate forms reliability,* referred to by Cohen, Manion and Morrison (2007: 147) as reliability through equivalence, uses two instruments both measuring the same concept/ variables and relating the scores for the same group of individuals to the two instruments;
3. *Alternate forms and test-retest reliability* is an approach based on the two preceding types of reliability;
4. *Interrater reliability* (another version of reliability through equivalence) is a procedure associated with observing behaviour involving more than one researcher; and
5. *Internal consistency reliability,* also called the split-half method, tests reliability and accuracy of an individual's score across the items on one instrument.

The current study used the first type of reliability, test-retest with the questionnaire to show consistency and replicability.

Whilst reliability means that scores from an instrument are stable and consistent, reliability alone is an insufficient condition for validity in research (Cohen, Manion & Morrison 2007: 133; Cresswell 2008: 169). A measure can be reliable but invalid. For example, if one weighs oneself regularly on the same bathroom scale you will gain a reliable measure (dependable and consistent) but an official scale may prove your measure of weight invalid (Neuman 2006: 196). In quantitative research, three types of validity are commonly discussed in the literature:

1. Content validity measures whether the questions on the instrument adequately cover the content or skills;
2. Criterion-related validity uses multiple measurement to relate the results of one instrument to another external criterion; and
3. Construct validity – "is a determination of the significance, meaning, purpose and use of scores from an instrument" (Neuman 2006: 193-194; Cohen, Manion & Morrison 2007: 137-141; Cresswell 2008: 172-173).

In both qualitative and quantitative research, validity should be regarded as a matter of degree as opposed to an absolute state. Cohen, Manion and Morrison (2007: 133) assert that it is impossible for research to be 100% valid.

4.7 DATA COLLECTION METHODS AND TOOLS

This section conveys to the reader the different qualitative and quantitative methods used in the current study. Qualitative methods include interviews, journals, mind maps, observation and artefacts. The questionnaire falls into the quantitative mode of inquiry. The methods used to analyse the different data conclude this section.

4.7.1 INTERVIEWING

Interviewing can be described as a process of asking questions and receiving answers. Interviews could include single or group interviews by the interviewer and/or research assistants. They could take place face-to-face, over the phone or electronically. Interviews could range from structured to semi-structured to unstructured. Despite the different types of interviews, there are similarities and differences across the range (Fontana & Frey 2008: 119). Whenever interviews are used as a tool to collect data from participants, the following guide is helpful:

- Keep your research question in mind at all times;
- Have a clear idea of what you intend to invoke from the interviewee/s;
- Be mindful of the interview duration; and
- Use the knowledge that you already possess about the question to your advantage (Crabtree 2006a).

"Interviewers are not invisible neutral entities", say Fontana and Frey (2008: 144). A neutral stance is sheer fallacy because interviewers, who are culturally, politically, and socially situated, are influenced either intentionally or unintentionally by views, motives and prejudices. Fontana and Frey (2008: 116-117) refer to the interview as an active process of exchange between two or more people which "leads to a contextually bound and mutually created story". This type of interview is labelled the empathetic approach as opposed to the so-called objective, neutral, a-historical, apolitical approach. The empathetic interview emphasizes "humanness" before "focusing on theoretical or methodological" concerns (Fontana & Frey 2008: 118).

The interviewer should be a good listener. The interviewer probes timeously for responses, that is, in response to an interviewee's remarks. Interviewers should allow interviewees time to deliberate. Therefore, for interviewers, staying quiet is beneficial (Gorman & Clayton 2005: 135).

4.7.1.1 SEMI-STRUCTURED INTERVIEWS

The semi-structured or even unstructured interview always has some opening questions to guide the conversation. More probing questions follow which are also composed in advance. Semi-structured interviews were conducted with all of the teachers. An interview guide was developed and refined iteratively. The guide consists of aspects or topics which relate to the study. The guide is flexible so that if necessary a tangential thread in the exchange or discussion can be followed. The literature (Huysamen 1994: 145-146; Crabtree 2006a) strongly suggests that, once data has been collected, analysis should be conducted to improve questioning in subsequent interviews.

Semi-structured interviews work best when only one chance to interview is possible. The interview is frequently preceded by other means of data collection such as observation, journal keeping, a questionnaire or artefacts. As note-taking, listening and responding during interviews detracts from the development of a rapport between interviewer and interviewee, it is best to record the interview provided the interviewees agree to this process. Recordings are then transcribed before being analysed.

The advantages of a semi-structured interview rest on 1) guide topics being developed beforehand permitting the interviewer to appear skilled; 2) allowing interviewees the "freedom" to express their ideas in their own way (Crabtree 2006b: benefits); and 3) the provision of "reliable, comparable qualitative data" (Crabtree 2006b: when to use semi-structured interviews).

4.7.1.2 GROUP INTERVIEWS

Initially, when the envisaged sample was bigger than 29 participants, using focus groups of five or more participants seemed a pragmatic route to take. Focus group methodology involves collecting qualitative data from group participants in informal discussion centred on a particular topic. In focus group interviewing, the purpose is to stimulate discussion amongst participants and to understand the 'meanings and norms' that bring about their answers (Bloor et al. 2001: 43-45; Flick 2009: 203-4). Unlike group interviews where the interviewer seeks answers, focus group questions assist in "concentrating the group's attention and interaction on a particular topic" (Bloor et al. 2001: 43-45). The researcher poses a question to the group, not an individual.

In the end, the researcher opted for single, duo and trio interviews and one bigger group interview of six participants (See Appendix 2, the interview schedule). The large group interview required some expertise and understanding of group dynamics. Larger groups also require the skilful manipulation of participants: talkative participants need to be quietened and reticent participants coaxed to speak up (Fontana & Frey 2008).

The interviews took place after the researcher had assessed the participants' journals and their assignments. The study participants were presented with the assessed work which they could use during the interview. A combination approach to interviewing was used in which an interview guide was combined with standardized open-ended questioning (Patton 2002: 349). The combined approach allowed the researcher to be more flexible in relating the interview to individuals whilst sticking more or less to the same questions which facilitated data organisation and analysis.

4.7.1.3 EXPERT INTERVIEWS

In this study six WCED district heads of curriculum were interviewed to find out their views on information literacy and whether it is included as part of in-service curriculum training. As the

chief curriculum advisors, they are considered experts in curriculum matters and their expertise as a group is sought through these semi-structured interviews.

Interviewing experts can be problematic. Time is always of the essence with subject specialists. The interviewer has to competently focus the questions (the interview guide provides a stronger directive focus) and keep the expert on track. Meuser and Nagel (quoted in Flick 2009: 167) establish several ways the expert interview can go wrong: 1) the person turns out not to be an expert; 2) the person may thwart the interview; 3) the expert draws in the interviewer into internal strife within the organisation and deflects the conversation away from the topic; 4) the interviewee foists more personal information than expert knowledge onto the interviewer; and 5) the expert delivers a "rhetorical interview" or a lecture instead of a question-answer interview. The latter can be useful if the expert is knowledgeable on the topic but it can be a disaster if not because steering the interview back to the pertinent topic may prove hard.

For the above reasons, the expert interview is most often used as a complementary method rather than on its own (Flick 2009: 168).

4.7.2 JOURNALS

The journal or diary is a useful tool of data collection as the writing takes place over a protracted period of time. The 29 participants in the study were required to keep a "solicited" diary, not a personal private diary. Meth (2003: 196) distinguishes between the solicited and the private diary. Solicited dairies are kept at the behest of a researcher and participants know that they are going to be viewed "publicly". Private diaries on the other hand are for strictly personal consumption. Requesting participants to keep a diary concentrating on particular topics or criteria set by the researcher raises power relations challenges in the research project. The writing in the journals may reflect what the researcher wants to hear and therefore may exclude knowledge that the writer feels is important.

Nevertheless, journal keeping promotes participant involvement and engagement in the research process and is regarded as a useful qualitative research method (Meth 2003: 195). There are several advantages of journal writing for both the writer and the reader (researcher): the writer's points of view and priorities are divulged; diaries offer "temporal insights" whereas other methods such as interviews and questionnaires are usually once-off affairs; diary writing can be empowering; diary writing can be used as a reflective tool; and diaries can be used as part of a multiple method approach (Spalding & Wilson 2002: 1394,1396; Meth 2003: 196, 198, 200, 201).

The kind of journal the researcher requested was both longitudinal and reflective. Participants were each given hard cover A6 lined notebooks to write in over a period of between eight and ten weeks. The strength of protracted journal writing lies in its "break in logic" between entries. Meth (2003: 198) claims this probably reflects more precisely the varied thoughts and feelings in human awareness. In interviews and questionnaires a particular line of response can be adopted by both respondent and interviewer. Interviews can easily skew responses and send subsequent responses off on a particular tangent.

Diary writing as a reflective tool can be empowering. Empowerment is the "ability to effect progressive social change through the research process" (Meth 2003: 201). The researcher's intention was not the lofty ideal of "emancipation". Her rationale for using journal writing was to educe reflection and raise awareness amongst participants about educational practices. Her decision to use the method was related to its being a way of generating research.

"Reflective thinking", as Spalding and Wilson (2002: 1394) state, "begins with the state of doubt, hesitation or perplexity and moves the act of searching to find material that will resolve, clarify or otherwise address the doubt. This material could be past experience or a fund of relevant knowledge". The researcher's invitation to participants was to keep a reflective diary in which they described their feelings, thoughts and actions whilst participating in the course as well as whilst integrating information literacy in the classroom. She made two assumptions: 1)

that all participants who happen to be teachers understood what diary writing was; and 2) that all participants (teachers) understood what reflection was. The researcher assumed that all teachers knew what diary writing was because, as part of OBE in-service training of which she was a part a few years ago, teachers were introduced to the concept and it is one of a range of assessment tools that teachers can use. Similarly with reflective thinking, teachers are constantly involved in in-service professional development and continuing education; the researcher assumed that the concept was not new to them.

Spalding and Wilson (2002: 1395) in their study of student teachers' reflective journal writing chose to make explicit the different levels of reflection after realising that reflective thinking needs to be taught, it does not come naturally. They used Valli's (1997: 74-79) typology of five different levels of reflection. The first level is regarded as technical reflection requiring directing one's action through a straightforward application of research on teaching. This is a form of technical rationality rather than reflective practice. The second level, reflection in or on practice, focuses on pedagogical activity in context. This type of reflection develops in connection with one's own teaching performance. The third level, deliberative reflection, involves weighing competing claims or viewpoints. The fourth level, personalistic reflection, is directed at developmental teaching. The fifth level, critical reflection, is the highest level because it considers the social and political context of schooling and teaching.

Valli's (1997) classification of reflection is not hierarchical and one type of reflection should not be valued more than another. The different types of reflection are not exclusive silos and they are open to interpretation (Spalding & Wilson 2002: 1399).

Diaries have been used successfully combined with other data collection methods such as interviews. Meth (2003: 200) combined diary writing with focus group interviews. The two approaches can accommodate respondents who may respond differently to various modes for a range of reasons. Spalding and Wilson (2002: 1402) combined diaries with artefacts (assessed

pieces of work) and semi-structured interviews. In the current study, besides diary keeping, the questionnaire, mind maps, interviews (both focus group as well as semi-structured), observation and participant chosen artefacts (assessed pieces of work) formed part of the multiple methods approach.

4.7.3 OBSERVATION

Cresswell (2008: 221) defines observation as "the process of gathering open-ended, firsthand information by observing people and places at a research site". Observation enables on-the-spot recording of the physical environment, the human setting and human interaction. The observer needs to be a good listener and pay attention to visual information (Gorman & Clayton 2005: 104; Cohen, Manion & Morrison 2007: 396-397; Cresswell 2008: 222).

There are different kinds of observation which extend from unstructured to 'pre-ordinate' or highly structured observation (Cohen, Manion & Morrison 2007: 397). The researcher opted for unstructured observation which meant that she went into a situation to see what was taking place before deciding on its importance for the research. The researcher did not know ahead of time what the main issues would be. Instead, she allowed them to emerge.

In observation, the role of the observer lies on a continuum from being a complete observer to being a complete participant and this role is not static. This researcher was never strictly detached as she was the course instructor. The setting was a computer laboratory where the instructor guided the 29 teachers in the sample in their interaction with web-based information. She kept field notes describing what occurred and reflections on possible explanations for what she observed for use later in the interviews.

Observation as a means to data collection has its disadvantages. Both Gorman and Clayton (2005: 105) and Cohen, Manion and Morrison (2007: 410) caution potential users about this method's risk of bias. For example, the observer may pay selective attention or select items according to some personal judgment; or people being observed may behave differently if they know this is happening.

Making inferences from these observations may be problematic without other evidence. Thus triangulation with other data collection methods such as the interviews, journals and questionnaires in this study are crucial to decide on the intentions or causes that lie behind the participants' behaviour.

4.7.4 THE QUESTIONNAIRE

The information literacy questionnaire was distributed amongst the 29 teachers in the sample at the start of the course and again at the end of the course. The Kurbanoglu, Akkoyunlu, and Umay (2006: 742) information literacy 28-item self-efficacy scale, with an alpha reliability coefficient of 0.92, was employed to measure teachers' beliefs about their information literacy. Self-efficacy is the belief in one's ability to successfully complete a task. At the root of self-efficacy lies human motivation and personal achievement. Self-efficacy beliefs determine the lengths to which people will persevere and how resilient they will be when faced with difficulties and how much effort they will expend on an activity (Kurbanoglu, Akkoyunlu, & Umay 2006: 731). The way a person perceives self-efficacy is not the measure of that person's skills but the belief in their ability to perform under diverse conditions with the skills possessed. The scale, therefore, did not test teachers' information literacy capabilities but rather their perceived competency and confidence in using information literacy skills.

The decision to incorporate the information literacy self-efficacy questionnaire as a pre- and post-course instrument was based on the following criteria:

- There is a high correlation between the scale which contains eight groupings of statements related to information literacy and the research questions of the study;
- The instrument contains accepted scales of measurement (Cresswell 2008: 168-169); and
- Kurbanoglu, Akkoyunlu and Umay (2006) successfully applied the instrument in a study of college students' information literacy.

4.7.5 PARTICIPANTS AND ARTEFACTS

The participants in this study are 29 teachers who participated in a forty hour Information Literacy Education course which forms part of the ACE: School Librarianship programme. The educators in this purposive sample teach in some of the poorest schools. The sample of teachers is spread across metropolitan (urban) and rural schools in the Western Cape.

As part of the course assessment, teachers had to

- keep a reflective journal during the course sessions as well as whilst implementing the research project in the classroom;
- create an annotated list of websites for all the school subjects (namely, five websites for each of the eight subjects also called learning areas in South Africa);
- construct assignment topic statements for each subject that would engage and excite learners to produce thoughtful assignments; and
- provide evidence of a planned, implemented research project in the classroom.

4.8 DATA TRANSCRIPTION AND ANALYSIS

All interviews in academic social research should be audio-taped or video-taped. Transcription of recorded sessions can be expensive and time-consuming. Transcriptions should reflect as close as possible the interview but need not be the "Jeffersonian" form as used by conversation analysts (Wilkinson 2004: 179). Simple orthographic transcriptions suited the researcher's needs.

ATLAS.ti was used to manage the qualitatively collected data. The software package allows for the storage and retrieval of data. In addition to the data management facility, the software also assists in the analysis of the data. The latest version (5.0) of ATLAS.ti was chosen because it works well with a wide range of qualitative data. It allows the user to import, display, code, analyse and query file formats such as Microsoft Office file formats (Word, Excel, PowerPoint), rich text format, graphic files, hypertext mark-up language and audio-visual files (Review essays 2004: 452; Flick 2009: 366). It was used to facilitate the conceptual content analysis of the different interviews, as well as the journal writings and observation data. Data from the pre- and post-test questionnaire, which forms the quantitative data component of the study, were analysed using statistical software.

4.9 CONCLUSION

This chapter has explained the rationale for the methodological choices made, namely a mixed methods approach but with a stronger emphasis on qualitative research. The data collection methods and tools included interviews, journals, observation, questionnaires and assignment artefacts. Chapter five which follows next presents the findings.

CHAPTER FIVE

RESEARCH FINDINGS

5.1 INTRODUCTION

In this chapter the findings of the study and an initial analysis are presented. As an introduction to the findings, the information literacy education course is described and a profile of the teachers in the sample sketched.

The information literacy education course is one of eight modules in the school librarianship programme. Previously completed modules are Information Sources and Reference; children's and youth literature; school library administration; cataloguing and classification. During these courses they search online reference tools, use search engines and directories and are introduced to a library management system. The teachers in the school librarianship programme are expected to be computer literate by the time they attend the programme. Most schools in the Western Cape have computer laboratories and most teachers have undergone training in computer basics (Western Cape 2011b).

The expectation is also that teachers themselves are information literate in order for them to participate in a course which expects them to mediate information literacy with their learners. The assumption is based on a curriculum requirement that teachers use research projects as one form of assessment. One of the cross curricular outcomes is the ability of learners to 'collect, analyse, organise and critically evaluate information' also regarded as research ability. The vehicle of research projects is a good way for teachers to mediate information literacy with learners.

The information literacy education course takes teachers on a journey from theoretical concepts such as constructivism, multiple intelligence, Bloom's (1956) taxonomy, cognition and related terms to practical ways of making information literacy explicit in the classroom. Teachers are

taught to consider motivational techniques as strategies in learning through projects (Small & Arnone 2000; Shenton & Fitzgibbons 2010: 171). Teachers are taught how to work against plagiarism by turning research projects into more engaging assignments. They examine cognition (Bloom's 1956 taxonomy) in terms of the information literacy skills and attitudes required by research projects. As part of actualizing information literacy, they examined a variety of information literacy models and used a model to plan a research project. Locating, adapting and translating templates and tools such as note-taking, mind mapping, and time management in research projects formed part of the practical component of the course. As most of the teachers participating in the study came from schools without libraries, an entire session was devoted to developing a working relationship with their public libraries. In an equally important session the complex issue of what it takes to become a school that exemplifies information literacy was addressed. The emphasis of the course was on implementing information literacy through a research project in the classroom.

The assessment activities included revamping a "traditional" project to incorporate motivational techniques; locating web resources for all the learning areas/subjects; formulating research project topics in each subject in a way that will engage and excite learners to produce thoughtful assignments; providing evidence of a mediated research project with a class. The evidence should be visible in the project plan, teachers' journals, just-in-time information skills interventions, assessment tools used, templates used with learners, bibliographies and samples of learners' work completed and assessed by the teachers.

None of the teachers is a fulltime school librarian. The South African situation is similar to New Zealand where no professionally trained school librarians are employed in schools but unlike New Zealand where 95% have a stocked school library (Moore 1997, see 2.5.4.1). The teachers in the study are all fulltime classroom teachers who have the responsibility of the school library in addition to their classes to teach. The average age of the teachers is 45 years. Of the 29 teachers interviewed, two are males. There are six high school teachers, 22 primary school teachers and one subject advisor. Home languages are Afrikaans (17 teachers); Xhosa (six teachers); and English (six teachers). Nine teachers teach in urban areas, eleven schools are in

rural villages and seven schools are in rural towns. The majority of schools (71%) fall in quintiles one and two designated the lowest economic levels for schools in the Western Cape. The schools in these quintiles reflect at least 50% of schools nationwide (Wildeman 2008). All the schools, save the three in rural villages, have computer laboratories with between 20 and 25 work stations in each laboratory. All the laboratories have some Internet access ranging from three computers to all computers having access. Eight teachers have Internet access at home and 19 have computers at home. Teachers were asked how often they went online and a surprising result emerged: of the eight teachers with Internet access at home, only three go online on a daily basis. Twelve teachers use computers every day, nine once per week and eight about three times per week. Most teachers who use computers on a daily basis are in the Intermediate Phase (five teachers) or in the Senior and FET phases (six teachers). There is no correlation between urban teachers and either increased computer or Internet access. Four schools have partially functioning libraries: two are in urban areas and two in rural areas. Twelve schools have a public library further than 3km away. Access to public libraries is varied: for example, one rural village school buses in children from the outlying farms. They have no access to libraries on these farms and the public library near the school has opening hours in the afternoons when these children have to take the bus back home. There are three schools with public libraries more than 10kms away and often children do not have taxi fare to reach these libraries or they close too early for learners to justify the taxi fare. All the teachers are members of the EDULIS library where they may borrow block loans of books for a month at a time.

The findings follow and are presented in this order:

- The findings of the information literacy self-efficacy questionnaire
- The journal findings
- The interview findings with the teachers
- The interview findings with the heads of district curriculum services

5.2 FINDINGS FROM THE QUESTIONNAIRE

This section provides reasons why the questionnaire was incorporated into the study, an explanation of self-efficacy and its links to information literacy, and the results of the self-efficacy study. The questionnaire responses addressed two of the research questions in particular: 1) How do teachers understand information literacy and information literacy education; and 2) At what level are teachers' web knowledge and skills?

5.2.1 INTRODUCTION

The decision to incorporate the self-efficacy questionnaire in the study relates to the influence that self-efficacy can have on the determination of the participants to persevere in the course. The higher the self-efficacy, the more easily they will believe that they can accomplish the course outcome. The lower the self-efficacy, the more participants may believe that the course will be tougher than it is and may impose undue stress and anxiety leading to compromised or constricted approaches to problem solving (Pajares 2002).

The course lecturer (the researcher) gained insight into participants' beliefs about their information literacy competencies right at the start of the course. Bandura (1997: 2) contends that "people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true". Part of the course addressed the role of motivation in learning and in developing information literacy amongst children and adolescents. Course participants were introduced to the expectancy-value theory of motivation through the work of Small and Arnone (2000), who are among the chief proponents of the theory. It is a theory that has been successfully applied in classrooms. Expectancy-value theory states that a person will only make some effort to do a task if two motivations are in place.

1. Value - a person must be able to identify something of personal interest or meaning in achieving the task;

2. Expectancy for success - a person must have the expectation of being able to accomplish the task successfully.

Teachers (participants) were asked to rate their "motivational style quotient" (after Small & Arnone 2000) when they give learners research assignments. Some of the statements that formed part of the motivational style quotient were:

- I give research tasks that are challenging but attainable;
- I ensure learners have enough time and guidance to use the information resources in order to complete a research project;
- I create mini-lessons during research projects for those learners who need extra help for example using an index in a book or creating key words for searching online; and
- I model enthusiasm for library and information skills.

This theory of motivation right at the beginning of the course created much discussion and introspection amongst the participants. We discussed how younger learners are more resilient at trying despite failure whereas older learners have learned to associate failure with the lack of ability. We discussed how important it is for teachers to believe that learners will succeed. Learners can easily perceive if teachers do not have faith in their capabilities. The self-fulfilling prophecy comes into play here: if teachers expect learners to succeed, learners will live up to their expectations. The opposite is also true.

Through the discussion about motivation of learners the researcher (lecturer) was also indirectly addressing the role of motivation in self-efficacy beliefs about the information literacy education course. Some (12) of the participants expressed self-doubt through their lower than average pre-course self-efficacy scores. Through the course intervention the researcher was hoping to raise these scores or erase/expunge negative thoughts. Kurbanoglu (2003: 636) asserts a similar motive for the use of the self-efficacy scale in the study of information management students in Turkey.

5.2.2 SELF-EFFICACY

Self-efficacy can be defined as an individual's own beliefs about what he or she is capable of doing. A person's ability to actually achieve a goal is related to whether or not that person believes that the goal can be successfully achieved (Bandura 1986). The concept of self-efficacy is central to Bandura's social cognitive theory, which posits that personality is an interaction between three components: the environment, behaviour, and one's psychological processes. Self-efficacy beliefs are influenced by understanding cause-and-effect relationships, the development of language and the ability to self-observe and self-reflect. A person develops a sense of self-efficacy through actual experiences, observation of others' experiences and through listening to other people's commentary about the person's capabilities (Bandura 1997). Self-efficacy is about beliefs and not actual skill levels. According to Bandura's theory, people with high self-efficacy believe they can succeed and are more likely to tackle difficult jobs thinking they can accomplish them. Alternatively, people with low self-efficacy believe that tasks are more difficult than they really are and tend to avoid them (Bandura 1986). Self-efficacy beliefs determine the lengths to which people will persevere and how resilient they will be when faced with difficulties and how much effort they will expend on an activity (Kurbanoglu, Akkoyunlu & Umay 2006).

Self-efficacy has been used in a variety of fields since Bandura developed the concept in 1977 (Bandura 1986; 1997). For example, Schwarzer and Jerusalem's (1995) health psychology generalised scale; the Pajares and Schunk (2001) study of self-efficacy in academic achievement; Waldman's (2003) study on freshmen's use of the library's electronic resources; and Kurbanoglu's (2003) and Kurbanoglu, Akkoyunlu & Umay's (2006) link between self-efficacy and information literacy.

According to Pajares (1997) the most important way an individual develops self-efficacy is by interpreting what they did. Children's self-efficacy is more influenced by verbal input from a parent or other grown-up than that of mature adults (Pajares 1997). Waldman (2003: self-efficacy) quoting Pajares makes the point that "it is usually easier to weaken self-efficacy beliefs through negative appraisals than to strengthen such beliefs through positive encouragement'.

Teachers, therefore, need to be aware of their interactions with learners and the effect they may have in the development or underdevelopment of children's self-efficacy.

The researcher had previously taught information literacy education to a group of teachers in a different South African province. The experience presented her with troubling questions about information literacy and teacher education, one of which was related to self-efficacy. The information literacy self-efficacy 28-item scale presented a way of identifying the *perceived* competency and confidence in information literacy. The scale is not intended to measure the actual information literacy capabilities of participants. The pre-test questionnaire assisted the researcher/lecturer in determining a baseline of confidence in information literacy amongst the participants. High confidence levels are associated with positive outcomes. In academic studies it has been found that students with high self-efficacy beliefs achieve successful outcomes by increasing motivation, effort, and focus on the task at hand while decreasing anxiety and dispelling negative thinking (Bandura 1997). These studies show that self-efficacy beliefs influence self-regulatory processes such as goal setting, self-monitoring; self-evaluation and strategy use. The higher the self-efficacy of students the more likely they will aim their goals higher and their self-monitoring strategies will be more effective (Pajares & Schunk 2001; Waldman 2003).

If the self-efficacy beliefs are too low, the participants may not be self-motivated to succeed. An awareness of the self-efficacy levels of the participants influenced the lecturer's/researcher's approach as new or different strategies may be needed for participants with low self-confidence in information literacy.

Self-efficacy varies from one subject to another. For example, a person may have high self-efficacy beliefs in using printed information such as books and magazines but may have low self-efficacy beliefs in using online information. Self-efficacy beliefs are also not static and may change over time with different experiences and exposure. It was hoped that with different and positive experiences participants' self-efficacy in relation to information literacy would rise.

Seventy six percent (76%) of the study participants teach in primary schools. These teachers trained before the new curriculum came into being in 1997. The training did not include information literacy nor did it provide a method for teaching children how to conduct research projects, a vehicle for developing information literacy. Participants were not expected to conduct research themselves so that conducting and writing up research was very new to them.

Pajares and Schunk (2001) distinguish between self-efficacy and self-concept (self-esteem) although some authors use the two terms interchangeably or subsume self-efficacy under the self-concept belief. Self-efficacy, according to Bandura (1997) and Pajares (2002) is the belief that one is capable and confident of one's own abilities. Self-concept or self-esteem is about self-worth, which is influenced by the values cultural and social formations place on the traits the individual possesses. Self-efficacy is less attached to cultural formations. Using an example to illustrate the difference, an individual may have poor self-efficacy in handwriting, but it has no effect on the person's self-esteem because that activity does not define who the person is or determine the person's self-worth.

5.2.2.1 LINKS BETWEEN SELF-EFFICACY AND INFORMATION LITERACY

Pajares and Schunk (2001: Self-concept, self-efficacy, and academic achievement) and Waldman (2003) show through their studies that 'self-efficacy beliefs influence self-regulatory processes such as goal setting, self-monitoring; self-evaluation and strategy use". An information literate person embodies the attitude that learning is lifelong. To be a lifelong learner you need to be able to self-regulate – actions of independent learning and self-reflection come into play here. Such a person understands that the only constant in today's knowledge society is change. This person adopts a flexible approach to learning aware that the information landscape is constantly changing. An information literate person has traits that recognise that information literacy skills and abilities need to be honed and that excellence in knowledge production takes time and perseverance. An information literate person in today's information society has a high self-efficacy because such a person can use an inquiry-based framework to read for understanding, ultimately creating new knowledge and understanding.

The originators of the information literacy self-efficacy questionnaire utilized Doyle's (1994) traits of an information literate person; the information problem-solving approach of Spitzer, Eisenberg and Lowe (1998); the information literacy standards and outcome statements emanating from the AASL (1998a; 1998b), SCONUL (1999a; 1999b), ACRL (2002), and the Australian and New Zealand Information Literacy Framework (ANZIL) (Bundy 2004a; Kurbanoglu, Akkoyunlu & Umay 2006). The questionnaire addresses information literacy according to the following seven broad criteria: 1) Defining the problem (Section A); 2) Developing a search strategy (Section B); 3) Finding and gathering information (Section C); 4) Evaluating and using information (Section D); 5) Synthesizing information (Section E); 6) Presenting findings (Section F); and 7) Reflecting on the process and product (Section F). The Likert scale range is as follows: 7= almost always true, 6= usually true, 5= often true, 4= occasionally true, 3= sometimes but infrequently true, 2= usually not true and 1= almost never true.

5.2.3 RESULTS OF THE SELF-EFFICACY STUDY

The information literacy self-efficacy questionnaire (see Appendix 3) was developed and refined by Kurbanoglu, Akkoyunlu and Umay over a period of a few years (2003-2006). The 28-item questionnaire with a seven point Likert scale has a high Cronbach's alpha of 0.91. The correlation coefficient of the test-retest indicates reliability for the 28-item scale as high.

The null hypothesis of the current study is that there is no difference between the information literacy scores on the 28-item scale before and after the information literacy education course.

Table two on the next page compares the mean scores per item (28 items) for the pre- and post-course information literacy self-efficacy:

Table 2: Comparison of mean scores for the pre-and post-course information literacy self-efficacy (n=29)

Items		Pre-test		Post-test	
		Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
A1	Define the information need	4.5	1.4	5.3	1.1
B2	Identify a variety of potential sources of information	4.7	1.1	5.3	1.1
B3	Limit search strategies by subject, language and date	4.5	1.0	4.9	0.9
B4	Initiate search strategies by using keywords and Boolean logic	4.3	1.2	5.1	1.1
C5	Decide where and how to find the information needed	4.7	1.2	5.3	0.7
C6	Use different kinds of print sources (that is books, periodicals, encyclopaedias, chronologies, and so on)	5.0	1.6	5.5	1.1
C7	Use electronic information sources	4.4	1.5	5.5	1.2
C8	Locate information sources in the library	4.8	1.4	5.4	1.1
C9	Use library catalogue	4.4	1.8	4.8	1.3
C10	Locate resources in the library using the library catalogue	4.3	1.2	4.6	1.4
C11	Use Internet search tools (such as search engines, directories, and so on)	4.3	1.8	5.3	1.0
C12	Use different kinds (types) of libraries	4.5	1.6	5.2	1.0
D13	Use many resources at the same time to undertake research	4.4	1.5	5.5	1.3
D14	Determine the authoritativeness, currency and reliability of the information sources	3.8	1.4	4.8	1.2
D15	Select information most appropriate to the information need	4.5	1.3	5.4	0.9

D16	Identify points of agreement and disagreement among sources	4.0	1.4	5.0	0.3
D17	Evaluate World Wide Web sources	3.7	1.4	4.9	1.1
E18	Synthesize newly gathered information with previous information	4.3	1.3	5.1	1.0
E19	Interpret the visual information (that is graphs, tables, diagrams)	4.5	1.5	5.2	1.2
F20	Write a research paper	3.5	1.4	4.8	1.3
F21	Determine the content and form the parts (introduction, conclusion) of a presentation (written, oral)	4.3	1.3	5.2	0.9
F22	Prepare a bibliography	4.2	1.5	5.4	1.3
F23	Create bibliographic records and organise the bibliography	4.0	1.4	5.2	1.2
F24	Create bibliographic records for different kinds of materials (that is books, articles, web pages)	3.7	1.4	4.8	1.2
F25	Make citations and use quotations within the text	3.6	1.4	4.9	1.1
F26	Choose a format (that is written, oral, visual) appropriate to communicate with the audience	4.0	1.5	5.4	1.2
G27	Learn from the information problem solving experience and improve information literacy skills	4.1	1.3	5.5	1.0
G28	Criticize the quality of the information seeking process and its products	4.0	1.4	5.3	1.1

Both the pre-course questionnaire scores and the post-course questionnaire scores were taken from the same source of 29 participants with each data value in one sample having a corresponding data value in the other sample. By applying the Jaque-Bera test to the sample paired differences, the conclusion reached at 5% significance level (p=0.05) is that the population paired differences can be assumed to be normally distributed. Thus, based on the

mean summaries in Table two above, the mean pre-course scores and the post-course scores are tested for significant differences or not.

With d=24.7 (the mean of the sample of paired differences) and s=40.1(standard deviation of the sample of paired differences), then the t-test statistic = -3.3 and the critical value is t=-2.8 with 28 degrees of freedom, p=0.005. Therefore, because the critical value (-2.8) is larger than the test statistic (-3.3), the conclusion reached is that there is enough statistical evidence to suggest that the pre-course information literacy self-efficacy scores and the post-course self-efficacy scores are statistically different.

5.2.3.1 INTERPRETING THE PRE-COURSE QUESTIONNAIRE RESULTS

The pre-course mean total of 117.6 (SD 31.7) or 4.2 in terms of the Likert scale indicates that the participants' self-efficacy was above average to begin with. The information literacy attribute participants felt most confident about was *using different kinds of print sources* (score of 5=often true). This result makes sense as the teachers (participants) have had the most exposure to printed sources both in their pre-service and in-service training. The lowest information literacy attribute went to *writing a research paper* (F20) which scored on average 3.5 (sometimes but rarely true). Seventy six percent (76%) of the participants are primary school teachers who attended teacher training colleges where writing a research paper did not form part of the training. The category in which participants had the least self-efficacy was F - *presenting or communicating information* - with seven items and a mean score of 27.3 or 3.9 on the Likert scale. If teachers were themselves not confident and competent to do research and present their findings with the attendant bibliographic conventions, they could not be expected to be able to teach it to their learners.

Category D, which involves engaging with different sources of information and assessing their worth, had two items scored below a 4: D14 - Determine the authoritativeness, currency and reliability of the information sources (score of 3.8; and D17 - Evaluate World Wide Web sources (score of 3.7). Teachers seem unfamiliar with the act of evaluating a source to determine its worth, particularly when it comes to online information. As mentioned before, teachers are more

comfortable in the printed environment, but then again they seem to have taken printed material at face value not concerning themselves with bias or accuracy of printed sources.

5.2.3.2 INTERPRETING THE POST-COURSE QUESTIONNAIRE RESULTS

Statistically, there was a fairly significant leap in self-efficacy from the beginning of the course (total mean score of 117.6, SD of 31.7) to after the course (total mean score of 143.9, SD of 21.9). The category in which participants improved their self-efficacy the most was F which advanced by 8 points on average (from 27.3 to 35.3). In the pre-course questionnaire, category F scores were on the whole the lowest. The course intervention seems to have boosted participants' confidence in carrying out research and communicating findings using academic conventions. The participants' perceived self-efficacy went from a low "sometimes but rarely true" to a relatively positive "often true" in terms of the Likert scale.

Category C, *locating and assessing resources*, improved from 35.7 to 40.9, a difference of 5.2 points and the second largest increase in self-efficacy. Ninety three percent (93%) of the schools in which these participants teach do not have libraries. Using catalogues to locate resources would require lots of practice which the participants seemed to lack at the beginning of the course. For 83% of participants the public library is within a 5km radius of the school, but few indicated that they were active members of the public library. The teachers had already completed the ACE course *information sources and reference services* but still lacked confidence. During other school librarianship ACE courses participants were introduced to different types of libraries such as university and education libraries and they were taken to exemplary school libraries. As part of the information literacy education course, participants' attitudes towards public libraries were challenged. As the majority had no school libraries, it was ludicrous to ignore a library in the community. Participants were exposed to the extensive collection of the education library, EDULIS. Part of participants' information literacy education course assessment was to ensure that learners had ample access to a variety of resources. Teachers had to provide evidence that they had exposed learners to a wide variety of information

sources. They had to show how learners had used different sources and provide a list of references in the correct bibliographic format.

Within category C, items C7 and C11, both related to searching and using online tools, leapt from an average of 4.4 to 5.5 points and 4.3 to 5.3 points respectively. Successive exposure to online catalogues, electronic journals and web-based information increased the self-efficacy of the participants. For the information literacy education course in particular, teachers had to locate a minimum of five websites for each school subject to recommend to their colleagues. They were also taught to evaluate websites and expected to use web resources in their research project with their learners. Within a short space of six months (a university semester) the teachers' self-efficacy grew remarkably.

Three category D items, D13, D14, and D17, improved on average by one point: D13 went from 4.4 to 5.5; D14 went from 3.8 to 4.8; and D17 went from 3.7 to 4.9. In preparing teachers to mediate information literacy in their classrooms, teachers themselves needed to be comfortable using several sources simultaneously (D13). Teachers were taught how to ascertain the reliability and authoritativeness of information sources (D14) and to approach web-based information more critically (D17) - with less trust and more scepticism.

There are only two items in the G category both of which are related to reflecting on the information literacy process and skills and reflecting on the product. Both items had improved scores rising from 4.1 to 5.5 and 4.0 to 5.3 respectively. For the course assessment teachers had to implement a research project in their respective classrooms. The experience would have taught them invaluable lessons which would feed into an improved subsequent research project. One of the best ways of learning is through application in a real situation and/or teaching others. When one teaches others, one first has to understand the topic or subject oneself: this requires comprehension, interpretation, synthesis and reflection. It is through reflection that metacognition occurs. Teachers have gained confidence through the course by not only learning *about* the information seeking process but by having to *implement* or apply it in the classroom.

The general self-efficacy scores of the participants rose from 117.6 to 143.9 or Likert scale 4.2 "occasionally true" to 5.1 "often true". If this study's results are compared, for example, with those of the Kurbanoglu (2003) study on self-efficacy and information literacy at the Turkish Hacettepe University, these results are relatively improved from the pre- to the post-questionnaire. This study's scores went up by .9 whereas the Turkish study saw only slight improvements in comparing students' information literacy self-efficacy from first to third year: between first and second year there was an improvement of .6 points and from second to third year, an improvement of .26 points. Again, these are not actual skills being rated but beliefs or perceptions about being able to accomplish them.

5.2.3.3 PARTICIPANTS WITH LOW SELF-EFFICACY BEFORE THE COURSE

Twelve (12) or 41% of the 29 participants scored a total mean value less than 107. See Table three below for their pre- and post-course scores. In terms of the Likert range, that is a 3= sometimes or seldom true. The only significant factor within this group is that 10 of the 12 teachers are teaching at the Grades 1-6 level. The other two are Grade 12 teachers. All of them started the course with relatively low self-efficacy beliefs and gained tremendous confidence through the course, except for #19 whose self-efficacy gains were minimal. Gains ranged from between 26.6% to 112.5%, except for participant #19 whose self-efficacy gains were a mere 2.97% and who remained efficaciously lower than the average even after the course.

Table 3: Participants with a low pre-course self-efficacy

Participant #	Grade level	Pre-course	Post- course	Difference	% Difference
5	3	91	144	53	58.2%
6	3	101	130	29	28.7%
7	2	64	136	72	112.5%
8	2	73	136	63	86.3%
9	5	102	134	34	33.3%
10	4	102	150	48	47.1%

15	2	79	100	21	26.6%
16	2	106	157	51	48.1%
17	1	67	132	65	97.0%
19	12	101	104	3	2.97%
20	6	80	112	32	40.0%
23	12	69	137	68	98.6%

5.2.3.4 PARTICIPANTS WHO DECREASED THEIR SELF-EFFICACY

Four participants (#2; #12; #14; #22) decreased their self-efficacy. See Figure 4 below.

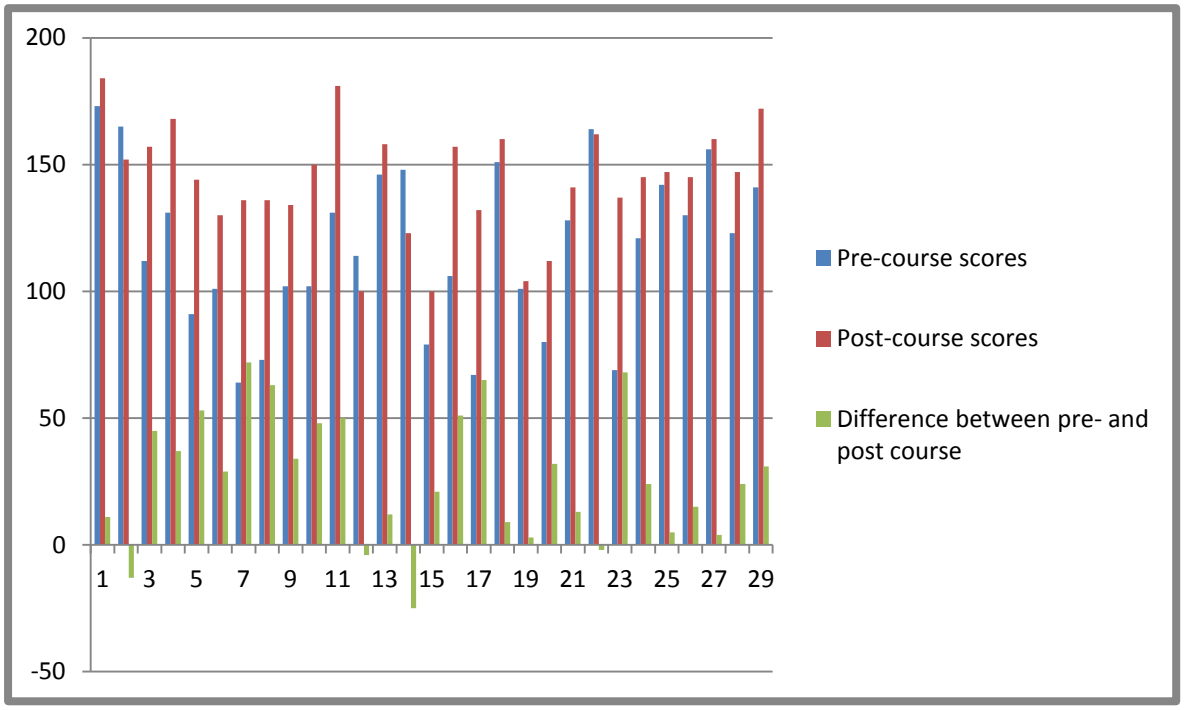


Figure 4: Differences between participants' pre- and post-course scores

Participants #2, #14 and #22 started off fairly confident with a self-efficacy average of 5 on the Likert scale or =often true. Although their self-efficacy scores decreased, they remained relatively efficacious. These participants come from a variety of backgrounds: rural, urban, high and primary school. The one thing they all had in common was very good computer literacy skills. Bandura (1997), in one of his studies, examined the relationship between self-efficacy and computer use. He recognised that computers offer a good way for individuals to manage their own learning. Those students who were confident computer users transferred this confidence to educational achievement. The information literacy education course may have made the participants realise that their computer literacy skills are but one aspect of information literacy. Their confidence may have taken a knock when they realised that competency in information literacy is a wider, all encompassing concept. The Latham and Gross (2008) study of undergraduates' information literacy identified that confidence is not a reliable predictor of competence. But the self-efficacy scale is not a measure of actual competence. It is more a gauge of how participants think they will perform. These participants who completed the course work may have accepted that they had overestimated their initial competence.

Participant #12 started off efficaciously below the overall mean of 117.6 or 4.2 on the Likert scale and went even lower from 114 (4.1) to 100 (3.6). A Grade 2 teacher from a rural area, she finds the course at times overwhelming especially the Internet environment which is brand new to her, she claims in her journal. Her strongest decline is in category C, *locating and accessing resources.* The school has no library and the public library is not close by – it is10km away. She has no computer at home and although there is a computer laboratory at school, there is only one computer connected to the Internet in the secretary's office. In her interview she admits to being a self-confessed technophobe.

5.2.3.5 PARTICIPANTS WHO REMAINED HIGHLY EFFICACIOUS

At the other end of the spectrum there were four participants who (#1; #4; #11; #29) considered themselves highly efficacious after the course scoring 6 on the Likert scale or = usually true.

Their pre-course scores were relatively high to begin with ranging from 131 (4.7) to 173 (6.2). See Table four below:

Table 4: Participants who remained highly efficacious

Participant #	**Pre-course score**	**Post-course score**	**Difference**	**% Difference**
1	173	184	11	6.4%
4	131	168	37	28.2%
11	131	181	50	38.2%
29	141	172	31	22.0%

The common element shared amongst these four teachers is their confidence and competence in searching and evaluating online information. Participants #4 and #29 had no computers at home, but unlike participant #12, they made use of the computer laboratories at school to access the Internet. Participant # 4 is in fact a LAN operator at school and participant # 29 bought her own laptop and USB Internet modem during the course as she recognized the need for personal Internet access. Participant #11 is a WCED school library advisor with expected high self-efficacy which improves even more. She offers workshop training to teachers in how to use the library's resources and it is assumed that her self-efficacy will be higher than most teachers. The three (#4; #11; #29) participants made the greatest strides in category F, *presenting and communicating findings* (see Appendix 4).

Participant #1 remained the most efficacious of the participants before and after the course. She is a highly motivated, deep thinking, self-reflective individual. She teaches at a deep rural primary school. Later in this study the journal findings and personal interview findings reveal her as an example of true change agent. Pajares (2002) maintains that individuals with higher self-efficacy 'use more cognitive and metacognitive strategies' and participant #1 certainly has more complex mental models than most, as will be shown in later findings.

5.2.4 CONCLUSION

As there were more rural than urban teachers in the study, more Afrikaans speaking teachers than either English or Xhosa speakers, more female than male teachers, a comparison using these variables proved unproductive. Even age as a variable does not prove significant amongst these participants. There were no significant differences between pre- and post-course questionnaire scores for these variables.

The most important finding is that the information literacy education course appears to have improved the self-efficacy of the majority of participants in the study. The next section will deal with more qualitative data – that found in the participants' journals and data gathered through interviews of the same sample as in the questionnaire findings.

5.3 FINDINGS FROM THE JOURNALS

The findings from the journals, one of the qualitative data gathering tools, are presented here. The journals were useful in answering five of the seven research questions: How do teachers understand information literacy and information literacy education? How do teachers make their information literacy explicit in the classroom? To what extent is information literacy successfully integrated within learning areas? At what level are teachers' web knowledge and skills? What are the differences and similarities between teachers' and school librarians' opinions of information literacy? It was both disappointing and telling that teachers did not address information literacy assessment in their journals. Data related to assessment had to be collected from interviews and artefacts.

5.3.1 INTRODUCTION

The study participants (who are teachers) kept a longitudinal, reflective journal documenting their thoughts, feelings and actions as they progressed through the information literacy education course and as they implemented a research project in their respective classrooms at school.

The journal as a tool for reflection and assessment was new to most (69% or 20) participants on the course. This revelation was a surprise to the researcher as one of the forms of assessment in OBE and the RNCS is writing a journal. In the interviews, which are reported on later in this chapter, there are teachers who own up to being reluctant journal writers. Some teachers wrote extensively and intensively while others wrote sporadically and sketchily. Some teachers focused on the stipulated criteria, others digressed and wrote completely off the point.

Some of the themes surfacing in the journals arise in the interview findings again later on in this chapter, for example, constraining elements in the school environment that contribute to uncertainty and impede pedagogic change; the use of ICTs; scaffolding learners' learning and teaching information literacy skills; and the affective side of information literacy. The journals do provide better insight than the interviews into how participants understand information literacy as the topic unfolds in the course. It must be said that the different data gathering tools complement one another well, that is, the questionnaire, the journal writing and the interviews.

The majority of participants use English as a second language which, in rural areas, is rarely heard spoken. The participants' verbatim accounts are not always in standard English but the researcher wishes to convey the authenticity of their writing and has retained their original language in the quotations as far as possible.

5.3.2 PARTICIPANTS' UNDERSTANDING OF INFORMATION LITERACY (EDUCATION)

The most important themes that emerge from participant's journals about information literacy and information literacy education are summarized under eight headings: teacher's grasp of a theoretical framework; multiple intelligence; plagiarism; designing engaging, challenging research projects; planning the research assignment; guiding learners using models and scaffolding; information sources and "aha" moments.

5.3.2.1 TEACHER'S GRASP OF A THEORETICAL FRAMEWORK

Within the first few hours of starting the information literacy education course, teacher #9 is hearing credible voices or testimonies from experts in the literature that convince her to challenge the status quo/ to change. She says:

> Correct role modelling is essential. That makes me think a lot. Am I doing the right work? As a teacher it is the assumption that we are experts with skills, knowledge and abilities to teach the children, in this case the "novice". I believe it is true. If we can't teach the learner, we need to get (information) literate. A teacher cannot stop learning or say she/he is fully qualified, but we lack the right skills to teach learners to be information literate. A person who aren't [sic] experienced cannot guide another properly.

This participant is more the exception than the rule as many participants (#6; #7; #11; #14; #15; #20; #21) are left dazed, by their own accounts, by the concepts or "big words". The vocabulary and concepts they are referring to are constructivism, cognition, mediation, Bloom's (1956) taxonomy of cognitive processes, knowledge construction, critical thinking, questioning, and others. The vast majority of participants (23 or 79%) use English as a second language, the language of instruction at the university. But it's not the unfamiliarity of English alone that perplexes them, as participant #21 is a high school English teacher, but the actual ideas that are foreign and which begin to shake up their fundamental beliefs about learning and teaching.

Another exception is participant #1 who loves big words, for example, "domain-specific", despite her mother tongue being Afrikaans. Participant #13, an English speaking Grade 7 teacher in a rural school, calls the session on different concepts related to information literacy "truly, a most enlightening session".

> The most important fact of the day that I will remember is that in the classroom I am the mediator who should guide the learner. Here Bloom's taxonomy which is the hierarchy of cognitive processes assists us in ways to accommodate and assimilate new information.

Participant #10 ponders the statement "higher order learning depends very much on both metacognitive knowledge and on domain-specific knowledge" in the course workbook and makes the point in her journal that sometimes she forgets that her learners do not have the domain-specific knowledge that she has about the subjects she teaches. So her challenge is to understand the anxiety of her learners when giving them an assignment or the feelings they might have when handing in a project.

While there are participants who provide skimpy journal entries, almost checklist style, about what they have learned. There are some who provide deep insight into their thinking. Participant #1 reflects on the section in the course workbook in which the cognitive skills are linked to information skills in the research process. For example, when learners are engaging with information they need to be able to: compare information from different sources; distinguish between opinions (beliefs) and objective evidence (factual information); reason by identifying flaws/gaps in arguments; connect new information to one's own existing knowledge and experience; analyse different perspectives on the subject; pose questions to the texts in use keeping the topic in mind; categorise information into a framework of personal understanding; prioritise information using the "gold or garbage" method; organise information extracted using note-taking techniques (Zinn 2010). Participant #1 reflects:

> I will need to translate page 24 (of the coursework book) for my colleagues at school. Our learners can't even answer exam questions where they are asked to identify "voordele" [advantages] and "nadele" [disadvantages]. They have no idea what these concepts mean.

Participant # 10 says:

> Today we start with the cognitive skills and I start to think which of these skills I take for granted in my class. We do a lot of prior knowledge and from now on I think we should focus on keywords, mind maps and the W-questions (where, why, when, what). I must look at how I am going to teach this.

Participant #9 deliberates on the notion of the information search process as a triad of thoughts, actions and emotions. For ten years she has experienced in her own classroom that learning is not only about the cognitive:

> The child needs to be taught as a whole – thoughts, actions and feelings. That produces an excellent and proper human being [sic]. I also experienced that learning is an active engaging process. To get the learners active we need a stimulating and inspiring, motivational and comfortable environment. If the environment is not healthy or favourable, learning does not take place effectively.

Having been exposed to Kuhlthau's (2004) ISP model to information literacy, she thoughtfully states:

> To me the learners are unique and not everyone changes in the same way as the other. Because of that we need to address the learners' needs differently. I experienced it in the group work activity (during the course). In the classroom it is not always possible to do that because of the huge classes, time and lack of information resources.

Having endorsed Kuhlthau's approach, she immediately recognises shortcomings or challenges in her own environment. Her school, in a rural village, has classes of 45+ learners per classroom; there is no school library and no computer laboratory.

5.3.2.2 MULTIPLE INTELLIGENCES

Gardner's (1999) theory of multiple intelligences formed the basis of discussion about different learning styles and ways of knowing. The RNCS provides opportunities for learners to demonstrate their competency in subjects through a variety of presentation formats and not only traditional paper tests. Research projects need not be focused on essay writing only. Learners can express their talents in a variety of presentation formats. The participants found this discussion

fascinating. They had to decide in which intelligences their own strengths lie. Participant #21 refers to the exercise of identifying one's own intelligences as very "introspective". Several participants (#7; #9; #13; #27; #28) highlight in their journals how they have disadvantaged the learners in their class by not addressing all the intelligences. Now they have an idea of how to individualise assessment activities according to learning styles.

These findings are consistent with the pre-course questionnaire category F findings. Participants scored the lowest in F, presenting or communicating information. In category F participants have to choose a presentation format, determine the parts or how to organise a presentation. Participants lacked knowledge of the variety of possible formats as well as how to contribute to tapping into all learners' potential.

5.3.2.3 PLAGIARISM

The researcher is constantly surprised by how uninformed teachers are about plagiarism. The ethics of plagiarism do not seem to be part of in-service training. Where ethics do arise during in-service training, it is in connection with Internet usage. Schools are encouraged via their ICT head teacher to create an acceptable use policy which describes the appropriate way in which learners should use the Internet and email. None of the study participants on the information literacy education course were aware of such a policy at their respective schools despite the majority of participants' schools having a computer laboratory. Was it possible for 29 teachers at different schools to be blissfully unaware of such a policy? Alternatively, if the policy exists, it is not taken seriously. Nevertheless, the session dealing with plagiarism elicited an unanticipated outpouring in the journals of 16 (55%) participants. Teacher #13 relates:

> The presentation on plagiarism was an eye opener and it's amazing how we trespass unintentionally, but through ignorance. Plagiarism is in fact cheating or deception – quite a serious offence. Here I realised plagiarism is a major offence and is punishable and should be part of every school's discipline policy. Plagiarism is now specified as a violation in the technology agreement signed by all students and parents (in the USA).

> Good tips were given how to avoid this ... Also avoiding using others' works with minor cosmetic changes and also referencing everything I use from others'.

Other teachers' reactions are along a similar vein. Participant #9 confesses that she had no idea that if you use a person as a source of information that you should acknowledge the person in your bibliography. Participant #17 has a guilty conscience because she never gave a thought to the amount of effort authors put into creating a text. From now on she will be more mindful about acknowledging authorship. Participant #18 recounts: "In our schools we are copying without thinking we are doing wrong. Most of our teachers are guilty of committing plagiarism. Now it's time for introspection (focusing on my own acts and doings at school) and trying not to commit plagiarism".

Teacher #6 vows to make learners aware of plagiarism. Participant # 12 mentions: "Plagiarism is stealing someone else's ideas and pretending as if it is yours. It is wrong, don't do it! I have to find ways and means of preventing it by introducing activities that require thinking skills". Avoiding the copy-and-paste type of plagiarism teachers often confront in research projects, requires creating assignment topics in which learners have to think.

Teacher #20 reflects: "I never think why learners cheat and play [sic] plagiarism. How can I prevent it? I realise sometimes you just give marks". A few participants (#5; #11; #29) make the point that plagiarism should be part of the school's assessment policy clearly demonstrating that it has not been considered up until now. One way of assisting learners to overcome plagiarism is to teach them to acknowledge their sources of information. To this end, participant #10 and #12 promise to create a poster for their respective classrooms on how to reference and write up a bibliography. Participant #28 notes that she has learned how to reference from the Internet because in the past she did not know how to acknowledge web-based sources.

It is obvious from the journal entries of many participants' that the concept of plagiarism is new and intriguing to them. Equally fascinating is how to overcome or prevent plagiarism. Besides

good referencing and citation skills, teachers can prevent the copy-and-paste syndrome by creating assignment topics which make learners think.

5.3.2.4 DESIGNING ENGAGING, CHALLENGING RESEARCH PROJECTS

Using Loertscher's (1996) ideas on "turning assignments into more engaging problems", the teachers in the course had to design research projects which were engaging and challenging and which could not be simply copied and pasted. This exercise was partially in answer to the question of how to prevent plagiarism and as a preparation for the actual research project with their respective classes. The criteria for these "new" projects included: 1) posing problems or creating research tasks which elicit higher order thinking; 2) learners presenting their work to an authentic audience; 3) acknowledging multiple intelligences by encouraging an array of presentation formats; 4) advocating the use of a wide variety of information sources; and 5) incorporating the RNCS critical outcomes as attributes of learners (Zinn 2010).

Having accepted that one way of preventing plagiarism is to design research assignments in a more thoughtful way, when confronted with the exercise, participants realised that the task was harder than they had expected. There are those participants who express utter frustration with the exercise (# 24; #29) but with practice succeed in the end. Participant #29 who persevered despite having to redo the exercise a few times, mentions later in her interview how her colleagues now come to her (the expert) for assistance with research topics which could thwart copying and pasting. Then there are those participants who enjoy the exercise and see it as a healthy alternative to the worksheet syndrome. Enjoyment does not always equate with success. While participants #3; #11; #14; and #27 enjoy and manage to create engaging, thoughtful research topics, participants #4 and #12 are amongst a group of about ten participants (35%) who do not succeed with this exercise in the end.

All is not lost as the participants continue to grapple with different aspects of the course including the planning of a research assignment and scaffolding learners throughout the assignment which will be described next.

5.3.2.5 PLANNING THE RESEARCH ASSIGNMENT

The researcher (as lecturer) provided the participants with a template which participants could use to plan their class research assignment. On the plan participants had to note the topic statement, the grade level, the critical outcomes addressed, the concepts, skills and attitudes; the activities or learning experiences to be covered for the duration of the project; the assessment; and the references (actual information resources) used. The participants handed in a draft planning template which the researcher marked and returned to participants with feedback on how to improve if necessary.

The participants (#14#17; #22; #24; #25; #27; #29) found the planning template confounding. The only planning template they were used to was the WCED lesson plan. They had never been asked to draw up a plan for a research assignment before. The researcher provided an example of a completed research plan (template) but this did not seem to help much. The unfamiliarity of how to approach research assignments became evident as draft after draft, teachers struggled to put on paper a plan of how they will execute this project in class.

Some participants identify their shortcomings of the past. Participant # 11 points out that the research project plan should extend beyond mere brainstorming with learners. Participants #3 and #21 understand that when the project is planned, the assessment should be planned simultaneously and not as an afterthought. Participants #9 and #29 are of the opinion that thorough planning is imperative especially if teachers wish to entertain a variety of intelligences.

5.3.2.6 GUIDING LEARNERS USING MODELS AND SCAFFOLDING

The participants were introduced to different information literacy models to provide them with a framework for understanding the information search process and as a way of making information literacy explicit to learners. They were exposed to Eisenberg and Berkowitz's (1990) Big3™ and Big6™; McKenzie's (1997) research cycle; the Alberta (2004) inquiry model; Kuhlthau's (2004) ISP; and LIASA's (2004) information literacy guidelines.

The participants had little prior experience of writing a research assignment either as part of pre- or in-service teacher training. This information was gleaned during the course as well as more formally during interviews. Discussing and engaging with the frameworks in different ways using videos and storytelling seemed to help some, but not all, participants in coming to terms with the information search process. Participant # 23, a Grade 1 teacher and participant #24, a Grade 12 teacher express frustration at "not getting it". They do eventually understand the frameworks about half way through the course.

To clarify the Big6™ model, the researcher related the story of the Bright Bird (Eisenberg & Berkowitz 1990) which is a problem-solving allegory. Many of the teachers (#3; #16; #17; #19) enjoy the story and could see the correlation between the story and the model. Teachers (#5; #9; #17; #29) expressed appreciation of other models too as they provide an in depth approach to research inquiry which they had not been taught before. In the words of teacher #13:

> During this session I realised that time after time, that certain aspects of these models, Mckenzie's research cycle, the Focus on Inquiry (Alberta Learning), are very important because it focuses on in depth planning which does not always take place.

Part and parcel of understanding the information search process and how the models are to work in practice is to understand the role of the teacher as mediator in the process. Mediation is the process by which a more experienced or knowledgeable person (mediator) guides a novice to maximize his/her learning potential in new fields of development (Zinn 2010). Teachers need to make information literacy explicit. They also need to model the information search process in class for learners to grasp and emulate. These are the ideas expressed in the journals of teachers #3; #7; and #10. "Never pretend that you know everything. Be a role model. Encourage your learners to question", says teacher #20.

> When learners are assisted in such a way (using the inquiry model) we are allowing and guiding them to reach their full potential. I am convinced by implementing these methods any learner will produce a project of good quality,

are the thoughts conveyed in teacher #13's journal. "I need to assist learners throughout the process (mediator) because they mostly do not have help at home", teacher #14 mentions, reminded that her learners come from indigent homes.

The participants have reached the stage where they understand the search process and know that the teacher plays an important part in guiding the inquiry of learners. The teachers (#3; #7; #9; #11; #14; #18 #23; #28) are convinced that scaffolding learners, teaching them the information literacy skills explicitly, providing feedback and reflecting continually will make all the difference in research project results. Teacher #20 refers to the steps in the research process as "a key opening a locked door" of course referring to how inadequate she felt beforehand with research projects. Teachers were provided with different tools such as mind mapping templates; tools for teaching note-taking, research organisers and time management templates, amongst others.

Besides having the tools to assist learners and a framework for guiding them, teachers also realise that motivation plays a key role in a successful outcome of a research project. Many teachers had not known how to motivate learners in projects until being challenged by Small and Arnone's (2000) Motivational Style Quotient (MSQ) in which teachers had to rate themselves in terms of motivation when giving learners a research assignment. Many teachers were surprised by their low rating and realised that learners needed much more guidance and motivation from them (teachers #4; #6; #7; #9; #17; #28). The MSQ was another strategy in the awareness raising of teachers about the non-cognitive aspects of information literacy. Teacher #1 cleverly links the expectancy-value theory of motivation to the Pygmalion factor, the self-fulfilling prophecy by stating: "If you tell me often enough that I am stupid, I will lose courage, feel stupid, act stupid and eventually be regarded as stupid. Maybe even become stupid".

The participants seemed well on their way to implementing a research project in their classrooms now that they understood what information literacy is and how to mediate it in the classroom. One last obstacle was information sources. Most of the schools did not have school libraries but they did have computer laboratories. What were participants' views about sourcing information?

5.3.2.7 INFORMATION SOURCES

In addressing the challenge of resourcing research projects, the course discussions and activities centred on building relationships with public libraries, requesting block loans from EDULIS and district resource centres, as well as using the Internet and electronic encyclopaedias. Participant #10 reports in her journal that she is in a quandary because her school has neither a library nor computer laboratory and the public library is 35km away, an almost impossible distance to travel for her learners of a poor, rural hamlet. She makes a plan in the end and reserves a block loan from EDULIS. Several other participants (#1; #20; #22; #27; #29) also eventually borrow a block loan from EDULIS for their class projects.

Participant #1 relates how a colleague took three classes of learners unannounced to the local public library for a project. The public librarian was furious. In the course the participants are made aware of the building of good relations with the local library and how and when to liaise with the librarians especially regarding projects.

The experiences of the participants in the computer laboratories on the UWC campus were documented with colourful phrases of irritation, annoyance, anger, and for a few, joy. As the participants had had experience of using the Internet during a previous school librarianship course, the researcher allowed participants to search for useful educational websites that they could recommend to colleagues. The instruction was to find five websites for each of the eight school subjects and to annotate them. It was assumed that teachers knew how to open and save a Word document, copy and paste URLs, create tables, and use a search engine to find websites.

The first day of observation in the computer laboratory proved the researcher wrong. Participant #29 relates how she thought she had copied and pasted websites only to end up with a blank document. She was furious with herself. Participant #24 relates constantly how she loathes going to the computer laboratory to search for websites. Participant #19 is surprised that she has to find 40 websites as she is “Internet illiterate”. Teachers (#6; #20; and #29) were amazed that they could supplement books and other print resources with pre-selected websites for their learners.

The Internet literally opened up a new world to them (#10; #22). There were those participants who took to the Internet instantaneously (#2; #3; #18; #14). Except for the slow access in the laboratory, the technophiles were quite happy. Participant #1, one of the four participants who were Internet literate to begin with, makes the keen observation that not much is available in Afrikaans, the home language of her learners. Czerniewicz and Brown (2005), in their South African study of access to ICTs for teaching and learning, confirm participant #1's remark by stating that English remains the dominant language of African producers of Internet content despite English being the home language of a minuscule percentage of the African population.

By the second laboratory session, the researcher realised that the majority of teachers were struggling not only with searching but also computer literacy. At this stage the researcher introduced the teachers to a database called *Weblinks Research* to which the UWC library subscribed. It is an Australian database with African input from a South African agent. It is organised by subject and grade level as well as by teacher or learner resources. The teachers (#23; #27; #28) started to enjoy the possibilities of the web now that they had access to selected websites. The participants had a taste of what it was like to search for information without guidance. This exercise was to demonstrate to them that they should never simply send learners to "surf the Internet" – it is too daunting, especially at primary school level.

Another exercise to teach educators about the complexity of reading and understanding websites, was to have them evaluate two websites along a similar theme. They record this experience in their journals as "dreadful" (#17); "terrible" (#11); "frustrating" (#3); "difficult" (#14; #18; #29); "not easy" (#10). The negative response had much to do with their inexperience of the Internet, the fact that English is not the home language for most participants but is the language of most websites, and the theme which was *genocide*. In another example the researcher used an educational website, *Zapato.net*, set up to intentionally mislead and test users' knowledge and gullibility. Some of the content included topics such as 'buying dehydrated water', 'wearing an aluminium deflector beanie as a low-cost solution to combating mind-control', or trying to save an imaginary country called the 'Republic of Cascadia'. Many participants could not detect that

the websites were fake as they lacked the subject knowledge and/or did not know how to check for the credibility of information on the Internet.

5.3.2.8 "AHA" MOMENTS

As the participants trudge through the course, their understanding of information literacy increases. They were given tools, they teased apart different theoretical frameworks, they were made aware that learning involves emotion; all the features to enable information literacy education to take place. Participants actually mention their "aha" moments. For example, teacher #21's moment of clarity arrives when he realises that learners need to be explicitly taught how to "grapple with texts", that it does not come naturally to most learners. He also mentions that learners need to "define the topic" and they need to be "shown what an end product looks like". Teacher #9 refers to her moment of "revelation" after having done "some self-examination" as recognizing that she is "doing all the discovering for learners". "I need to allow them to be more independent".

The most lucid voice is that of teacher #1. She chastises herself by referring to previous research projects she had given her Grade 7 classes. Her journal entries encapsulate several of Valli's (1997) levels of reflection: personalistic reflection, which focuses on developmental teaching; critical reflection, which incorporates the social and political context of schooling; and reflection on practice, which focuses on pedagogical activity in practice. She writes:

> I like giving interesting (for me at least – is it interesting for them?) assignments, but I have failed in the following through of it. I realise now that I expected way too much of my Grade 7 social science learners. Maybe that is why more than half did not hand in their assignments. I have expected them to read many different books (that I brought to school via block loan) and to synthesize the information without giving them a framework. I take it for granted that they know how to sift and collate information from different sources. I thought they could do it because they enjoyed reading the books and researching the information. They must have been totally overwhelmed! I feel awful now. I did ask them if they had been taught how to take notes and they said, *no*. So I gave them a brief overview of it, but I did not do enough. I assumed because they were quiet in class

and reading the books that they were managing ok. Obviously they were not. I should have kept tabs on them and assessed them on an ongoing basis. They have never had similar assignments from other teachers. All that is expected of them is to use textbooks and fill in forms. That makes it easier to mark, but what is the point of it? – The learner has the required number of pieces of work in their portfolios – but a lot of it is meaningless, 'busy' work.

How am I going to integrate information in my own curriculum? I will have to work consciously to do it. It is not going to happen by-the-by. It is going to be a lot of hard work, a lot of preparation, a lot of careful thought. I will basically have to revamp all my teaching work.

Next question, how on earth am I going to convince my colleagues to do the same? As it is, I already have **NO** support from the other staff...

The ideas about information literacy and implementing a research project using a framework in participants' journals reflect their conceptions of information literacy but do they manage to change theory into practice? The next section describes their journal entries as they implement a project in class.

5.3.3 CONDUCTING PROJECTS IN CLASS

Not every participant describes how the project unfolded in class, but then not everyone was equally eloquent and detailed. Only 15 kept a reasonable account. The follow up interview provided the researcher with a way of collecting data which was missing in the journals. Different data gathering tools assisted the researcher in triangulating the evidence and contributed towards authenticity and a way of verifying the evidence.

5.3.3.1 UNCERTAINTY

Feelings of uncertainty beset many of the participants as they start to implement the research project in their respective classrooms. For all the participants this is the first time that they are using a framework and where their project plans, assessment and project activities have to correspond. For example, if their project plan indicates that note-taking skills are taught, then there should be evidence in the learners' work as well as in the assessment that these skills were taught and assessed. Uncertainty was expressed in a variety of ways. Participant #2 dithers for two weeks and changes her topic twice. She is teaching at a new school, a different grade, and her class is very big (50 learners). The "research project" she undertakes is of the conventional 'fill-in-the-blanks' from the textbook type. From interactions with her during the course it is obvious to the researcher that she understands information literacy but is not prepared to either extend herself or challenge the status quo at her new school. She admonishes herself with the last entry in her journal: "THINK COULD HAVE DONE BETTER!!! Not impress [sic] with myself". She remains dissatisfied in the end.

The lack of confidence to undertake a research project with younger learners is demonstrated in three participants choosing higher grades than their own in their first attempt at implementing a project "the proper way": Participant #17, a Grade 1 teacher, uses learners in Grade 6; #18 and #20, both Grade 4 teachers, use learners in Grade 8. Participant #9 tries to use a Grade 9 class but resorts back to her Grade 5 class. Participant #6 uses her Grade 3 class but conducts the project "after hours" because she chooses a topic not part of the stipulated work for the term. Of the five participants mentioned above, four participants (#6; #9; #17; and #20) start off with a lower than average self-efficacy. Participant #18 is fairly efficacious to begin with.

The conditions under which teachers teach in some schools could influence the rate of change or the inclination for changing approaches to teaching and learning. Most of the participants who particularly mention socio-economic challenges as well as those who mention leadership problems are teaching in schools identified as quintiles one to three, the poorest schools. Besides the large classes (45+ learners), the draining summer heat in the Western Cape especially in

rural, inland areas and classrooms without air conditioners and good ventilation, impact on effective learning (#1; #2; and #14). Participants highlight the difficulty of teaching children with foetal alcohol syndrome and other severe learning disabilities without the necessary support in the classroom (#1; #13; #16; #20; #27). Participants express their annoyance at not being able to teach in a sustained manner because of administrative interruptions whilst teaching (#12), and sporting activities that shorten teaching periods (#14; #18). The lack of both school libraries and computer laboratories are discouraging factors for participants #9 and #10. The reading and comprehension levels of learners are another sore point (#1; #27). The low reading levels are especially mentioned by participants #2; #15; #25; and #27. A lack of leadership support for change is mentioned by participants #1; #17; and #20. All of these challenges could undermine or thwart teachers' adoption of information literacy education.

5.3.3.2 PLANNING AND RESOURCING PROJECTS

One thread running through the journals is that planning and preparation for the research project took time and effort. Participant #1 relates that "it was a lot of really hard work, but I think that once one gets into the habit of doing it this way, it will be easier". Participant #14 re-reads the course workbook and scans the CD-ROM with photocopiable templates and tools which could also be adapted and translated (one of the course handouts) to prepare for her project. Participant #8 takes two weeks to plan for her Grade 2 project. At first "sceptical" that her learners could do a research project, she relents. She contacts the local public library which assists her with information resources. She searches the web for suitable information and consults Encarta and a South African encyclopaedia. All set, she informs the parents about the project as this is the first time learners are doing a project and using a library.

As part of their planning, several participants (#1; #4; #5; #8; #28) explicitly mention contacting the public library to inform them of the impending project to which the public library responds very warmly. It is generally uncommon for teachers to have such a good working relationship with the local public library. One participant (#14) claims she informs the public library of the project but, on scrutinizing her project, the researcher finds there is no need for learners to

consult any additional resources as the project consists of measuring certain articles such as a table, the classroom or the black board. There is no evidence in the form of a bibliography of either the teacher using resources or the learners. Different but related anomalies are: mentioning the use of a library or the Internet and then not providing evidence in a bibliography (#4); providing vague bibliographies such as "Internet, DVD, magazines" (#12); and the teacher providing a bibliography but there is no evidence in the learners' work of a bibliography (#13). The participants had learned about plagiarism during the course but awareness was not sufficient to persuade them to adopt the practice of acknowledging their sources. Despite the bibliography templates and tools which were compiled for their convenience, not many used them. Perhaps there were not enough enabling influences or influencers to convince them to change.

Participants on the whole have consulted library books, used expert people and the Internet for their research projects. Participants #3; #13, #10; #17 and #25 explicitly mention using their school library collections even if they are still in boxes (unorganised). Participants #8; #16; and #20 use multimedia such as DVDs in the classroom as part of motivation and for accessing information. EDULIS block loans were used by participants #1; #6; #10; #22; and #29 even though participant #6 is let down by the paucity of Afrikaans titles on her topic.

A healthy number of participants (#1; #3; #5; #6; #8; #10; #13; #14; #17; #18; #19; #20; #28; #29) use websites either as teachers' resources and/or learners'. The Afrikaans website *Mieliestronk* (www.mieliestronk.co.za) is a favourite of participant #6 and #8 but participant #1 bewails *Mieliestronk* for having a cartoon with a "dinosaur and a hominid holding hands" which is impossible and inaccurate in terms of pre-historical evidence. She emphasizes that she has "spent a LOT of time explaining to them (learners) that humans and dinosaurs NEVER shared the earth simultaneously". Participants #10 and #17 use the one working computer with Internet access in the administration office to allow their learners to read on specified websites. Participant #25 explicitly regrets not being able to use the Internet because the Internet was either down or the laboratory was unavailable. Participant #13, a self-confessed technophobe, provides no bibliographical evidence of using web resources despite taking her learners into the computer laboratory for that purpose.

Participants #7 and #21 bring resources into the classroom and participants #1 and #20 use experts as information resources: #1 uses a museum curator and #21 uses a municipal worker. There were participants who do not explicitly mention using any resources (for example, #24) and some have not gone beyond a variety of textbooks (#9; #26).

This positive attitude towards finding and using a variety of information sources is evidenced in participants' increase in self-efficacy in category C, *locating and accessing information*, in the post-course questionnaire findings. Scores in the sub-categories relating to Internet sources increased substantially after the course.

5.3.3.3 SKILLS TAUGHT

Part of their new found confidence in mediating information literacy through research projects is the skills they explicitly mention that they teach. Table five below lists the variety of information literacy skills in descending order of importance according to number of times mentioned:

Table 5: Information literacy skills participants taught as part of the research project

Information literacy skills	**N=29**	**Participant**
Reading information on the Internet; exploring information on the web	7	#1; #10; #13; #17; #18; #19; #28
Making notes	6	#1; #8; #10; #13; #17; #29
Reading strategies: reading for information; sorting and sifting information	5	#5; #8; #10; #17; #29
Using Dewey Decimal Classification to find information in a library	4	#1; #5; #10; #28
Brainstorming	3	#1; #10; #16
Creating a bibliography	3	#1; #4; #10
Using prior knowledge	3	#6; #10; #12
Questioning	2	#13; #9

Identifying keywords and mind mapping	2	#8; #17
Drawing up interviewing questions	2	#17; #29
Creating drafts	2	#1; #10
Dictionary skills	2	#10; #13;
Paragraph writing	2	#1; #10
Reflecting	2	#6; #17
Defining the topic	1	#29
Using the index of an encyclopaedia	1	#1
Identifying bibliographic information such as the author, title, publisher, date, and so on.	1	#10
Report writing	1	#13
Criteria for making a poster	1	#29
How to evaluate one's work using a checklist	1	#10
How to organise information under headings	1	#13

5.3.3.4 WHAT TEACHERS DID DIFFERENTLY

It is quite apparent that teaching learners' information literacy is not 'business as usual'. Participants are scaffolding learners' learning and "holding their hand" throughout the process (see table above). Participants are motivating the learners more, for example, by reading stories and singing songs with older learners, an unexpected activity (#17); through healthy class competition motivating learners to visit the public library (#8); by providing enough time for learners to absorb the new approach and finish successfully (#19); by taking learners as a class to public libraries (#1; #5; #28); by inviting experts in the community to address learners (#1; #16).

By all accounts, the learners are relishing the new approach to research projects. Adjectives used

to describe the learners' experiences are, amongst others, "excited, curious, creative, surprised, eager, and enthusiastic" (#1; #5; #10; #12; #13;#19; #28; #29). It seems that learners enjoy reading the collections of library books, visits to either the school or public library, and they are particularly excited to access the Internet. They also appreciate the new skills they are learning. Participant #16 is of the opinion that her learners' self-esteem has improved. In Zinn's (1997) study, learners experienced a similar rise in self-esteem. It also appears that more learners complete a successful project than before (#1; #5; #9; #29). It was very clear to participant #8 that her learners "remember better when they draw a mind map".

Participants employed innovative features in their research projects which show them to be risk takers and change agents in their own right. Participant # 8 videotaped her entire project so that she could show her learners, the parents and her colleagues. She went to extraordinary lengths to capture her changes. Participant #10, recognizing the enormous amount of effort she was putting into the research project, creatively allocated marks across several subjects which the project spanned. Participant #1 introduced, in her words, "ground-breaking" changes by inviting experts from the community to view the presentations and assess the learners' projects. Grade 3 learners in participant #5's class made Mother's Day gifts which they sold to raise funds for the upcoming school library. While these methods may not seem very novel to the seasoned mediator, these teachers are indeed pioneers at their schools.

5.3.3.5 ROOM FOR IMPROVEMENT

Reflecting on practice is the sign of a good teacher. As this is the first time that participants try out this new "method" of teaching research projects, mistakes are bound to be made and there is always room for improvement. Teacher #1 says that next year she will allow her learners to do group work which she personally dislikes. She will also provide them with note cards and spend more time teaching them note-taking. Teacher #10 will concentrate more on reading techniques. Learners need much more practice in creating a bibliography (#4 and #10). Teacher #29 wants to continue to improve the way she asks questions so that learners can think instead of just copying and pasting. For teacher #24 who lacked confidence in the beginning, using older learners to

assist her in the computer laboratory, she insists she will do better next time as she has gained confidence.

5.3.4 CONCLUSION

Using journal writing as one piece of evidence in the argument for teachers' competency in teaching information literacy has proved rewarding in terms of the insights they illuminate. The participants were taken through a course on information literacy which culminates in their implementing information literacy in their respective classrooms. The journal documents this steep journey from learning theoretically about information literacy to applying it in the classroom. Keeping a journal is not for everyone. The writing ranged from sparse, almost point form entries to comprehensive, introspective records. As a whole, the journals provide invaluable temporal accounts of teachers' experiences. The words of one astute participant lends credence to the information literacy education course, one of the courses in the training of school librarians: She (#1) thanks the lecturer (researcher) for the course as it made her realise that one cannot teach any subject in isolation. She says: "I expected to be taught how to be a librarian. I never imagined it would help me improve my teaching!"

5.4 FINDINGS FROM THE INTERVIEWS WITH TEACHERS

This section presents and provides some analysis of the findings of the interviews with the teachers. Teachers' interview responses were strongest in answering five of the seven research questions: How do teachers make their information literacy explicit in the classroom? To what extent is information literacy successfully integrated within learning areas? To what extent is information literacy assessed in the curriculum? At what level are teachers' web knowledge and skills? What are the differences and similarities between teachers' and librarians' opinions of information literacy? The interviews were especially valuable in uncovering how teachers assess information literacy, a topic they either skimmed over or ignored in the journals.

5.4.1 INTRODUCTION

The face-to-face interview has its advantages and disadvantages and it is best used as part of a mixed methods approach. In this study the interviews perform an iterative function as a follow up on the journal writing and questionnaires. The strength of in-person interviews is the good response rate as well as the possibility of probing when answers are evasive. If the interview takes place in the interviewee's natural surroundings, the interviewer gains insight into the person's environment as well. Twenty nine (29) teachers in training to become school librarians volunteered to be part of the study and were interviewed. Sixteen interviews in total were conducted with the participating teachers: nine were individual interviews, four interviews consisted of pairs, two interviews were groups of three teachers and one was a focus group of six teachers. Interviewees chose to speak in either English or Afrikaans.

Apart from the 29 teachers interviewed, six education district chief curriculum advisors were also interviewed individually. The findings of the two groups, teachers and chief advisors, will be reported on separately.

An advantage of a data collecting strategy can also have its drawbacks. For example, the researcher had to travel into distant, rural areas and incur costs for 13 interviews. Fortunately, the

researcher conducted her own interviews and completed her own interview transcriptions requiring no extra supervision or costs. Appendix 2 offers the interview schedule indicating dates of the interviews, interviewee numbers (for the teachers) and pseudonyms (for the chief advisors) and places where the interviews occurred.

First the interview findings of the teachers will be addressed followed by the findings of the interviews with the chief advisors. The teachers are alternatively referred to as the participants in these findings or when more accuracy is required, they will be referred to as a numbered interviewee: for example, interviewee #6 means interviewee number six. The list of semi-structured interview questions put to the teachers can be found in Appendix 5. Essentially, the questioning revolved around the keeping of the journal, approaches to inquiry-based projects before attending the information literacy education course, whether teachers changed their approach after the course, the affective side of implementing a different approach to inquiry-based projects in their class, and their attitude to ICTs.

5.4.2 EXPERIENCES OF KEEPING A JOURNAL

The use of solicited journals in education has been documented in the literature by Meth (2003) and Spalding and Wilson (2002). Diaries as a form of creative writing have been avidly used by language teachers over the decades. A solicited journal differs from a private journal as participants are requested to focus on particular topics or criteria. The 29 teachers in the current study were asked to keep a solicited journal for the course, *information literacy education.* It formed part of their summative assessment.

The journal is one data collection method which forms part of the researcher's multiple methods approach. All methods have their strengths and weaknesses and the journals' were dealt with in 5.3. Some participants wrote extensively, others briefly. The researcher therefore decided to cross-check the journal writing by questioning participants in the interview about the experience. She asked them in the interviews whether or not they had kept a journal as part of any previous

course. She also invited them to express their opinions about the usefulness of the journal as a reflective tool.

Nine (31%) of the 29 participants had previously kept a journal for a different course. Six had kept a journal during their National Professional Diploma in Education (NPDE) mathematics course; one had kept a journal for a history course on the holocaust, one whilst participating in an ACE *human rights and values*; and one during OBE training. The criteria for the NPDE mathematics course journal overlapped extensively with the criteria for the information literacy education course journal, namely, participants had to document their feelings, thoughts and new learning as they participated in the course and whilst implementing an inquiry-based project (also referred to as the research project) in their class. As expressed under the limitations in Chapter one, it was not possible for the researcher to be present in class to witness teachers mediating information literacy through the project. The journal was one way of 'observing' from a distance the joys, anxieties, and frustrations of implementing a project in a class.

Some participants who had kept a journal before claimed it was easier the second time (the current study) round because they had had some practice (#5; #13). This did not necessarily translate into journals of better quality or depth. One of the weaknesses of the journal for this study was the language of expression. Seventy nine percent (79%) of the participants use English as a second language but wrote their journals in English. The language of instruction on the course is English and participants submitted their course work in English. Time and again participants mention in their journals the difficulty of learning new concepts on the course in their second language. One participant (#27) mentions in the interview that she was frustrated learning through the medium of English as Afrikaans is her home language. However, she never mentions in her journal how she struggles to understand English because, in her words, she was "reluctant to burden others" and she feared that she would come across as "stupid". Another drawback to the journal then is people's perception that expressing your feelings to an unfamiliar person (the researcher) is strange or peculiar. Alternatively, teachers may view 'feelings' as not a worthy measure of learning divorcing the affective from the cognitive knowledge.

All the teachers in the interviews maintained that keeping a journal was useful. Not everyone was convinced right from the start as some saw the journals as "extra work" (#11; #14; #21; #24). They soon discovered the cathartic benefits of their journals. For many (70% mentioned this expressly in the interviews) the journal was a release of their pent-up anxieties and fearfulness as they went through the process of implementing the research project, all on their own, with their classes. As part of the course they were introduced to the research of Kuhlthau (2004) and the triad of thoughts, feelings and actions that capture learning. The researcher was hoping that the participants would use their journals to express their emotions as they proceeded from the start to the end of the project implementation in class. One participant (#29) saw the journal as "her friend" to whom she could tell anything and everything. Another participant (#21) said: "It allowed me to be compulsive. I could vent without interfering with the lecture".

When asked to elaborate on what they meant by the usefulness of the journal, participants most often stated its worth as a reflection tool. They could go back and refresh their memories, for example, of what they understood in the course, or when in their own classrooms, what they had done the previous day and what had been planned for the next day. Two participants (#14; #27) emphatically stated that the aging process (both are 50+ years old) has affected their memory and the journal was a good memory aid. A unique way of looking at the journal was as a "mental bookmark" (#21). As participants were writing in their journals at the end of every class, the journal became an invaluable reference tool – noting where the difficulties lay (#22); adding explanations in their own words (#10); acting as reminders to be more explicit in teaching and making fewer assumptions of what learners can accomplish without guidance (#23). Participant #10 states: "The journal helped me implement the assignment more than the course workbook because it was written in my own words. It was not someone else's thoughts." Participant #17 summarizes her experience of the journal thus:

> At school the journal was useful because there were days when I took longer to finish a task. Keeping the journal made me keep at it because I needed to have the project done in a certain time-frame. It helped me not to forget. Then it was like a stress reliever, a pace keeper too. I could see that I started there and I'm here now. Without even noticing it, I had made some progress, although it doesn't feel this way. I was alone in it. The journal helped me to express my feelings.

Surprisingly, the journal catapulted some participants in new directions. Some (#9; #12; #20; #28; #29) started journal writing with their own classes. Grade 2 teacher (#12) comments: "The journal was a novel idea to me but I loved it. I copied the idea and let my learners keep a journal. The problem with the LitNum programme is that teachers just photocopy and learners fill in the blanks. With journals, learners have to compose their thoughts and write". Hart (1999) laments the work sheet syndrome which encourages a copy-and-paste like mentality rather than critical thinking. The years of educational research in South Africa identified that little writing is done in class (Baxen & Green 1998; Taylor & Vinjevold 1999; South Africa 2008). This teacher's move is therefore a step in the right direction and a positive spinoff from the course.

The weblog is a natural progression of the written journal which techno-savvy children will enjoy and of which teachers need to take advantage (#11). Teacher #22 attributes the journal to her better self-management now: "It helped me to be smarter. No more notes scribbled on pieces of paper. I now have a daily planner in my bag". The ability to organise and manage oneself is an information literacy trait (Doyle 1994).

5.4.3 SCHOOL ENVIRONMENT: CONSTRAINTS AND SUPPORTS

While the information literacy education course participants are attending class and learning how information literacy should and could be mediated with learners, back in their respective schools they are faced with environmental, social and administrative realities. About 68% or 19 of the schools fall into the lowest quintiles one and two and teachers are faced with a host of challenges on a daily basis. Teachers mention having to teach children with foetal alcohol syndrome (FAS) and children who regularly repeat grades once per phase together with "normal" children (#1; #13; #20). The class sizes are huge: teacher #20 has 60 children in her Grade 4 class; teacher #13 has 50 children in her Grade 7 class. Discipline becomes a major issue in a multi-level class where the children are cognitively challenged (#1; #13). These schools do not have classroom assistants. Parents are not involved in their children's education (#1; #12) and the home environments lack stimulating print media. Most schools (about 92%) do not have functioning libraries (only two have functioning library facilities). More schools have computer laboratories

than school libraries but access is not automatic, as will be discussed later. At some schools that have neither, the teachers express concern about how they will manage to conduct research projects with their classes (#9; #10; #15; #16).

In summer, the Western Cape can be hot and stifling, at times in excess of 45 degrees Celsius (#1; #11; #14). Classrooms are generally overcrowded with little space to move (#13; #20). There is no air conditioning. The power supply from Eskom is erratic and computers that depend on electricity are rendered useless (#1).

Other challenges include learner absenteeism (#12; #27) and administrative challenges: for example, teachers being called to a meeting in the middle of lesson time (#12); representing the school or staff on different committees which impact on time (#12); summer sports codes which influence the academic programme (#6;#14; #18) and families with HIV/AIDS members who require constant care (#12).

Described above is the harsh socio-economic context of many a South African school in the lowest quintiles and echo the findings in the literature of the South African Human Rights Commission (2006). Despite these severe conditions under which teachers teach, there are those who are prepared to persevere and be change agents in their schools.

5.4.4 TEACHERS' APPROACHES TO RESEARCH PROJECTS BEFORE ATTENDING THE INFORMATION LITERACY EDUCATION COURSE

From the diaries it is clear that teachers were puzzled as to how information literacy fits into their role as future school librarians (#10). As the course progressed it became clearer that information literacy is one of the key connections between the classroom and the library, between the academic programme and achieving the outcomes, and between learner knowledge construction and lifelong learning.

From the literature (Zinn 1997; Hart 1999; Maepa & Mhinga 2003; Hart 2005; South Africa 2009c) it is apparent that, despite a new curriculum which advocates learning as a process, teachers had either not changed their beliefs or they were confounded by this new approach. For this reason the participating teachers were asked in the interview about their approaches to teaching research projects before attending the information literacy education course.

Interviewee #11 has been teaching for 35 years. She is also a school library advisor, employed in one of the districts and conducting in-service training with teachers. Her answer is frank:

> In my years (as a teacher and during pre-service teacher training) we did not do projects. We were always teaching and telling. We were not trained to teach projects. We were expected to give the children the knowledge.

Her superior, one of the district chief curriculum advisors (alias Mr Adams) interviewed, understood her role primarily as "showing teachers how they can use the library". She had not had any professional training, yet he expected her to carry out the function. As a school library advisor she demonstrates the confused messages about curriculum that pervaded the implementation of the RNCS.

How did teachers conduct research projects with their classes before the course? The most common response was that they would give the learners a topic and tell them to "do it". The next time they would see the project would be when it was time to hand in (#4; #17; #19; #20; # 21; #22; #23; #29). A Grade 4 teacher (#18) confessed that she simply skipped that form of assessment: "I did not know how to start, how to manage it, how to go from beginning to end". Grade 1 teacher (#24) did not have the confidence nor did she have a method for teaching her class how to conduct research projects:

> I would not think of giving them a research project. Normally, I would take everything and tell it to them like a story and then ask questions afterwards. I never asked them to go find out because maybe just two children in the class will come with a picture.

Sometimes teachers would refer learners to the public library without necessarily finding out for themselves if the library had material on the research topic (#4; #28). Teachers, especially at

high school level, would provide learners with an instruction sheet telling learners how to proceed. They would read through the instructions with the learners and ask for any questions needing clarification (#23; #25; #28) after which learners were left on their own. The assumption was that learners at high school level should be capable of independent research. If the teacher provides more scaffolding, it is equivalent to spoon feeding (Merchant & Hepworth 2002). The result all too often was that learners performed poorly on these projects because high school teachers assumed learners possessed information literacy skills. Grade 12 teacher (#23) confides:

> My expectations of learners were too high. I would tell them that they should be able to work independently because next year when they are at university, the lecturer just lectures and they have to find their way on their own. They will need to stand on their own two feet.

Four high school teachers (#21; #22; #23; #25) admit separately that they now realise learners did not understand the questions, did not know how to focus their assignments and were unfamiliar with the information search process. Grade 12 teacher (#22) explains: "we expected learners to perform to a standard or image that was in our minds". She clearly illustrates that she recognises the difference between the mental model of the teacher and the learner as identified in Pitts's 1994 study.

Finding appropriate information, at the right level, for large numbers of learners is a constant headache for learners, teachers and parents. Often, teachers themselves are at fault for not taking the trouble to find out if enough information sources are available, as Grade 4 teacher (#20) states:

> We (teachers) were negligent before. We ourselves did not do research. We would give them the task, say go to the library, and then we would see it at the end again. Usually the children just copied from each other. I never thought why learners cheated and plagiarized or how I could prevent it. I realise that sometimes you (the teacher) just give a mark.

Before attending the course, many teachers were clueless about plagiarism and how to prevent it. One Grade 3 teacher (#29) comments:

> I just gave them (the children) a topic and they had to do the research themselves. I didn't care where they got their information from. I just expected them to be able to do it. They did not do very well because they really didn't know what I wanted. Also, the questions I gave them, those who went to the computer, just copied and pasted everything. I would mark it because I didn't know it was wrong. I didn't know about plagiarism. Then I would just mark 'very good'.

There were those teachers who understood that information was at a premium and brought all the required information into the class themselves (#7; #27). They did this despite knowing that one of the curriculum outcomes is that learners should be able to find information. Locating information is also a fundamental feature of information literacy. Grade 4 teacher (#27) admits:

> I myself had never done research before. I can't remember before ever doing it and suddenly with the new curriculum these things were forced on us and we had to undertake it to the best of our abilities. The instructions (to the learners) were not explained too well. So I found the information myself. I did not break up the skills into manageable bites. To be honest, most of the work was my own research instead of the child's. I knew it was not the child's own work.

In schools where resources were scarce some teachers owned up to using worksheets, the "fill in the blanks" type of project (#6; #10). The worksheets would be based on content directly from the textbook. The learners simply found the sentences and missing words copying them directly from the textbook. Another version of this type of "research project" which interviewee #6 calls the "old method," was to ask questions orally based on the textbook.

What seemed to limit some teachers was their conception of an information source, referred to by Bruce (1997) as the *information sources* face. It did not matter whether teachers were Local Area Network (LAN) operators (#4; #18) and experienced in using computers or whether they were technophobes (#5; #13; #24) – they did not consider using any information other than

books for research projects. A Grade 7 teacher (#13) says she always felt limited by the information she was finding in books in the library but she dreaded the computer. She called the computer "the monster". A teacher already on the doorstep of retirement, she became an Internet convert once she cleared the obstacles in her mind. Another common mistake of teachers in the Grades 1-4 class is to think that learners that young cannot make sense of information on the Internet. The result was that some teachers conducted their projects for the information literacy education course assessment with older learners (#17; #18; #20). Some teachers may have been confident computer users (computer literate) but they were ill prepared for using the Internet with learners. The information literacy education course gave them the confidence and competence to use the Internet with their learners. The use of the Internet and ICTs will be further elaborated on under a separate heading.

There were two teachers (#14; #26) who were already providing scaffolds such as note-taking and monitoring information use in class but as soon as project work became homework, parents ended up doing the projects (#3).

To end this section the researcher would like to refer to a perceptive Grade 7 teacher (#1) from a small, rural hamlet. She had given her learners a project the previous year for which she received a "bad response". The topic was democracy so she focused on Martin Luther King. She made photocopies from the Internet and brought library books into the class. The learners rewrote everything verbatim whether in English or Afrikaans (their home language). She relates:

> I thought they (the learners) did this to spite me. I explained to them but they didn't get it. The outcome was not achieved. They don't know the USA. They don't know what apartheid is. I have to teach it. I gave them the assignment, gave them photocopies, to fill in the answers, but they could not do it. Even factual questions they could not find, for example, the birth date of Martin Luther King. If they found and matched a word, they wrote the entire paragraph.

Her realisation was that she had not given them anything to make their own (Shenton & Fitzgibbons 2010). Projects the learners had undertaken in the past were of the 'copy and paste +

pictures = good marks' variety: the more 'window dressing' (colour and pictures), the better the mark. How did the course, information literacy education, make a difference to teachers' understanding of how research projects should be taught? Clearly, most teachers in the past did not think it required any 'teaching' – it would happen by osmosis (Walker 2001).

5.4.5 TEACHING CHILDREN TO DO RESEARCH PROJECTS: CHANGES AFTER THE COURSE

One of the interview questions, posed to participating teachers, was: did the way you teach children research projects change after the course? Only a few (five) journal entries explicitly mention an awareness of the change in approach. In the rest of the journals one has to read between the lines. It became apparent in the interviews that teachers had not provided a full picture of implementing the project in class, either in their journals or in the assessment evidence for the course. Using several tools for data collection, the mixed methods approach, was a wise choice for this study.

During course attendance, participants had to draft a research project plan which included a topic statement; duration of the project; outcomes, values, attitudes, and skills; assessment: assessor, type of assessment, assessment intervals (timing); activities/lessons; and list of references/bibliography. They had never done a research project plan before and many had to revise their drafts a few times. The researcher was pleased when all the participants mentioned, in different ways, thorough planning of the project in terms of outcomes, resources, and just-in-time skills during the interviews. In the words of Grade 4 teacher (#10):

> You can't just give a child a page and say fill in the blanks. You yourself have to sit and plan thoroughly. Then they enjoy it tremendously. It's now no longer just the beginning and see the kids at the end any more, but also the in between, the process.

For high school teachers #21 and #22 it meant providing better explanations of project requirements including marks for the quality of answers, a bibliography and evidence of a wide variety of resources consulted.

The researcher was aware that most participants' schools (64% or 18) had no library, eight (29%) had a collection of library material in a room but unstaffed, and only two schools had a functioning library (the district resource centre is excluded from this count). As the course lecturer, the researcher dwelt upon the notion of information sources to unsettle teachers' complacency and sense of circumstantial victimhood. In the course, teachers debated their attitudes towards the public library (given their non-existent or underdeveloped school libraries) and strategies to build a warm, working relationship with this significant educational institution. Teachers were exposed to the collections available at the EDULIS library and the satellite resource centres. Block loans of library material can be borrowed from both the EDULIS and district resource centres for class projects. The final information source which teachers underutilised or bypassed completely was the Internet. Only four (14%) teachers had enough experience prior to the course to locate online information. Because of teachers' inexperience with the Internet, they were introduced to a database called *Weblinks Research* (www.weblinksresearch.co.za) which offered them access to annotated websites per school subject.

Part of the planning included finding relevant and enough resources for the class project. Those who had resource collections or functioning school libraries started there. For Grade 4 teacher #27 her collection was old and outdated so she looked to the EDULIS library. Unfortunately, because every Grade 4 teacher works on exactly the same curriculum content at the same time in the year, there were not many library resources left, especially in Afrikaans, the predominant language in the Western Cape. The public library nearest the school is considered out-of-bounds because of the gangsterism in the area. The computer laboratory had been undergoing changes so that was out of the question. Her last resort was to search the Internet on her home computer and print out information for her learners to use. Even using the Afrikaans website called

Mieliestronk (www.mieliestronk.com), she had to repackage the information for her class whose language levels she bemoans as weak.

For the first time and to the pleasant surprise of many public libraries, teachers contacted them informing them of their impending projects. Several teachers (#1; #5; #7; #9; #28) took the opportunity to accompany the learners to the public library and to work with the public librarian. Teacher #20 ordered a block loan from the nearest district resource centre. The most overwhelming response (15 or 52%) from teachers was to the use of the Internet. Their exposure to the World Wide Web during the course had broken through an invisible barrier to information access. Several teachers (#3; #17; #19; #20; #23; #24; #28; #29) located specific websites during their project planning and provided the URLs as Internet resources for the learners to use. One of the issues discussed during the course was teachers' throwaway line about finding information: "go to the library, use the Internet". Teachers were challenged to model good practice when it came to guiding research projects. This included providing bibliographies or reference lists and showing learners how to search for information in libraries and on the Internet.

A course assessment criterion for the teachers' implementation of the research project in the classroom was the advocacy of a wide range of information sources. Teachers had somehow limited themselves to think of information only in terms of books. During the course we discussed a wide array of information sources including people who are experts in their field, newspapers, DVDs, the web and many more. It became apparent that teachers were reluctant to use information sources which they could not 1) authenticate and judge the value of; 2) confidently compare; and 3) reference. It seems that teachers' own lack of information literacy affected that of learners.

The message that teachers received through OBE training about independent learning was equated with non-interference. Grade 3 teacher (#29) puts it this way:

> The way the WCED put OBE across to us - child-centred learning - you give the child work and then you fold your arms and wait. The problem with all teachers and projects is

that they are not offering enough guidance because when OBE came, it said it was child-centred. The child must do it him/herself. We did not know we must guide the learners.

The information literacy education course focused extensively on ways teachers can scaffold learners whilst involved with a research inquiry. Teachers learnt theoretically about Vygotsky's (1978) Zone of Proximal Development, why and how to motivate learners throughout the process of the research inquiry, teaching just-in-time information literacy skills and creating research projects that will engage learners and make them think rather than copy and paste answers. The teachers' responses in the interviews with regard to the guidance and support they gave the learners were reassuring. From Grade 1 to Grade 12, the teachers reported the difference that motivation and scaffolding made to learning outcomes of the research projects. On the next page is a table listing interviewees' references to ways that they guided and supported learners:

Table 6: Ways in which participants scaffolded learners' learning

Scaffolds/ Just-in-time lessons	**N=29**	**Teachers who explicitly mention**
Evaluating and locating websites	10	#3; #4; #13; #17; #19; #20; #23; #24; #28; #29
Bibliography and plagiarism	7	#9; #18; #19; #20; #22; #25; #28
Presenting, for example, reports; slide shows, and so on.	6	#3; #18;#19; #22; #23; #27
Motivation	6	#4; #9; #10; #14; #17; #21
Note-taking	5	#3; #4; #17; #27; #29
Brainstorming	5	#15; #16; #18; #19; #21
Mind mapping	5	#1; #13; #19; #27; #28
Identifying keywords	4	#18; #19; #25; #27
Dictionary skills	3	#4; #14; #25
Sorting, sifting and extracting pertinent information	3	#9; #18; #25

Writing paragraphs	3	#1; #19; #27
Interviewing	2	#17; #19
Draft assignments	2	#18; #21
Using Encarta and its translation facility	2	#4; #6
Dewey Decimal Classification and locating books	1	#25

Three foundation phase teachers, who were sceptical that young children who had just begun to read could be taught to enquire on their own, mention how surprised they were at their learners' successful undertaking of a guided project. Teacher #24, a self-confessed technophobe, took her Grade 1 class into the computer laboratory with the assistance of more capable Grade 7s. Several Grade 1s were familiar with the computer and when introduced to specific websites were totally fascinated. This was the teacher's "aha" moment. Teacher #12, a Grade 2 teacher, by allowing her learners to demonstrate tea-making, realised how she had been standing in the way of her learners' growth. By letting the learners do the task themselves, they remembered it better. Usually, she would simply have shown them and they would have watched, a passive activity. Teacher #7 threw the "ball into their (the learners') court" by guiding them in collecting information at the public library and in the computer laboratory. Usually she would provide all the information herself.

In the South African education literature there is much discussion about teachers' lack of subject knowledge due to their impoverished schooling during apartheid. What emerges from the interviews is that the children attending the interviewees' schools are from indigent homes and circumstances that do not develop cognition and knowledge in children. Teachers in the interviews relate how knowledge and concepts children are expected to have by a certain grade cannot be taken for granted. Teacher #1, a Grade 7 teacher, tells how, in describing a praying mantis's head as triangular shaped, she received blank stares as the children confided that they did not know what a triangle was. Grade 4 teacher #27 wanted her learners to write a report in which they had to use a table only to discover that they did not know the concept of columns and rows yet. Grade 11 teacher #25 asked her learners to write a comparative essay on two religions.

The researcher remarked that the topic seemed more appropriate for younger learners. Teacher #25 explained that the learners' English language and cognitive abilities were deficient.

Not all the participants understood and were persuaded to adopt a different approach to research projects. For teachers #15 and #16 aspects in the information literacy education course were lost in translation as they grappled with academic English, being Afrikaans speaking. Teacher #15, for example, misunderstood the research project assessment task and provided two months of lessons none of which included a guided inquiry project. Grade 4 teacher #2 dislikes the "chaos of group work" and her project was of the 'fill-in-the-blanks from the textbook' type. Upon inquiry she claimed that she had started teaching at a new school, a new grade and a new subject. In her new environment she felt it best to conform and not try a different approach. To her mind the learners could not accomplish the minimum of matching a column A to column B, never mind a research project.

There are deep-thinking teachers amongst the participants who are not convinced that matching columns or filling in the blanks from a textbook is contributing to lifelong learning. Teacher #1 believes that when children create mind maps and paragraphs in their own words, although it is difficult, it is more meaningful for the child. It is the child's own work. It's better than a thick project which is not the child's own.

5.4.6 ASSESSMENT OF PROJECTS

The journal entries provided insufficient depth of evidence about the assessment of the research projects. The interviews allowed the researcher to ask more pointed questions about assessment – whether or not it had changed and if so, how it had changed. Following up in an iterative way from the journal to the interview is a strength of qualitative research.

Emerging from the interviews was an unexpected revelation. Not only was the revelation unexpected, it was repeated fairly often in different interviews. When the participants described the teaching of research projects before the information literacy education course, a familiar

rejoinder was to give learners their assignments and then to wait for the finished product with little or no interventions in-between. The widespread practice was to focus on the end product. The researcher envisaged an assessment tool focusing on end products: for example, criteria for a good poster, an oral or a report and no other criteria. Astonishingly, the criteria teachers had used to assess projects before looked very similar to the information literacy rubrics which included, for example, abilities to locate information, extract pertinent information, create bibliographies, conduct interviews, and so on. The puzzling question for the researcher was how did teachers fill out the rubrics before if they only concentrated on the final presentation? The teachers' replies were quite enlightening.

Teachers described how they conducted research projects superficially before. Research projects were considered baffling because teachers had little idea of how to reach the outcomes. They were also considered tiresome because a minority of learners achieved success, many projects were simply copied from better learners and some learners failed to submit projects. Teachers said:

- In the past, only a few of the bright learners would succeed in completing but they would just copy and paste anyway. For me, as long as they looked for information, I would mark it very good (#29);
- We have guidelines and assessment criteria per subject but one does projects superficially (#13);
- Before, I did not concentrate on what the learners really learnt (#28);
- Before, I was giving myself a mark because I did all the work (#27);
- The rubrics I used were a mixture of existing (OBE) rubrics from courses I had attended and the information literacy education course (#20);
- I used the rubric that was given with the heritage task for Grade 12 (#19);
- I used the same rubric as before, but applied it more creatively (#21);
- I could better understand the existing rubrics e.g. getting learners to say things in their own words (#4).

What exactly did teachers undertake differently? A common thread ran through their replies. For the first time, they were teaching and assessing the process of learning through research projects. They used one of the information literacy models to assist them in the teaching of research projects to guide them towards understanding the assessment rubrics. In the words of the teachers:

- I used a rubric and the Big6™. I was looking at the journey through the project (#3);
- This course taught me to look at learning in depth. I assisted learners during the process (#13);
- Now the learners show understanding of what they are doing. By following the steps in the process, it has really helped. The learners welcomed this method. Before, they were frustrated because they had no clue of how to proceed (#28);
- In terms of assessment: before the memo was mainly of "filling in the gap". It changed. I had to create a rubric for paragraph writing. Rubrics offer a fair assessment. I assessed how they (the learners) managed to get to the end. Learning happens on the way. This I never assessed before. So not just end product (#1; #10);
- I showed learners the assessment rubric I was going to use together with the task so that they knew what to expect (#18; #20).

Another strong strand running through the discussion on assessment was the improved average learner performance. Now that teachers understood the research process better and could teach it more confidently, their expectations of their learners were also raised. Seeing their learners improve even moderately, won teachers over to the new approach to research projects:

- Now at least 85% of my learners accomplished the project (#29);
- More learners succeeded with their project this time, even the slow learners (#13);
- There was a difference in their results, even if it was not a big difference (#27);
- Because each step is assessed, children are getting better marks (#10);
- Twenty out of forty learners did well this time. This is an improvement (#4).

During the course we discussed how one research project can straddle more than one subject. Only two teachers saw the potential value of a cross-curricula project and the time it saved on assessment especially given the large classes (#5; #10).

Teachers raised other unique lines of reasoning during the interview discussion on assessment. Traditionally trained teachers like to keep control of their learners. A teacher in her 60s (#13), who has been teaching for many years, has found a way out of the teacher-centred class by using mind maps. In her view the mind map teaches learners to think. The class first discusses topics in groups before each group has a turn to report back. "The mind map helps boost learners' self-esteem."

Teacher #28 was the only participant who explicitly mentioned reflection as a key to learners' improvement. She used a reflection sheet because she wanted to know what the child really learned through the task. 'I think it is important that learners must reflect and point out their own strengths and weaknesses'.

Finally, there were teachers (#19; #20) whose learners' projects stood out and who were praised by the district subject advisors who came to moderate the projects. The subject advisors invited the teachers to share their 'new' method with the school cluster groups.

Not all the teachers approached the assessment differently. Grade 2 teachers #15 and #16 favoured the use of self-assessment and peer assessment in the form of emoticons and generally too many 'social' criteria such as 'did you all work well together' which they agreed after discussion was not always effective. When they attended the NPDE the previous year they found that peer assessment was not always accurate or tended to be biased. Teacher #14 had made no changes to her approach because she 'usually gives learners worksheets'. Significantly, a non-governmental organisation, READ South Africa, course the previous year encouraged more free writing and the sharing of writing through displays outside the classroom.

5.4.7 WCED IN-SERVICE TRAINING

The average age of the teachers in the study being 46 years implied that most were trained as new teachers before OBE came into being in 1997. New forms of assessment such as research projects therefore required in-service training. The researcher asked the teachers whether the WCED had provided any training in how to teach children research projects. All the teachers replied with an overwhelming "no".

Teacher #1 has never attended OBE training and depends on the head of department to cascade the training to her. The cascade model has not worked at her school, which echoes the research literature findings (Taylor 2007). She reports that her head of department has not spoken about research projects after any training. Teachers teach the same way they taught 30 years ago. Posters and adverts are lovely and colourful and marked using a rubric, but there is no deep learning. Teacher #17 has a similar view stating that approaches to projects at her school are staid and have not changed with OBE.

Teacher #27 relates that in natural science in-service training they covered research but were not actually taught a method. 'It (the training) was quite elementary, superficially done, not as in depth as the course with you. After your course I can see how much better the learners are doing'. Teacher #10 concurs that the WCED training was inadequate:

> I think that the trainers themselves did not know because now that I've done the information literacy education course, I know how to help the children with research projects. It's going much better, really. All I can remember about the WCED training is that there were a lot of books handed out, colour-coded for each learning area. But nobody taught us a method for research assignments.

The WCED does offer training. They offer lots of workshops but they never concentrate on research projects. They trained teachers in how to use the computer but not the Internet (#15; #16). They trained teachers to create rubrics but not how to teach aspects within the rubrics such

as note-taking, mind mapping or synthesizing (#3; #15; #16). It is assumed that teachers know how to teach research projects (#13; #15; #16; #18; #29).

Subsequent to the information literacy education course, a few teachers attended in-service training courses in mathematics (#4) and WebQuests (#1; #2; #25). The mathematics training included a problem-solving method which the teacher identified as familiar and similar to the information literacy model of Eisenberg and Berkowitz (Big6™) (1990). The teachers who attended the WebQuest training felt at a distinct advantage because the course taught them how to set up research assignments on the web. The teachers could apply what they had learned on the information literacy education course. For example, they used an information literacy model to create the research assignment, they could download websites, they knew how to hyperlink, they had knowledge of specific educational websites and they knew how to assess a project.

Although none of the teachers on the information literacy education course teaches computer applications technology (CAT), teacher #28 makes an interesting observation at her school that the "CAT teacher does projects the proper way". As mentioned in the literature review, the White paper on e-Education (South Africa 2004) uses the language of information literacy in its definition of e-education. The CAT curriculum has information management as one of its six topics (South Africa 2011a). Information management involves defining a task, using a plan to solve a problem or address a task, identifying sources of information, data handling, ethical use of information, and the processing of data into information that leads to knowledge and decision-making. The details under the information management heading resemble information literacy to the core. The implication is that information literacy is identifiable only with computers and information technology. The department of basic education has made an inextricable and explicit link between computers/ICTs and information literacy. Nowhere else in the curriculum is it as overt. It is therefore not surprising that information literacy as an intellectual framework unconfined by any set of technologies has not penetrated other school subjects.

5.4.8 THE INTERNET

One of the information literacy education course assignments was an annotated list of websites for each learning area/subject. As the majority of schools have computer laboratories, and as the future school librarians in their respective schools, teachers on the course were tasked with finding five websites for each of the eight school subjects/learning areas. The websites were to be annotated and linked to a school phase. The teachers had already completed four courses towards the ACE school librarianship which included a course on information sources and reference services. The researcher assumed that all teachers were computer literate as the Khanya (Western Cape 2011a) ICT project has been offering training in basic computer literacy since its inception in 2001. The other assumption was that teachers, who had successfully completed the *information sources* course, had carried out Internet searching and so should have basic Internet skills. Teachers were taught to set up a web-based email address using Gmail or Yahoo! during the information literacy education course.

Observation of teachers on the first Internet search session of the course quickly dispelled the researcher's assumptions. The vast majority of teachers had not developed basic computer literacy or basic Internet search skills. They could not open and save a document, copy and paste from the web, work between tabs or windows, or create a table. For this reason teachers were introduced to the *Weblinks Research* database which offered links to selected websites per subject per grade, and included Afrikaans websites, Afrikaans being the predominant language in the Western Cape.

The question about the Internet to the teachers in the interviews was to find out if they had continued to use the Internet after the course, how they were using it for personal use, if they thought it was important for learners to be conversant and how they were using it in the classroom.

Teachers were using the Internet in a variety of ways for personal use. See the table below:

Table 7: Personal use of the Internet

What are teachers doing online?	**n=29**	**Who explicitly mentions these tools and services**
Finding personal information such as health, sport, devotions	28	Only #12 was not using the Internet
Emailing	18	#1; #4; #10; #11; #13; #16;#17; #18;#19;#21; #22; #23;#24; #25; #26;#27; #28; #29
E-filing tax returns	14	#3; #4; #9; #11; #14; #17; #18; #19; #22; #21; #23; #24; #25; #29
Facebook	12	#4; #11; #13; #14; #17; #18; #21; #22; #25; #27; #28; #29
Blogging and Wikis	5	#4; #13; #14; #19; #22
Internet banking	4	#3; #11; #21; #29
Checking the WCED website for: curriculum news; Grade 12 forms; jobs bulletin; exam papers and memos	3	#16; #19; #22
Online purchases: theatre tickets, airline tickets	3	#11; #24; #27
Reading the news	2	#4; #17
Check personal credit report	1	#4
Other social media: Twitter; YouTube	1	#29
Listservs	1	#19
Online storage of documents	1	#27

The teachers' rate of Internet adoption within a year is phenomenal. The final course in the ACE School Librarianship is *ICT Applications in School Libraries.* By the time the teachers were interviewed, some had completed the last course which included leveraging social media applications in school libraries. Besides using the Internet for finding information, communication and social networking, teachers were also using it for e-commerce and

education. Two unusual uses for the Internet stand out: the one is establishing your credit rating, the other storing documents in cyberspace. It seems that several teachers at interviewee #4's school bought on credit, defaulted on their repayments, and were now trying to clear their blacklisted names. This teacher was lending his colleagues a helping hand. The issue of blacklisted teachers is raised later under the heading: interview findings with chief curriculum advisors when the discussion centres on the Department of Education's Laptop project (Davids 2011). The second unusual feature, storing documents in cyberspace, was prompted by teacher #27's experience of technology failure. This 51 year old teacher initially struggled with technology but through sheer perseverance and hard work became one of the top achievers in the *ICT Applications* course. Now, she says, "I can't live without the Internet". Several teachers were spurred on to buy their own PCs and laptops and USB modems for wireless Internet access (#9; #13; #20; #28; #29).

The only teacher (#12) who is not using the Internet is a Grade 2 teacher who does not have a computer at home. She says that at her school Internet access is restricted because teachers have abused the privilege.

Now that most teachers are comfortable using the Internet for personal use, what is their attitude to learners' use of the Internet? The teachers responded with a resounding "very important". Teachers themselves use the Internet as a starting point for lesson planning now. Through the course they realised that, especially at primary school level, it is best to provide learners with URLs of specific websites. This is part of the teacher's preparation. Older and inexperienced learners need to be taught how to search for information, how to evaluate websites, why information on the web cannot be taken at face value and how to use information from the web in an ethical way. One teacher (#21) uses Facebook to link to websites dealing with the English prescribed books. Teachers in the interviews speak about learners' fascination with the Internet and how they are more willing to take risks with the new technologies than teachers.

Teachers do voice their frustration at restricted access to the computer laboratories and the Internet (#22). At some primary schools the arrangement is for class teachers to take learners into the computer laboratory for literacy and numeracy in the foundation phase and for language and mathematics in the subsequent phases (#14; #26). At high school the mathematics, science, language and CAT classes are given preference. If you teach any other subject, you need to make a special arrangement and this can cause frustration when booking systems are not adhered to (#9; #21; #22; #25). It helps to be on good terms with the computer administrator, or at high school the CAT teacher (#23). Internet access is curtailed at some schools (#4; #20; #26) while at others there is more freedom (#8; #17; #24). In the rural areas teachers complain about slow Internet access (#1; #20). Where Internet access is curtailed, teachers print information for learners to use (#1; #2; #15; #16). Where schools allow learners to access the Internet, it must be done under supervision (#28).

Two teachers mention that they will soon be writing an e-skills examination set by the Khanya ICT organisation. They are both confident that they will sail through the exam.

5.4.9 FEELINGS, THOUGHTS AND ACTIONS

The researcher wanted to ascertain from the participating teachers in the study what their feelings, thoughts and actions were at the start of the project implementation, during the project implementation and at the end of the project.

Most teachers expressed uncertainty and anxiety when faced with the task of teaching their learners how to undertake a research project. The bases for their anxieties were varied. There were those who were not absolutely sure that they understood the approach well enough to teach it. They doubted their own knowledge constructs. Teacher #29 says: “During the class project, I was unsure and worried. I was not sure what you really wanted. Even when my children were excited, I was not sure whether this was what you wanted”. Teacher #25 admits:

> I was a bit apprehensive because I did not know what to expect from the learners. In actual fact, I did not know what to expect from myself because, although I was empowered, not having done things this way before, I thought, what am I going to do right here?

Teacher #26 replies: "Initially I was scared because it was new, different and I'm uncertain".

Many uncertainties stemmed from implementing a new approach not familiar to colleagues at school and running the risk of ridicule if the approach failed. The education system is not one for encouraging risk taking (Fullan 1993). Some teachers who teach lower grades, for example the foundation phase, lacked the self-confidence and confidence in their learners to undertake the project at that phase level. Teacher #18 says:

> I was a nervous wreck in the beginning. I was scared. How must I do this? I read through the course notes for the method. It was my guide. It helped to refresh my memory. I started the project with Grade 4. I stopped. I was confused. I was not confident to teach Grade 4 Internet skills. I started with Grade 8. At least Grade 8 learners knew how to work a mouse, and so on. I was not as confident with the computer yet.

The biggest worries revolved around whether or not their learners would take to an approach not endorsed or reinforced by the other teachers. Teacher #24 says:

> I have been teaching Grade 1 for 25 years. I was in a rut. I had nightmares about the information literacy education course. Every day I delayed starting the project in my class. I was reluctant because, although I had it down on paper, I feared what I was going to get back from the learners. In my mind these children are not going to get it and then it is going to be a flop.

Teacher #7 mentions: “In the beginning I was apprehensive because I thought that the children could never do this. The children don’t get support from the home/ parents”. Teacher #4 explains:

> I was not sure in the beginning whether learners would understand the new approach. I was quite anxious. I prepared well for the project. I wondered whether learners are going to be committed to the project. I was but a drop in the ocean. No other educators were using this approach.

For some teachers external factors such as the start of the new school year and additional administrative duties or being told on the first day of school to teach a new subject to a new grade affected their performance. Teacher #9 explains her predicament:

> I was not really happy in the beginning. The year before I was a senior phase teacher (Grades 7-9) and when I returned to school I was made a Grade 4 teacher of mathematics, a new learning area for me. I really did not know where to start.

For teacher #17 the beginning of the year is a stressful time. The WCED the district officers arrives within the first week of school to collect data regarding baseline figures. Because of administrative duties, she has lost the first two weeks of school. She could not orientate herself. She first had to do her administrative job but the journal kept her on track.

There were teachers (#19; 21; #28), all at high schools, who expressed optimism right from the beginning because they knew that learners could only improve with the new approach.

Teacher #1 experienced a dialectical tension. She was conflicted about doing a project simply for a course mark or to trying something radically different or new. She says:

> At the start it was difficult. I was in a quandary. Do I do a project just for the lecturer or for me and the learners? It’s easy to do window dressing. I wanted a project I could use in class. It was frustrating. I became paralysed. I call this analysis paralysis.

How did the participants move beyond their initial uncertainties and anxieties? What actions did they take to move forward and did they resolve their uncertainties or were they disappointed? Teachers describe how they hooked the learners by thorough planning, by motivating and scaffolding learners from start to finish and being flexible – listening to the learners. Teacher #29 says:

> You (the lecturer/researcher) would teach us scaffolding in lectures and I would try it with my class. As time went on and my learners were responding well, for example, wanting to go to the library because they found something interesting even when it was not their time and they would come after school. Their responses developed my confidence.

Teacher #13 confides how she wins learners over: "I ask them their opinions. I never say 'this is what you are going to do'. I motivate my learners. I get them to own the project". Teacher #28 felt confident from the beginning because the just-in-time skills lessons (in the course) helped her to teach the learners step by step, systematically. Teacher #24 relates: "I was surprised at how much they know already, and what they were capable of doing. Although I had Grade 7 learners assisting the Grade 1s in the laboratory, I insisted that the Grade 1s search and I was surprised. That gave me confidence".

For some teachers the scaffolding helped overcome existing constraints. Teacher #27 relates:

> Things did not work as quickly as I expected it to because of the language issue. That's a barrier we need to overcome. During the project I was feeling less frustrated. Previously, I was always on my nerves because of the time I need to expend. But the process now goes much faster. I learnt that you break up the skills into smaller units e.g. note-taking, you break down into first finding the main idea and tackle systematically. I scaffolded them (the learners) all the way and that is why they succeeded

High school teachers appeared to have fewer initial anxieties. Interviewee #21, a Grade 12 teacher mentions:

> I took a gamble. I wanted to test myself - see how much value I could transfer to my class from the course. My confidence level was high. I was worried initially about the learners, but they reacted well. I was confident because I was ready. It's (the process approach) now stuck to my brain.

Interviewee #22, also a Grade 12 teacher relates: "I was confident and the learners were excited to evaluate information on the Internet. Now I was organised and I had information in place. If I don't know how to guide learners, it will be frustrating. If a teacher knows what to do, it is no problem".

Teacher #1 did not want her learners to become bored so she constantly repackaged the information so that her learners could understand. For example, with the bibliography, she decided they simply had to provide the surname, name and title of the source. Expecting learners to do everything perfectly for their very first research project was too much. She says: "I moved from frustration because I was flexible".

Naturally, the results or outcomes of the new approach will play a role in determining whether or not the approach will be continued. Interviewees expressed their success with the new approach in different ways: Learners' enjoyment of their research projects (#1; #3; #13; #29), trying the approach with subsequent assignments (#4); improved marks (#4; #19; #23; #29), and compliments from colleagues (#4). For some teachers, teaching the research assignment for the first time and for a university course mark was nerve-wracking. Some chose to teach older learners (#18; #20) because of the lack of confidence in their own abilities. Once they had gained confidence, they subsequently used the same approach with their own classes with equal and greater success. Interviewee #18 recalls:

> I conducted a second project with my Grade 4 class on model cars. I took extracts from the Internet to share with the class. The children surprised me. One boy showed us how to make wheels of a car from paper. I learned from the learner! The children were excited. In retrospect, I could have learned with my learners. The little ones (Grade 4s) are more eager.

For teacher #4, using this approach the first time was a struggle, but by the 3rd and 4th terms these learners were approaching him with (research projects) in other learning areas. In the end, he was happier because they had learned something new. They were coming to him with other projects as they saw there is an easier way to work with projects.

Learners were enjoying the research projects. Projects were usually considered a bind. In some instances parents used to do their children's projects (#3; #26). Using the new approach teachers felt more motivated and confident about tackling projects in future (#13; #24). Interviewees speak of 'doing learners an injustice' before (#29), 'underestimating learners' (#13). Learners produced wonderful projects, their own work not their teachers' or their parents', through guidance and motivation. Learners were proud of their projects, what they had accomplished (#13; #17. Teacher #20 was satisfied because new skills were taught. Teacher #19's research project marks were very good and the district subject advisor was impressed with the learners' work.

Besides the improvements in marks and the attitudes of the learners, teacher #1 relates two incidents from which she deduced that deep learning had occurred amongst her group of learners. The class project was human evolution. She discloses:

> About two months after the project a creationist came to our school to give a talk about dinosaurs and people living together. He had cartoons of people and dinosaurs; the earth was only 10 000 years old according to him. I was furious. But the children themselves said "Daai oom het gejok" (that uncle lied). We had a discussion in which we compared the two versions. Why it is important to learn new things. The message was, no matter what they remembered after matriculation, they have been taught to think for themselves. The children could figure out that even a person with a PhD can talk nonsense. They weighed up the different points of view and the children in their opinion decided on what was the truth.

> Another example which showed me that the children had learned a lot: a girl found a fossil on the school grounds and identified it herself as between 10-100 000 years old – a Middle Stone Age tool. She looked at how it was made and could tell how it functioned.

Although most participants felt satisfied with their learners' and their own progress in the end, there were those for whom the implementation of the research project was a burden and they were glad it was over (#10; #14; #26). Not all the teachers overcame their initial uncertainties. Teacher #2, teaching at a new school remained frustrated to the end and felt she had not achieved her outcome. She identified her weakness as not having planned well. Teacher #25 was also disappointed with her learners who did not achieve writing a comparative essay. She claims it is their poor language and reading ability. Two teachers, one of whom the researcher rates as having successfully adopted and integrated information literacy in the curriculum (#29), and one who had adopted but not fully integrated information literacy (#9), were still doubtful at the end and were pleasantly surprised by their course results.

Interviewees stated that the course had given them confidence but of all the ACE school librarianship modules, this course was the most challenging. They felt strongly that the course would benefit all teachers, not only trainee school librarians. The course had provided tangible results in the classroom (#10; #21; #23). The teachers had not only learned new skills, their attitudes had changed. If they had written an exam on information literacy education, they would have forgotten everything. Because they had implemented the ideas practically in class, it would stay with them forever. In effect, the teachers were conducting action research in their classes.

5.4.10 CONSTRAINTS TO CONTINUED IMPLEMENTATION OF THE NEW APPROACH

As with many new approaches, the researcher wanted to find out whether teachers would continue with an information literacy approach to teaching inquiry-based projects. In particular,

teachers needed to identify constraints to continued implementation. As expected, the responses were wide and varied. The constraints are listed below in Table eight:

Table 8: Constraints to the new approach

Constraining Item	**N=29**	**Teacher #**
Large classes (45+)	11	#4; #5; #6; #7; #8; #9; #10; #11; #20; #25;#26
No functioning school library	10	#2; #8; #9; #15; #16; #17; #19; #20; #21; #23
Low literacy levels	5	#3; #4; #15; #16; #27
Projects take time	3	#5; #14; #25;
Work schedule is too tight/ curriculum demands	3	#5; #11; #15; #16
Poor computer skills	2	#3; #4
Poor time management/ lack of effort	2	#1; #11
Inaccessibility to Internet	2	#11; #21
Poor communications between schools and public libraries	2	#8; #9
Inclusive education without classroom assistants	2	#1; #13;
Teachers not information literate	2	#1; #24
School milieu	2	#2; #17
Social problems/ conditions	2	#1; #5
Limited availability of resources in languages other than English	1	#3
Teaching periods too short 50mins	1	#4
Cost of Internet access	1	#4
Poor Internet access	1	#11

Poor Internet skills of teachers	1	#11
Lack of training of all teachers in information literacy	1	#24

The biggest obstacles to continued implementation of information literacy seems to be the large class sizes (45+ learners in a class), a lack of functioning school libraries to provide resources and the low literacy levels of learners. Most of the schools (68%) in quintiles one and two have received a starter collection of library material (QuidsUp initiative). In the case of interviewee #2, the school's QuidsUp collection remains in boxes along with the rest of the library, packed up and housed in a storeroom. The school now has two qualified school librarians (interviewee #2 and another teacher) but does not see fit to use their expertise. The resources are locked away and the children cannot benefit from them.

The lack of a working relationship between schools and public libraries is of concern to some teachers. Teachers remark on the negative attitude some public librarians have towards school children (#2; #8). No doubt the other side of the coin is the perception that teachers are oblivious to the unreasonable demands they place on public libraries when they send learners without proper liaison/ negotiation as witnessed in the literature (Hart 2005; Maepa & Mhinga 2003).

Three teachers recognise that research projects take time if implemented in a guided way. The prescriptive nature of the curriculum (the work schedules as set by the WCED) works against an inquiry-based approach. Limiting factors related to ICTs are: learners' poor computer skills, curtailed access to the Internet, the prohibitive expense of Internet access, the slow Internet connectivity in rural areas and the inadequate Internet skills of teachers. More barriers to success concern the social and economic environment of the school, especially the poverty levels and children with learning disabilities such as FAS.

While most (86%) interviewees identified at least one factor which would influence their continued new approach to research projects, some (14%) were steadfast in their conviction that nothing could stand in their way (#12; #18; #28; #29). It is difficult to interpret their resolve as it may be influenced by the presence of the interviewer or it may be their candid opinion.

5.4.11 TRANSFER OF INFORMATION LITERACY EXPERIENCES

In asking interviewees if they had transferred their information literacy experiences in any way or influenced their colleagues with their new ideas from the course, 15 interviewees (52%) made positive responses. Many interviewees prefaced their responses with accounts about colleagues not prepared to learn new ways of teaching, especially if they have been teaching for many years, as well as professional jealousy and nastiness.

Interviewees have become the "go to" people, the information intermediaries in their schools in the sense that colleagues approach them if they need to find information online (#5; #13; #15; #16; #22: # 24; #27). Interviewee #29 shares a humorous aside: "They call me professor at school because I help them to find appropriate websites. I have set up an email account for each teacher". Teacher #25 has taught her colleagues to set up blogs, upload photographs and she has posted useful websites for each subject in the Khanya laboratory.

Some interviewees influenced colleagues to try the new approach. Interviewee #3 introduced the Big6™ to a colleague who likes to conduct class projects. Teacher #29, who has recently been appointed to deputy principal at her school, reveals another level of profound influence on her colleagues. A social science teacher setting a research project wanted to prevent learners from copying and pasting. Teachers were coming to her because they wanted to pose questions differently to learners. Together they engineered an engaging topic which challenged learners and to which learners responded very well. She says that her colleagues are won over when they see the success with the children. Other teachers echo this sentiment (#5; #27). In the case of

teacher #5, her colleagues who were recruited to assist with setting up the school library, serendipitously discovered "all the nice books and many were surprised at the number of different books. This gave them ideas for research topics. The library gave them the realisation that things can happen outside the classroom".

Teacher #24 has had some success with her school principal who teaches Grade 7 social science. He despaired when his class did not react positively to the 'traditional' approach to projects – namely he gave them a topic and told them to 'do it'. Teacher #24 explained to him the information search approach and he admitted that the entire staff needed to be taught the method.

Teachers #20, #18, and #19 have shared their learning experiences with their respective district subject advisors who responded well and encouraged them to facilitate cluster workshops to share with other teachers.

Once teacher #18 had completed her 'pilot' research projects with a Grade 8 class, she gained enough confidence to mediate three other projects with her own Grade 4 class. Transfer is recognisable in interviewees #1, #2, and #25s identifying the advantage they had over other teachers in the WebQuest courses in which teachers had to set up a research project on the web. Transfer is also recognizable in successive teachers' comments that learners are good at research projects (#27; #29).

For some teachers the shift has emboldened them. Teacher #21 states that the course has made him a more confident teacher. He was personally enriched. He has taken on a leadership role, for example, in initiating a staff development exercise in which all his colleagues went to the EDULIS library where they were given a presentation about the library and its services and all his colleagues joined as members.

5.4.12 CONCLUSION

Changing teachers' approaches to teaching and learning is a fundamental change, a transformation. It is not easy to persuade teachers to transform their teaching practice in a school environment which is not supportive. For these individual teachers from different schools who attended the information literacy education course and tried to change their practice, to whatever extent of success, they need to be applauded. In the interviews, they remark on a "changed mindset" of how they now monitored the process of learning through project work. Teachers understood that the learning happening through research projects encouraged independent learning, lifelong learning and learning that was different from direct teaching. It was not to be undervalued.

5.5 FINDINGS FROM THE INTERVIEWS WITH DISTRICT CHIEF CURRICULUM ADVISORS IN THE WESTERN CAPE

The findings from the final set of data, the interviews with the chief curriculum advisors, are presented below. The data collected from the advisors assisted in answering five of the seven research questions: How do teachers understand information literacy and information literacy education? How do teachers make their information literacy explicit in the classroom? To what extent is information literacy assessed in the curriculum? At what level are teachers' web knowledge and skills? What are the differences and similarities between teachers' and librarians' opinions of information literacy? The interviews with the advisors offered the most compelling data related to teachers' own information literacy and web skills

5.5.1 INTRODUCTION

The decision to interview the curriculum chiefs in each education district was based on the researcher's prior knowledge of teacher training, before the new OBE curriculum was introduced in South Africa, in which teachers were not exposed to resource-based learning. The corollary, therefore, should be that teachers are trained during in-service teacher training. The curriculum

chiefs of each district are responsible for the development and implementation of in-service training and would therefore be able to offer significant insight into teachers' grasp of resource-based learning and information literacy.

The researcher contacted each district chief curriculum advisor by email. When some did not respond, follow-up telephone calls were made. In the end, six of the eight curriculum heads were interviewed, three are stationed in rural areas (Mr Adams, Mr Davids and Mr Edwards) and three in urban areas (Mr Brown, Mr Cohen and Mr Fraser). Aliases have been used to protect their identity as far as possible. In a covering letter as well as in the face-to-face session, the study aims were explained. The teachers in the study are spread across all the educational districts.

District curriculum heads were provided with (see Appendix 6) a definition of information literacy taken from the Ministry of Education and National Library of New Zealand (2002) which states that 'information literacy is a broad concept that embraces information skills, ICT skills, and library skills along with problem-solving and cognitive skills, and the attitudes and values, that enable learners to function effectively in the information landscape'.

The researcher referred to South Africa as a signatory to UNESCO's (2007) *Information for All Programme* which endorses information literacy. It is recognised worldwide that knowledge societies require citizens to be able to access and use information, increasingly in digital format, to make informed decisions, solve problems, weigh evidence or generate new knowledge.

Each individual interview lasted approximately one hour. The interviews were conducted in English as all the chief curriculum advisors are suitably bilingual. The interviews were recorded with permission and the recordings transcribed.

The broad interview topics covered the following issues:

- Teachers' information literacy – what measures are in place to support, develop and assess teachers' own information literacy?
- In-service training opportunities to impart a method for teaching information literacy;
- Collaboration between teachers and resource providers such as public libraries;
- Preparation of Further Education and Training (Grades 10-12) learners for tertiary education, in particular their research abilities; and
- School principals and their role in fostering information literacy.

5.5.2 RATING TEACHERS' INFORMATION LITERACY

The district chief curriculum advisors were asked to provide a ballpark or general idea of teachers' own information literacy in their districts. The researcher accepted that these answers were not based on actual research but rather on anecdotal experience. One of the main sources for their anecdotes is research assignments which teachers set and which curriculum advisors, under the authority of the district chief curriculum advisor, moderate. Curriculum advisors gain further experience of teachers' information literacy by observing teachers teach in class during school visits, via workshops and by their use of resources in libraries and on the Internet.

A majority of responses (four of the six) from the chief curriculum advisors is that (in their considered opinion) the average teacher cannot be deemed information literate.

As one chief advisor claims:

> In general, I don't think that the teachers in this district, and probably other districts as well, have competencies in using information because, if I look at reports coming in from the curriculum advisors in different subjects in terms of research and how to structure a task for the learners, I don't think that teachers understand the whole process of investigations, of doing research, of using resource material.

Several chief advisors respond referring to computers and the Internet in particular when asked about teachers' own information literacy. In the Western Cape, 91% of schools have a computer laboratory but not all schools enjoy access to the Internet (Western Cape 2011b). Schools have to pay for their own Internet access with the result that schools in lower quintiles (poorer schools) do not enjoy as much freedom of access to the Internet as do schools in the higher quintiles. The Khanya ICT project which started in 2001, rolled out computers to schools first for administrative purposes, followed by the establishment of computer laboratories in all schools for curriculum delivery, especially for literacy and numeracy in the primary schools and mathematics and science in the high schools. As stated on their website: "By 2012 all schools will be using technology to support and deliver curriculum, and all learners will enjoy this enhanced learning environment". The project purports to "extend learners" through amongst others, "resource-based learning" (Western Cape 2011a). The latter is in relation to schools which have Internet access. It is significant that part of their training of teachers includes use of the Internet. Clarke's master's thesis (2010: 75) concluded that the promised development of teachers by Khanya did not receive the level of training required for curriculum integration. Basic computer literacy does not suffice in training teachers to use ICTs for teaching and learning. In fact, the goal of the Khanya ICT project was to focus on learner development, the expectation being that teachers should follow their own personal professional development.

The chief advisors are of the opinion it is imperative in this day and age of computers and the knowledge society that teachers should be comfortable in all information environments be they print or electronic. They are all too aware that teachers are "behind" when it comes to technology. In spite of the proximity to ICTs, teachers are not using it for a number of reasons. Mr Cohen lays the blame at the door of poor school management.

> In working class schools, very little is done. Ninety five to ninety eight percent (95-98%) of high schools in this district have Khanya laboratories. Yet, how many are functional? How many are used? They tend to be locked away because principals are afraid they will be damaged. Five to ten percent (5-10%) of laboratories are underutilised. Another 5% have computer problems and don't have the money to fix them especially in township

schools. Often the laboratories are not properly managed.

Mr Fraser is of the opinion that teachers have a lackadaisical attitude:

> Most (of this district's) schools do (have access to the Internet in their computer laboratories). But, whether they use it is another point... We have interactive white boards in most of the more advantaged schools (higher quintiles) and in all of Khanya laboratories. That is a medium they can use for their teaching via accessing information on the Internet. But, 80% of them do not use it.
>
> It has a lot to do with their "couldn't care attitude", a lot to do with them not having access at home. So they can only do research when they get to school. If they are not involved in a cluster or meeting or workshop, then it's their free time (the end of the school day). But do they make use of that free time to do research? Not in 80% of cases. I would say, no!

Teachers are not painted in a positive light by the chief advisors in terms of their own information literacy. Teachers do not seem to be aware of research protocol. For example, they easily accept assignments with no regard for acknowledging sources. Mr Davids bases his perception of teachers' information literacy on the moderation of assignments: "if you moderate the different subjects and tasks from learners, you would see that they (teachers) accept, for example, basic plagiarism, just taking stuff off the Internet, just quoting from a book".

There is little appreciation of the time, effort and depth of learning that should go into creating a research assignment and the concomitant assessment of the assignment. Another says: "We are aware that teachers are not reading the content of projects, just giving high marks if it (the assignment) looks neat and pretty".

Mr Edwards answers the question about teachers' information literacy in a very careful, considered and thoughtful way. He points to the opportunities the curriculum offers for implementing information literacy in the classroom. He shows the researcher a few project instruction sheets for economics, geography and history. They show immense promise in

developing information literacy in learners. At the same time, the advisor agrees with the researcher that teachers seem to have difficulty in supporting and providing scaffolding for learners in the process of the project. The average teacher is not confident of him/herself in the research process. He relents by saying: "if teachers have not studied how to do research, how can you teach this"?

5.5.3 IN-SERVICE TRAINING AND A METHOD FOR TEACHING RESEARCH PROJECTS

The chief advisors are cognisant of teachers' pre-service training, the vast majority of whom undertook their training at teachers' colleges before the new curriculum was instituted. The training was traditionally textbook based favouring rote-learning. Using libraries for information beyond the textbook was an alien phenomenon. The new curriculum, introduced into schools in 1997 and revised in 2004, promoted independent learning, learning from resources other than textbooks alone, required access to a well-functioning library for the resource hungry curriculum. At the same time the new curriculum was being introduced, teacher rationalisation was occurring. Teacher rationalisation was the government's response to a more equitable distribution of teachers (Jansen & Taylor 2003: 2-3). One of the consequences of the restructuring was the new dispensation for schools in which a specified ratio of learners to educators dictated how many teachers a school was granted. This ratio excluded specialist teachers such as physical education teachers, guidance councillors, school librarians and even the principal. In the Western Cape, the result was the shutting of school libraries and the redeployment of school librarians as classroom teachers. Only schools in the higher quintiles could afford to employ school librarians which were positions over and above their quota of teachers. They could do this by exacting high school fees from their wealthier parent base (Zinn 2006). With nobody assigned to run the school library in most schools, the libraries deteriorated. Effectively, a resource-based curriculum was introduced when specialised posts for school librarians were being eradicated. A paradoxical state of affairs indeed!

To change the way teachers have been teaching for decades, in-service training workshops,

usually conducted by provincial subject/curriculum advisors, were rolled out throughout the provinces. The new curriculum was introduced using a cascade model of transfer. The cascade model embodied the idea that the new curriculum could be introduced to representative teachers from schools who would then return to school to 'cascade' the learning to other colleagues. Both the new curriculum and the cascade model were subsequently discarded as neither was working (Jansen & Taylor 2003: 49). The revised national curriculum statement (NCS) was introduced in 2003 to every teacher, a mammoth logistical undertaking in any one province. In the Western Cape, for example, there were 31 870 teachers in public ordinary schools in 2009 (South Africa 2010). The revised curriculum offered opportunities for the teaching of information literacy. As Mr Edwards states:

> If we look at the critical outcomes, it definitely says there (he takes out the 12 critical outcomes) that learners should have
>
> - Research skills
> - Problem solving skills
> - Communication skills
> - Technological literacy
> - Learning skills
>
> So the teachers must do it [sic]. The outcomes mentioned are all linked to information literacy.

Mr Fraser shows the researcher a yearly assessment plan of a subject which clearly indicates that research projects are one form of assessment.

Yet, to quote all the teachers interviewed, they had either not been taught how to impart skills relating to research projects to children or they had been taught it very superficially as part of in-service training. It certainly did not form part of their initial teacher education.

While some chief advisors challenged the teachers' statements, that they were not receiving any

adequate guidance on research skills, others admitted that little or no focus was placed on information literacy or research skills.

In a defensive response at first, Mr Adams comments that he has not conducted research into whether or not the training in research skills his district curriculum advisors offer teachers, is effective or not. Then he concedes:

> The majority of workshops are held in the afternoons when teachers are tired. We can't have workshops before 3pm, which is the rule. The training is only one to one and a half hours long. The training time is not enough. You can give them information but nobody is going to read that.

Curriculum advisors offer workshop training in their particular subject. As each subject has to deal with research skills, described as the ability of learners to access and use information, per the critical outcome, the curriculum advisors need to facilitate understanding of the term research skills. Chief curriculum advisors believe this is being done.

Mr Adams is adamant that the literacy strategy in his district (of about 180 ordinary public schools) addresses information literacy. His message strongly correlates the ability to read with understanding in all subjects, not only the language class, with information literacy. In his mind, if learners can read and respond effectively in all learning areas they are information literate. He claims that the district uses a two prong approach in the teaching of research projects. The district advisor for school libraries usually runs quarterly workshops on how teachers can use the library and "how to extend the strategy for literacy into information literacy". At the time, the school library advisor did not have a professional qualification in school librarianship, thus one wonders about the quality of the workshops. The district literacy coordinator is responsible for developing a literacy strategy which includes "empowering teachers to use literacy to extend to other learning areas". The skills which children learn in the language class can be implemented in other learning areas such as science or history. This is where learners have an "opportunity to

demonstrate it (research skills) in other learning areas".

In digging deeper and trying to find out what these 'research skills' entail that the workshops offer, the researcher asks him if teachers are taught how to teach learners to extract relevant information from books, for example. Engaging with information in the research process is one of the fundamentally neglected and underestimated parts of inquiry. During the information literacy education course at UWC, it became evident that teachers generally provide learners with exhaustive instructions on what is required of the project, but neglect to provide strategies for engaging with information. The report of the review of the National Curriculum Statement (South Africa 2009c) mentioned that teachers lacked the expertise in teaching learners how to conduct research projects. The report intimated that projects were often poorly set with little guidance or scaffolding. It is assumed that learners will figure it out themselves or ask a parent or guardian to assist. An alternative explanation is that teachers are not aware of this difficult stage and/or they themselves don't know how to mediate it. Mr Adams's comment is instructive:

> That's a challenge. You are doing things you are not sure if teachers are implementing things. Research is always one we are talking about. I think the biggest challenge of OBE and the NCS is that we didn't have benchmarks. Teachers didn't have benchmarks. We don't know where the standard is. That is why two years ago we developed Formal Assessment Tasks (FAT) which demonstrated the different questioning levels in terms of Bloom's taxonomy... The year before last we gave them (the teachers) more than a hundred kinds for each grade, comprehension tests for different levels of learners. Then we set a test for Grades 4, 5 and 6 based on these types of comprehension tests. We developed a FAT based on this to ensure progress being made according to our expectations. So, we are trying to do all those kinds of things, but I'm not sure if it's always implemented.

The researcher's interpretation of his statement is twofold: the comprehension test offered teachers doesn't seem to be related to a variety of subjects in which questioning and answering is knowledge based. The comprehension pieces are extracted texts and the learner is not confronted

with a whole book. The transfer of learning from extracts to entire books may not be taking place. There may be some overlap in strategy but they are also significant differences when confronted with a whole book from which to extract pertinent information. Secondly, the sum of the research process is more than the individual parts. The learners need to be going from the whole to the parts but teachers need to see the big picture first. The researcher is not entirely convinced that the process of research projects is tackled in a meaningful enough way in the district. Mr Adams seems to be at his wits' end because all the different strategies are not necessarily implemented. He feels the in-service model is not working.

Mr Fraser claimed: "Only the Intel ® Teach to the Future and WebQuest courses guide the teachers in that direction". These computer-based courses were introduced in the last year or two and only a handful of teachers have been taken through this training.

There is a strong connection between information literacy and ICTs amongst the chief advisors. Mr Brown states in answer to a query about in-service training:

> I can honestly say to you, very little emphasis is placed on that (information literacy). When we talk curriculum business we talk about content and methodology but that methodology in many cases does not include that possibility of research methodology and how to apply research methodology and how to bring in using technology. .. It all boils down to the fact that they have not been equipped at school level (for research-based assignments). I don't think we have capacity in our schools to do that. We need to get there.

According to Mr Edwards, the curriculum demands that learners are taught how to collect, organise, analyse and critically evaluate information and his advisors are ensuring implementation happens through individual subjects. Although this district does not have a specialist advisor for information literacy, information skills are advanced through subjects and via the e-learning advisor using WebQuests. This is a new district and the chief advisor identified

the e-learning-library tandem as very important. A decade ago when the researcher worked in the WCED, she facilitated a workshop on information literacy for science advisors. This chief advisor was once an ordinary science advisor and he still uses the material and tools she shared with the science advisors back then.

5.5.4 THE LITERACY/ NUMERACY (LITNUM) STRATEGY

There has been a national literacy and numeracy imperative in education for two years now (South Africa 2011c). Provincial education departments are tasked with implementing the strategy in schools. In the Western Cape, over the past 10 years already there have been a variety of initiatives to improve the literacy levels at schools, for example, the WCED 100+ books in every Grade 1-6 classroom campaign (2001); the *Language is for learning* literacy campaign which kick-started the daily half hour of reading in the classroom up to Grade 9 (2002); the *Masifunde Sonke*: let us read together campaign (2001); and the *Foundations for learning* campaign which emphasized a sound foundation for languages in Grades R-6 (2008/9). The latest Annual National Assessment (ANA) June 2011, proved yet again that the literacy and numeracy levels of learners in Grades 3 and 6 are wanting. At national level the scores were 35% for literacy and 28% for numeracy in Grade 3, and 28% for literacy and 30% for numeracy in Grade 6. The "best" scores came from the Western Cape where the average Grade 3 literacy score was 46% and the Grade 6 literacy score was 35%. The scores came as no surprise as they merely confirmed previous low scores for South African learners on the international TIMMS and PIRLS research (South Africa 2011c: 10; Equal Education 2011: 5; LIS Transformation Charter 2009: 74).

All the chief curriculum advisors refer to the LitNum strategy as a national and provincial priority. Mr Brown and Mr Cohen question the implementation of this strategy. "We can't talk about the LitNum strategy without promoting reading and libraries," they say. They cannot fathom how a literacy strategy excludes the development of school libraries. Learners should be immersed in different kinds of texts at home and at school. Mr Brown mentions his displeasure

at the way that learners in primary schools are now being prepared for the LitNum tests the way Grade 12 learners are prepped for the matriculation examinations, by learning how to answer exam questions, by going over dozens of examples, rather than developing the joy of reading.

As mentioned before, a literacy strategy has been implemented in the Western Cape schools for almost a decade. Despite the strategy, the scores have been consistently low. These chief advisors understand that poor reading scores have implications for learning other subjects, including mathematics. It also has implications for information literacy. One of these strategies is a reading half hour every day in school. Where it is creatively and diligently implemented, the results have been good. But generally the implementation has been haphazard. Learning from this partial failure, the WCED embarked on a strategy of language across the curriculum, the *language is for learning* campaign. "Every teacher is a language/reading teacher" was their slogan. Mr Adams says about his district: "Two to three years ago we started a process 'love for reading'. We tried to bring across to learners that language is a holistic thing [sic]. It must be a thing that equips you for life".

The concern of the researcher is where are the learners finding material to read during this literacy half hour or for reading for enjoyment if there are few (26.15%) functioning school libraries? Most of the school libraries are in ex-model C schools where parents can afford to pay fees to maintain a library service. Public libraries often have to service several schools in a community where the home environment is print poor (Western Cape 2006b). One way the WCED has supported its literacy campaign is to mandate schools to use 10% of its learning teaching support material (LTSM) budget on library-related material (Western Cape 2010). When the researcher enquired from the chief advisors as to how much control they had over implementing this directive in schools, one advisor admitted candidly, "this is a very difficult part". Although the effects of not having a school library or a library collection are felt in the curriculum, the direct control over implementation of these norms and standards rests with the district school management advisors, not the curriculum advisors. Ultimately then, implementation depends on the management advisors' attitude towards books, reading and

libraries. As Mr Edwards confessed:

> The institutional management and governance (IMG) managers need to help us manage that (reading collections put into schools). I think they have some influence and responsibility towards ensuring that classrooms become print rich. Once again it depends on whether you have an affinity to books and libraries or not. It depends on the person but there is a responsibility as an official to be able to look after it.

Identifying the lack of a reading culture amongst South Africans, including amongst educators and high profile officials, is not new (South Africa 2008). Jansen in his speech at the *Sunday Times* Literary Awards 2011 quotes the late Prof Kader Asmal, one time minister of education who, when a parliamentarian, lamented the lack of a reading culture amongst his fellow parliamentarians (Jansen 2011a). Mr Davids started a reading sharing session for his curriculum advisors. He understands that advisors themselves need to be readers before they can advocate reading with teachers.

> What we have in our curriculum meetings from about 2 years ago, we have a reading reflection. That means curriculum advisors get a slot to talk to everyone about a book that they've read. There are those who don't read. They say: 'ek het nie tyd vir dit nie'[I don't have time for that] but most of the advisors like this activity.

The majority of South Africans learn English as a second or third language (South Africa.Info 2011). English as an additive language is introduced from Grade 2 and becomes the language of teaching and learning from Grade 4 onwards. Most of the non-fiction material in South Africa is in English, very little is available in indigenous languages of which there are ten in South Africa. Cognisant of the fact that the learners with the lowest literacy scores are from the lower quintile schools, the WCED through its Quids-Up campaign provided starter school libraries for 120 of the poorest schools. By the time this current study was undertaken, not all schools identified had received their consignment of library materials. The effectiveness of the Quids-Up campaign is the subject of a future study.

5.5.5 MATRICULATION RESULTS VERSUS QUALITY LEARNING

Chief curriculum advisors were asked about the quality of education Grade 12s (final year of high school) were receiving especially in terms of preparation for further study and lifelong learning. Firstly, there were chief advisors who took issue with the word "quality". The kind of quality the top echelons in the WCED are pushing for is more Grade 12s with a bachelor's degree at entrance to university. Several chief advisors expressed similar opinions about 'quality' to the researcher, summarized in Mr Davids's statement:

> We are looking for high pass percentages. What they do at school, they take exam papers from 15 years ago and actually work through them from day one in grade 12. For example, these are the ten things you write down about photosynthesis and not actually understanding the process of photosynthesis. They are teaching for exams. Teachers are not interested in the broader subject knowledge. They just want to know what will be asked in exams.

Mr Fraser echoes the previous view:

> As long as we are going to have this push to get learners through Grade 12, teachers are going to teach in order to get learners to pass. Teach to the exams, not teach to impart knowledge. That is where we are losing the battle. That is why we have this mass exodus (failing) after first year (at university) because they can't cope. They don't understand the work, they just know that it has to be done in this way to get the answer and that's not educating.

While there are those advisors who are aggrieved by the WCED's rather narrow focus on examinations, Mr Adams embraces the exam strategy in the name of quality:

> We are establishing learning communities in our district. We are looking at question analysis of each paper of all subjects. We could identify the teachers whose learners did well. Those are the teachers we are using as tutors in the circuits now.

The majority of chief advisors tell me "it's all about the numbers". Each district is assessed according to the Grade 12 pass rate. When the WCED talks about quality, it's really about how

many learners achieve entrance to a bachelor's degree at tertiary institutions. They are not concerned about what happens to learners after matriculation. These advisors are adamant that their view of quality is different. They relate how universities they have contact with admonish them about the poor quality of students entering universities:

> We do get feedback from colleagues at institutions around here saying learners cannot read and write properly even with a bachelor's pass. So clearly, we are not doing what we are supposed to in terms of preparing them for a research-based type of environment - writing up reports, doing research, and doing proper research and knowing what to do and how to do it.

The chief advisors strongly believe that the focus on matriculation results is a political game in South Africa. Every education district in the Western Cape received over R1million to improve the matriculation results in 2011. Advisors do question why such a huge budget is allocated to one grade, the smallest cohort of learners at the school level, when several other areas are in equal and urgent need such as early childhood education, adult basic education and training and school library programmes. Results from these areas of need are not immediately quantifiable or readily translated into figures as they require longer term research. According to a key informant in the WCED, it seems as if funds are being redirected from other programmes, for example Quids-Up, the school library start-up project, to the Grade 12 improvement project.

The advisors seem to have their hands tied. They admit "we are just putting out fires with the Grade 12 project". "In striving for results, we compromise education".

> This thing about targets: we can drive, drive, drive - pump in a lot of money with the Grade 12 project. You can push a child to pass Grade 12, but have you cultivated a love for the subject - an appreciation, for example, for life sciences, biology?

The idea that learners need to be enthralled by learning their subjects and motivated to want to find out more by themselves resonates with the ideas of Shenton and Fitzgibbons (2010). Lifelong learning is the true goal of information literacy education. "By tapping into students'

internal curiosity, interests and motivations, they can inspire as well as edify. The notion of equipping students with the skills they need to explore areas of interest, whether these lie in personal or scholarly domains, is now becoming central to education itself" (Shenton & Fitzgibbons 2010: 171).

There are opportunities in the curriculum to teach research skills in terms of the outcomes, but it does not necessarily happen for two possible reasons: 1) the final exam in Grade 12 still emphasizes rote learning; and 2) teachers are not competent to meet the outcomes requirements. Mr Edwards states:

> Many of the teachers also lack the skills because they come from a system where this was not required. I remember very well (as a child) my assignment was on volcanoes. I could plagiarize and my teacher gave me very good marks because it looked nice. But nowadays kids can do the same with the Internet - cut and paste - and teachers are impressed with what they get because it looks nice, but the information that's there has not been synthesized.

5.5.6 TECHNOLOGY AND ICTS

One of the questions for the curriculum heads was what kind of measures are in place to support, develop and assess teachers' own information literacy. Mr Adams mentions questioning skills as a top priority whilst most associated teachers' information literacy with web literacy. Web literacy is equivalent to Bruce's (1997) first face of information literacy, namely, the information technology experience. Questioning skills suggests a deeper understanding of information literacy education and challenges teachers to think about the different levels of questions along the lines of Bloom's taxonomy (McKenzie 1996).

The Khanya ICT project which has existed for at least ten years, has trained teachers in basic computer literacy. Those teachers involved with mathematics and science at high school received additional training in the specialist software for those subjects. At the primary school level,

literacy and numeracy software was the focus of specialist training. As mentioned before, 91% of schools in the Western Cape have computer laboratories but Internet access is a school's own responsibility. The technology set-up at schools varies considerably. At the more affluent schools, teachers are encouraged to use the technology which is made abundantly available:

> The more affluent schools, they have an interactive white board in every classroom, a computer in every class, teachers each have their own computer in the staff room *and* they are using it. They have access at home as well. They can do their research in their free time at home. That is what we are trying to inculcate in the other (less affluent) schools [Mr Fraser].

It is one thing to offer once off training, and another thing to retain and implement what you have learned. The advisors realise that the closer the access is, the greater the likelihood that teachers will use the technology. But most teachers do not have their own computers at home and if there is one computer in a staff room for 25 - 30 teachers, access becomes too difficult.

> Many schools have provided Internet access to teachers in the staffroom via a personal computer, but again, 30 staff members to share one personal computer, access again becomes a problem. The more access becomes a problem, the more you place research on the back burner because you are not going to fight to get access all the time. It's a major problem [Mr Fraser].

In 2010 the Department of Basic Education decided on a scheme to provide every teacher with a laptop. The deal worked out was that teachers would be subsidized in their purchase of a laptop. Unfortunately, the deal fell through because a large number of teachers are blacklisted for defaulting on previous account payments (Davids 2011). They are now not eligible for credit. This put paid to developing teachers' ICT skills yet again. Unless teachers are doing further studies for themselves and see their own progress stymied by the lack of ICTs, the computer is not a priority for a large number of teachers.

Some chief advisors criticize the rigid way the Khanya computer laboratories are utilized. The laboratories were set up with the aim of improving the mathematics and science results at high

school and the literacy and numeracy results at primary schools. One has to question the efficacy of the laboratory sessions given the low literacy results as they have not had the desired effect. The laboratory timetable is geared for these special classes but can be booked when otherwise free and after school. But many advisors relate that they are not utilised to the fullest extent.

> All schools have laboratories but I don't think all schools are using that. If you go to a school and ask teachers if they use the Khanya laboratory for their subject research, they reply: "no! ek het nie tyd daarvoor nie" [I don't have time for that] [Mr Davids].

Mr Fraser states:

> So Khanya requires the school to have a timetable for the laboratory for the week in that they can target all classes. So if the timetable indicates the laboratory is used to the maximum, teachers can't access the lab. They can do it after school, but often don't. Learners are more competent (at using computers) than teachers.

Besides basic computer literacy training, are teachers being trained to use the Internet? Clarke (2010: 80-82) in his study of ICTs in Western Cape schools identified a gap in teachers' knowledge of information resources on the web. There also appeared to be a lack of knowledge about the ethical use of online information which results in plagiarism. At this point in the interview, the researcher relates how teachers on the UWC information literacy education course, both rural and urban teachers, struggled to locate relevant web resources for different school subjects.

Approximately two years ago each district's organogram included five e-learning facilitators in whose portfolio Internet training was situated. Of the six districts in which interviews took place, only two have an e-learning facilitator who offers the required Internet training. Five of the six districts have a school library advisor but their roles do not include Internet training, a role which professionally trained librarians are more than capable of executing. The Khanya project comes to an end in 2012 and the expectation is that regular curriculum advisors would step in to take the place of the Khanya ICT trainers and include in their portfolios the work which the e-learning facilitators are currently carrying out.

Two things stand out starkly: 1) Any web or Internet-related work is really being undertaken in two districts only via the WebQuests. One district curriculum head mentions that in his district, where there are no e-learning facilitators, teachers from middle class schools are learning through a computer society; and 2) the curriculum advisors (under the chief advisors) still need to be trained to integrate their subjects with technology. There is hesitancy from some of the chief advisors regarding the transfer of the ICT responsibility to curriculum advisors.

> Some of our curriculum advisors are not developed to that extent where we expect them to be and they also don't realise that they don't have the capacity or ability. So it's a bit of a sore point at the moment [Mr Brown].

Clarke (2010: 69) found a similar sentiment about the lack of ICT expertise amongst curriculum advisors to offer sufficient support to teachers in their subjects.

While some of the chief advisors express uncertainty about ICT integration with the curriculum, especially creating a mind shift amongst curriculum advisors about the Internet and the use of social media, Mr Edwards puts a positive spin on the new role that curriculum advisors have to adopt. In his district he has both a school library advisor and an e-learning advisor. He says:

> Now we are focusing on integrating ICTs with the curriculum which I think is also a focus of information literacy. The fact that I have these two posts is an enabling factor for me. So, the two of them are in an ideal position to sharpen up the skills of the other curriculum advisors (their colleagues) who in turn can sharpen up skills of teachers. And I know that the e-learning advisor has been running quite a number of programmes, inter alia, the WebQuest which also deals with research projects and developing skills within the WebQuest programme. He is training all our advisors and teachers in using the social networks like blogs, Facebook and Wikis.

Teachers have to surmount a number of obstacles to accomplish ICT literacy and in particular, Internet proficiency. In rural areas connectivity is slow and erratic. In general, Internet access appears unaffordable to a large number of poorer schools as individual schools pay for their own Internet use. The average teacher does not have his or her own PC perhaps due to a lack of prioritising or lack of funds or both. Although the majority of schools have a computer

laboratory, access to it by all teachers is curtailed because of an emphasis on certain subjects and teachers seem reluctant to stay after school to use the laboratory. As the Khanya ICT project nears its end, some curriculum heads express nervousness in handing over the ICT facilitators' role to the curriculum advisors as they may not be ready come 2012.

5.5.7 SCHOOL PRINCIPALS AND THEIR ROLE IN FOSTERING INFORMATION LITERACY

The role of the school principal in developing an information literate school community, a strong theme in the literature of school librarianship, warranted a discussion about curriculum advisors' influence on school principals. It soon became apparent with each interview that curriculum advisors appear to have little influence over the school principal. School principals seem mainly answerable to a different silo within education called the institutional managers. As Mr Davids says of principals:

> Principals tend to refer curriculum questions to other teachers. Principals think their job is to wait for the circuit manager (institutional manager) and to show them attendance registers and things like that. Many principals will call the curriculum coordinator (in the school) because they are clueless. We are trying to change this. When we come to your school, you (principal) are accountable, don't give me another person. Hopefully, we will change that. Its four steps forward and ten steps back.

Du Toit (2009) voiced a similar dilemma about reporting lines affecting the successful implementation of policy within educational districts in her study in KwaZulu-Natal.

There is a quarterly convergence of district school principals, chief curriculum advisor and the institutional managers, but research projects are never on the agenda. These meetings are for information sharing. Research projects, when or if discussed, are dealt with within a subject and not as a general issue at a quarterly meeting.

Mr Edwards answers persuasively but in an abstract way when asked about his influence over

principals:

> I can speak to principals about their role as instructional leaders so that they take a lead. That's one way I can ensure that principals take on the role of being the head teacher at the school - that includes curriculum, libraries and information literacy. I can also motivate that he motivates staff. I can motivate that the principal spends his funding appropriately.

He continues in the subjunctive:

> I also have influence on principals in terms of how they spend their money - norms and standards money. If I think libraries are a priority, I could suggest that some of the funding should be on setting up libraries.

These possibilities exist but Mr Edwards does not state outright whether he has utilised the opportunity in the past or not. The only definite statement he makes is the following: "On 23 April, World Book Day, we sent posters into schools to mark the day and to raise awareness about reading".

All is not lost as one chief advisor applauds how a principal in an impoverished area took the lead to make the difference. Recognising that learners need to have access to the school library, the computer laboratories and also have a quiet place to study to offset their (learners') congested living environment, the principal and staff worked together in keeping facilities open until late afternoon. Access to information forms one part of information literacy and this school recognised it. The result is that the school has 'blossomed'. A school in a different impoverished informal settlement saw the fruits of this school and it now too is imitating the success story.

5.5.8 COLLABORATION BETWEEN TEACHERS AND RESOURCE PROVIDERS SUCH AS PUBLIC LIBRARIES, DISTRICT RESOURCE CENTRES AND THE EDULIS LIBRARY

Given the fact that about 74% of schools do not have school libraries in the Western Cape, the researcher is curious about how the WCED expects schools to source information for school projects and assignments and to foster the joy of reading. The responses varied.

In five of the six districts there is one curriculum advisor for developing school libraries in that district (there are 1455 public ordinary schools in the Western Cape with approximately 180 schools per district). This is certainly an impossible task for one individual given the backlog. Three districts have a resource centre, two are establishing a resource centre and one has no resource centre. Of the districts with resource centres, only one has a fulltime librarian, the other two depend on the goodwill of the school library advisor whose major task is to develop libraries in schools. The posts of resource centre librarian have been frozen. Having a resource centre in the district offers teachers access to a resource collection for both professional development and for classroom block loans for various activities such as research assignments.

The WCED also has a centralised library service called EDULIS, in Bellville, accessible physically to mainly the urban metropolitan educators. They offer free services to the schooling sector including block loans to schools for projects, Question Point *Ask-a-librarian* service, e-journal access to selected EBSCO databases, reviewed, annotated booklists in the three provincial languages (Xhosa, English and Afrikaans), support for school library organisation, and more (Education Library and Information Service 2002). Mobile library services are active in three districts.

When the national department of education introduced the Quids-Up campaign, the WCED chose to use those funds for the development of school libraries in the poorest schools in the province. One hundred and twenty (120) schools were identified and, depending on the size of the school, received library material for a start-up library. As there are no designated posts for school librarians, schools identified teachers who volunteered to be taken through a two week training session in how to start their libraries. The success of the project has not been scientifically investigated but anecdotal evidence suggests that in some schools boxes of library material remain unopened and stored in the safe in the office of the principal. Even where centralised school libraries were started with much sacrifice on the part of fulltime classroom teachers, these are now white elephants because there is no position such as a school librarian in terms of the Occupation Specific Dispensation for teachers. A future follow-up study of the

Quids-Up campaign will reveal to what extent the lowest quintile schools reacted in typical type one fashion, that is, schools for which no amount of funds and rewards make a difference.

As Mr Fraser says in reply to the query about the incongruity of a literacy campaign not linked to school library development:

> It's the powers that be that are not promoting it (school libraries). You know the Quids-Up project. We (in the district) have been promoting it. A number of our schools have libraries, but there are two problems: 1) the control of the library. Who takes control - issuing, etc and giving someone time to do that (sic). We can't have every teacher. There has to be one person; and 2) head office (our new superintendent general) does not support the project. She stopped Quids-Up last year and used the money for some other issues.

His response confirms the researcher's earlier remark from a key informant that Quids-Up funds had been redirected to the Grade 12 Improvement project.

In terms of information resources, therefore, a few Western Cape schools have access to school libraries, some have access to a district resource centre, but all have access to the EDULIS collection whose catalogue is available online and which offers a postal service. The other main provider of information resources is the local public or community library. These libraries fall under the jurisdiction of the local municipalities. In most instances they have become the default school library (Hart 2005; LIS Transformation Charter 2009). The question to the chief advisors was therefore a poignant one: when curriculum advisors are in conversation with teachers, how is the school's relationship with the community library addressed in terms of research assignments? It is evident from Maepa and Mhinga's (2003) study that teachers have a negative attitude towards the community/public library and are actually resistant to outreach programmes from the side of the public library. Radebe's (1997) study found an equally negative perception of libraries amongst school principals.

One respondent said frankly:

> We will make a statement at some point in the training 'use the facilities in the community, use your public library' but there's no real and honest conversation and relationship with those institutions.

Mr Fraser expresses frustration with teachers not willing to use the information resources when they are at hand:

> We are struggling to get them (teachers) to use EDULIS (this district is closest to EDULIS). Now for them to go to the public library is still more problematic. We do however have a few schools in X suburb in the immediate vicinity of a public library that uses it. But you have farm schools, and schools in informal settlements where there is nothing (no public libraries).

In answer to the question about school-public library collaboration, Mr Adams claims:

> My school library advisor worked on that some time ago in workshops. I am aware of schools which are utilising public libraries because it's across the street. They scaled down their own library. Schools should be aware of a strategy like that because the library advisor has done it with them. There must be communication between school and public library.

A small alarm went off in the mind of the researcher when he mentioned the scaling down of the school library as it seemed as if he were condoning it. He also assumes that if something has been communicated to teachers, they will do it. Other chief advisors are not as naive and recognise the gap between saying one thing and doing another.

> You see what is happening, our life sciences advisor, his wife is the chief librarian in town. Sheila (pseudonym) would talk to him and he would talk to me. What happens is all schools get assignments and then there is an influx of learners to the library. We send out letters to the schools to send programmes to her and she will create a special projects shelf/display. But there's a lack of planning. Then suddenly there are several schools at a time coming in. They (public libraries) are getting upset with us [Mr Davids].

Another alarm goes off in the mind of the researcher when she hears that there is a projects shelf

in the public library as it means learners do not experience locating information for themselves. This underscores what Hart discovered in her study of information literacy in public libraries (Hart 2005). Having a projects shelf is for pragmatic reasons as public libraries are overrun with learners from different schools in the afternoons all trying to find resources for projects.

The researcher mentions to the chief advisors that according to the provincial curriculum weekly schedule, the curriculum is mapped out so prescriptively that every Grade 4 teacher is teaching exactly the same section of work at the same time right across the province. The implication is that, if there is an assessment activity requiring library-based resources, those resources will be placed under tremendous stress whether in school, public, resource centre or the EDULIS library. This is yet again a reflection of curriculum designers either not taking into consideration the paucity of resources for learners across the country or assuming that research assignments can be conducted with a textbook or a worksheet. The provincial curriculum schedules were intended to resolve one problem, that is providing curriculum time management for teachers, but they created another, perhaps unforeseen problem.

Mr Adams washes his hands of it by saying: "Teachers must ensure they have enough resources ... There is a lot of information on the Internet. You do not have to buy books for that purpose". This last statement contradicts a previous claim that Internet connectivity in his rural district is slow and erratic. He also agreed with the researcher that teachers' Internet skills are on average poor.

The public library plays an important role in terms of literacy and family literacy in particular. Mr Cohen understands the role of the public library. His district is working in an impoverished community with the public library on a project of family reading. He accepts that it is better to improve existing school libraries with new resources as the success will be greater with an existing, active service than to start a school library where teachers and their pedagogy are not yet ready.

The books I collected from the USA worth R100 000, appropriate books, have been put into existing school libraries. We have distributed them and we follow and monitor that. We are promoting family reading in Y suburb where we work with public libraries. I am hoping that parents will volunteer to keep libraries open. They must see it as an investment. When schools are given books and there is a launch, I tell them that the next challenge will be sustaining it. Get teachers to advocate libraries with children.

5.5.9 CONCLUSION

The chief curriculum advisors in the districts are of the opinion that the average teacher does not possess all the information literacy attributes expected by the curriculum. In their opinion, teachers are not using the access to ICTs available at most schools optimally. Some chief advisors even cast doubt over the ordinary advisors' ICT abilities. While teachers in the study unanimously revealed that in-service training either neglected or addressed the teaching of research projects superficially, some chief advisors were initially defensive but when prodded, they relented supporting the teachers' views. The majority of the chief advisors are of the view that Grade 12 learners are not being prepared for independent, lifelong learning but rather to pass Grade 12 to exit the school system in sufficient numbers. The reporting lines of principals to district institutional managers and not to chief curriculum advisors cause undue difficulties when curriculum matters such as research projects are seldom or never prioritized in the quarterly meetings with principals.

5.6 GENERAL CONCLUSION FOR CHAPTER FIVE

In Chapter five, first the teachers in the study were profiled and the information literacy course described. The presentation and analysis of the quantitative data followed. One of the most important results of the questionnaire is that the information literacy course intervention appears to have improved the self-efficacy of the majority of teachers in the study. The bulk of the findings came from qualitative data: the participants' journals and interviews with the participants and curriculum experts. The journals provided invaluable temporal accounts of the

teachers' experiences. The interviews with the participating teachers in the study provided one more layer of evidence to the questionnaires and journals. The interviews expanded the breadth and range of the research. The results of the questionnaire, journals and assessed assignment pieces assisted in the development of the questions for the interviews.

All in all, the teachers understood that the mediated learning experience shared with learners during projects encouraged independent, lifelong learning and learning that was different from direct teaching or teaching as "telling". Bringing in the opinions and views of the chief curriculum advisors helped to corroborate the findings from the teachers. In the next chapter, further analysis will take place and the rationale for using a mixed methods approach will be justified.

CHAPTER SIX

DISCUSSION AND INTERPRETATION OF FINDINGS

6.1 INTRODUCTION

In Chapter five in which the findings are described, some analysis has already taken place. This chapter links up the findings from the questionnaire, journals, interviews and selected participants' assignment artefacts with the research questions. The strength of using a mainly qualitative approach to the study is that it allows the juxtaposition of the results that appear contradictory. The analysis therefore offers some surprises, fine distinctions as opposed to absolutes; it scrutinizes educational change and the inclination to retain the status quo, but it also suggests that a window of opportunity exists in teacher training to challenge teachers' beliefs about information literacy.

This study has used the idea of guided inquiry through research projects to foster information literacy. Inquiry-based learning and the information search process form the theoretical framework for this investigation. The research questions to be answered using the lenses of these frameworks are:

1. How do teachers understand information literacy and information literacy education?
2. How do teachers' make their information literacy explicit in the classroom?
3. To what extent is information literacy integrated within the subject/learning areas?
4. To what extent is information literacy assessed in the curriculum?
5. At what level are teachers' web knowledge and skills?
6. How do (school) librarians understand and conceive of information literacy?
7. What are the differences and similarities between teachers' and librarians' opinions of information literacy?

6.2 RESEARCH QUESTION ONE: HOW DO TEACHERS UNDERSTAND INFORMATION LITERACY AND INFORMATION LITERACY EDUCATION?

At the heart of the question about the teachers' understanding of information literacy is the sub-text: can the teachers be regarded as information literate? Teachers' information literacy and their ability to mediate information literacy has seldom been the target of investigation in the information literacy literature. Perhaps because of their educational status their information literacy capabilities have been accepted unquestioningly. Initially the researcher resorted to asking the interview participants to define information literacy and information literacy education respectively. After the first few interviews in which the participants tended to provide course workbook definitions, the researcher realised that those questions could be answered indirectly from the journals, interviews and teachers' artefacts. Doyle's (1994) definition of an information literate person and LIASA's (2004) definition of information literacy provided the researcher with the basic foundations of a definition. The LIASA (2004: 6) definition is all-encompassing and states that information literacy is:

> the ability to recognise the need for information and to manage it in any context. It is the active process of locating and collecting needed information from any source, including print, human or electronic resources, selecting and evaluating the information and then using it appropriately and ethically for personal growth and for participation in society as a critical and active citizen. This would entail using information for effective decision making or problem-solving, to express personal ideas, develop arguments, refute the opinions of others, learn new things, identify the truth or factual evidence about a topic, generate new knowledge and be effective in applying these skills towards life-long learning.

Fundamental to what information literacy is, is its ultimate goal, lifelong learning. Coupled with lifelong learning are some basic human rights in any democracy such as the right to education, the right to access information, the right to the franchise. How does an individual exercise the right to access information, for example, without being information literate (Britz & Lor 2010)? How does an individual exercise the right to access health or civil rights information without

being information literate? In other words, to be able to contribute to society in an effective way, individuals need to be information literate (Duke & Ward 2009).

We are living in a world in which ICTs are becoming ubiquitous even though but a fraction of South African society uses the Internet. Presently Internet penetration in South Africa is about 14% or 6.8 million users of an approximate 50 million population (Internet World Statistics 2011). Educators, though, are expected to prioritise ICTs (South Africa 2011b). When defining information literacy, the concept is often linked to or conflated with computers, the Internet and ICTs. A few teachers (#3; #14; #21) in the study originally linked it to computers. Their expectation was that they would be "working on computers all the time". Several of the curriculum advisors also answered the question about teachers' information literacy by relating it to their abilities to use ICTs (or not). Undoubtedly, in the 21st century, it is ludicrous to call yourself information literate if you do not use online information. Unsurprisingly, information literacy has emerged most strongly and most explicitly in relation to ICTs in South Africa (Czerniewicz 1999; South Africa 2004; Boekhorst & Britz 2004; South Africa Schooling 2025 2011d). The White Paper on e-Education (South Africa 2004) uses a large part of the definition associated with information literacy in its definition of e-education: "it is the ability to apply ICT skills to access, analyse, evaluate, integrate, present and communicate information". In countries such as the UK (Williams & Wavell 2006) and New Zealand (Probert 2009) the emphasis in education is also on ICTs. If government is highlighting ICTs one cannot blame ordinary people for thinking that it is the same as information literacy. Information literacy is a concept more familiar to people in the library world than elsewhere (Moore 2002).

If one facet of information literacy is the ability to use information across environments, including the use of electronic and online information, then the average participant in the study was not information literate at the start of the study. The self-efficacy rating scale indicates that the participants were most confident using printed sources of information. Their lack of confidence in using and evaluating web-based sources is reflected in their lower scores for these categories. Feelings of inadequacy and unease in using computers and the Internet are

demonstrated again in the journal findings and the interviews. There were a few teachers who were in fact self-confessed technophobes (#13; #19; #24).

The course intervention changed their perceptions about ICTs, especially the Internet, and opened up a new world of information to them. Through the participants' own words it is evident that their own personal use of online information leapfrogged after the course: using the Internet to find personal information on health, sport or devotion, for emailing, filing their tax returns and for using social network sites such as Facebook. The course was the impetus to a change in outlook towards ICTs by requiring participants to set up and use an email account, to locate and select 40 appropriate subject-related websites, and to be able to evaluate web-based resources. The participants improved their Internet literacy measurably by the end of the course: only one participant (#12) could not locate an adequate number of websites. About 16 participants used websites in their bibliographies (although most could not use the required bibliographic citation format for a web-based resource and not all websites were pertinent). Their self-efficacy scores in relation to the use of online resources grew remarkably (by one point on the Likert scale). In terms of the information literacy trait of finding and using online resources the participants had made considerable progress.

But, information literacy is more than a technology or ICT issue. ICTs are one layer or facet of it (Hart 2006). Some people mistake technology or ICT fluency for information literacy (Henri & Oberg 2005; Combes 2006; Probert 2009). Being able to manipulate the technology cannot be equated with using or engaging with the ideas and making meaning or evaluating the information from the texts or images and creating new information. For the researcher, information literacy is more an intellectual framework requiring cognitive skills, metacognitive attributes and critical literacy (Dudziak 2006).

Eighty six percent (25) of participants understood what information literacy is by the end of the course (see Appendix 1). Of course, it is difficult to talk in absolutes. Another way of putting it is

to say that 25 participants exhibited many of Doyle's (1994) information literacy traits at the end of the course while four participants exhibited limited traits. Not everyone who understood what information literacy is translated it into action. Participant #2 has sound perceptions about information literacy and information literacy education:

> Information literacy is a means of getting information to use to further your own knowledge to be a better person. Information literacy education is the means for learners or what learners will need to complete an exercise or assignment, help them how to complete research assignments. The skills learners will need are how and where to search; how to compile information; how to sift it; use it to complete the task at hand. The outlook or attitude needed to become information literate is to be open to learning. You don't always know everything.

Whilst participant #2 has a fairly clear idea about information literacy, she does not succeed in going beyond a worksheet-textbook project. Participant #2 is one of three participants' whose self-efficacy score decreases after the course. In her journal and during the interview she chides herself for not being successful. She realised when she handed in her assignment before it was assessed by the researcher that she had not succeeded. While this participant is information literate her negative circumstances seemed to have overshadowed her ability to make it explicit in the classroom. Merchant and Hepworth (2002) in their study mention how perplexed they are at teachers' inability to make information literacy explicit in the classroom. Similar findings were reported by Moore (1997), Slyfied (2001), and Probert (2009).

Participant #4 also fails to translate his understanding of information literacy into action in the classroom. He defines information literacy (education):

> An information literate person is someone who is familiar with different types of information – computers, Internet, magazines, books, newspapers and how to help people to gather information. I can check information and use it. I may not have knowledge, but I know where to go to find out and I know how to share information.

In the interview he relates the problems with literacy levels at the school and project work. Even though he is given the tools, he does not use them successfully to change his approach to projects.

Some chief district curriculum advisors call teachers' information literacy into question based on the research projects that they and their subject advisors moderate. Annually, learners' portfolios, which include research projects, are moderated by district subject advisors. It is therefore not only teachers' lack of ICT literacy that have persuaded chief advisors of teachers' poor information literacy abilities. According to them, teachers are not aware of research practice. Teachers accept projects that are plagiarized. The ethical use of information is a non-issue with teachers. Teachers are marking superficially and giving marks for "pretty" projects instead of looking at the depth and effort of the research. While some chief advisors dismiss teachers as information illiterate based on ICT abilities and moderation of research projects, others are more understanding and sympathetic of their plight. Most of the participants were trained as teachers before 1997 when the new curriculum was introduced. Whilst training to become teachers, it was not expected that they use libraries (Fredericks 1993; Olën 1994), did research or conduct projects with learners.

The participants' pre-course self-efficacy scores were lowest for category F which deals with writing a research paper, knowing bibliographic conventions, and choosing an appropriate format to communicate findings. The second lowest pre-course self-efficacy scores were for two items in category D: determining the authoritativeness, currency and reliability of information sources; and evaluating World Wide Web sources of information. Feeling inept and unsure about doing research and working with web-related sources contributes to the researcher's overall impression that the participants are not quite information literate.

With the new curriculum (1997, revised in 2002) it was assumed that teachers were information literate, that they would (miraculously) all be self-motivated to improve their computer and ICT

skills and that they would be able to teach and assess research projects. During the years of apartheid education, learners were given research projects. The aim of these projects was to teach independent learning; they were for enrichment and never really contributed towards a final assessment mark (Zinn 1997). With the introduction of the new curriculum, one of the cross curricula outcomes was to collect, organise, analyse and critically evaluate information (South Africa 1997; 2002). Process learning is supposed to take place, and formative assessment is the new hallmark. The assumption amongst trained teacher librarians was that projects would now be given more thought: they would be guided (scaffolded) to show that the learning was taking place throughout the process. Teachers needed to go beyond looking at the end product only. Disappointingly, teacher librarian posts were never confirmed in the new dispensation, and teachers continued to provide learners with the minimum support in research projects (King 2007; South Africa 2009c).

What did teachers expect from research projects before the course? What did their information literacy education amount to before the course? An ironical state of affairs developed in schools: on the one hand teachers undermined or doubted learners' abilities and thus skipped research assignments altogether, especially in the lower grades. On the other hand teachers expected miracles from learners, especially learners from Grades 6 upwards. The belief was that research and information search skills would emerge organically or naturally. Zinn (1997), Moore (1997), Walker (2001), Merchant and Hepworth (2002), Williams and Wavell (2006), and Probert (2009) repeat observations of the same mantra - teachers assuming that information literacy will happen by osmosis; that information handling skills will come naturally and that research assignments are naturally motivating.

The in-service teacher training in South Africa over the last 10 to 15 years, to assist teachers' understanding of the new curriculum and its different revisions, seems not to have altered the way teachers communicate research projects to learners in any fundamental way (South Africa 2009c). The message which teachers received from the training was that projects were for children to develop independent learning and teachers were mere facilitators in the classroom.

There are a few basic flaws in this hypothesis: firstly, most learners in South Africa come from homes in which parents are barely literate and in which the socio-economic circumstances are at the level just above survival (SAHRC 2006). The likelihood is low that there would be information resources such as books, magazines, or newspapers in the average South African home (Taylor, Fleisch & Schindler 2008). It is unrealistic to expect parents and caregivers in those circumstances to be able to help their offspring with projects. Secondly, the assumption is that learners will be sufficiently self-motivated to undertake the research despite not being taught, an expectation unheard of for any other form of assessment in the curriculum.

Teachers' beliefs about research projects and how to educate learners about information literacy are coloured by their own schooling, their teacher education and their in-service training. From their own testimonies and those from some of the chief advisors', we learn that they equated independent learning as non-interference or standing back. Merchant and Hepworth (2002) and Williams and Wavell (2006) mention "independent learning" as a misunderstood phenomenon by teachers in the UK as well. The South African teachers' (participants') own schooling and pre-service training did not prepare them for research projects. Their way of making sense of the new curriculum was to interpret research projects for survival in the classroom: without access to resources such as in a library, teachers resorted to fill-in-the-blanks-from-the-textbook-worksheets; without an understanding of the underlying pedagogy of research projects, teachers gave learners topics and sent them on their way to "discover" the answers, seeing (or more often not) them again with the end product; without the insight of knowing that teachers had different mental models (after Pitts 1994) to learners, teachers expected learners to be able to use books, magazines, or the Internet to locate pertinent information, read various texts and synthesize information; without themselves having done any form of research before, teachers accepted or turned a blind eye to plagiarized work. In their in-service training, they appear to have been told that a page of detailed instructions about the project (for example length, due date, focus points, etc) with oral clarifications are enough. Teachers' approaches to teaching children information literacy via research projects did not change with the new curriculum because teachers were not given the tools or insight to conceptualise a different approach.

In the words of participant #1 in defining information literacy (education):

> Information literacy is everything any intelligent person must have. You can't be without it. You can't contribute to society without it. If you can't find information and use it effectively, then you are not information literate.
>
> Information literacy education is only something I realised after the course. You have to teach it like you teach ABC. You can't pick it up through osmosis. The kind of home learners come from makes it difficult. Even teachers on the course thought that the Big6™ referred to the Big 6 animals (mammals in South Africa). Then again, even teachers (adults) could not make sense of the course.

The chief curriculum advisors do not rate teachers' information literacy highly. They base their negative opinions on teachers' lack of ICT and in particular their Internet abilities. They also refer to teachers' questionable assessment of research projects which demonstrate a lack of research protocol. By observing the study participants in the computer laboratory and assessing web exercises it comes across that they lack confidence in the Internet environment, one of the 21st century information domains that teachers are required to master. The latest qualifications framework for teacher education expects *beginner* teachers to be ICT literate and to be able to "read at a high level" (South Africa 2011b: 14). After the course, there is a change in the teachers' information literacy competency. Their self-efficacy improves. They are using the web with more confidence both for personal use and with learners.

The course intervention and assessment requirements had compelled teachers to reflect on their accustomed way of conducting projects with learners. The tension between the "old" and the "new" way caused great anxiety amongst a fair number of participants especially when they started planning for and implementing the project in the class. The anxiety and uncertainty they experienced is reminiscent of that in Kuhlthau's ISP model (Kuhlthau, Heinström & Todd 2008). In the interviews and journals they refer to being undecided about which topics to choose, unsure of their own understanding of information literacy, anxious because they know that learners' reading levels are generally poor, concerned that they were opting for an atypical approach to

research projects. The implementation of the guided inquiry project in the class was a problem in itself that they had to solve. They had a few major challenges: limited-to-no access to school libraries; most learners from indigent homes; low reading levels; resources, when available, not in the home language of the learners; school environments not conducive to radical pedagogical change. Given these barriers to change, it is remarkable that any changes happened at all. Most of the participants had the tenacity to press on, to search for and use information in public libraries, educational resource centres and most admirably information on the Internet. They accepted that trying an alternative approach was not going to be popular with their colleagues at school who are content in their comfort zones. Once they saw the positive effects of their continued guidance and motivation on the learners, they gained confidence to see their projects through to the end.

The majority of participants in the current study have some understanding of information literacy and information literacy education by the end of the course. Research questions two, three, four and five unravel in more depth to what extent information literacy education is addressed by the participants.

6.3 RESEARCH QUESTION TWO: HOW DO TEACHERS MAKE THEIR INFORMATION LITERACY EXPLICIT IN THE CLASSROOM?

The assumption of the second research question is that the participants themselves are information literate – for how does one teach something if you yourself lack the knowledge and skills? Teachers' own information literacy is not rated highly by most of the chief curriculum advisors. The participants rate themselves low in terms of some items on the information literacy self-efficacy. At the start of the course, participants are struggling with finding and evaluating online information. From the interviews and journals it is evident that, before the course, besides information literacy being an unheard of concept, the mediating of information literacy in the classroom was equally absent.

One of the best ways of identifying information literacy education is in how teachers mediate research projects. The common response from participants to how they taught research projects was to provide learners with a topic; tell them to go to the (public) library or the Internet for information and to present their project on a stipulated date. As in the Pitts' (1994), Zinn's (1997), Merchant and Hepworth's (2002) and Williams and Wavell's (2006) studies, learners were provided with little direction in the mistaken belief that this taught independent learning when it really sowed confusion. The "final product became an end in itself rather than a communication medium for understandings created with the information" (Pitts 1994: 382). Before the course, the participants did not make their own information literacy explicit to the learners.

The teachers participating in the interviews relate emphatically that their in-service training deals with research projects superficially or not at all. The chief advisors vary in their responses from stating outright that they do not focus on it, to others stating that, because it is a cross-curricula outcome and one form of assessment, the subject advisors *ought to* be offering training in it. Then again, workshops offered in the afternoon when teachers are tired are not really working according to the chief curriculum advisors. The failure of workshops is highlighted in the literature (Bodenstein 2008; South Africa 2009c).

Undoubtedly literacy plays a crucial role in information literacy. Mr Adams, one of the chief advisors, as well as teachers in the Williams and Cole (2007) study make the link between literacy, reading and information literacy. The teachers in the present study often mention literacy related challenges. The national department of basic education and the Western Cape Education Department (WCED) have had a literacy and numeracy (LitNum) strategy in place for a number of years now. The incongruity of this strategy is the lack of policy, legislation or basic will (Equal Education 2011) to develop functioning, sustainable school libraries in the country.

In the WCED, the QuidsUp programme (completed 2011) presented schools in quintiles one and two, and some in quintile three, with collections for start-up libraries. There is some understanding in the WCED that a literacy strategy will not be successful without school libraries. Unfortunately, these collections are not mediated by trained librarians and end up remaining in boxes or on shelves locked away as posts for librarians do not exist. At the same time, using the quintile system to allocate resources may be a political ploy but may not be the best strategy as, according to Muller and Roberts (2000), Taylor (2007), and Taylor, Fleisch and Schindler (2008), amongst these schools may be the proverbial failing schools. Type one schools, or the failing schools as they are also called, are those for which no amount of funds and rewards will make a difference. These are usually the lowest quintile schools level one and two. Testing this hypothesis in the schools with QuidsUp resources is an investigation for a different study.

Another question put to the chief advisors concerned the quality of education in schools. In particular, are the matriculants ready to undertake research assignments at the tertiary level? The ANA (South Africa 2011c) test results indicated that the literacy and numeracy levels of South African learners are noticeably lower than other countries of similar gross domestic product (GDP). King's (2007) study of incoming students to UWC showed that only 10.4% had been taught information literacy at school level. Most of the chief advisors agreed that quality education was not happening at the matriculation level. Morrow (2007) defines quality education in relation to the modern world. An individual who cannot learn independently from reading is at a disadvantage in society today. The Equal Education movement defines quality education as synonymous with having effective school library programmes.

The chief advisors are of the opinion that learners in Grade 12 (matriculation year) are being taught to pass and not necessarily to inculcate a love for a subject. The emphasis is on rote learning and pushing through as many Grade 12 learners thereby compromising quality education. Although lifelong learning may be one of the ultimate goals of education as expressed through research projects and information literacy, it is not happening because of the narrow

focus on examinations and because many teachers are not competent to teach research and information literacy. Jansen (2011b: 15), one of the many critics of the Grade 12 examination, lambasts it as regurgitation and not real learning. He maintains that real learning should be "transformative, change beliefs, alter behaviour". The Grade 12 year focuses on results not knowledge acquisition or the desire for lifelong learning.

On a positive note, Mr Adams, relates that his district has identified teachers' lack of questioning skills and they will be concentrating on that aspect. This is a good sign as being able to phrase different types of questions is a fundamental element of information literacy and inquiry-based learning. Another optimistic route that Mr Fraser and Mr Edwards are following is that of training teachers in WebQuests. Although Asselin, Kymes and Lam (2007) deride WebQuests as being too rigid and synonymous with a lockstep method, in the South African context in the absence of any training of teachers in research projects, it is better than nothing.

How did participants in the study make information literacy explicit in the classroom given the new knowledge and tools to support their mediation? The course assessment requirements compelled participants to show clearly how they had planned, executed and assessed a research project in their class. As participant #10 relates, if she had simply written an examination on the course, she would have forgotten most ideas within the first few months. Instead, she was acting as a role model for information literacy by mediating it in the classroom. This is precisely what most participants did to a greater or lesser extent: Starting out with great anxiety and uncertainty they plotted and planned the project. They knew that the plan outcomes had to incorporate research skills and values as well as new knowledge as the project had to be grounded in a subject. The assessment rubric had to be divulged at the start of the project so that learners knew how they were going to be assessed. The learning activities had to feature ways in which they were going to scaffold learners' learning throughout the process of the project. The plan, the activities and the assessment had to correspond. For example, if the assessment required a bibliography then one of the activities needed to be a just-in-time lesson on how to write a bibliography or how to identify the author, title and date in an information source.

The participants brainstormed the research topics with the learners eliciting their prior knowledge and showed them how to mind map. The participants knew that it was important to keep the learners interested, so they motivated their learners in a variety of ways: some stimulating their interest with DVDs, inviting speakers, visiting museums and libraries, showing them how to search on the Internet, and providing them with tools and intervention support to guide them with formative feedback.

They knew that the research task required that learners go beyond the textbook and that they use a variety of information sources. To show learners what it meant to be resourceful, participants contacted and made arrangements with the local public library, several taking their learners to the library themselves. Others requested block loans from the district resource centres or the EDULIS library. If the school had a collection of library material, they conducted an impromptu lesson on how to use Dewey Decimal Classification. They organised visits to the computer laboratory and opened up a new world of online information for learners.

Participants explained plagiarism to learners, taught learners how to find bibliographic information such as the author and publication details, how to reference, how to locate websites, how to evaluate information on the web, why it is better to use a variety of information sources, how to use the index and contents pages by keyword, and how to use dictionaries and encyclopaedias.

Learners were given guidance on how to sort and sift information, organise information under headings, take notes, how to write good paragraphs in their own words, how to draw up interview questions, create a draft, criteria for report writing and poster making.

Only six teachers (#2; #6; #12; #14; #15 and #26), in the researcher's opinion, provide no evidence that they had made information literacy explicit in their class. Although some of their

plans may feature research outcomes, their activities, the learners' projects and their assessment belie their plans. Four of these teachers (#6; #12; #15 and #26) are also considered not information literate by the end of the course. Participants #2 and #14 on the other hand, who are quite capable, provide conventional lessons bereft of a guided inquiry project.

Seventy nine percent (79%) of participants were involved in a guided inquiry project involving some or all of the above support features. The key to unlocking the learners' information literacy was for the teachers' to make their information literacy explicit. The participants had learned an invaluable lesson, as supported in the literature by Asselin and Lee (2002) and Branch (2004), which is that teachers need to learn how to teach information literacy.

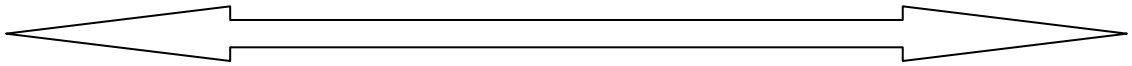
6.4 RESEARCH QUESTION THREE: TO WHAT EXTENT IS INFORMATION LITERACY SUCCESSFULLY INTEGRATED WITHIN LEARNING AREAS?

During teacher in-service training, information literacy does not seem to be made explicit in any substantial way. Access to resources in the form of functioning school libraries is questionable. Despite these constraints, the participants in the information literacy education course were required to demonstrate that they would attempt a research project with their learners by guiding the inquiry, an approach which they had learned in the course. Through this guided inquiry project they would show to what extent they had made information literacy explicit in the classroom.

All change involves a process of learning. The kind of change the participants were expected to undergo could be classed as a paradigm shift as the change challenged their fundamental beliefs and assumptions about teaching and learning. All the participants had experienced transmission education in their own schooling, their training to be teachers, and their years of teaching. After 1997, the new curriculum brought with it constructivist elements such as learner-centredness and different forms of assessment but it seems to have caused confusion in teachers. The researcher

was aware that the information literacy education course was a radical departure from transmission teaching. Analysing the changes, they range from small, subtle differences to more overt, visible changes.

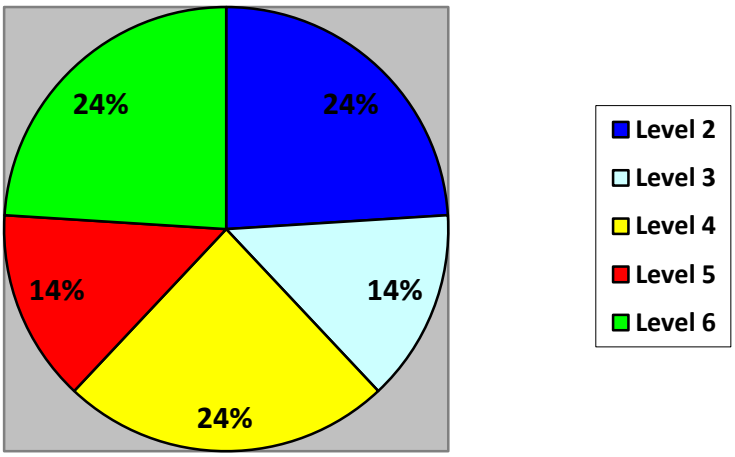
According to Fullan's (1993) criteria for substantial change, four core competencies, namely personal vision-building, inquiry, mastery and collaboration, need to be in place. The researcher was under no illusion that all the participants would be able to change their beliefs radically after a single course. Adapting Havelock's (1973) framework of change agency in education, the participants have been placed on a continuum of change from levels one to six, where level one signifies no change has occurred and level six signifies that information literacy has been successfully integrated into subject/s. See Figure 5 below. Havelock's model or framework has been used in the past to show that innovation in education is seldom embraced by everyone the first time around. Depending on the individual's awareness level and openness to information literacy at the outset, the rate of change differs and can be pegged along a continuum.



Level 1 (no change) Level 6 (integration)

Figure 5: Change continuum (Havelock 1973:115)

Level one indicates no change in beliefs or behaviour after the information literacy education course. Level two indicates that the participants express a personal interest in or curiosity about information literacy. Level three indicates that participants are evaluating or reflecting on information literacy but are not quite prepared to try it with their learners for various reasons. Level four participants are trialing or testing some aspects of information literacy with their learners. Level five participants have adopted most aspects of information literacy education but there are elements missing or not totally convincing. Level six participants have integrated information literacy successfully into their subject/s. The chart below depicts the percentage of participants distributed across the levels. There are no teachers identified at level one. See Figure 6.



Level of change	Brief description	Number of participants N=29	Participants
2	Interest or curiosity	7	#2; #4; #6; #12; #14; #15; #26
3	Evaluating	4	#7; #16; #19; #27
4	Trialing or Testing	7	#9; #11; #18; #20; #22; #23;#24
5	Adopted	4	#13; #17; #21; #25
6	Integrated	7	#1; #3; #5; #8; #10; #28; #29

Figure 6: Participants' levels of conversion to information literacy education

Level 2:

These participants do not provide evidence of a guided research project. Their gains are personal development and curiosity. Participant #2 has been discussed at length before. She has advanced computer skills and understands information literacy education but lacks the nerve to implement it. Her approach to projects did not change. Although participant #4 mentions that he teaches learners how to create a bibliography, locate and evaluate websites, take notes, and use a science dictionary, there is no evidence in his assignment of a bibliography (either his own or learners') or how he taught the other skills. There is no doubt, based on the interview, that he is interested

in a different approach to teaching research projects. Participant #6 uses mainly textbooks and the project is a worksheet showing no evidence that resources other than textbooks were used. Participant #12 gained by realising that active learning is better than passive spoon feeding. Being in control and "the sage on the stage" is a difficult trait for some teachers to relinquish. Teacher #14 has good computer and web skills and proves that she can create engaging, challenging research assignment topics, but in her actual project there is no research component. It is simply a lesson on measurement. The benefit of the course for teachers #15 and #26 is the confidence in using the Internet. Teacher #15 also brainstormed with her Grade 2 class for the first time after the course.

Level 3:

This group is evaluating or reflecting on the idea of information literacy, trying to make sense of it. Participant #19, a self-confessed Internet illiterate in the beginning, provides a research plan minus mention of research skills and attributes, minus a bibliography and missing any evidence of how she scaffolded her learners' learning. Her learners in Grade 12 do provide a non-standard bibliography of mainly textbooks and relevant, but not the most pertinent, websites on the topic of heritage. In the interview it emerges that she introduced her history class to websites and provided several templates (note-taking, writing paragraphs, how to interview, and so on.). Her journal only mentions web resources. Triangulating evidence from the project, the journal and the interview convinces the researcher that the participant may be motivating the learners more to take notes and use the Internet but a lack of solid evidence counts against any opinion of her as making information literacy explicit in a substantial way.

Participant #27 is hesitant to implement a guided project in her class because the learners' literacy levels are very low. Although she mentions teaching them how to choose keywords, mind mapping, writing paragraphs, and how to write reports, the evidence is missing from her project handed in and assessed. Her engaging, challenging topics for one of the exercises proves that she "gets it", that is guided inquiry.

Participant #7 provides photographs to show that the learners were viewing books, but the learners' work does not indicate this in the project. The learners have no bibliography. Participant #16 happens to include data collection as part of a whole series of lessons. In the interview she divulges that she is not yet convinced to use the resources of the neighbouring public library whilst there is no school library. Her bibliography is a collection of textbooks. These participants may possibly be guiding learners in some way but they do not convince the researcher.

Level 4:

These participants are trialing or testing some aspects of information literacy with their learners. They understand information literacy and their research plans, templates or tools for scaffolding; assessment rubrics and/or learners' work provide evidence of trying to make information literacy explicit. Participants #11 and #24 produce excellent mind map, note-taking and bibliographic recording tools but there is no proof in the learners' work that they had been applied. Participants #22 and #23, both Grade 12 teachers, despite the criteria in their respective rubrics for bibliographies, their learners' work show either no bibliography or an acceptance of vague references like "DVDs" or "websites". Participant #18 has no research plan, but the learners' work provides enough proof of scaffolding and use of the Internet is apparent in their bibliographies. Teacher #20, in an isolated rural village, went out of her way to borrow a block loan of books from the education resource centre in the next town, use Internet sites, and a DVD for motivation (all verifiable through photographs) but the learners did not produce a bibliography. Participant #9's learners produce no bibliography but she does teach them questioning skills and identifying different types of graphs in newspapers.

Level 5:

The participants who are level 5 have adopted most aspects of information literacy education but there are elements missing or not totally convincing. Participant #17 demonstrates her ability to guide her learners by motivating them in a variety of ways, by actively engaging her learners in the research process using numerous tools and just-in-time lessons. Her main drawback is she

uses older learners from a higher grade and not her own class. Participant #21, a Grade 12 teacher who grasps information literacy education within the first few sessions and assists in persuading other participants to the value of making information literacy explicit, resorts to a type of 'spoon feeding' by providing learners with resources. One of the skills in information literacy is locating appropriate information, and this should be encouraged by Grade 12, the pre-tertiary year. Despite this "lapse" the assignment is well-planned, with guidance provided throughout the process and opportunities for learners to hand in drafts.

Participant #13 provided minute details in her journal of her progress in implementing her project. She executes her plan well, guiding and motivating her learners throughout the search process. Her learners conduct a type of census research related to population growth in the community. She unfortunately does not provide a solid bibliography nor do her learners.

Participant #25's assessment rubric shows that her learners were required to define their topic, locate information in a library, extract pertinent information, take notes, and write a comparative essay. Her oversight is not explaining in the plan and the journal how she executed the project. Thus it is only in the interview that one learns how she taught them the Dewey Decimal system, dictionary skills, how to use an index and other skills.

Level 6:

Seven participants managed to integrate information literacy fully using the research project. These teachers minute in detail in their journals every skill they taught their learners. They remark on the tremendous amount of planning that took place. They relate the changes in the learners' attitudes and results in real learning that took place. All of them used a wide variety of resources. Both the teachers and their learners' produce bibliographies. The topics were engaging and the participants understood that the learners' had to "make it their own". Using an information literacy model as a framework, they meticulously recorded their progress through the search process noting difficulties and small achievements; reflecting where they should

concentrate in the next project. The assessment rubric used indicated clearly that it was for a research project. In the final analysis, they remarked that substantial learning had taken place in terms of the new knowledge gained, the information handling skills learned and the attitude towards learning from resources was a positive experience.

The continuum helps demonstrate that participants in the study had undergone differentiated changes. The adapted change agency framework allows the researcher to demonstrate nuanced changes in teachers' beliefs about information literacy education. While level two participants made personal gains and may not have succeeded in making information literacy explicit, from levels three to six the participants have guided learners by varying degrees. It is extraordinary for teachers who have radical change foisted upon them to embrace it (Fullan 1993). Seven teachers "owned" the changes and went beyond "window dressing" or superficial restructuring.

The participants' continued implementation of information literacy education is a subject for a future longitudinal study. Some of the challenges to sustaining implementation that participants mention are unique to South Africa; others overlap with the international literature. The very large class sizes of 45+ learners, having no functioning school library, inaccessibility to the Internet and very low literacy levels are unique to South Africa and militate against sustaining information literacy education. The reservations to sustaining information literacy education coinciding with the international literature refer to time constraints – a curriculum schedule being too tight and geared for examinations (Slyfield 2001; Information skills for teachers 2006; Williams & Wavell 2006; Jorosi & Isaac 2008), teachers' own lack of information literacy (Slyfield 2001); and teachers' lack of knowledge of how to teach information literacy skills (Slyfield 2001; Merchant & Hepworth 2002; Information skills for teachers 2006).

6.5 RESEARCH QUESTION FOUR: TO WHAT EXTENT IS INFORMATION LITERACY ASSESSED IN THE CURRICULUM?

The journals did not provide ample evidence of how the participants assessed the research projects. The main sources of evidence are therefore the interviews and the participants' assignment artefacts, or more exactly their assessment rubrics and learners' assessed pieces. Without the interview discussions, a large number of assessment rubrics the participants used would have remained baffling to the researcher. Using a variety of tools to collect data has been advantageous in this study as it has assisted with triangulation.

As the participants were expected to guide learners' research projects from start to finish, their assessments needed to reflect more than end product evaluations. In relating how they conducted projects before the course, participants' emphases seemed to be on the final product, for example, a poster or an oral. To assist the participants in constructing a rubric, currently a popular way of assessing, the course offered rubrics which matched the information literacy models' broad categories. Participants were also steered to websites which offered more examples of information literacy rubrics. Viewing the rubrics that participants used in their final projects, the researcher recognised some as standard WCED fare. These WCED rubrics included aspects such as using a variety of information sources, creating a bibliography, presenting information and so on. If the participants were using these WCED rubrics before the course, how did they assign a mark for categories such as a bibliography if the learners were not taught?

The participants unravelled this puzzle by explaining that during WCED workshops they are taught how to create a rubric but not how to teach each item in the rubric, for example, mind mapping or synthesizing. It was assumed that teachers knew how to do this. Projects were mystifying to teachers as they had no clear idea how to achieve the cross-curricula outcomes, *collect, organise, analyse and critically evaluate information;* and *communicate effectively using visual, symbolic or language skills in various modes.* The superficial handling of research

projects during in-service training resulted in teachers fudging the teaching of it. At the high school level in particular, teachers provide lengthy documents detailing what learners need to do as if this explanation equals the teaching of the information search process (see Appendix 7). This is one permitted way of dodging the teaching as teachers are simply mimicking their subject advisors' advice. At the high school level research skills is often one criterion of a research project rubric described as "consulting a wide range of sources", which underestimates the complexity of the information search process (see Appendix 8). A further disappointment is the rewarding of Grade 12 learners with marks for vague bibliographies such as "DVDs" or "websites". By Grade 12, learners should be able to write a correct bibliography using a style chosen by the school. It is no wonder that by the time they reach tertiary level, they cannot use a correct format nor do they appreciate the ethical use of information sources (Sayed 1998; CHE 2004; De Jager & Nassimbeni 2002; King 2007).

Some participants disguised their ineptitude with research projects, especially at primary school level, by not using the project as a form of assessment at all or by concentrating on social skills in the criteria such as group work skills, writing neatly, and other "touchy feely" criteria. Moore (1997) makes a similar remark about projects at a primary school where the emphasis seemed to be on the social skills related to group work rather than the development of cognitive skills. In the current study there were no criteria related to information handling skills, as perhaps, there was no intended research project. Peer assessment was another favourite with projects but, as it was often biased, it became essentially meaningless with teachers not seeming to take it seriously.

The course intervention, according to the participants, helped them make sense of some of the existing rubrics for projects. For the first time they could teach their learners how to mind map, how to take notes and how to write a bibliography, criteria usually assessed without teaching them.

What many teachers and learners found most useful was using an information literacy model. A

model is useful for teachers unfamiliar with research and the information search process. Herring (2007), in relating how a model is an enabling tool, explains that it provides hooks for learners to approach resource-based learning. For example, it makes learners aware of the variety of information sources available, and so on. A model bears fruit after applying it in a few projects as it gives learners the opportunity to practise and reinforce what they have learned before. In the South African setting in which households are print poor and parents barely literate, an information literacy model has its worth. Most children do not live in households in which parents can guide and assist them with projects.

There were 16 (55%) participants who either used the WCED rubrics, a rubric mainly concentrating on the end product or who did not provide evidence that the rubric created was used to assess the learners' projects. Thirteen (45%) participants adapted or created their own rubrics (see Appendix1). These 13 participants were now assessing the "research journey" and not simply the end product. The participants were, for the first time, assessing the search process in depth. The learners welcomed an information literacy model because previously they had no clue how to proceed with projects. Learners were provided with the assessment rubric at the start of the project. The rubric was not an afterthought. The learners had a clear idea how to pitch their projects. The participants were additionally providing formative assessment or feedback to learners every step of the way with the result that more learners completed their projects successfully, on time and the experience was a positive one for learners. Moore (1997) relates in her study how teachers who are not aware of how to scaffold learners' learning neglect to provide assessment criteria upfront. The 13 teachers in the current study not only endorse information skills they are "operationalising" them in research project activities.

Appended are five examples from participants #1 (Appendix 9 in Afrikaans is a translation of McKenzie's 1997 model in Table one); #13 (Appendix 10); #10 (Appendix 11); #25 (Appendix 12); and #29 (Appendix 13) of research project assessment rubrics which incorporate aspects of information literacy such as defining the need, planning a search strategy, locating information sources, accessing and using information, using a dictionary, selecting information, synthesizing

information, organising information, using information to report findings, and creating a bibliography. Importantly, these participants provide evidence in their learners' submissions/ work that they taught these aspects.

One of the exercises the participants undertook was to "turn traditional topics into more engaging research projects". This exercise was intended as a practice for their "real project" which they would implement in class. The other purpose was to think about phrasing topics for inquiry which would prevent copy and paste. Seven participants (24%) do not succeed in this exercise. The surprise is that of the 22 participants who do succeed in the exercise, most lapse back into "traditional" topic statements when it comes to their "real project".

6.6 RESEARCH QUESTION FIVE: AT WHAT LEVEL ARE TEACHERS' WEB KNOWLEDGE AND SKILLS?

At one stage, the ACE school librarianship programme had a separate course called *the Internet and web for school librarians* which was dropped in favour of a more integrated approach. A stand-alone course dealing with the Internet seemed unnecessary now that teachers had access at school. What this study uncovers is that access to computers with Internet connectivity for teachers is a layered, complex digital divide issue.

While 93% of the schools in the study have computer laboratories with Internet access, these laboratories are, first and foremost, for learning mathematics and science at the high school level and for literacy and numeracy at the primary school level. The rest of the school subjects may make use of the computer laboratory when "free" or not assigned to first choice subjects. Access to the Internet depends on individual schools' ability to pay for the service. Access to the Internet is also dependent on a regular and stable electricity supply. The poorest schools, quintiles one and two, are least likely able to pay for unlimited Internet access. Internet connectivity in rural areas is erratic. In urban poor areas the problem is theft of computers and copper cables.

For teachers at the poorest schools, having a computer and Internet access at home is not a priority. When the teacher participants in the study started, only nine (31%) had Internet access at home, although 19 (65.5%) had a computer at home. Despite the Khanya project offering teachers training in basic computer literacy and use of the Internet, it does not seem to have impacted on the teachers in the study in any meaningful way. Clarke (2010) in his Western Cape study questions the effectiveness of the Khanya Internet training. Fourie and Krauss (2010) highlight the Internet challenges in poorer communities in South Africa.

Having ICTs at a school does not necessarily mean that the school has changed its teaching and learning culture (Cuban, Kirkpatrick & Peck 2001; Henri, Hay & Oberg 2002). Yet, ICTs can predispose people to information literacy (Moore 2002). When the chief curriculum advisors answered a question on how they develop, support and assess teachers' information literacy, they equate it (information literacy) with web literacy. They talk about teachers being "behind" when it comes to technology and teachers not seeing to their own professional development – identified as a dependency attitude by Taylor (2010).

When the participants start out their computer literacy is at the beginner level. There are a few technophobes (participants #13; #19; #24; and #26) and a few technophiles (participants #2; #4; #11; #14; and #21) at the start. The web was unfamiliar terrain for most. They did not have personal email so they were taught to set up one themselves and to use it. Participants had great difficulty detecting misleading information on websites. In part, the reason could be that English is a second language for the majority. On the other hand, not knowing basic science (selling dehydrated water is absurd) and geography (not knowing that the Republic of Cascadia does not exist), or how to verify information, points to a cognitive/knowledge problem. The participants were unaware of plagiarism and seemed not to consider web evaluation important. Any information found on the web was taken at face value by most.

Even though 13 participants (about 45%) mention teaching web evaluation and exploring websites with learners either in their journals and/or the interview, fewer (less than 10) provide enough evidence to suggest that they handle online information with healthy scepticism but also with integrity. The Internet opens up a new world of information to the participants. When participants struggle to locate appropriate subject-based websites for an exercise, the *Weblinks Research* database is their saving grace. Weblinks becomes the scaffold for these inexperienced teachers. Their confidence soars as can be seen in their improved self-efficacy (going from 4.5 to 5.5 on the Likert scale) and their performance in collecting annotated subject websites (all except participant #12 completed the exercise successfully).

The participants seem to have been catapulted into the 21st century information world by the end of the course. They are using the web to find personal information (28 participants), to email (18), file tax returns (14), for social networking (17), for Internet banking (four), purchasing tickets (three) and much more. Many felt compelled, through the course, to purchase Internet access at home. Even though the participants were forced to change due to external pressure (from the course), the change foisted on them brought about positive, personal shifts in their beliefs about the web or online information. Participants embraced the change.

6.7 RESEARCH QUESTION SIX: HOW DO (SCHOOL) LIBRARIANS UNDERSTAND AND CONCEIVE OF INFORMATION LITERACY?

For this question the researcher turned to the literature. For school librarians trained in the last 20 to 25 years in North America and Australia, information literacy, viewed as a keystone of lifelong learning, has been pivotal to their education. There has been an understanding that the world we are living in has a proliferation of information which school going learners in this instance have to learn to handle, interact with, make sense of and build on to create their own understanding. The information landscape has been changing rapidly and we have to learn not to be mesmerised by the flash of the latest information technology. Instead, we need to learn how to

harness the new information technology to assist us to manage the information glut. Learners still need to be able to distinguish the inane from essential knowledge, to read between the lines, to learn to build arguments from different points of view, irrespective of the format in which the information comes (Todd & Gordon 2010).

It is not paradoxical that school librarians are also called teacher-librarians in Canada and Australia. These school librarians have a dual qualification as teachers and as librarians. As all librarians are aware, knowing the needs of your client base is paramount. In the school setting librarians do not only work with learners but with teachers too making curriculum connections a very important feature of their training. As curriculum changes were introduced, school librarians moved to meet these new demands. For example, as the curriculum embraced learner-centredness, resource-based learning and independent learning, school librarians responded with information literacy models and school library standards for information literacy.

The information literacy skills models which grew out of practice – such as those popularised by Gawith (1987;1988;1991), Eisenberg & Berkowitz (1990), and Herring (1996), to mention just a few, assisted school librarians in teaching the information search process which underpinned independent learning projects. Many of these models formed the basis for the development of information literacy curriculums such as the Ontario School Library Association's (1999) curriculum *Information Studies, Kindergarten to Grade 12*, the Ryan and Capra (2001) information literacy grade level programmes and the California information skills grade level standards (California Media and Library Educators Association 1994). These grade level scope-and- sequence curricula offered school librarians a revitalized way of "teaching" in the school library.

The school library standards which emerged in the late 1980s in the USA (AASL 1988), revised a decade later (AASL 1998a), and refashioned into the 2007 *Standards for the 21st century learner* (AASL 2007) are another route to connecting school libraries to the curriculum. The

2007 standards are expressed in terms of learners' abilities to use skills, resources and tools to: 1) inquire, think critically, and gain knowledge; 2) draw conclusions, make informed decisions, apply knowledge to new situations, and create new knowledge; 3) share knowledge and participate ethically and productively as members of our democratic society; and 4) pursue personal and aesthetic growth (AASL 2007). Traditional information literacy is located under the item *inquire, think critically and gain knowledge*. The new standards emphasize through inquiry that learning is not only about skills but dispositions (attitudes towards learning) too (Stripling 2008: 50; Donham 2008: 43). These standards finally pay dividend to Kuhlthau's (2004) ISP model with its triad of thoughts, feelings (dispositions) and actions. The elements that underpin the four standards are skills, dispositions, responsibilities and self-assessment strategies. Coming through quite strongly in the new standards are technology related issues such as being able to read with understanding in different formats including on the Internet, using information ethically especially in a socially networked world, and developing ICT skills to be able to work in a technological world (AASL 2007).

Inquiry-based learning like learning using research-based projects is "messy" (Stripling 2008: 51). It forms the bedrock for the collaboration with teachers through the subjects that they teach. School librarians who have been schooled in collaborative programme planning (Haycock 2007) expect to be able to plan, teach and assess inquiry-based research projects with teachers.

The LIASA (2004) *Information Literacy Guidelines Grades R-12* were the South African school librarians' attempt to devise a framework similar to the information skills models and standards found elsewhere in the world (Hart & Zinn 2007: 96). The framework makes explicit links between information literacy and assessment standards of each subject/learning area. The guidelines, constructed by a consultative forum, were meant to be ready for uptake by school librarians once a national school library policy was passed. Since their release in 2004 there has been no national school library policy. With 92% of schools without libraries or librarians, the guidelines have not taken root in any substantial way.

The literature review Chapter (two) describes a chain of interlinked information literacy guidelines, models and standards to be found in state, national and international school library associations across the globe. Implementing information literacy, as understood and expressed by school librarians in terms of models and standards, requires an alliance amongst educators (teachers, principal, and librarian) based on trust and value. If there is little understanding, appreciation of and no common educational vision and goal amongst the alliance partners, it is unlikely that information literacy envisaged by school librarians will materialise.

6.8 RESEARCH QUESTION SEVEN: WHAT ARE THE DIFFERENCES AND SIMILARITIES BETWEEN TEACHERS' AND LIBRARIANS' OPINIONS OF INFORMATION LITERACY?

When the participants undertook information literacy education, it was the fourth course in the ACE school librarianship. They had completed courses more easily identifiable with school library administration and organisation as well as children's and youth literature which linked with literacy in the curriculum. Initially, information literacy was a puzzle to them. Firstly, it was a foreign concept, because they had never been provided with a method for teaching children how to conduct research-based assignments. Secondly, they could not fathom what information literacy had to do with becoming a school librarian. These school librarians in-training were being educated for a future role in which they would be fulltime librarians. In this future ideal school they would have the knowledge and skills about information literacy which they could share with their colleagues. Failing these fulltime librarian positions, the participants would have gained invaluable insight into how children learn through inquiry-based learning, and how to plan, mediate and assess research projects.

The participants, who are also fulltime classroom or subject teachers, tell a consistent story about how they usually "give" learners research projects. While the sample is too small to generalise, the value of this qualitative research lies in the illuminative insights it offers about the phenomenon of information literacy (education) as perceived through teaching research projects.

Teachers' (participants') beliefs about how projects should be approached reveal a uniform thread. Some beliefs remained strong despite the course intervention. This was expected, as beliefs which are ingrained and challenge the very foundation of teaching and learning are not usually overturned by a single intervention. There is much truth in the old adage that "teachers teach the way they were taught". The way one is taught at school follows you into your teaching career.

Some common beliefs about research projects and information literacy by the participating teachers as compared to librarians' views:

6.8.1 LIBRARIES AS STOREHOUSES OF INFORMATION

Most teachers in the study, in describing how they conducted projects before the course, relate that they would send learners to fetch information from the public library (see 5.3.4). Public libraries are regarded as warehouses stuffed with material which could give learners answers. Before the course, participants gave little consideration to how libraries are organised or location skills required by learners.

In the South African context the public library is the most frequently used library. It appears that public librarians have done little to change the image of libraries as "stores" and information as a "utility" (Hart 2006).

6.8.2 PUBLIC LIBRARIES AS THE DE FACTO SCHOOL LIBRARY

Teachers' attitudes towards public libraries varied. Some teachers treated them as their personal library and expected public librarians to "service" their 45+ learners in the class, most times, without consultation (teacher #1 remarks at 5.3.2.7). Teachers treated public librarians with disdain. Public librarians were considered the "suppliers" of a service (see Mr Davids' comment at 5.4.8).

For several years since the inception of the new curriculum in 1997, schools and public libraries have been at loggerheads over the uneven relationship that exists between the two parties. Falling under different ministries, public libraries under the Ministry of Arts and Culture and schools under the Ministry of Education, the relationship between schools and public libraries on the ground remains tenuous. Teachers think nothing of sending or taking three classes, without notification, to do a project in the library (observation of teachers #1 and #4). The implication is that teachers' understanding of the information search process is flawed, perhaps because they themselves have never done research (for example a research essay). They seldom venture beyond the textbook (the bibliographies of teachers #6; #9; #14; #15; #16; #24; and #26 reflect mainly textbooks) and they find libraries intimidating (teacher #8 admits to feeling threatened).

6.8.3 INFORMATION LITERACY IS INTUITIVE

A common thread running through the interview stories was the belief that the skills and knowledge learners required for undertaking research projects would be acquired by "osmosis". As in the Williams and Wavell (2006) study, the teachers only became aware of the complexity and range of search and cognitive skills once they had been taught about it. Baxen and Green (1998) expound that teachers assume learners can use material such as charts without mediation. Williams and Wavell (2006) attest to a similar line of thinking amongst the teachers in their study: they assumed that providing access to information was enough. For one of the most introspective participants (#1) in the current study it was an eye-opener for her to discover that simply providing a collection of material for learners to use is insufficient if you wish to develop learners' information literacy.

6.8.4 A LIST OF INSTRUCTIONS CLARIFIES THE INFORMATION NEED

Linked to the assumption that learners are developing information literacy intuitively is the notion that a list of instructions and clarified points are enough explanation for learners to tackle research projects on their own.

It is unfortunate that, in the South African context, public librarians themselves are ambivalent, perhaps because of their lack of information literacy education about their role, or the extent of their role, in teaching information skills. According to Hart (2006) only one out of 57 public librarians in her study had had training in information literacy.

The school librarianship literature on the other hand is quite definite in its consideration of information literacy as a guided, scaffolded learning experience. Professionally trained school librarians understand that information literacy is complex and that the range of search and cognitive skills has to be explicitly taught. By the end of the course 79% of participants demonstrate that they attempted a guided research project and taught their learners information skills to support their learning.

6.8.5 ETHICAL USE OF INFORMATION

The teachers in the study are not confident users of information, especially not web-based information. They have difficulty evaluating information and tend to take information at face value. Unlike the teachers in the Williams and Wavell (2006) study, these participants found the concept of plagiarism quite new. Having learned about plagiarism in the course, 86% of participants provide a bibliography, of which only 48% provide a fair to good selection of information sources. Teachers (24% of participants) are still using textbooks as their main source of information even for research projects. Only 38% (11 participants) expected their learners to provide bibliographies.

Engaging with a wide variety of information sources is still a challenge for most participants by the end of the course: 24% provide no bibliography, 24% are using textbooks mainly, 62% do not expect a bibliography from learners and 45% are using websites. During the interviews participants relate that they are becoming more comfortable in the web environment but it seems more related to their personal use of the Internet and not necessarily related to their teaching. The ethical use of information seems to have been placed on the back burner while teachers themselves widen their information horizons.

School librarians understand that taking care to acknowledge one's sources of information as accurately as possible not only prevents plagiarism, but more importantly librarians recognise that individuals are building on and sharing the knowledge of others in society.

6.8.6 LIFELONG LEARNING

Although both teachers and librarians agree that lifelong learning and independent learning are important goals for learners, their routes to these goals differ. Unless teachers are explicitly taught information literacy education, they do not see the point of 1) motivating learners throughout the process of the project as they believe that projects are motivating in and of itself; 2) engaging learners in well-thought out projects which are cognitively stimulating and which cannot simply be copied and pasted; and 3) "holding learners by the hand" to guide the inquiry using an information literacy framework. School librarians know that these three factors are significant in building confidence as independent learning does not arise naturally out of a vacuum.

The participating teachers state that learning through projects takes time which they cannot afford as the curriculum demands constrain them (see 5.3.10). Teachers are therefore more interested in "end products" which can be "marked" than *how* children are learning (see 5.3.4). As in the British study *Information skills for teachers* (2006), the participating teachers in the current study did not think about the process of learning, the skills and the attitudes, before the course. This is prevalent amongst many teachers according to the chief district curriculum advisors.

6.8.7 SHIFTING PARADIGMS OF SCHOOL LIBRARIES

It appears that changing the perceptions of the role of librarians is a hard task. The traditional role of librarian, as "provider of information" or as "recommender of fiction", seems to have stuck in the minds of teachers, administrators, even teacher educators. While school librarians may be experiencing some success in North America and Australia in the teaching of

information literacy, the same cannot be said for countries like South Africa with a minority of schools having functioning school libraries. The teaching role of the school librarian is not a universally accepted role and school librarians have to constantly renegotiate collaborative practices with other educators to assert this role.

This question is really hard to answer because in South Africa there are too few professionally trained school librarians. While there may be other points of comparison between teachers and librarians, only the most significant themes have been compared between the teacher participants in the study and the international school library literature and to a lesser extent the local public library literature.

6.9 CONCLUSION

The discussion and interpretation chapter returns to the research questions to be answered. The interpretation of the results weaves together the findings from the questionnaires, journals, and interviews with the selected, assessed pieces from the participants' assignments such as the bibliography and rubrics used (see Appendix 1). The mixed methods approach has paid off. The quantitative data from the questionnaires triangulated with the findings from the interviews, journals and assessed pieces from the assignment assisted in interpreting the results in a more nuanced way. Contradictions and apparent paradoxes in the journals and assessed assignments could be clarified in the interviews.

Each question answered exposed sequentially deeper layers of teachers' understanding of information literacy education. In the end only seven of the 29 teachers successfully integrated information literacy in a class research project. Nevertheless, all teachers made small gains whether it was in terms of using and evaluating Internet-based information or realizing that active learning is better than passive spoon feeding. Of all the questions to be answered, question seven posed a challenge as the predominant image in international literature is of a professionally trained school librarian employed in a school which is not the case in South Africa.

The seventh and final chapter follows providing a synopsis of the entire thesis, the contribution of study to growing knowledge in the field of information literacy education and recommendations for future studies.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

Chapter seven provides an overview of the entire thesis and relates to what extent the research problem has been successfully addressed. The chapter offers a summation of the entire study and includes an examination of the study's distinct value to growing knowledge in the field of information literacy education. A background to the thesis and its structure is the starting point for this chapter which includes a summary of the research problem and a brief synopsis of the structure of the thesis. The findings for each research question related to the research problem are summarized next and contextualised in terms of this and prior research. The last sections deal with the present study's contribution to the body of knowledge, the implications of the research for theory, practice and policy and the suggestions for further research.

This study investigated teachers' competency in mediating information literacy in the classroom. The study achieved its purpose in showing in a nuanced way that teachers, having undergone instruction in information literacy education, could teach their learners information literacy to a greater or lesser extent using a guided inquiry project.

7.2 BACKGROUND TO THE THESIS AND ITS STRUCTURE

Brief summaries of the research problem and structure of the current research follow.

7.2.1 SUMMARY OF THE RESEARCH PROBLEM

Chapter one provides a statement of the research problem which was to investigate teachers' understanding of information literacy and their competency in information literacy education.

Chapter one, 1.1 to 1.3, clarifies further the grounds on which the research problem is based and which is described below. These rationales include: evidence for information literacy in the past and present 2012 revised curriculum in South Africa which ought to make it compulsory in the curriculum; universities' expectations of student information literacy attributes indicating that they require school-leaving learners to possess some or all of these traits; the Education Ministry itself querying teachers' lack of abilities in teaching research assignments and projects; and the researcher's own previous experience of teaching educators information literacy education and their ill-preparedness for supporting learners during the information literacy process.

The problem is further situated in the national and international context. The international literature continues to vocalise the importance of information literacy through its association with inquiry-based learning at the school level. The international literature on teacher education questions certain assumptions that have been made in the past: for example, teachers who know their subject will automatically be able to mediate information literacy through their subject (Branch 2004); trainee teachers know how to do research (Asselin & Lee 2002); and collaboration between teachers and school librarians is part of teacher education (Moreillon 2008). It seems that, despite the information literacy standards for students and teachers adopted in countries such as the USA, Canada, New Zealand and Australia, the implementation has not been as successful as anticipated as evidenced in the renewed call for its advocacy in Australian pre-service teacher education (Australia [Commonwealth]. Parliament …2011) and Duke and Ward's (2009) meta-synthesis of information literacy in teacher education. In South African studies the research findings by Fredericks (1993) and Olën (1994) call for library and information skills to be embedded in initial teacher education. More recent studies on teacher education and information literacy education have not been undertaken in South Africa.

Chapter two, the literature review, provides a refinement of the arguments for information literacy in the 21st century and its increased necessity in bridging the digital divide. As information becomes increasingly available online, people need to have the wherewithal to operate in new technological environments. Government tends to emphasize ICTs in terms of access to computers and computer literacy (South Africa 2011d), but in order for people to enjoy

social inclusion, exercise their human rights, and fit into the global village they also need information literacy (Britz & Lor 2010). The South African education context with its scarcity of school libraries and few school librarians necessitates the question: who is teaching information literacy in our schools? Information literacy is strongly associated with school librarians in the international literature. Depending on public librarians to teach information literacy is risky as they are often not quite equipped for that role (Hart 2005).

Situating the research problem within the context of South Africa's education landscape, there are a number of challenges which need to be noted. The majority of participating teachers in the study teach in the lowest quintile schools, quintiles one and two, regarded as the poorest. At the time of the study, only one school (quintile 5) in an urban area had a fully functioning library, the rest had either a collection (store of mainly books, no librarian) or nothing at all. Access to information in libraries or on the Internet, although not easy is not impossible. Forty one percent (41%) or 12 schools (n=29) had access to a public library within a 3km walking distance and all, save three schools, had computer laboratories with some Internet access. Language and literacy are twin problems in this landscape as information is most often available in English while the home languages in the Western Cape are mainly Afrikaans and to a lesser extent Xhosa and English. The language and literacy scores in the Western Cape are below 50%: Grade 3 literacy is 43% and Grade 6 language is 40% (South Africa 2011c:20). Literacy is a precursor to information literacy. If the language and literacy levels are low, learners will struggle with information literacy (Zinn 2000). Further exacerbating conditions are large class sizes of 45+ learners per class, information resource-poor homes of learners, and teacher unpreparedness for the radical educational reforms.

There have not been many studies that focus on the information literacy education competencies of qualified teachers. Examples of studies conducted are those of Merchant and Hepworth (2002) and Williams and Wavell (2006) in the UK; Moore (1997), Slyfield (2001) and Probert (2009) in New Zealand; Henri (2001) in Hong Kong; Asselin, Kymes and Lam (2007) in Canada; and Baxen and Green (1998) and Hart (1999) in South Africa. The competency of teachers in

information literacy education is therefore an apt study 15 years since the first introduction of a new curriculum in South Africa.

7.2.2 BRIEF OVERVIEW OF THE STRUCTURE OF THE CURRENT RESEARCH

In investigating the problem of this research, the thesis adopted the following structure: Chapter one provided the rationale for the study by positing that 1) information literacy is inferred in the National Curriculum Statement (both 2011 and 2002) by characterising the successful attributes of a learner as they manifest in *collect, organise, analyse and critically evaluate information; identify and solve problems and make decisions using critical and creative thinking; and communicate effectively using visual, symbolic or language skills in various modes;* 2) at the tertiary education level students are expected to be able to learn independently from information resources, access and use information increasingly available online only, and undertake research resulting in the writing of research papers. Students' information literacy preparation at the school level appears inadequate and disparate; and 3) school librarians, the traditionally accepted purveyors of information literacy education, are few and far between in South Africa. Are teachers by implication, therefore, teaching information literacy in schools?

The chapter continues to support the research problem by providing more background evidence that teachers, in their pre-service training, nationally and internationally, are not being prepared for resource-based learning and the teaching of information literacy. Within the Ministry of Education a panel of experts, set up by the Ministry, came to the conclusion that research projects and assignments, the realm in which information literacy is often tackled, are dealt with superficially by teachers.

Having stated the purpose for the study, the rationale and providing preliminary evidence as background to the research, the chapter delves into defining information literacy and important concepts related to information literacy. The context of South African education and the

assumptions and limitations of the study follow. The key questions are proposed before the principal theories (of information seeking and use, inquiry-based learning and constructivism) upon which the research project is constructed are described. Finally, the choice of research methodology and the mixed methods approach are explained, followed by a brief outline of each chapter.

Chapter two, the literature review, is a selection from the vast literature that exists on information literacy. The debate in the literature about ICT or digital literacy versus information literacy is addressed and the notion of information literacy as an intellectual framework not confined to any set of technologies is advocated. Information literacy as a basic human right is an important concept in the literature for a developing South Africa where the accent seems to be on access to and use of ICTs but not necessarily information literacy. A brief foray into information literacy amongst incoming university students provides insight into the under-preparedness of new undergraduates not only in South Africa, but worldwide too.

The bulk of the literature reviewed in Chapter two highlights information literacy experienced in the school context as the purpose of the study is to explore how teachers understand information literacy and how they see their role in information literacy education. Thus the debates, contentions, trends, issues and the gaps in the literature provide a backdrop to the current study as well as providing examples of methodologies and approaches which support the current study's approach/framework. The literature on school librarians and their teaching role provided essential knowledge for answering one of the research questions.

Chapter three presents the theoretical framework. It begins by providing a critical discussion of constructivism especially in the way it has reared its head in education debates in South Africa. The chapter continues by developing a sound argument for inquiry-based learning as one of the frameworks to be used in the current study. Inquiry-based learning's characteristics, models and relationship to information literacy are considered. The important elements of an inquiry model,

that incorporate information literacy, such as process learning, asking good questions, motivation, scaffolding and metacognition, were examined as they formed the kernel of the current study. Finally, a case is made for the process-based approach to information literacy as epitomised in the information search process model and similar models as the complementary theoretical framework.

The research methodology and the attendant approach, data gathering instruments and participant sample are the focus in Chapter four. Starting by defining what research is, Chapter four proceeds to discuss the terminology variation in the literature regarding methodology, methods, design and paradigm. The purpose of examining terminology variation in the literature is to persuade the reader that the researcher's pragmatic choice of a mixed methods approach suited the type of research questions to be answered. In the current study, therefore, quantitative and qualitative modes of research and data are combined.

The justification for conducting mixed methods research in the current study is borne out by the triangulation it offered in corroborating and converging results in Chapter five from the questionnaires, interviews, journals and assignment artefacts. In the current study, the responses in the pre-and post-course questionnaires, the quantitative data, provide reliable measures of efficacy which inform an unintentional or accidental research question for this study related to the value and significance of the course intervention.

The overriding mode of inquiry for the current study is qualitative which incorporates design strategies or features such as purposive sampling. The small sample (29 participants) implies that results are not generalizable. Rather the intention is an in-depth inquiry with multiple layers enabling a rich, textured understanding of teachers' information literacy (education).

Issues of triangulation, validity and reliability are addressed in terms of their different interpretation or understanding in qualitative versus quantitative approaches to research. The data collection methods and tools used such as interviews, journals, unstructured observation, questionnaires and assignment artefacts wrap up Chapter four with a brief reference to the data analysis software used.

Chapter five presents the data collected with some analysis. The data provides evidence to answer most of the research questions (the evidence for the research question related to school librarians' opinions about information literacy comes from the literature review 2.3.5). The chapter commences by setting the study in the context of the school librarianship programme at the University of the Western Cape and by providing background information to the teachers in the purposive sample. The rest of the sequence of findings is presented in the following order: the participants' questionnaire from two iterations; the participants' journals; the interviews with the participants; and the interviews with the district chief curriculum advisors. The quantitative data from the questionnaire were analysed using a spreadsheet and a statistical package, R software version 2.13.1. The qualitative data collated was analysed using a qualitative software package, Atlas.ti 5.0. Atlas.ti facilitated the conceptual content analysis of all the interviews and journal writing.

Chapter six provides an evaluation and interpretation of the findings presented in Chapter five. The analysis links the findings from the questionnaire, journals, interviews of participants and district chief curriculum advisors with the research questions and the literature reviewed in Chapter two. The chapter unfolds according to the order of the research questions. The research questions in turn are answered within the theoretical frameworks expressed in Chapter three.

This last chapter, Chapter seven, offers a final synthesis and summation of the entire study. The researcher views the findings in Chapter five within the context of the current study's research questions, this time to ascertain to what extent the questions were answered and the study

fulfilled.

7.3 CONCLUSIONS ABOUT EACH RESEARCH QUESTION

The findings for each research question are summarized from Chapter six and explained within the context of this and prior research examined in Chapter two. Seven questions which were formulated to investigate the study are summarized here. Research questions one to five together form a unit presenting a composite picture of the teachers' information literacy competencies. Questions six and seven are subsidiary but they provide a link between the teachers' outlook on information literacy and that of school librarians', the role they may play in the future.

7.3.1 RESEARCH QUESTION ONE: TEACHERS' UNDERSTANDING OF INFORMATION LITERACY (EDUCATION)

The first research question asked:

How do teachers understand information literacy and information literacy education?

And by implication: are teachers themselves information literate? This question was answered by triangulating direct responses from participant interviews with responses from district chief curriculum advisors, journal entries, assignment artefacts and comparing them to studies in the literature. The extent to which the participating teachers in the study could be deemed information literate should be viewed from two different reference points: before the course and after the course.

Before the course: Firstly, the predominant image the district chief curriculum advisors interviewed have of teachers is that they are not information literate. They base their impressions on moderated research projects and teachers' lack of ICT literacy. Teachers are not aware of research protocol, turn a blind eye to plagiarized projects, and assess projects superficially. The district chiefs' views provide a perspective of teachers which is corroborated by the participant teachers in the study through their journals, interviews and questionnaire responses. Through the

questionnaire at the start of the course participants expressed their short comings in writing research papers, being familiar with bibliographic conventions, choosing the best format to communicate findings, evaluating web-based information and generally working in a web environment. From the interviews and journal entries there is further corroboration with the chief advisors' perspectives of teachers as exhibiting few of Doyle's (1994) information literacy traits. But their lack of information literacy is most keenly felt in their inability to teach it. If people are themselves not confident about a particular subject or approach, it is even more difficult to teach someone else.

Before the course, the participants understood information literacy evident in research projects as occurring naturally or organically. This view of information literacy happening by osmosis appears to be a worldwide trend amongst teachers (Moore 1997; Zinn 1997; Walker 2001; Merchant & Hepworth 2002; Williams & Wavell 2006; Probert 2009). All the skills, values and knowledge attendant on information literacy are seldom taught or inadequately taught. The message which the participants seem to be taking away from in-service training supports the notion that a detailed list of instructions is enough for learners to develop independent learning. Unlike learners in the UK or New Zealand, for learners in quintiles one to two schools in the Western Cape, and probably for most of South Africa, it cannot be assumed that parents and caregivers, who are themselves barely literate, can assist learners with research projects. The South African homes of these learners will have very few information resources (Taylor, Fleisch & Schindler 2008) and very few schools will have organised, functioning school libraries. British and New Zealand learners are highly likely to be more privileged in having better access to information sources and better qualified teachers than South African learners, yet, even then the various international studies, highlighted in Chapter two, question the inadequate guidance teachers give learners during research projects.

Unlike the curriculum review panel of experts (South Africa 2009c), whose solution to the projects conundrum is fewer projects per subject and more exemplars, this study, like the international studies before this one, advocates teaching teachers how to mediate information

literacy; give them insight and understanding of information literacy. For too long it has been assumed that teachers are information literate and should therefore be able to mediate information literacy in the classroom. This current study shows, like the international studies, that teachers have to be exposed to information literacy education.

After the course: Whilst participating in the information literacy education course and implementing the guided inquiry approach with their learners, many participants underwent several changes. They began to understand that the scaffolding of learning through research projects was of paramount importance. They expanded their view of what constitutes an information source and the world of the Internet in particular provided them with an enhanced view of information sourcing. Participants' self-efficacy scores on the post-course questionnaire improve considerably especially those questions related to writing a research paper and using online information. Despite the anxiety and uncertainty participants faced in implementing a new approach and in overcoming daunting challenges (such as limited-to-no school libraries, low literacy levels, school environments not conducive to fundamental pedagogical change), most participants persevered and demonstrated many of Doyle's information literacy traits including metacognition which, amongst other things, accepts that learning can involve complex moods of uncertainty, frustration and doubt.

As mentioned in Chapter six (6.4), information literacy is complex and it is more constructive to talk about gradations of information literacy. The outcome of the information literacy education course was never intended to be equated with "a measured dose of fertiliser for crops" (Patton 2002). Radical change usually takes time and requires enabling factors to be in place before people will trial new, transformative ideas. In establishing participants' information literacy levels after the course, evidence seems to point to a majority (25 or 86%) exhibiting many of Doyle's information literacy traits with a minority (four or 14%) exhibiting limited traits.

In concluding this question, it can be said that the majority of participants progressed from having an unclear view of information literacy to having a satisfactory grasp of information literacy and information literacy education.

7.3.2 RESEARCH QUESTION TWO: MAKING INFORMATION LITERACY EXPLICIT IN THE CLASSROOM

The second research questioned asked:

How do teachers make their information literacy explicit in the classroom?

This research question digs down one more layer of the intricate web that information literacy weaves. Participants struggling with their own understanding of information literacy at the start of the course would lack the confidence to impart it to others. Once again, the intervention of the course changed the outcome of this question.

Before the course, participants would typically give learners a topic and send them on their way to find information in the public library or on the Internet. On a predetermined date, learners would present their project. Interview responses from participants repeatedly told a story of in-service training treating projects superficially or not at all. Some chief advisors concur with participants' experiences, while others are reluctant to agree as in their opinion it *ought* to be taught.

Literacy is an antecedent to information literacy. One of the major obstacles participants face is the lack of information sources on the one hand and the low literacy and numeracy levels on the other. Expecting learners to improve their literacy or carry out research projects without resources is almost impossible. One would expect that government would prioritise functioning school libraries in its fight against dismal literacy levels but this has not been the case.

Another angle on teachers' overt inculcation of information literacy is to examine incoming university students' research and information handling abilities. From the South African literature (Sayed 1998; King 2007) it is clear that first year students are less than ready for information literacy at the tertiary level. Although Grade 12 learners are expected to undertake research projects at school, according to King's study (2007), participants' and chief advisors' interview responses, they are not receiving adequate guidance.

Once exposed to information literacy education in the course, participants were equipped with the knowledge and tools to scaffold learning through research projects. The participants were challenged to step out of their comfort zones and to make use of information sources in public libraries, district resource centres, block loans from EDULIS and on the Internet. Not only did participants have to locate resources, they also had to evaluate the information for learners' suitability including websites, a very new experience for most participants. Overcoming the information sources barrier and in particular the confidence barrier to accessing online information, 23 or 79% of participants, armed with tools and knowledge to support their teaching of information literacy, were involved in a guided inquiry project involving some or all of the support features mentioned in Chapter five (5.2.3.4 and 5.3.5) and Chapter six (6.3). The majority of participants were convinced in the end that information literacy needs to be taught explicitly, much as expressed in the international literature by Asselin and Lee (2002); Branch (2004); and Probert (2009).

7.3.3 RESEARCH QUESTION THREE: INTEGRATING INFORMATION LITERACY WITHIN SUBJECTS

Research question three asked:

> To what extent is information literacy integrated within subject/learning areas?

Question two dug one layer deeper to find out to what extent participants had been able to mediate information literacy by overtly teaching it. The metaphor of peeling an onion to reveal

ever deeper layers comes to mind. Question three provides an even deeper analysis of participants' actual abilities to mediate information literacy successfully. Information literacy is a multi-faceted phenomenon best served by analysing the evidence presented in a nuanced way.

Integral to question three is the nature of change. Participants' fundamental beliefs and assumptions about teaching and learning were challenged by the information literacy education course. To expect all the participants to change from transmission teaching to the guided inquiry approach is over optimistic given all the constraints mentioned in Chapter five (5.3.3 and 5.3.10). Using an adapted version of Havelock's (1973) framework of change agency in education, the participants' subtle changes were plotted along a continuum from one to six, one indicating that no change had occurred and six that full integration in the subject/learning area had occurred.

To plumb the depths of this analysis, question three begins to triangulate more directly what participants are saying (in journals and interviews) with what they are actually doing in the classroom – the proverbial, "did they walk the talk?" Using the adapted Havelock framework, the researcher deduced that all participants had undergone some form of change. Participants pegged at level two (seven or 24%) are defined as being curious about information literacy. Their gains are personal development. None of these seven participants provide evidence of a guided research project. From levels three to six, the participants provide evidence ranging from some to full integration of information literacy within subject research projects.

The level three participants (four or 14%) are evaluating or reflecting on information literacy but are not quite prepared to try it with their learners for various reasons. There is disparity between what they say (in journals and interviews) and what they do (what they produce as evidence in their assignment artefacts). Those participants at level four (seven or 24%) are trialing or testing some aspects of information literacy with their learners. Level five participants (four or 14%) have adopted most aspects of information literacy education but there are elements missing or

not totally convincing. Level six participants (seven or 24%) have integrated information literacy successfully into their subject/s.

The continuum shows that participants first need to understand information literacy and make it their own before they can teach it to others. The adapted change agency framework allows for nuanced changes in teachers' beliefs about information literacy education to be displayed. The seven or 24% of participants who went beyond Fullan's (1993) "superficial restructuring" and adopted radical change are extraordinary teachers who succeeded despite the difficulties of teaching in some of the lowest quintile schools.

7.3.4 RESEARCH QUESTION FOUR: ASSESSMENT OF INFORMATION LITERACY

Research question four asked:

> To what extent is information literacy assessed in the curriculum?

It is instructive that the participants mention very little about assessment in their journals. Teachers are taught during in-service training that planning, activities and assessment should fit together. These three elements of teaching should be created simultaneously. The assessment should never be an afterthought. Thus, when participants shied away from assessment in their journals and used pre-existing WCED rubrics to assess their projects, a warning bell tolled. The answers to this question were successfully revealed during the interviews coupled with examining the assignment artefacts.

The participants' disclosures in the interviews regarding assessment uncovered deception, superficiality and undermining of the curriculum not necessarily for malicious reasons but more for survival in the classroom. It appears that, before the course, the participating teachers used WCED assessment rubric exemplars for research projects but fabricated the results. Participants

explained that they were taught how to create rubrics but not necessarily how to teach each item in the research project rubric. Criteria for a rubric such as a bibliography or note-taking were never taught. Research projects were dealt with in a superficial way during workshops which minimised the true value that comes with learning through projects. Teachers such as the participants in the study, for whom research was unfamiliar, knew no better and replicated what they had learned in workshops. Accessing sufficient resources at the right level in the right language (home language) would continue to be a problem for the majority of schools which do not have functioning libraries and for which Internet access is limited because of costs or bandwidth problems.

After the course, only 13 or 45% of participants altered their assessment rubrics. The rest of the participants (16 or 55%) either used the exemplars from the WCED, a rubric which concentrated on the end product or did not provide evidence of use of a rubric (see Appendix 1).

7.3.5 RESEARCH QUESTION FIVE: TEACHERS' WEB KNOWLEDGE AND SKILLS

Research question five asked:

> At what level are teachers' web knowledge and skills?

This question was successfully answered by triangulating evidence from laboratory observation, chief curriculum advisors' points of view, the self-efficacy questionnaire, interviews with participants with participant assignment artefacts. This question illustrates the many-layered facets of the digital divide. The majority (93%) of participants' schools has computer laboratories with Internet access in theory, but in practice the access to the "hardware" is more complicated. Specific subjects like mathematics, science and languages have preference over other subjects which may book left-over laboratory sessions. To effect access for all may thus depend on efficient laboratory management practices which some chief curriculum advisors (Mr Cohen and Mr Brown) question exist to any great extent. Gaining access to the Internet is

another snag in overcoming the digital divide. Factors that influence Internet connectivity are: a school's ability to pay for Internet services; electricity supply, and bandwidth, especially in more rural areas.

The majority of participants in the study arrived at the course with basic computer literacy skills and fairly poor web skills and knowledge. At the start of the course 19 (65.5%) participants had a computer in their homes but only nine (31%) had Internet access. It appears that participants, for a host of reasons ranging from restricted access at school to limited or no access at home, were either not motivated or perhaps did not see the value of accessing web-based information. The participants struggled with basic computer skills such as copying and pasting, saving and retrieving files and working between different files. Initially, the participants despaired when asked to retrieve appropriate subject-based websites and evaluate the worth and legitimacy of a website.

Although 28 (97%) managed to find relevant subject-based information on the *Weblinks Research* database, when it came to finding pertinent information on their project topic, less than 10 participants' assignment artefacts indicate that they had used web-based information confidently and critically. This low result was not unexpected as the participants were coming off a novice base for Internet usage. By the time participants were interviewed six months after the course, it is clear that participants had made great strides in using the web, especially for personal information. The course intervention had fast-tracked their adoption of the web. The number of participants with Internet access at home had more than doubled (from nine to 20 participants) by the time of the interviews.

Participants had been persuaded of the value of using the web as a source of information, as well as for communicating and collaborating. They also agree that the web is "very important" for learners.

7.3.6 RESEARCH QUESTION SIX: SCHOOL LIBRARIANS' UNDERSTANDING OF INFORMATION LITERACY

Research question six asked:

How do (school) librarians understand and conceive of information literacy?

The literature was used as the source of information to answer this question as the South African cohort of professionally trained school librarians is small and not all librarians working in schools have a professional library qualification.

The literature informs us that information literacy education has been an essential component of school librarian training for the last 20 to 25 years in North America and Australia. In Canada and Australia school librarians are referred to as teacher-librarians as they possess a dual qualification as teachers and librarians. School or teacher-librarians are expected to be conversant with curriculum changes. When curriculum reform introduced learner-centred education, independent learning, and resource-based learning, librarians used their knowledge of information literacy to make the connections to the reformed curricula. Librarians developed information literacy skills models and grade level scope and sequence curricula to teach information literacy in the school library preferably in a collaborative way with subject-based teachers.

Defining information literacy in the 21st century poses some challenges as information technology inevitably shapes the debate. As discussed in Chapter two, some influential school library scholars such as Callison (2003) and Valenza (2007) use new terminology such as "information fluency". To these scholars information literacy is viewed as belonging to a print-dominated world, which forms part of information fluency along with computer literacy and critical thinking. Other school library scholars such as Herring (2007); Kuhlthau, Heinström, and Todd (2008); and Todd and Gordon (2010) see information literacy as an overarching concept, an intellectual framework rather than one belonging to print technology.

The latest USA school library standards (AASL 2007) emphasis on learning through inquiry embraces not only skills, responsibilities and self-assessment strategies but dispositions too. At the same time, the standards focus quite intentionally on being able to function in a technological (ICT) world. All these strategic routes to information literacy using guidelines, models and standards may come to nought if other partners in the educational collaboration, such as the teachers and principals, undermine the teaching role of the school librarian. This latter aspect will be touched on in the summary of the last research question.

7.3.7 RESEARCH QUESTION SEVEN: COMPARING TEACHERS' AND SCHOOL LIBRARIANS' VIEWS OF INFORMATION LITERACY

Research question seven asked:

> What are the differences and similarities between teachers' and librarians' opinions of information literacy?

This question was the least satisfactorily answered which the researcher attributes in part to trying to compare information literacy, seen through the eyes of school librarians from sophisticated, well-resourced, first-world backgrounds, with those of teachers from underprivileged schools who have gone through a single course on information literacy education. Nevertheless, the researcher has identified a few points of comparison.

In the South African context the public library is to all intents and purposes the school library, as a minority (7.7%) of schools have libraries. Unfortunately, both teachers and public librarians perceive libraries as storehouses of information. In Hart's (2005) study, public librarians understand information literacy as another word for book education in which the focus is on locating sources of information. Unlike the professionally trained school librarian counterparts in North America and Australia, the South African public librarians appear not to have been trained in information literacy (education). The comparison between teachers and librarians has thus

been restricted to participating teachers in the study and the hypothetical school librarian in the literature.

The school librarianship literature describes the library more as a learning laboratory or learning commons, rather than a place to "fetch stuff". The participants in the study started off likening libraries to storehouses but by the end of the course, many had a changed outlook on libraries. Most participants had not experienced a school library programme either whilst themselves learners or during their teaching. After the information literacy education course they began to understand that the school librarian has a vital role to play in collaboratively guiding learner inquiry with the teacher. They began to understand that the information search process is a complex mix of cognition, skills and attitudes which need to be taught explicitly.

Whilst school librarians appreciate that undertaking research projects involves a complex combination of knowledge, skills and dispositions, teachers (the participants) have to be taught to scaffold the learning that goes into projects as it seems to be absent from their training. Teachers have to be persuaded that a list of in-depth instructions is not enough and that information literacy rarely happens by "osmosis".

In comparing the participants' and school librarians' attitudes to the ethical use of information, even after the information literacy course, 24% of participating teachers fail to submit a bibliography and 62% do not expect their learners to provide a bibliography.

School librarians encourage consultation with a wide range of information sources. Twenty four percent (24%) of teachers in the study still held on to textbooks as their main source of information. The majority of participating teachers are web neophytes. Less than half (45%) referred to websites in their research projects with learners.

Both teachers and school librarians recognize that lifelong learning and independent learning should be one of the ultimate goals of education. School librarians believe that information literacy helps build lifelong learners. School librarians believe that mediating information literacy is of paramount importance. Participating study teachers on the other hand tell us that numerous obstacles prevent them from achieving the lifelong learning goal through the information literacy route. These obstacles are very large classes, no functioning school library, low literacy levels, the time-consuming nature of projects and various other curriculum, management and technology access constraints.

7.4 THE STUDY'S CONTRIBUTION TO THE BODY OF KNOWLEDGE VIS-À-VIS THE RESEARCH PROBLEM

The research problem was to investigate and assess the competency of teachers in information literacy education. The study was confined to the Western Cape amongst a group of volunteering teachers, forming a purposive sample. The value of a qualitative study lays in its rich, textured, illuminative insights that unfold. Patton (2002: 582-583) citing Stake explains that the merit of qualitative research rests in its "particularization".

> What becomes useful understanding is full and thorough knowledge of the particular, recognizing it also in new and foreign contexts. That knowledge is a form of generalization too, not scientific induction but naturalistic generalization, arrived at by recognizing the similarities of objects and issues in and out of context and by sensing the natural covariations of happenings. To generalize in this way is to be both intuitive and empirical …

This study confirms previous, local research such as that completed by Baxen and Green (1998) and Hart (1999) that many South African teachers seem to lack sufficient information literacy traits (using Doyle's 1994 attributes). During the course, the researcher as lecturer provided participants with a sizeable reference list. In most instances, participants could also view more than 50 selected books on information literacy during the lecture periods. It was thus very disappointing that only four or five (14 -17%) participants included any information literacy

handbooks or online references to information literacy websites in their own bibliographies. They seemed to have confined themselves to the minimum, the course workbook.

This study went beyond anecdotal evidence to demonstrate that a minority of participating teachers felt the need to access online information before the course. Their own information literacy was compromised. It is expected of teachers living in the 21st century global society and as role models of learners to use ICTs in their teaching. Teachers' hesitancy or lack of curiosity about the Internet was a combination of technophobia, lack of easy access at convenient times for teachers and/or disappointment when the Internet was not working and perhaps lack of incentive or drive.

Their initial discomfort at being challenged by the course and the implementation of the project in their classrooms was palpable in their journals, interviews and even in their first questionnaire responses. Kuhlthau (2004) regards these feelings of uncertainty when confronted with a task requiring deep understanding as a normal part of the information search process. A few participants experienced and expressed "aha" moments which are akin to Kuhlthau's moment of "clarity". There were participants who were disappointed with themselves and the outcome of their projects and specifically said so. On the other hand, there were participants who felt a tremendous sense of accomplishment. Kuhlthau's model (2004) of the ISP captures these feelings of either disappointment or satisfaction as a normal part of information seeking and use.

The literature on teachers' information literacy and their ability to mediate information literacy has been expanded by this study. The international literature is concentrated in the more developed countries such as the UK, Canada, USA, Hong Kong and New Zealand. In these first world countries access to information resources is plentiful, access to Internet-based information relatively unproblematic, teacher subject knowledge and general knowledge is presumably high due to teacher education expectation levels, and the conditions under which teachers teach appear relatively satisfactory. The teachers in the present study are rooted in a developing

country scenario: the majority (77%) are based in the poorest (quintiles one and two) South African schools; their access to information resources limited at the time of the investigation, especially in terms of access to a functioning school library; access to the Internet appears tricky but not impossible; teachers' general knowledge appears inadequate (subject knowledge not tested); and the conditions of teaching are relatively unsatisfactory, namely, large class sizes (45+ learners), classrooms too small to accommodate large classes resulting in overcrowding, poor ventilation especially in summer heat temperatures of more than 35°C, and learners from impoverished homes, many with learning difficulties such as very low reading abilities and disabilities such as foetal alcohol syndrome.

Studies that are context bound and use purposive samples are not usually recognized for their generalizability, but rather the contribution they make in the social construction of knowledge, the building of general knowledge of a phenomenon such as teachers' information literacy. Some authors such as Cronbach and Associates (1980: 231-235) steer away from terms such as "generalization" in qualitative research and prefer the term "extrapolation". Patton (2002: 584) defines extrapolation as

> modest speculations on the likely applicability of findings to other situations under similar, but not identical, conditions. Extrapolations are logical, thoughtful, case derived, and problem oriented rather than statistical and probabilistic.

While the study is not generalizable to other developing countries or even the rest of South Africa, "extrapolations", in the words of Cronbach and Associates (1980) are possible for the Western Cape region. The majority of chief curriculum advisors who are spread across the Western Cape allude to commonalities: conditions under which teachers teach such as a lack of school libraries; teachers' beliefs about research projects which are influenced by the lack of knowledge and skills from their own schooling and initial teacher training and the unworkable model of knowledge and skills transfer from workshops; a concentration on "quantity" rather than "quality" education at the Grade 12 level as disproportionally large sums of money are allocated to improving throughput at the expense of developing learners' curiosity and deep interest in a subject; teachers not teaching research skills in Grade 12 because of a final

examination that still tends to favour rote learning and/or teachers not competent to meet the outcomes requirements of the curriculum which offers opportunities to teach research skills; teachers with uneven experience of the Internet - much depends on the management of the computer laboratory and Internet connectivity, the availability of ICTs for teachers in the staff room, and subject advisors' competency. Although 92% of schools in the study have computer laboratories with Internet access, albeit irregular, teachers appear to have deficient Internet search and knowledge skills.

The study provides a rare insight into teachers' varied behaviour when challenged by an information literacy education course under somewhat tough, developing country conditions. Their behaviour before the course was constrained by their own beliefs strongly influenced by teaching as "telling", limiting their view of information sources to books, and giving learners a set of instructions for projects and telling them "to do it" with no further scaffolding. The course provoked the teachers to change their approach to teaching projects. The study captures the nuanced changes in the individual teachers: some (24% or seven) teachers could not go beyond the level of personal development – in other words, they were curious and interested, but they did not translate their curiosity into a guided inquiry project. Twenty two teachers (76%) have guided their learners to varying degrees.

The mainly qualitative study using a combination of data collection tools such as journals, interviews and assignment artefacts coupled with the quantitative self-efficacy questionnaire affords the reader a composite picture of the teachers' struggles to make sense of the new information literacy education course, through which their own information literacy or lack of it is exposed and the extent to which they could inculcate information literacy using a class project. The study allows us a window into the world of these teachers who relate how they conducted projects with their classes before the course and after the course. They provide the insights seemingly lacking in the report, Review of the implementation of the NCS (2009), namely, the underlying pedagogical shortcomings of teachers undertaking research projects in class. The teachers in the study were not ready to undertake research projects before doing the course. It

appears that in-service training in how to teach projects is conducted very superficially. What the study uncovers is that an inquiry-based approach to learning and teaching, founded on constructivist principles, is not being broached in any substantial way in in-service training. A worrying trend amongst some chief curriculum advisors is to expect teachers to be proficient at projects because, in their words, "they (subject advisors) are doing it in workshops with teachers". Teachers cannot be expected to change their beliefs about and attitudes to research projects if the subject advisors themselves do not act as role models of information literacy; if the enabling circumstances do not prevail, such as easy access to school library material and the Internet or if the curriculum does not offer the space and time for engaging in proper guided inquiry.

The unethical use of information in the school environment appears to be widespread and seemingly unchecked. None of the study participants on the information literacy education course was aware of an acceptable use policy at their respective schools despite the majority of participants' schools having a computer laboratory. The ethics around plagiarism do not seem to be part of in-service training, a school's discipline policy or the assessment policy. The unethical use of information seems a non-issue at school level and teachers appear ignorant, until made aware, of how to prevent it.

7.5 IMPLICATIONS OF THE RESEARCH FOR THEORY, PRACTICE AND POLICY

This study has implications for theories in librarianship, especially as they pertain to a developmental context. The contributions of this current study to practice and policy are addressed in various ways below.

7.5.1 IMPLICATIONS FOR THEORY

This study is underpinned by constructivism, the foundation for both inquiry-based learning and the Information Search Process (ISP) theory of Kuhlthau (2004). The study concentrates on how teachers enact or apply constructivism in the classroom. At the same time the study examines, using the lens of the ISP theory and related information literacy models, how teachers themselves search for and use information. For teachers who have not previously been exposed to doing research themselves, the intersection of the inquiry model with the information literacy models proved an invaluable guide both for developing their own information literacy and for operationalizing information literacy in the classroom.

The other elements of an inquiry model, namely, process learning, asking good questions, motivation, scaffolding, and metacognition, worked well in the course and many teachers responded favourably in their implementation of the project. However, the long term or continued implementation of a guided inquiry approach may not be practically possible and will be discussed under the next heading.

Before the course, even the brightest teachers had only reached the level of "identifier" in Kuhlthau's (2004) ranking of mediation. At this level, the mediation involves the librarian (or teacher in this case) providing a stack of information resources without further guidance or intervention. Teachers' lack of knowledge and use of the variety of information sources available and a lack of access to libraries under apartheid disadvantaged teachers in moving smoothly to the level of Kuhlthau's "counsellor". At the counsellor level you are helping learners to view information seeking and use as a process of making meaning. Without the sound knowledge of information sources and Internet-based information in particular, most teachers became unstuck. An alternative theory could shed light on this sociological aspect of information literacy. A theory such as *ICT for development* (Fourie & Krauss 2010: 107),Chatman's *information poverty* theory (Hersberger 2005: 75) or Lloyd's (2010) socio-cultural framework could better explain

the historical effect of teachers' unequal access to information and the challenge of educating teachers in information literacy in developing communities.

Fourie and Krauss (2010: 110) noted that most of information literacy literature does not concede that there are challenges in developing contexts from an ICT for Development perspective. At the same time the authors identified a gap in the ICT for Development literature which has not yet addressed information literacy or information literacy training.

Chatman's theory of information poverty proposes that the information poor perceive themselves to be devoid of any sources that might help them. Information poverty is to a degree associated with class difference. "Information poverty is determined by self-protective behaviours, which are used in response to social norms" (Hersberger 2005: 76). The information poor refrain from exposing themselves to risks because in their minds negative consequences will predominate. Information poverty theory has been applied in "contexts in which information seekers practise some sort of protective behaviour which as a result affects their access to useful or helpful information" (Hersberger 2005: 77).

The concept of information literacy as a socio-cultural practice, expounded by Lloyd (2010), builds on Bruce's (1997) phenomenographic approach to information literacy. For Lloyd (2010), informed learning involves collaborative, socio-cultural practices within a context specific setting. The socio-cultural framework incorporates the 'social, historical, political and economic arrangements' that are the legacy within an environment or site (Lloyd 2010: 182).

The teachers in the study seemed to be hindered from seeking information and had to be coaxed and at times compelled to face their reluctance in information seeking. The teachers are from the lower middle class or *petit bourgeoisie* in terms of their economic status but they are working in schools where the parents are either working class or unemployed (quintiles one and two schools). The teachers tend to see themselves as victims of circumstances: victims of apartheid schooling; victims of segregated, unequal teacher training; victims of poorly-resourced social services (such as community libraries) – their victim identity largely overshadows the positive possibilities in taking risks, such as collaborating with public libraries. The teachers' reaction which is almost a reflex is to lay blame on the education system for their continued inadequacies.

7.5.2 IMPLICATIONS FOR PRACTICE

According to the teachers, the information literacy education course was one of the most difficult courses in the ACE school librarianship programme. The course was challenging because it questioned the way teachers were operationalizing projects in the class; it put their own information literacy under the spotlight; and the assessment of the course demanded teachers show evidence that they had implemented (or tried to implement) a project using guided inquiry. Despite all the challenges, teachers expressed gratitude: for example, a teacher mentions that if she had simply written an examination on the course she would have forgotten everything three months later. By getting the teachers to teach a project using guided inquiry meant they had to put into practice what they had learned theoretically. Another teacher expressed appreciation by complimenting the course in not only making her a potentially good school librarian but also a better teacher. A Grade 12 teacher suggested that all teachers need to complete a course in information literacy education.

The positive feedback about the course should not detract from critics of the constructivist, inquiry-based approach. The teachers themselves are not overly optimistic that they will be able to continue implementing a guided project. The literature alludes to the clash between the theory and practice of constructivism (for example, Williams & Wavell 2006). Tobias (2009) and Duffy (2009) claim that a process approach to learning is more time consuming than being taught directly, if considering the cost-benefit effects. The process approach is in direct conflict with an approach that emphasises examinations and completing a syllabus, the latter both being the order of the day in South Africa. The sceptics (Tobias 2009; Duffy 2009) also claim that the average teacher in North America is not capable of a constructivist approach because they do not have the higher levels of knowledge and ability that the approach demands. The LIS field has provided ample examples of an alternative to the "acquisition" model of teaching, for example in the Lance (2005; 2006; 2007) studies.

The researcher recommends that a middle road be found in practice between constructivism and direct teaching for pragmatic reasons. As one of the goals of schooling is lifelong learning, even the critics admit that process learning is considered the best route.

One of the implications of the research for practice is hinted at by one of the teachers, namely, all teachers need to be taught how to make information literacy explicit. While many universities in South Africa are already providing information literacy training, pre-service teachers still need to be taught how to mediate it in an embedded way in the school subjects they teach. For the teachers already in schools, who graduated 15 to 20 years ago, their own information literacy needs to be addressed first in continuing education programmes. The next step would be information literacy education in-service programmes.

7.5.3 IMPLICATIONS OF THE RESEARCH FOR POLICY

The implications of the research for policy are discussed under four points:

1. There has been an assumption that teachers are information literate and are therefore capable of teaching learners information literacy. The South African curriculum review of 2009 put paid to that assumption but the report's remedies offered a quick fix – fewer projects and exemplars. The current study suggests that teachers need to be educated in the fundamentals of cognition, constructivist approaches, motivation theory and other elements of guided inquiry. The *Schooling 2025* (South Africa 2011d) vision statement refers only to teachers becoming ICT literate. The *minimum requirements for teacher education qualifications* (South Africa 2011b) for new teachers expects new graduates to be ICT literate as well as having a "high level of literacy" or meta-literacy. Teacher education policy documents should make more explicit reference to information literacy (education) as is done in the e-education policy (South Africa 2004).
2. Teachers state repeatedly that the lack of access to an organised, functioning school library thwarts undertaking research projects and promoting literacy. Since school library policy was first tabled in 1997 (Hart & Zinn 2007), no official policy has yet been

accepted 15 years later. The WCED granted all schools in quintiles one and two, at least, a start-up library collection. But there is no official position for a school librarian at schools meaning that schools would have to fund the position out of their own pockets, a nearly impossible undertaking for poor schools. Participating teachers in the study, who have since qualified as professional school librarians, remain classroom teachers as it is too expensive for poor schools to hire extra teachers. Unless there is a policy change, library collections may remain in boxes or dusty rooms because there are no posts for librarians.

3. The most recent curriculum policy states that one purpose of the curriculum is to equip learners with the "knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country" (South Africa 2011a: 4). Some of the principles are active learning as opposed to rote learning; instilling a human rights culture in education that incorporates inclusivity, environmental and social justice; and providing a quality education commensurate with that of other countries. To actualize these principles require Fredericks' (1993) teachers who are information literate and who can teach information literacy education. The chief curriculum advisors are sceptical of teachers' information literacy education competency. One of the suggestions from this current research, therefore, is for educational authorities to consider in-service training for teachers in information literacy education to ensure that the revised curriculum goes beyond rhetoric.
4. The study did not examine the present pre-service teacher training per se, but provides a view of teacher training of about 15 years ago. New teachers graduating from teacher education programmes are expected to have good ICT literacy and a "high level of literacy" (South Africa 2011b). A recommendation from this research is that the interpretation of "high level of literacy" be understood as information literacy which is a broad concept that embraces meta-literacy, media literacy, information skills, ICT literacy, and library skills in conjunction with critical thinking and cognitive skills, and attitudes and values, that enable people to function effectively in the information landscape. A narrow interpretation of the new teacher education policy could limit a "high level of literacy" to exclude crucial information literacy traits required of teachers in mediating information literacy in the classroom.

7.6 FURTHER RESEARCH

Seven recommendations are made for further research:

1. Initially, the study sought to include a survey of teacher education programmes and how they incorporate information literacy education in the training of teachers. This would have made the study too large and unwieldy. A study examining teacher education programmes and the implementation of the new teacher education policy could provide up-to-date perspectives of whether or not the programmes include information literacy education.
2. The chief curriculum advisors insinuate that some of the subject advisors whom they manage cannot be deemed information literate for a variety of reasons. These subject advisors are individuals who lead and guide teachers in the field. This study therefore recommends that empirical research be conducted to test subject advisors' information literacy.
3. The teachers in the study allude to the strong possibility that they will not be able to continue to use a guided inquiry approach which is best for instilling information literacy in learners. A follow-up study would be useful in ascertaining to what extent the teachers could continue using guided inquiry or whether they simply resorted back to their comfort zones.
4. The WCED provided start-up libraries (the QuidsUp project) for all quintiles one and two schools, and some quintile three schools. The average literacy levels in Western Cape primary and high schools fall below 50%: Grade 3 literacy scored a pass rate of 43% and Grade 6 language had a pass rate of 40% (South Africa 2011c:20). Further research could establish to what extent the QuidsUp project made any difference for literacy and information literacy at the recipient schools.
5. The WCED Khanya project (Allies-Husselman 2011), whose goal was to install computer laboratories in all Western Cape schools, promises to have laboratories in all schools by the end of March 2012. By October 2011, 91% of schools possessed computer laboratories leaving 136 schools still without. No other province has managed to complete such a feat and the WCED needs to be congratulated. One of the reasons for the rollout of computer laboratories was to improve the literacy and numeracy levels amongst

learners. While some studies have been completed on the effect of technology on literacy and numeracy scores, new research should extend to include the effect of ICTs on learners' information literacy.

6. Under the heading implications of the research for theory, a suggestion was made that an additional theoretical lens such as the theories of *information poverty* or *ICT for development* could improve our understanding of teachers' information literacy. These sociological lenses may assist researchers in understanding perspectives of teachers who had endured education under the apartheid regime and the effect that it had on teachers' epistemology, their beliefs and attitudes to teaching and how children learn. Researchers could also include digital divide issues and the effect it has on teachers' information literacy development.
7. The teachers in the study reacted surprised at the session on plagiarism. They seemed genuinely ignorant of many aspects of plagiarism. The fact that some teachers (24%), after being exposed to the course, failed to submit a bibliography and 62% did not expect learners to provide a bibliography with their project warrants further research into the ethics of information use in the school environment.

7.7 CONCLUSION

This chapter reviewed the research problem and the research questions and related to what extent the research problem and questions had been successfully addressed through the findings. The research problem investigated information literacy in the classroom by assessing the competency of Western Cape teachers in information literacy education. The background to the problem sketched a scenario in which the curriculum requires information literacy; first year university students are expected to possess some or many information literacy traits; and the Education Ministry as well as the researcher identified that most teachers were ill-prepared to mediate information literacy. Further support for the research problem emanated from the international literature where information literacy linked to inquiry-based learning remains high on the agenda. The assumption, that teachers who know their subject can automatically mediate information literacy in their subject, has been proven to be inaccurate. Teachers need information

literacy *education* which is not yet commonly part of either pre-service or in-service teacher education. The last studies conducted in South Africa which addressed some of the elements of teacher education and information literacy were done more than 18 years ago, well before the adoption of the Internet on a wide scale in education. Access to the Internet with its plethora of information necessitates more information literacy education.

In order to answer the research problem, seven questions were developed relating to the teachers' own understanding of information literacy and information literacy education; how they make information literacy explicit in the classroom; the extent to which information literacy is integrated within subjects and assessed in the curriculum; the level of the teachers' web knowledge and skills; and how librarians', especially school librarians', opinions of information literacy differed from teachers'. This final chapter examined the results of each research question against the data collected by the various data collection methods and tools, and against the surveyed literature.

This chapter has drawn attention to the study's contribution to the body of knowledge in respect of the research problem. The current study agrees with earlier research conducted in South Africa showing that teachers seem to lack information literacy traits such as consulting information sources widely and going beyond the textbook. The study provides evidence that before the information literacy education course, the majority of participating teachers did not view ICTs and the Internet as worthy of investigation even when available at schools. The literature on teachers' information literacy and their ability to mediate information literacy has been expanded by this study. The literature on teachers' information literacy has been concentrated in more developed countries such as the UK, Canada, the USA, Hong Kong and New Zealand. The study's strength is the capturing of nuanced changes in teachers who teach in mainly impoverished environments when challenged by an information literacy education course. The findings of the study are not generalizable but, in the words of Cronbach and Associates (1980) "extrapolations" are possible for the Western Cape, the region across which the teachers and chief curriculum advisors are distributed.

The chapter has provided evidence of how constructivism which underpins the ISP theory and inquiry-based learning has been successfully applied in this study. But the ISP theory may need to be augmented by more sociological theories of information literacy such as *ICT for development* (Fourie & Krauss 2010) or Chatman's *information poverty* theory (Hersberger 2005) to better explain the challenge of educating teachers in information literacy in developing communities.

In terms of practical application this research has demonstrated that teachers can put into practice theories they have learned, namely constructivism. The benefits of actualizing learning through implementing a project, rather than merely writing an examination to write "off" learning, has been shown to contribute to deep learning. An implication for practice is to ensure that all pre-service teachers receive information literacy *education* and all in-service teachers' information literacy is addressed in continuing education programmes.

Four points were made in terms of the implications of the study for policy. They related to teacher education documents, in-service teacher training and the post of school librarian. Finally, to conclude this chapter, seven recommendations were made about further research.

REFERENCES

African National Congress. 1994. *A policy framework for education and training*. Johannesburg: (s.n.).

Alberta Learning. 2004. *Focus on inquiry: a teacher's guide to implementing inquiry-based learning*. Edmonton, Alberta: Alberta Learning and Teaching Resources Branch. [Online]. Available http://www.learning.gov.ab.ca/k_12/curriculum/bySubject/focusoninquiry.pdf Accessed 12 April 2005.

Alexandria proclamation on information literacy and lifelong learning. 2005. [Online] Available http://www.infolit.org/International_Colloquium/alexproceng.doc Accessed 20 January 2006.

Allies-Husselman, H. 2011. Time for Khanya Project to log off. *Athlone News*, 5 October 2011. [Online] Available http:// http://www.khanya.co.za/news/media/?pageid=531 Accessed 30 November 2011.

American Association of School Librarians (AASL). 1988. *Information power – guidelines for school library media programs.* Chicago, IL: ALA.

American Association of School Librarians (AASL). 1998a. *Standards for student learning*. Chicago, IL: ALA.

American Association of School Librarians (AASL).1998b. *Information power: building partnerships for learning.* Chicago, IL: ALA.

American Association of School Librarians (AASL). 2007. *Standards for the 21st century learner*. Chicago, IL: ALA. [Online]. Available http://www.ala.org/aasl/standards Accessed 4 October 2008.

Association of College and Research Libraries (ACRL). 2002. *Information literacy competency standards for higher education*. Chicago, IL: ALA. [Online]. Available http://www.ala.org/ala/acrl/acrlissues/acrlinfolit/infolitstandards/standardstoolkit.cfm Accessed 20 May 2007.

Asselin, M. 2003. School libraries in pre-service teacher education: a research program examining the inclusion of school libraries and information literacy in pre-service teacher education from national and international perspectives. In Zinn, S., Hart. G. & Howe, E. (eds). *IASL reports 2003: School libraries breaking down barriers. Selected papers from the 32nd Annual Conference of the International Association of School Librarianship and the 7th International Forum on Research in School Librarianship, Durban, South Africa, 7-11 July*. Seattle: IASL, 13-22.

Asselin, M. 2004. Guiding the inclusion of information literacy. *Teacher librarian,* 31(4): 63-65.

Asselin, M. 2005. Preparing preservice teachers as members of information literate school communities. In Henri, J. & Asseslin, M. (eds). *The information literate school community 2: issues of leadership*, 187-202. Wagga Wagga, Australia: Centre for Information Studies, Charles Sturt University.

Asselin, M., Kymes, A. & Lam, V. 2007. A critical examination of information literacy instruction during a grade 9 research project. *Simile*, 7(4): 1-18.

Asselin, M. & Lee, E. 2002. "I wish someone had taught me": information literacy in a teacher education program. *Teacher librarian,* 30 (2): 10-17.

Australia [Commonwealth]. Parliament. House of Representatives. Standing Committee on Education and Employment. 2011. *School libraries and teacher librarians in 21st centuryAustralia*. Canberra: Commonwealth of Australia.

Australian School Library Association (ASLA). 2009. *Statement on guided inquiry and the curriculum*. [Online]. Available http://www.asla.org.au/policy/guided.inquiry.curriculum.htm Accessed 24 March 2009.

Babbie, E. & Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press.

Bandura, A. 1986. *Social foundations of thought and action: a social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. 1997. *Self-efficacy: the exercise of control*. New York: Freeman.

Bates, M.J. 2005. An introduction to metatheories, theories, and models. In Fisher, K.E., Erderlez, S. & McKechnie, L.E.F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 1-24.

Bawden, D. 2001. Progress in documentation – information and digital literacies: a review of the concepts, *Journal of documentation*, 57(2): 218-259.

Baxen, J. & Green, L. 1998. *Primary teachers' use of learning materials*. [Online]. Available http://www.jet.org.za Accessed 10 August 2010.

Belkin, N.J. 2005. Anomalous state of knowledge. In Fischer, K E., Erdelez, S. & McKenchnie, E F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 44-88.

Bilal, D. 2002. Children's use of the Yahooligan! Web search engine: II. Cognitive and physical behaviors on fully self-generated search tasks. *Journal of American society for information science and technology*, 53(13): 1170-1183.

Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. 1956. *Taxonomy of educational objectives: the classification of educational goals. handbook 1*: *cognitive domain*. New York: Longman.

Bloor, M., Frankland, J., Thomas, M. & Robson, K. 2001. *Focus groups in social research*. Thousand Oaks, CA: Sage.

Bodenstein, M. 2008. *Conference report: what works in school development? Birchwood Conference Centre, Boksburg, 28-29 February, 2008*. [Online]. Available http://www.jet.org.za Accessed 24 April 2009.

Boekhorst, A.K. & Britz, J.J. 2004. Information literacy at school level: a comparative study between The Netherlands and South Africa. *South African journal of libraries and information science*, 70(2): 63-71.

Boyce, S. 2004. Information literacy and school librarianship: a critical look at pedagogy and profession. In La Marca, S. and Manning, M. (eds). *Reality bytes: information literacy for independent learning.* Carlton, Victoria: SLAV: 19-32.

Branch, J. 2004. Teaching, learning and information literacy: developing an understanding of pre- service teachers' knowledge. *Behavioral & social sciences librarian*, 22(1): 33-46.

Britz, J. & Lor, P. 2010. The right to be information literate: the core foundation of the knowledge society. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 41: 8-24.

Brooks, J.G. & Brooks, M.G. 1993. *In search of understanding: the case for constructivist classrooms.* Alexandria, VA: Association for the Supervision and Curriculum Development.

Bruce, C. 1997. *The seven faces of information literacy*. Adelaide: Auslib Press.

Bruce, C. 2002. Information literacy as a catalyst for educational change: a background paper. *White paper prepared for UNESCO, the U.S. National Commission on Libraries and Information Science, and the National Forum on Information Literacy, for use at the Information Literacy Meeting of Experts, Prague, The Czech Republic*. [Online]. Available http://www.nclis.gov/libinter/infolitconf&meet/papers/bruce-fullpaper.pdf Accessed 11 June 2009

Bundy, A. 2004a. *Australian and New Zealand information literacy framework: principles, standards and practice*. Adelaide: Australian and New Zealand Institute for Information Literacy. [Online]. Available http://www.library.unisa.edu.au/learn/infolit/Infolit-2nd-edition.pdf Accessed 12 June 2009.

Bundy, A. 2004b. One essential direction: information literacy, information technology fluency. *Journal of eliteracy*, 1: 7-22.

Butler, R.J. 2009. *Reflections in personal construct theory*. Chichester, UK: Wiley-Blackwell.

Buzan, T. & Buzan, B. 1996. *The mind map book: how to use radiant thinking to maximize your brain's untapped potential*. London: Penguin.

California Media and Library Educators Association. 1994. *From library skills to information literacy a handbook for the 21st century*. Castle Rock, Colo: Hi Willow Research and Publishing.

Callison, D. 2003. Information fluency: key instructional word. *School library media activities monthly,* 20(4): 38-39.

Callison, D. & Preddy, L. 2006. *The blue book on information age inquiry, instruction and literacy.* Westport, CT: Libraries Unlimited.

Carr, J. 1998. *Information literacy and teacher education*. Washington DC: ERIC Clearinghouse on Teaching and Teacher Education.

Case, D.O. 2007. *Looking for information: a survey of research on information seeking, needs and behavior*. 2nd ed. Amsterdam: Elsevier.

Chisholm, L. 2005. The state of South Africa's schools. In Daniel, J., Southall, R. & Lutchman, J. (eds). *State of the nation: South Africa 2004-2005*. Cape Town: HSRC Press: 210-226.

Church, A.P. 2008. The instructional role of the library media specialist as perceived by elementary school principals. [Online]. Available http://ala.org/ala/mgrps/divs/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume11/church.cfm Accessed 27 July 2010.

Clarke, L. 2010. *The information and communication technology infrastructures in public schools in the Western Cape: a case study*. M.Ed thesis. Bellville: University of the Western Cape. M. Ed thesis. [Online]. Available http://etd.uwc.ac.za/ Accessed 1July 2011.

Cohen, L., Manion, L. & Morrison, K. 2007. *Research methods in education*. 6th ed. London: Routledge.

Combes, B. 2006 [DVD]. Techno savvy and all-knowing or techno-oriented? Information-seeking behaviour and the Net generation. In Martins, A.B., Falcao, A.P, Conde, E., Andrade, I., Nunes, N.B., Vitorino, M.J. (eds). *IASL reports 2006: the multiple faces of literacy: reading knowing, doing – IASL reports, 2006. Selected papers from the 35th Annual Conference of the International Association of School Librarianship and the 10th International Forum on Research in School Librarianship*, *Lisbon, Portugal, 3-7 July 2006*. Erie, PA: International Association of School Librarianship.

Council on Higher Education (CHE). 2004. *South African higher education in the first decade of democracy*. Pretoria: CHE. [Online]. Available http://www.che.org.za/documents/d000081/SA_HE_10ears_Nov2004.pdf Accessed 25 August 2010.

Crabtree, C.D. 2006a. Qualitative research guidelines project: interviewing. [Online]. Available http://www.qualres.org/HomeInte-3595.html Accessed 1 Nov 2010.

Crabtree, C.D. 2006b. Qualitative research guidelines project: semi-structured interviews. [Online]. Available http://www.qualres.org/HomeSemi-3629.html Accessed 1 Nov 2010.

Craver, K.W. 1990. The instructional role of the school library media specialist 1980-1989. *School library media annual*, 8: 4-13.

Cresswell, J.W. 1998. *Qualitative inquiry and research design: choosing among five traditions.* Thousand Oaks, CA: Sage Publications.

Cresswell, J.W. 2003. *Research design: qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

Cresswell, J.W. 2008. *Educational research: planning, conducting, and evaluating quantitative and qualitative research*. 3rd ed. Upper Saddle River, NJ: Pearson Education International.

Cronbach, L.J. & Associates. 1980. *Toward reform of program evaluation*. San Francisco: Jossey-Bass.

Cuban, L. 2001. *Oversold and underused: computers in the classroom.* Cambridge, MA: Harvard University Press.

Cuban, L., Kirkpatrick, H. & Peck, C. 2001. High access and low use of technologies in high school classrooms: explaining an apparent paradox. *American educational research journal*, 38(4): 813- 834.

Czerniewicz, L. 1999. Information literacy in schools in the Western Cape: a preliminary study: a report prepared for the INFOLIT Project of the Adamastor Trust. Rondebosch, Cape Town: Adamastor Trust.

Czerniewicz, L. & Brown, C. 2005. Access to ICTs for teaching and learning – from single artifact to inter-related resources. *International journal of education and development using ICT*, 1(2). [Online]. Available http://ijedict.dec.uwi.edu/viewarticle.php?id=38 Accessed 22 November 2007.

Davids, S. 2011. Bold teacher laptop plan hits hurdle. *Port Elizabeth herald online* 26 April. [Online]. Available http://www.peherald.com/news/article/1190 Accessed 26 August 2011.

De Bono, E. 1987. *Six thinking hats*. London: Penguin.

De Jager, K. & Nassimbeni, M. 2002. Institutionalising information literacy in tertiary education: lessons learned from South African programs. *Library trends*, 51(2): 167-184.

De Jager, K., Nassimbeni, M. & Underwood, P. 2007. Libraries, literacies and learning: retrospect and prospects. In Bothma, Theo, Underwood, Peter & Ngulube, Patrick (eds). *Libraries for the future: progress and development of South African libraries.* Pretoria: LIASA & IFLA: 133-148.

Denzin, N.K. & Lincoln, Y.S. 2005. *The SAGE handbook of qualitative research*. 3rd ed. Thousand Oaks, CA: Sage Publications.

Dervin, B. 2005. What methodology does to theory: sense-making methodology as exemplar. In Fischer, K.E., Erdelez, S. & McKenchnie, E.F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 25-30.

Dodge, B. 2007. WebQuest.org. [Online]. Available http://webquest.org/ Accessed 22 April 2012.

Donham, J. 2008. Standards! Standards! Standards! *Teacher librarian*, 35(4): 43-46.

Doyle, C.S. 1994. *Information literacy in an information society: a concept for the information age*. Syracuse, NY: Syracuse University.

Drayton, B., & Falk, J.K. 2001. Tell-tale signs of the inquiry-oriented classroom. *NASSP bulletin,* 85(623): 24–34.

Dubazana, K. 2008. *The school library as an integral part of the curriculum*. M.Ed thesis. Durban: University of KwaZulu-Natal.

Dubazana, K. & Hoskins, R. 2011. Making a difference: the role of the Education Library Information and Technology Services (ELITS) in developing school libraries in KwaZulu-Natal. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 42: 113-131.

Dubazana, K. & Karlsson, J. 2006. Integration of the school library into the curriculum. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 33: 1-12.

Dudziak, E.A. 2006. Information literacy as an emancipatory process directed to social inclusion in a knowledge society. Paper presented at the World Library and Information Congress: 72nd IFLA general conference and council, 20-24 August 2006, Seoul, Korea. [Online]. Available http://www.ifla.org/IV/ifla72/index.htm Accessed 4 June 2010.

Duffy, T.M. 2009. Building lines of communication and a research agenda. In Tobias, S. & Duffy, T.M. (eds). *Constructivist instruction: success or failure*? London: Routledge: 351-367.

Duke, T.S. & Ward, J.D. 2009. Preparing information literate teachers: a metasynthesis. *Library & information science research*, 31: 247-256.

DuPlooy, G.M. 2001. *Communication research: techniques, methods and applications*. Lansdowne: Juta.

Du Toit, M. 2009. Policy formulation and practical implementation problems: KwaZulu-Natal, school library policy, South Africa. *Synergy*, 7(2). [Online]. Available http://www.slav.vic.edu.au/synergy/volume-7-number-2-2009/research/ Accessed 30 August 2011.

Education Library and Information Service (EDULIS) 2002. [Online]. Available http://curriculum.wcape.school.za/site/118/page/view/74 Accessed 26 August 2011.

Eisenberg, M. & Berkowitz, R.E. 1990. *Information problem-solving: the Big Six Skills approach to library & information skills instruction*. Norwood, N.J.: Ablex Pub. Corp.

Eisenberg, M.B. & Lowe, C.A. & Spitzer, K.L. 2004. *Information Literacy: essential skills for the information age*. 2nd ed. Westport, CT: Libraries Unlimited.

Emmons, M., Keefe, E.B., Moore, V.M., Sánchez, R.M., Mals, M.M. & Neely, T.Y. 2009. Teaching information literacy skills to prepare teachers who can bridge the research-to-practice gap. *Reference & user services quarterly*, 49(2): 140-150.

Equal Education (South Africa). 2011. *We can't afford not to: costing the provision of functional school libraries in South African public schools*. Khayelitsha [South

Africa]: Equal Education. [Online]. Available http://www.equaleducation.org.za/sites/default/files/EqualEducationCosting Booklet.pdf Accessed 20 July 2011.

Esterhuizen, E. & Kuhn, R. 2010. CHELSA draft guidelines on Information Literacy: paving the way to a South African national framework. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 41: 83-106.

Fiske, E.B. & Ladd, H.F. 2004. *Elusive equity*. Washington, DC: Brookings Institution Press.

Flick, U. 2009. *An introduction to qualitative research*. 4th ed. Thousand Oaks, CA: Sage Publications.

Fontana, A. & Frey, J.H. 2008. The interview: from neutral stance to political involvement. In Denzin, N. & Lincoln, Y. (eds). *Collecting and interpreting qualitative materials*. Thousand Oaks, CA: Sage Publications: 115-159.

Fourie, I. & Krauss, K. 2010. Information literacy training for teachers in a developing South African context: suggestions for a multi-disciplinary planning approach. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 41: 107-122.

Fox Interactive (Firm) & Twentieth Century-Fox Corporation. 1996. *The Simpsons show recaps: the day the violence died, 3/17/96*. Sterling, CO: Fox Interactive. [Online]. Available http://thesimpsons.com/recaps/season7/#episode19 Accessed 2 February 2011.

Fredericks, G.H. 1993. *Educational developments and the role of the school library and teacher-librarian in the education of blacks in South Africa with special reference to a sample of schools in the Cape Peninsula*. D.Bibl. thesis. Bellville: University of the Western Cape.

Fullan, M. 1993. Why teachers must become change agents. *Educational leadership*, 50(6): 1-13.

Gardner, H. 1999. *Intelligence reframed. Multiple intelligences for the 21st century*. New York: Basic Books.

Garner, S.D. 2006. *High-level colloquium on information literacy and lifelong learning, Bibliotheca Alexandria, Alexandria, Egypt, November 6-9, 2005 report of a meeting sponsored by the United Nations Education, Scientific, and Cultural Organisation (UNESCO), National Forum on Information Literacy (NFIL) and the International Federation of Library Associations and Institutions (IFLA)*. Alexandria, Egypt: Bibliotheca Alexandria.[Online]. Available http://www.ifla.org/III/wsis/High-Level-Colloquium.pdf Accessed 19 January 2007.

Gawith, G. 1987. *Information Alive! Information skills for researching and reading*. Auckland: Longman Paul.

Gawith, G. 1988. *Action learning: student guide to research and information skills*. Auckland: Longman Paul.

Gawith, G.1991. R*ipping in to research: Information skills for secondary and tertiary students*. Auckland: Longman Paul.

George Lucas Educational Foundation (GLEF). 2001. Project-based learning research. *Edutopia online.* [Online]. Available http://www.glef.org/php/article.php?id=Art_887Accessed 19 September 2009.

Gorman, G.E. & Clayton, P. 1997. *Qualitative research for the information professional: a practical handbook*. London: Facet.

Gorman, G.E. & Clayton, P. 2005. *Qualitative research for the information professional: a practical handbook*. 2nd ed. London: Facet.

Gredler, M.E. 2005. *Learning and instruction: theory into practice.* Upper Saddle River, NJ: Pearson Education, Inc.

Greene, J.C. 2010. Knowledge accumulation: three views on the nature and role of knowledge in social science. In Luttrell, W. (ed). *Qualitative educational research: readings in reflexive methodology and transformative practice.* London: Routledge: 63-77.

Guba, E.G. & Lincoln, Y.S. 1988. Do inquiry paradigms imply inquiry methodologies? In Fetterman, D. (ed). *Qualitative approaches to evaluation in education: the silent scientific revolution.* New York: Praeger: 89-115.

Hara, K. 2006. Review of the literature on information skills instruction. *Education,* 26(3): 518-524.

Hart, G. 1999. *Project work as a vehicle for information literacy education in disadvantaged schools: an ethnographic field study of grade seven project work in a primary school in Cape Town.* M.LIS. Rondebosch: UCT.

Hart, G. 2005. *The readiness of public libraries in South Africa for information literacy education: the case of Mpumalanga Province.* PhD thesis. Rondebosch: UCT.

Hart, G. 2006. Information literacy: the missing link in South Africa's educational transformation? [Online]. Available http://www.uneca.org/codi/codi5/content/CODI-V-KLIS-nformation_Literacy_Missing_Link_South_Africa_Educational_Transformation-Hart-EN.pdf Accessed 3 January 2007.

Hart, G. 2011. The "tricky business" of dual-use school community libraries: a case study in rural South Africa. *Libri*, 61(3): 211-225.

Hart, G. & Zinn, S. 2007. The conundrum of school libraries in South Africa. In Bothma,

T., Ngulube, P. & Underwood, P. (eds). *Libraries for the future: Progress and development of South African libraries*. Pretoria: LIASA & IFLA: 89-106. [Online] http://www.dissanet.com/ifla/pdf/LIASA%2007%20Hart%20&%20Zinn.pdf Accessed 1 September 2010.

Hartzell, G. 1997. The invisible school librarian: why other educators are blind to your value. *School library journal*, 24. Parts 1 & 2.

Hartzell, G. 2002. What's it take. Supplement to *Teacher librarian*, 30(1): 81-86.

Harvard School of Public Health. 2011. *The nutrition source. Food pyramids: what should you really eat*? [Online]. Available http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/pyramid-full-story/index.html Accessed 20 June 2011.

Havelock, R. 1973. *The change agent's guide to innovation in education*. Englewood Cliffs, NJ: Educational Technology Publications.

Hay, L., Henri, J. & Oberg, D. 1999. The role of the principal in an information literate School community: think global, act local. In Henri, J. & Bonanno, K. (eds). *The information literate school community: best practice*. Wagga Wagga, Australia: Centre for information studies, Charles Sturt University: 121-147.

Haycock, K. 2007. Collaboration: critical success factors for student learning. *School libraries worldwide*, 13(1): 25-35.

Heinström, J. 2006. Fast surfing for availability or deep diving into quality: motivation and information seeking among middle and high school students. *Information research,*11(4). [Online]. Available http://informationr.net/ir/11-4/paper265.html Accessed 3 July 2009.

Henri, J. 2001. Thinking and informing: a reality check on class teachers and teacher librarians. In Hughes, P. & Selby, L. (eds). *Proceedings of the fifth international forum on research in school librarianship & 30th annual conference of the IASL, Auckland, New Zealand, 9-12 July, 2001*. Seattle, WA: IASL: 119-128.

Henri, J. 2005. Understanding the information literate school community. In Henri, J. & Asselin, M. (eds). *Leadership issues in the information literate school community*. Westport, CT: Libraries Unlimited: 11-17.

Henri, J. & Lee, S. 2005 [DVD]. Information policy and Hong Kong schools: a review of the literature and preliminary benchmarking of practice. In Lee, S., Warning, P., Singh, D., Howe, E., Farmer, L., & Hughes, S. (eds). *IASL reports 2005: information leadership in a culture of change. Selected papers from the 34th Annual Conference of the International Association of School Librarianship and ninth International Forum on Research in School Librarianship, Hong Kong, China, 8-12 July 2005*. Erie, PA: IASL.

Henri, J. & Oberg, D. 2005. The leadership role of the principal in the information literate school community. In Henri, J. & Asselin, M. (eds). *Leadership issues in the information literate school community*. Westport, CT: Libraries Unlimited: 79-91.

Henri, J., Hay, L. & Oberg, D. 2002. *The school library-principal relationship: guidelines for research and practice*. The Hague: IFLA.

Herring, J.E. 1996. *Teaching information skills in schools*. London: Library Association Publishing.

Herring, J.E. 2007. A critical investigation of students' and teachers' views of the use of Information literacy skills in school assignments. [Online]. Available

http://www.ala.org/ala/mgrps/divs/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume9/informationliteracy.cfm Accessed 27 July 2010.

Hersberger, J. 2005. Chatman's information poverty. In Fisher, E., Erderlez, S. & McKechnie, L.E.F. (eds). Theories *of information behavior*. Medford, NJ: Information Today, Inc.: 75-78.

Hoadley, U. & Ward, C.L. 2009. *Managing to learn: instructional leadership in South African secondary schools.* Cape Town: HSRC Press. [Online]. Available http://www.hsrcpress.ac.za Accessed 7 April 2009.

Holt-Reynolds, D. 2000. What does the teacher do? Constructivist pedagogies and the prospective teachers' beliefs about the role of a teacher. *Teaching and teacher education*, 16(1): 21-32.

Holtzman, D. & Dwane, Y. 2011. *ANA results disturbing*. [Online]. Available http://www.equaleducation.org.za Accessed 21 July 2011.

Horton, F.W. 2007. *Understanding information literacy: a primer*. Paris: UNESCO.

Hoskins, R. 2006. Libraries and teacher-librarians in KwaZulu-Natal. *Innovation: journal of appropriate librarianship and information work in Southern Africa,* 33: 59-75.

Huysamen, G.K. 1994. *Methodology for the social and behavioural sciences*. Johannesburg: Southern Book Publishers.

Information literacy: an international state of the art report. 2007. 2nd draft. [Online]. Available http://www.uv.mx/usbi_ver/unesco Accessed 30 March 2010.

Information skills for teachers: a report for the Eduserv Foundation information literacy programme. 2006. [Online]. Available

http://www.netskills.ac.uk/content/projects/eduserv-info-lit/NetskillsEduservInfoLit.pdf Accessed 31 July 2011.

International Society for Technology in Education (ISTE). 2008. *National education technology standards and performance indicators for teachers*. [Online]. Available http://www.iste.org Accessed 14 January 2009.

Internet World Statistics. 2011. Internet usage statistics for Africa, March 31, 2011. [Online]: Available http://www.Internetworldstats.com Accessed 8 June 2011.

Irving, C. & Crawford, J. 2007. Information literacy: the link between secondary and tertiary education project and its wider implications. *Journal of librarianship and information science*, 39(17). [Online]. Available http://lis.sagepub.com/cgi/content/abstract/39/1/17 Accessed 3 March 2009.

Jansen, J. 2011a. In defence of books at a time when they are scorned. *Sunday Times,* 3 July. [Online]. Available http://www.timeslive.co.za/sundaytimes/2011/07/03/in-defence-of-books-at-a-time-when-they-re-scorned Accessed 4 July 2011.

Jansen, J. 2011b. Testing time for kids. *The Times*, 3 November: 15.

Jansen, J. & Taylor, N. 2003. Educational change in South Africa 1994-2003: case studies in large-scale education reform. [Online]. Available http://www.jet.org.za/publications/research/Jansenand Taylor_World Bank report.pdf Accessed 4 March 2009.

Janssen, C. 2012. Web 1.0. [Online]. Available

http://www.techopedia.com/definition/27960/web-10/ Accessed 12 November 2012.

Johnson, C.M. & O'English, L. 2003. Information literacy in pre-service teacher

education: an annotated bibliography. *Behavioral & social sciences librarian*, 22(1): 129-139.

Johnson, R.B. & Onwuegbuzie, A.J. 2004. Mixed methods research: a research paradigm whose time has come. *Educational researcher*, 33(7): 14-26.

Jorosi, B.N. & Isaac, G.G. 2008. Teaching information literacy skills in community junior secondary schools in Gaborone, Botswana. *Information development*, 24(2): 123-134.

King, L. 2007. Information *literacy of incoming undergraduate arts students at the University of the Western Cape: assessment of competencies and proficiencies*. PhD thesis. Bellville: University of the Western Cape. [Online]. Available http://etd.uwc.ac.za/ Accessed 12 July 2008.

Kruss, G. 2009. *Opportunities and challenges for teacher education curriculum in South Africa*: 1- 17. [Online]. Available http://www.hsrcpress.ac.za Accessed 7 April 2009.

Kühne, B. 1995. The Barkestorp project: investigating school library use. *School libraries worldwide,* 1(1): 13–27.

Kuhlthau, C. 1993. *Seeking meaning: a process approach to library and information services*. Norwood, NJ: Ablex.

Kuhlthau, C. 2004. *Seeking meaning: a process approach to library and information services*. 2nd ed. Westport, CT: Libraries Unlimited.

Kuhlthau, C. 2010. Guided inquiry:school libraries in the 21st century. *School Libraries Worldwide*, 16(1): 17-28.

Kuhlthau, C., Heinström, J. & Todd, R. 2008. The information search process revisited: is the model still useful? *Information research*, 13 (4). [Online]. Available http://informationr.net/ir/13-4/paper355.html Accessed 31 August 2009.

Kuhlthau, C., Maniotes L., & Caspari, A. 2007. *Guided inquiry: learning in the 21st century*. Westport, CN: Libraries Unlimited.

Kurbanoglu, S. 2003. Self-efficacy: a concept closely linked to information literacy and lifelong learning. *Journal of documentation*, 59(6): 635-646.

Kurbanoglu, S., Akkoyunlu, B. & Umay, A. 2006. Developing the information literacy self-efficacy scale. *Journal of documentation*, 62(6): 730-743.

Ladbrook, J. & Probert, E. 2011. Information skills and critical literacy: where are our digikids at with online searching and are their teachers helping*? Australian journal of educational technology*, 27: 105-121.

Lance, K.C. 2005/2006/2007. *School library impact studies*. [Online]. Available http://www.lrs.org/impact.asp Accessed 19 June 2008.

Latham, D. & Gross, M. 2008. Broken links: undergraduates look back on their experiences with information literacy in K-12 education. [Online]. Available http://www.ala.org/ala/mgrps/divs/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume11/lathamgross.cfm Accessed 27 July 2010.

Learning for the future. 2001. 2nd ed. Sydney: Curriculum Corporation.

Leu, D.J., Kinzer, C.K., Coiro, J.L. & Cammack, D.W. 2004. Towards a theory of new literacies emerging from the Internet and other information and communication technologies. In Ruddell, R.B. & Unrau, N.J. (eds). *Theoretical models and*

processes of reading. 5th ed. Newark, DE: International Reading Association: 1570-1613.

Library and Information Association of South Africa (LIASA). 2004. *Information literacy guidelines: grades R – 12*. Pretoria: LIASA.

Library and Information Services (LIS) Transformation Charter. 2009. Pretoria: Department of Arts and Culture (DAC) & National Council for Library and Information Services (NCLIS) [Online]. Available http://www.nlsa.ac.za/NLSA/docs/LIS Transformation Charter_draft.pdf Accessed 6 February 2010.

Limberg, L. 2000. Is there a relationship between information seeking and learning outcomes? In: Bruce, C. and Candy, P. *Information literacy around the world*. Wagga Wagga: Centre for Information Studies: 193-208.

Limberg, L. 2005a. Informing information literacy education through empirical research. In Henri, J. & Asselin, M. (eds). *Leadership issues in the information literate school community*. Westport, CT: Libraries Unlimited: 39-50.

Limberg, L. 2005b. Phenomenography. In Fisher, E., Erderlez, S. & McKechnie, L.E.F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 280-283.

Lloyd, A. 2003. Information literacy: the meta-competency of the knowledge economy. *Journal of librarianship and information science,* 35(2): 87-92.

Lloyd, A. 2010. Information literacy landscapes: information literacy in education, workplace and everyday contexts. Oxford: Chandos publishing.

Loertscher, D. 1996. All that glitters may not be gold. *Emergency librarian*, 24(2): 20-21, 23-25.

Loertscher, D. 2002. *Taxonomies of the school library media program*. 2nd ed. San Jose, CA: Hi Willow.

Loertscher, D. 2008. Information literacy: 20 years later. *Teacher librarian,* 35(5): 42-43.

Lowe, C.A. & Eisenberg, M.B. 2005. Big6™skills for information literacy. In Fisher, K.E., Erderlez, S. & McKechnie, L.E.F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 63-68.

Luttrell, W. 2010. Introduction: the promise of qualitative research in education. In Luttrell, W. (ed). *Qualitative educational research: readings in reflexive methodology and transformative practice.* London: Routledge: 1-20.

Macfarlane, D. 2011. The damage schools do to children. *Mail & guardian*, July 1-7:15.

Maepa, E. & Mhinga, R. 2003. Integrating a community library into the teaching and learning programme of local schools: experiences from Seshego Community Library, South Africa. In Zinn, S., Hart G., & Howe, E. (eds). *IASL reports 2003: school libraries breaking down barriers. Selected papers from the 32nd Annual Conference of the International Association of School Librarianship and the 7th International Forum on Research in School Librarianship, Durban, South Africa, 7-11 July 2003.* Seattle: IASL: 270-279.

Markless, S. & Streatfield, D. 2007. Three decades of information literacy: redefining the parameters. [Online]. Available http://www.informat.org/pdfs/Streatfield-Markless.pdf Accessed 26 June 2011.

Marland, M. 1990. Information skills and the whole-school curriculum. In Irving, A. (ed). *Educating information users in schools: seminar: selected papers.* London: British Library Research and Development Department: 18-29.

Marton, F. 1994. Phenomenography. In Husén, T. & Postlethwaite, T.N. (eds). *The international encyclopedia of education*. 2nd ed. Vol 8. London: Pergamon Press: 4424-4429. [Online]. Available http://www.ped.gu.se/biorn/phgraph/civil/main/1res.appr.html Accessed 6 October 2008.

Mayer, R.E. 2009. Constructivism as a theory of learning versus constructivism as a prescription for instruction. In Tobias, S. & Duffy, T.M. (eds). *Constructivist instruction: success or failure*? London: Routledge: 184-200.

McEuen, S. 2001. How fluent with information technology are our students. *EDUCAUSE quarterly* 4: 8-17.

McKechnie, L.E.F. 2005. Vygotsky's zone of proximal development. In Fisher, K.E., Erderlez, S. & McKechnie, L.E.F. (eds). *Theories of information behavior*. Medford, NJ: Information Today, Inc.: 373-376.

McKenzie, J. 1996. *Questions*. [Online]. Available http://www.fno.org/sept96/questions.html Accessed 13 July 1999.

McKenzie, J. 1997. The research cycle revisited. [Online]. Available http://fno.org/oct97/research.html Accessed 17 August 1998.

McKenzie, J. 1999. *Beyond technology: questioning, research and the information literate school.* Bellingham, WA: Fromnowon Press.

Merchant, L. & Hepworth, M. 2002. Information literacy of teachers and pupils in secondary schools. *Journal of librarianship and information science,* 34(2): 81-89.

Meth, P. 2003. Entries and omissions: using solicited diaries in geographical research.

Area, 35(2): 195-205.

Ministry of Education & National Library of New Zealand. 2002. *The school library and learning in the information landscape: guidelines for schools.*Wellington, New Zealand: Ministry of Education.

Montiel-Overall, P. & Jones, P. 2011. Teacher and school librarian collaboration: a preliminary report of teachers' perceptions about frequency and importance to student learning. *Canadian journal of information and library science,* 35(1): 49-76.

Moore, P. 1997. Teaching information problem solving in primary schools: an information literacy survey. Paper presented at the 63rd IFLA Conference, 31 August-5 September, 1997, Copenhagen, Denmark. [Online]. Available http://archive.ifla.org/IV/ifla63/63moop.htm Accessed 22 June 2009.

Moore, P. 2002. An analysis of information literacy education worldwide. White Paper prepared for UNESCO, the US National Commission on Libraries and Information Science, and the National Forum on Information Literacy, for use at the *Information Literacy Meeting of Experts*, Prague, The Czech Republic, September 20-23, 2003. [Online]. Available http://www.nclis.gov/libinter/infolitconf&meet/moore-fullpaper.pdf Accessed 4 July 2003.

Moreillon, J. 2008. Two heads are better than one: influencing pre-service classroom teachers' understanding and practice of classroom-library collaboration. [Online]. Available http://ala.org/ala/mgrps/divs/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume11/moreillon.cfm Accessed 27 July 2010.

Morrow, W. 2007. *Learning to teach in South Africa*. Cape Town: HSRC Press. [Online]. Available http://hsrcpress.ac.za Accessed 25 July 2007.

Muller, J. & Roberts, J. 2000. *The sound and the fury of international school reform: a critical review*. [Online]. Available http://www.jet.org.za Accessed 18 January 2007.

Neuman, W.L. 2006. *Social research methods: qualitative and quantitative approaches*. 6th ed. London: Pearson Education, Inc.

Olën, S. 1994. *The school media centre in the curricular for initial teachers' training.* D. Bibl thesis. Pretoria: University of South Africa.

Ontario School Library Association. 1999. *Information studies: kindergarten to grade 12.* Toronto: Ontario Library Association.

Pajares, F. 1997. Current directions in self-efficacy research. In Maehr, M. & Pintrich, P.R. (eds). *Advances in motivation and achievement*. *Vol. 10*. Greenwich, CT: JAI Press: 1-49.

Pajares, F. 2002. Overview of social cognitive theory and of self-efficacy. [Online]. Available: http://www.emory.edu/EDUCATION/mfp/eff.html Accessed 27 September 2011.

Pajares, F. & Schunk, D.H. 2001. Self beliefs and school success: self-efficacy, self-concept and school achievement. [Online]. Available http://des.emory.edu/mfp/PajaresSchunk2001.html Accessed 19 September 2011.

Partnership for 21st century skills. 2007. *Framework for 21st century learning*. [Online]. Available http://www.21stcenturyskills.org Accessed 15 May 2008.

Patton, M.Q. 2002. *Qualitative research and evaluation methods*. 3rd ed. Thousand Oaks, CA: Sage Publications.

People for education. 2006. *School libraries and student achievement in Ontario*. Toronto: Ontario Library Association. [Online]. Available

http://www.peopleforeducation.com/reports/library/OLAstudy.pdf Accessed 13 April 2006.

Peräkylä, A. 2004. Reliability and validity in research based on naturally occurring social interaction. In Silverman, D. (ed). *Qualitative research: theory, method and practice*. 2nd ed. Thousand Oaks, CA: Sage Publications: 283-304.

Pickard, A. & Dixon, P. 2004. The applicability of constructivist user studies: how can constructivist inquiry inform service providers and systems designers? *Information research*, 9(3): paper 175 [Online]: Available http://InformationR.net/ir/9-3/paper175.html Accessed 12 January 2011.

Pitts, J.M. 1994. *Personal understandings and mental models of information: a qualitative study of factors associated with the information seeking and use of adolescents.* PhD thesis. Ann Arbor, MI: UMI.

Prague declaration. 2003. *Towards an information literate society*. [Online]. Available http://www.nclis.gov/libinter/infolitconf&meet/postinfolitconf&meet/PragueDeclaration.pdf Accessed 1 September 2008.

Probert, E. 2009. Information literacy skills: teacher understandings and practice. *Computers and education,* 53: 24-33.

Radebe, T. 1997. Experiences of teacher-librarians in the workplace after completion of the school librarianship programme. *South African journal of library & information science*, 65(4): 218- 226.

Review essays. 2004. NVivo 2.0 and ATLAS.ti 5.0: a comparative review of two popular qualitative data-analysis programs. *Field methods,* 16(4): 439–469.

Richardson, V. & Placier, P. 2001. Teacher change. In Richardson, V. (ed). *Handbook of research on teaching*. 4th ed. Washington, DC: American Educational Research Association: 905-950.

Ryan, J. & Capra, S. 2001. *Information literacy toolkit. Grades 7 and up*. Chicago,ILL: ALA.

Saetre, T.P. & Willars, G. 2002. *The IFLA/UNESCO school library guidelines*. The Hague: IFLA Headquarters. [Online]. Available http://archive.ifla.org/VII/s11/pubs/sguide02.pdf Accessed 23 July 2010.

Saskatchewan schools. 2005. *Resource-based learning definition*. [Online]. Available http://www.saskschools.ca/curr_content/teachlib/rbl/rblmain.htm Accessed 9 November 2006.

Saunders, S. 2011. In a worse state than we think. *Mail & guardian*, July 1-7: 42.

Sayed, Y. 1998. *The segregated information highway*. Cape Town: University of Cape Town Press.

Scholastic. 2008. *School libraries work! Research foundation paper*. New York: Scholastic Library Publishing.

Schwarzer, R. & Jerusalem, M. 1995. Generalized self-efficacy scale. In Weinman, J., Wright, S. & Johnston, M. (eds). *Measures in health psychology: a user's portfolio. Causal and control beliefs.* Windsor: NFER-NELSON: 195-213.

SCONUL. 1999a. *Information skills in higher education: a SCONUL position paper*. [Online]. Available http://www.sconul.ac.uk/groups/information_literacy/papers/Seven_pillars.html Accessed 9 August 2011.

SCONUL. 1999b. *Seven pillars of information literacy*. [Online]. Available http://www.sconul.ac.uk/groups/information_literacy/papers/seven_pillars.html Accessed 9 August 2011.

Shenton, A.K. 2007. The paradoxical world of young peoples' information behavior. *School libraries worldwide,* 13(2): 1-17.

Shenton, A.K. & Fitzgibbons, M. 2010. Making information literacy relevant. *Library review*, 59(3): 165-174.

Shephard, L.A. 2001. The role of classroom assessment in teaching and learning. In Richardson, V. (ed). *Handbook of research on teaching*. 4th ed. Washington, DC: American Educational Research Association: 1066-1101.

Slyfield, H. 2001. Information literacy in New Zealand secondary and primary schools. In Hughes, P. & Selby, L. (eds). *Proceedings of the fifth international forum on research in school librarianship & 30th annual conference of the IASL*, Auckland, New Zealand, 9-12 July, 2001. Seattle, WA: IASL: 162-181.

Small, R.V. & Arnone, M.P. 2000. *Turning kids on to research*. Englewood, Colo: Libraries Unlimited.

Small, R.V., Shanahan, K.A. & Stasak, N. 2010. The impact of New York's school libraries on student achievement and motivation: Phase III. [Online]. Available http://www.ala.org/ala/mgrps/divs/aasl/aaslpubsandjournals/slmrb/slmrcontents/volume13/small_phase3.cfm Accessed 1 March 2011.

South Africa. 1994a. *Core teaching programme for information skills: Grade 1 to Standard 10.* Pretoria: Department of Education.

South Africa. 1994b. *Education and training in a democratic South Africa first steps to*

develop a new system draft policy document for consultation. Cape Town: The Ministry.

South Africa. 1997. *Curriculum 2005: lifelong learning for the 21st century.* Pretoria: Department of Education.

South Africa. 1998. A national policy framework for school library standards: a discussion document. Directorate: Centre for Educational Technology and Distance Education. Pretoria: Department of Education. Unpublished report.

South Africa. 2002. *Revised national curriculum statement*, *June 2002*. Pretoria: Department of Education. [Online]. Available: http://wced.wcape.gov.za/ncs/ncs.html Accessed 12 December 2006.

South Africa. 2004. *White paper on e-education: transforming learning and teaching through information and communication technologies*. Pretoria: Department of Education. [Online]. Available http://www.info.gov.za/whitpapers/2003/e-education.pdf Accessed 23 May 2005.

South Africa. 2007. National Education Infrastructure Management System's (NEIMS) *national assessment report (public ordinary schools)*. Pretoria: Department of Education. [Online]. Available http://llnw.creamermedia.co.za/articles/attachments/07378_070914pos_report.pdf Accessed 12 August 2008.

South Africa. 2008. *National reading strategy*. Pretoria: Department of Education. [Online]. Available http://www.info.gov.za/view/DownloadFileAction?id=78955 Accessed 26 August 2011.

South Africa. 2009a. *Education statistics in South Africa 2009*. Pretoria: Department of Basic Education. [Online]. Available http://www.doe.gov.za Accessed 14 Feb 2011.

South Africa. 2009b. National Education Infrastructure Management System's (NEIMS) *national assessment report (public ordinary schools).* Pretoria: Department of Basic Education. [Online]. Available http://llnw.creamermedia.co.za/articles/attachments/07378_070914pos_report.pdf Accessed 1August 2011.

South Africa. 2009c. *Review of the implementation of the national curriculum statement (NCS): final report*. [Online]. Available http://www.education.gov.za Accessed 1 August 2011.

South Africa. 2010. *School realities report, 2010*. Pretoria: Department of Basic Education. [Online]. Available http://www.education.gov.za/EMIS/StatisticalPublications/tabid/462/Default.aspx Accessed 20 May 2011.

South Africa. 2011a. *Curriculum and assessment policy statement (CAPS): computer applications technology (CAT)*. Pretoria: Department of Basic Education. [Online]. Available http://www.education.gov.za Accessed 18 September 2011.

South Africa. 2011b. *The minimum requirements for teacher education qualifications*. Pretoria: Department of Higher Education and Training. [Online]. Available http://www.dhet.gov.za Accessed 17 August 2011.

South Africa. 2011c. *Report on the annual national assessments (ANA) of 2011*. Pretoria: Department of Basic Education. [Online]. Available http://www.education.gov.za Accessed 14 July 2011.

South Africa. 2011d. *Schooling 2025*. [Online]. Available http://www.education.gov.za/Curriculum/Schooling2025/tabid/401/Default.aspx Accessed 2 August 2011.

South Africa. 2012. *National guidelines for school library and information services*. [Online]. Available http://www.education.gov.za Accessed 20 March 2012.

South Africa.Info. 2011. Western Cape Province. [Online]. Available http://southafrica.info/about/facts.htm#provinces Accessed 1 August 2011.

South African Human Rights Commission, & Public hearing on the right to basic education. 2006. *Report of the public hearing on the right to basic education: 12-14 October 2005*. [Online]. Available http://www.sahrc.org.za/home/21/files/Reports/Right to basic education 2006.pdf Accessed 12 January 2009.

Spalding, E. & Wilson, A. 2002. Demystifying reflection: a study of pedagogical strategies that encourage reflective journal writing. *Teachers college record,* 104(7): 1393-1421.

Spitzer, K.L., Eisenberg, M.B. & Lowe, C.A. 1998. *Information literacy essential skills for the information age*. Syracuse, N.Y.: Syracuse University.

Statistics South Africa. 2011. *Mid-year population estimates*. Pretoria: Statistics South Africa. [Online]. Available http://www.stassa.gov.za/publications/P0302/P03022011.pdf Accessed 29 July 2011.

Stilwell, C. 2010. Research into information behavior in the South African context: a preliminary exploration and bibliography: 1980 to date. *Innovation: journal of appropriate librarianship and information work in Southern Africa*, 40: 1-33.

Stripling, B.K. 2008. Inquiry: inquiring minds want to know. *School library media activities monthly*, 25(1): 50 – 52.

Stripling, B.K. & Pitts, J.M. 1988. *Brainstorms and blueprints teaching library research as a*

thinking process. Englewood, Colo: Libraries Unlimited.

Taylor, N. 2001. *Anything but knowledge: the case of the undisciplined curriculum*. [Online]. Available http://www.jet.org.za Accessed 10 August 2010.

Taylor , N. 2007. Equity, efficiency and the development of South African schools. In Townsend, T. (ed). *International handbook of school effectiveness and improvement*. Dordrecht, NL: Springer. [Online]. Available http://www.jet.org.za Accessed 10 August 2010.

Taylor, N. 2010. Patronage kills education. *The Times*, 2 March 2010. [Online]. Available http://www.jet.org.za Accessed 10 August 2010.

Taylor, N. & Vinjevold, P. (eds). 1999. *Getting learning right*. Johannesburg: Joint Education Trust.

Taylor, N., Fleisch, B. & Schindler, J. 2008. *Changes in education since 1994*. Study commissioned by the policy unit of the office of the presidency. [Online]. Available www.jet.org.za Accessed 7 July 2009.

Taylor, R.S. 1968. Question negotiation and information seeking in libraries. *College and research libraries*, 29(3): 178-194.

Tobias, S. 2009. An eclectic appraisal of the success or failure of constructivist instruction. In Tobias, S. & Duffy, T.M. (eds). *Constructivist instruction: success or failure*? London: Routledge: 336-350.

Todd, R. 2002. School librarian as teachers: learning outcomes and evidence-based practice. Paper presented at the 68th IFLA Conference, 18-24 August, 2002, Glasgow. [Online]. Available http://www.ifla.org/IV/ifla68/papers/084-119e.pdf Accessed 13 July 2007.

Todd, R. 2008. Collaboration: from myth to reality. Let's get down to business. Just do it! *School library media activities monthly*, 24(7): 54-58.

Todd, R. & Gordon, C. 2010. *School libraries, now more than ever: a position paper of the Center for International Scholarship in School Libraries (CISSL).* New Brunswick: School of information and communication, Rutgers.

Todd, R., Kuhlthau, C. & OELMA 2004. *Student learning through Ohio school libraries: the Ohio research study*. Columbus, OH: Ohio Educational Library Media Association. [Online]. Available http://www.oelma.org/studentlearning.htm Accessed 6 June 2004.

UNESCO. 2007. Information for all programme (IFAP): report 2006-2007. Nolan, T. & Fabricio, C. (eds). [Online]. Available http://unesdoc.unesco.org/images/0015/001592/159223e.pdf Accessed 30 April 2009.

Valenza, J.K. 2007. Web2.0 meets information literacy. Newsletter for IFLA section number 11: school libraries and resource centers, (11): 14 -17.

Valli, L. 1997. Listening to other voices: a description of teacher reflection in the United States. *Peabody journal of education,* 72(1): 67-88.

Van der Walt, P. 2005. The design of an information literacy instruction programme for upper elementary children in the public library. M.Tech thesis. Pretoria: University of South Africa.

Van Deusen, J. & Tallman, J.I. 1994. The impact of scheduling on curriculum consultation and information skills instruction. *School library media quarterly*, 23(1):17-25; 27-31; 33-37.

Von Glaserfeld, E. 2005. Introduction: aspects of constructivism. In Fostnot, C.T. (ed). *Constructivism: theory, perspectives and practice*. 2nd ed. New York, NY: Teachers College Press: 3-38.

Vygotsky, L.S. 1978. *Mind in society: the development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Waldman, M. 2003. Freshmen's use of library electronic resources and self-efficacy. *Information research,* 8(2). [Online]. Available http://informationr.net/ir/8-2/paper150.html Accessed 29 May 2009.

Walker, C. 2001. Information literacy: how low do we go? *Mousaion,* 19(2): 61- 72.

Western Cape (South Africa). 2001. *Better thinking – better learning: towards the critical outcomes, a thinking skills starter pack*. Cape Town: Western Cape Education Department.

Western Cape (South Africa). 2005. *Western Cape Education Department provincial grade 6 systemic evaluation 2004 report*. Pretoria: Human Sciences Research Council.

Western Cape (South Africa). 2006a. *A human capital development strategy for the Western Cape: a focus on youth.* Cape Town: Western Cape Education Department. [Online]. Available http://www.capegateway.gov.za/Text/2006/4/hcds_english.pdf Accessed 23 March 2006.

Western Cape (South Africa). 2006b. *Literacy and Numeracy Strategy 2006-2016.* Cape Town: Western Cape Education Department.

Western Cape (South Africa). 2007. The quality of teaching and learning and educator development. Cape Town: Western Cape Education Department. Unpublished.

Western Cape (South Africa). 2010. *WCED circular 0037/2010*. Cape Town: Western Cape Education Department. [Online]. Available http://wced.school.za/circulars/circulars10/e37_10.html Accessed 27 August 2011.

Western Cape (South Africa). 2011a. *ICTs in WCED schools*. [Online]. Available http://wced.wcape.gov.za/home/projects/school_it.html Accessed 8 July 2011.

Western Cape (South Africa). 2011b. *Khanya achievements*. [Online]. Available http://wced.wcape.gov.za/home/projects/lgkhan.html Accessed 8 July 2011.

Whelan, D.L. 2003. Why isn't information literacy catching on? *School library journal*, 1 September 2003. [Online]. Available http://www.schoollibraryjournal.com/article/CA318993.html Accessed 29 January 2008.

Wildeman, R. 2008. Reviewing eight years of the implementation of the school funding norms, 2000 to 2008. [Online]. Available http://www.idasa.org.za Accessed 13 August 2008.

Wilkinson, S. 2004. Focus group research. In Silverman, D. (ed). *Qualitative research: theory, method and practice.* 2nd ed. London: Sage Publications: 177-199.

Williams, D. & Coles, L. 2007. Teachers' approaches to finding and using research evidence: an information literacy perspective. *Educational research*, 49(2): 185 – 206.

Williams, D. & Wavell, C. 2006. *Information literacy in the classroom: secondary school teachers' conceptions.* Research report 15, Department of Information Management, Aberdeen Business School, The Robert Gordon University. [Online]. Available http://www.rgu.ac.uk/files/ACF4DAA.pdf Accessed 17 August 2008.

Wilson, T.D. no date. *Structure in research methods*. [Online]. Available: http://informationr.net/tdw/publ/ppt/ResMethods/sld001.htm Accessed 1 February 2011.

Wilson, T.D. 2002. Alfred Schutz, phenomenology and research methodology for information behaviour research. A paper delivered at *ISIC4 – Fourth International Conference on Information Seeking in Context*, UniversidadeLusiada,Lisbon, Portugal, September 11 to 13, 2002. [Online]. Available: http://informationr.net/tdw/publ/papers/schutz02.html Accessed 25 January 2011.

Young, M.F.D. 2008. *Bringing knowledge back in: from social constructivism to social realism in the sociology of education*. London: Routledge.

Youth Learn 2010. Introduction to inquiry learning and asking questions. [Online]. Available http://www.youthlearn.org/ Accessed 9 July 2010.

Zinn, S. 1997. *Integrating information skills into the curriculum: an action research investigation at an ex-House of Representatives high school.* M. Bibl. Thesis. Bellville: University of the Western Cape. [Online]. Available http://etd.uwc.ac.za Accessed 25 May 2004.

Zinn, S. 2000. Outcomes-based education and non-English mother tongue speakers from disadvantaged environments: a double-edged handicap to acquiring information literacy. *Mousaion,* 18(2):40-53.

Zinn, S. 2002. Information literacy skills: A national perspective. In Education Library Information and Technology Services (ELITS), *Ghost libraries and Curriculum 2005: Proceedings of the 1st Annual Provincial Conference, 11-13 July*. Durban: Department of Education and Culture KwaZulu–Natal, 6–13. [Online]. Available http://www.kzneducation.gov.za/elits/2002_%20CONFERENCE_PROCEEDINGS.doc Accessed 17 May 2003.

Zinn, S. 2006. Have trained school librarians made a difference for school libraries in South Africa? *Innovation: journal of appropriate librarianship and information work in Southern Africa,* 33: 21-35.

Zinn, S. 2008. Report: ACE School librarianship, information literacy education course, Port Elizabeth, 7-11 January, 2008. Bellville: UWC, Department of Library & Information Science. Unpublished.

Zinn, S. 2010. ACE school librarianship. Information literacy education: coursework book. Bellville: UWC, Department of Library & Information Science. Unpublished.

Appendix 1: Participants' project assessment

Partici-pant #	Information literate at end?	Rubric contains information literacy criteria?	Rating level	Annotated list of web resources?	Engaging projects exercise?	Bibliography?	Bibliography includes websites?	Bibliography quality	Learners provide bibliography?
1	Yes	yes	6 integrated	yes	yes	yes	yes	good	yes
2	Yes	no	2 curiosity	yes	yes	no	no	n/a	no
3	Yes	yes	5 adopted	yes	yes	yes	yes	fair	yes
4	Yes	no	2 curiosity	yes	no	no	no	n/a	no
5	Yes	yes	6 integrated	yes	yes	yes	yes	good	yes
6	No	no	2 curiosity	yes	no	yes	yes	textbooks	no
7	Yes	no	3 evaluating	yes	yes	yes	no	fair	no
8	Yes	yes	6 integrated	yes	yes	yes	yes	good	yes
9	Yes	no	4 trialling	yes	yes	yes	yes	textbooks mainly	no
10	Yes	yes	6 integrated	yes	yes	yes	yes	good	yes
11	Yes	no	4 trialling	yes	yes	yes	yes	fair	no
12	No	no	2 curiosity	no	no	no	no	n/a	no
13	Yes	yes	5 adopted	yes	yes	yes	yes	fair	no
14	Yes	no	2 curiosity	yes	yes	yes	yes	textbooks	no
15	No	no	2 curiosity	yes	no	yes	yes	textbooks	no
16	Yes	no	3 evaluating	yes	no	yes	no	textbooks mainly	yes
17	Yes	yes	5 adopted	yes	yes	yes	yes	fair	no
18	Yes	yes	4 trialling	yes	yes	no	no	n/a	yes
19	Yes	yes	3 evaluating	yes	no	yes	yes	poor	yes
20	Yes	yes	4 trialling	yes	yes	yes	no	good	no
21	Yes	no	5 adopted	yes	yes	yes	yes	newspapers	no
22	Yes	yes	4 trialling	yes	yes	yes	no	fair	no
23	Yes	yes	4 trialling	yes	yes	yes	yes	poor	no
24	No	no	4 trialling	yes	yes	yes	no	textbooks	no
25	Yes	yes	5 adopted	yes	yes	yes	no	fair	yes
26	No	no	2 curiosity	yes	no	yes	no	textbooks	no
27	No	no	3 evaluating	yes	yes	yes	no	poor	no
28	Yes	yes	6 integrated	yes	yes	yes	yes	good	yes
29	Yes	yes	6 integrated	yes	yes	yes	no	good	yes

Appendix 2: Schedule of interviews with teachers

Date	Interviewee #	Place
28 November 2010	1	Prince Albert
29 November 2010	2	Oudtshoorn
29 November 2010	3	George
30 November 2010	4	Knysna
14 December 2010	5	University of the Western Cape
14 December 2010	6	University of the Western Cape
14 December 2010	7	University of the Western Cape
14 December 2010	8	University of the Western Cape
14 December 2010	9	University of the Western Cape
14 December 2010	10	University of the Western Cape
11 January 2011	11	University of the Western Cape
11 January 2011	12	University of the Western Cape
13 January 2011	13	Stellenbosch
13 January 2011	14	Paarl
14 January 2011	15	Ceres
14 January 2011	16	Ceres
17 January 2011	17	Worcester
18 January 2011	18	Robertson
18 January 2011	19	Robertson
18 January 2011	20	McGregor
25 March 2011	21	University of the Western Cape
25 March 2011	22	University of the Western Cape
25 March 2011	23	University of the Western Cape
5 April 2011	24	University of the Western Cape
5 April 2011	25	University of the Western Cape
5 April 2011	26	University of the Western Cape
5 April 2011	27	University of the Western Cape
5 April 2011	28	University of the Western Cape
8 April 2011	29	University of the Western Cape

NB The different colours indicate which participants were interviewed together.

Schedule of interviews with district chief curriculum advisors

Date	Interviewee Pseudonyms	Place
11 May 2011	Mr Adams	District 1 (rural)
12 May 2011	Mr Brown	District 2 (urban)
20 May 2011	Mr Cohen	District 3 (urban)
26 May 2011	Mr Davids	District 4 (rural)
26 May 2011	Mr Edwards	District 5 (rural)
27 May 2011	Mr Fraser	District 6 (urban)

Appendix 3: Information literacy self-efficacy scale

This scale has been prepared to determine your level of efficacy on issues related with information (to find, use and communicate information). Here the notations shall be referred to as 7 = almost always true, 6 = usually true, 5 = often true, 4 = occasionally true, 3 = sometimes but infrequently true, 2 = usually not true, 1 = almost never true. Please mark the most suitable choice for you.

A = Defining the need for information B = Initiating the search strategy C = locating and accessing the resources D = Assessing and comprehending information E = Interpreting, synthesizing, and using information F = Communicating Information G = Evaluating the product and process

	I feel confident and competent to							
A 1	Define the information I need	1	2	3	4	5	6	7
B 2	Identify a variety of potential sources of information	1	2	3	4	5	6	7
B 3	Limit search strategies by subject, language and date	1	2	3	4	5	6	7
B 4	Initiate search strategies by using keywords and Boolean logic	1	2	3	4	5	6	7
C 5	Decide where and how to find the information I need	1	2	3	4	5	6	7
C 6	Use different kinds of print sources (i.e. books, periodicals, encyclopedias, chronologies, etc.)	1	2	3	4	5	6	7
C 7	Use electronic information sources	1	2	3	4	5	6	7
C 8	Locate information sources in the library	1	2	3	4	5	6	7
C 9	Use library catalogue	1	2	3	4	5	6	7
C 1 0	Locate resources in the library using the library catalogue	1	2	3	4	5	6	7
C 1	Use internet search tools (such as search engines,	1	2	3	4	5	6	7

1	directories, etc.)							
C 1 2	Use different kinds (types) of libraries	1	2	3	4	5	6	7
D 1 3	Use many resources at the same time to make a research	1	2	3	4	5	6	7
D 1 4	Determine the authoritativeness, currency and reliability of the information sources	1	2	3	4	5	6	7
D 1 5	Select information most appropriate to the information need	1	2	3	4	5	6	7
D 1 6	Identify points of agreement and disagreement among sources	1	2	3	4	5	6	7
D 1 7	Evaluate World Wide Web sources	1	2	3	4	5	6	7
E 1 8	Synthesize newly gathered information with previous information	1	2	3	4	5	6	7
E 1 9	Interpret the visual information (i.e. graphs, tables, diagrams)	1	2	3	4	5	6	7
F 2 0	Write a research paper	1	2	3	4	5	6	7
F 2 1	Determine the content and form the parts (introduction, conclusion) of a presentation (written, oral)	1	2	3	4	5	6	7
F 2 2	Prepare a bibliography	1	2	3	4	5	6	7
F 2	Create bibliographic records and organise the	1	2	3	4	5	6	7

3	bibliography							
F24	Create bibliographic records for different kinds of materials (i.e. books, articles, web pages)	1	2	3	4	5	6	7
F25	Make citations and use quotations within the text	1	2	3	4	5	6	7
F26	Choose a format (i.e. written, oral, visual) appropriate to communicate with the audience	1	2	3	4	5	6	7
G27	Learn from my information problem solving experience and improve my information literacy skill	1	2	3	4	5	6	7
G28	Criticize the quality of my information seeking process and its products	1	2	3	4	5	6	7

Appendix 4: Individual participant self-efficacy scores

#	Pre	Post	Diff	Pre_A	Post_A	Pre_B	Post_B	Pre_C	Post_C
1	173	184	11	6	7	19	21	53	56
2	165	152	-13	7	6	16	14	56	45
3	112	157	45	4	6	16	17	33	47
4	131	168	37	5	6	15	17	43	48
5	91	144	53	3	5	9	15	27	40
6	101	130	29	3	4	13	8	32	35
7	64	136	72	3	5	8	15	19	41
8	73	136	63	3	6	10	17	21	40
9	102	134	34	3	6	12	17	26	36
10	102	150	48	3	6	11	18	28	43
11	131	181	50	5	6	19	18	44	50
12	114	100	-4	5	3	13	11	40	28
13	146	158	12	6	6	14	17	42	46
14	148	123	-25	6	5	15	14	40	29
15	79	100	21	3	4	12	12	23	31
16	106	157	51	4	4	9	14	22	46
17	67	132	65	3	5	12	14	28	40
18	151	160	9	6	6	17	17	47	47
19	101	104	3	4	3	10	11	32	17
20	80	112	32	2	4	8	12	24	29
21	128	141	13	6	6	14	15	41	39
22	164	162	-2	5	7	15	17	49	50
23	69	137	68	3	5	9	15	17	40
24	121	145	24	4	5	13	15	34	43
25	142	147	5	6	6	17	15	45	45
26	130	145	15	6	6	15	17	38	38
27	156	160	4	5	5	14	17	47	42
28	123	147	24	6	5	16	13	38	43
29	141	172	31	6	7	15	19	45	51
					A		B		C

Appendix 4: continued

#	Pre_D	Post_D	Pre_E	Post_E	Pre_F	Post_F	Pre_G	Post_G	#
1	33	35	13	14	39	37	10	14	1
2	28	25	13	11	34	37	11	14	2
3	24	27		11	28	38	7	11	3
4	22	30	9	12	31	43	6	12	4
5	18	26	8	10	20	38	6	10	5
6	17	25	7	13	23	32	6	13	6
7	10	23	4	10	15	33	5	9	7
8	11	24	5	8	17	31	6	10	8
9	16	21	8	9	30	37	7	8	9
10	20	26	8	9	26	36	6	12	10
11	22	35	8	14	25	44	8	14	11
12	19	18	6	7	24	25	7	8	12
13	25	21	11	12	36	44	12	12	13
14	22	27	13	10	40	29	12	9	14
15	15	18	6	6	14	21	6	8	15
16	18	29	10	10	33	42	10	12	16
17	10	23	4	9	7	31	3	10	17
18	28	29	10	12	34	39	9	10	18
19	18	13	7	6	24	18	6	6	19
20	14	18	5	8	21	32	6	9	20
21	17	26	10	11	33	32	7	12	21
22	32	27	13	10	38	39	12	12	22
23	11	23	6	10	18	32	5	10	23
24	22	26	9	11	29	34	10	11	24
25	22	26	11	11	30	34	11	10	25
26	22	26	10	11	29	37	10	10	26
27	25	27	13	13	40	53	12	13	27
28	23	28	9	10	23	37	8	11	28
29	24	27	9	11	31	45	11	12	29
		D		E		F		G	

Appendix 5: Semi-structured interview questions for the teachers

1. In a nutshell, what do you understand by information literacy and information literacy education?

2. How did you approach the teaching of research projects before attending the Information Literacy Education course?

3. How did you approach the teaching of the research project for your course assignment? How did you make information literacy explicit to learners? How did you assess the research projects? What do you regard as a successfully completed project?

4. Describe your feelings, thoughts, and actions at the start, during and at the end of the research project with the learners.

5. In what way does the WCED in-service training prepare you to teach learners how to undertake research projects?

6. Is it important for you to use the new literacies of the Internet for yourself and your teaching? Why? How do you incorporate the Internet in your lessons with learners? Is it important for learners to access the Internet?

7. What constrains you in mediating information literacy with learners?

8. Can you provide any evidence that learners have transferred their learning on your project to other subjects? Have you influenced colleagues with new learning from the course in any way?

Appendix 6: Letter to district chief curriculum advisors

15 April 2011

Dear

I am conducting a study towards my PhD degree at the University of KwaZulu-Natal on ***Information literacy in the classroom: assessing the competency of Western Cape teachers in information literacy education***. My aim is to ascertain

- Teachers' understanding of the concept;
- How it is integrated with learning areas/subjects; and
- To what extent an intervention such as the ACE: School Librarianship course on information literacy education will change teachers' thinking.

South Africa, you may know, is a signatory to UNESCO's *Information for All Programme* which endorses information literacy. It is recognised worldwide that knowledge societies require citizens to be able to access and use information, increasingly in digital format, to make informed decisions, solve problems, weigh evidence or generate new knowledge.

Information literacy is a broad concept that embraces information skills, ICT skills, and library skills along with problem-solving and cognitive skills, and the attitudes and values, that enable learners to function effectively in the information landscape (Ministry of Education & National Library of New Zealand 2002).

Part of my study is to collect evidence about information literacy education at the in-service training level. To this end I would like to request an interview with you which should last approximately one hour. The broad interview schedule below is a guide.

I would like to hear from you about:

- Teachers' information literacy – what measures are in place to support, develop and assess teachers' own information literacy?
- In-service training opportunities to impart a method for teaching information literacy
- Collaboration between teachers and resource providers such as public libraries
- Preparation of FET learners for tertiary education, in particular their research abilities
- School principals and their role in fostering information literacy

If you agree to the interview, the consent form on the next page requires your signature. Please be assured that your confidentiality and privacy will be kept throughout the study and no reference will be made to your name or your district in the thesis, presentations or publications based on the study. You have the right to withdraw from the study at any time with no attendant explanation. I will respect this right of withdrawal.

The interviews will be recorded to facilitate the conversation and to ensure accuracy. The recordings will be stored safely in my office at the University of the Western Cape and in this way guarantee that there is no unauthorized access or disclosure of confidential information. Once the study has been completed and assessed, the recordings will be disposed of responsibly, usually after five years.

Yours truly,

Sandra Zinn

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Appendix 6: continued

Declaration of Consent

I confirm that I have read and understand the contents of this document and the nature of the study, and I consent to participating in the study.

I know that I am at liberty to withdraw from the study at any time, should I so desire.

Name of Participant

_____ **(please print clearly)**

Signature of Participant

_____

Date

_____

Appendix 7: Grade 12 history heritage assignment

GRADE: 12 **EDUCATORS:**

HISTORY HERITAGE ASSIGNMENT LO 4: ASS 1, 2 & 3

TOTAL: 75

DUE DATE:
.....

Topic key question:
What are the ideologies and debates around heritage?

Task key questions:
Why is heritage controversial and debated? What are the similarities and differences between memorials/public history and living heritage?

Timeframe: You will have two / three weeks to complete this task.

Instructions:
For this task you will need to choose a memorial / monument (either in your community, or town /city or a national monument); you will need to choose an example of a tradition, ritual that is observed in your family or community that illustrates a living heritage.

Presentation: Written neatly and typed
Length: About two (2) typed or written pages.
Illustrations: These should only be used if you wish to illustrate a point you are making, for example about symbolism used in the monument.

YOU MAY NOT USE ILLUSTRATIONS JUST FOR THE SAKE OF PUTTING SOMETHING INTO YOUR ASSIGNMENT-YOU WILL BE PENALISED FOR THIS!

Step 1 – Research to answer the question: Why is heritage controversial and debated?

- Your teacher will discuss the different interpretations of heritage which makes heritage a controversial issue.
- Then you will be asked to read the provided material, or to look up the meaning of heritage and the debates around heritage and write a short introductory paragraph for your assignment.

Step 2
Write a paragraph about the monument you have chosen. Think about the following to guide you with writing your paragraph. You can also add other information:

- What is the memorial/monument?

Who or what event is being commemorated (remembered) with the memorial/monument?

- Has anyone/or group been left out?
- Why did the community /nation feel that it was important to construct this monument /memorial at the time?
- What symbolism has been used in the construction of the monument?
- Is the memory of the event /person still important today? Explain.
- Could the monument be made more inclusive of all South Africans today?

Step 3
Choose an example of a tradition or ritual that is observed in your family or community that illustrates living heritage. Write a paragraph about the tradition or ritual thinking about the following:

- What is the tradition or ritual?
- What is being commemorated?
- Why is the tradition or ritual important? (In other words why has it been handed down over generations?)
- What symbolism is incorporated in the tradition or ritual?
- Has the tradition or ritual changed or been adopted over time?

Step 4
Write a paragraph which explains the similarities and differences between monuments/memorials and traditions/rituals as forms of heritage.
Step 5
Bibliography: make a list of the resources used for the project.

Criteria for assessment
The following criteria will be used to assess your work:

1. Is able to explain why heritage is controversial and debated.
2. Is able to explain the difference between the two kinds of heritage.
3. Is able to use the examples effectively in explaining debates around monument and memorials.
4. Is able to use examples effectively in explaining debates around traditions and rituals.
5. Is able to select relevant information and data from sources.
6. Is able to explain the use of symbolism in monuments, memorials, traditions and rituals.
7. Is able to present information logically and coherently.
8. Has used illustrations effectively.

Heritage assignment: Grade 12 TOTAL : 75

Criteria	Level 1 Not achieved	Level 2 Partly	Level 3 Achieved	Excellent Level 4
Explains why heritage is controversial and debated	Has not understood the controversies and debates around heritage. (0-2)	Show a partial understanding of the controversies and debates around heritage. (3-4)	Show an adequate understanding of the controversies and debates around heritage. (5-7)	Show an excellent understanding of the controversies and heritage (8-10)
Explain the difference between the two kinds of heritage	Not been able to explain the difference between the two kinds of heritage. (0-2)	Limited explanation of the difference between the two kinds of heritage. (3-4)	Has adequately explained different between the two kinds of heritage (5-7)	Excellent explanation of the different the two kinds of heritage (8-10
Use the example effectively in explaining debates around monuments and memorials	Not been able to use the example effectively in explaining debates around monuments and memorials (0-2)	The use of the example in explaining debates around show limited understanding of the debates around monuments and memorials (3-4)	Effective use of the example in explaining debates around monuments and memorials (5-7)	Excellent usage of the example in explaining debates around monuments and memorials(8-10
Use the example effectively in explaining debates around traditions and rituals.	Not been able to use the example effectively in explaining debates around tradition and rituals (0-2)	The use of the example in explaining debate around shows limited understanding of the debates around tradition and ritual (3-4)	Effective use of the example in explaining debates around traditions and rituals (5-7)	Excellent usage of the example in explaining debates around traditions and rituals(8-10)
Select relevant information and data from sources.	Not been able to select relevant information and data from the sources (0-2)	Some information and data not relevant to the topic (3-5)	Select relevant information and data from the sources (5-7)	Excellent selection of information and data from the sources(8-10)
Shows understanding of symbolism in monuments, memorials, traditions, rituals.	Does not understanding in monuments memorials, traditions and rituals (0-2)	Shows a limited understanding of symbolism in monuments, traditions and rituals (3-4)	Has demonstrated an understanding of the use of symbolism in monuments, traditions and rituals (5-7)	Shows excellent selection insight and understanding of the use of symbolism in monuments, tradition and rituals (8-10)
Presentation of information is logical and coherent.	Information lacks logic and coherence (0-2)	Information has some logic and coherence (3-4)	Information has logical and coherence (5-7)	Information shows excellent logical, coherence and insight. (8-10)
Use of illustrations	Illustration used show some relevance to the information provided (0-1)	Illustration used show some relevance to the information provided. (2)	Has uses show illustrations appropriately to demonstrate points made about heritage (3-4)	Excellent selection and use of illustrations to demonstrate points made about heritage. (5)

Appendix 8: Assessment rubric for oral presentations

ASSESSMENT RUBRIC FOR ORAL PRESENTATION / PREPARED SPEAKING

	Code 7 Outstanding 8-10	Code 6 Meritorious 7	Code 5 Substantial 6	Code 4 Adequate 5	Code 3 Moderate 4	Code 2 Elementary 3	Code 1 Not achieved 0-2
Research skills and presentation	Convincing evidence that a wide range of relevant sources have been consulted Presentation impressive	Sound evidence that a wide range of relevant sources have been consulted A well structured presentation	Good evidence that a wide range of relevant sources have been consulted Substantially structured presentation	Satisfactory evidence that relevant sources have been consulted Presentation is adequate	Some evidence that relevant sources were used Presentation is moderately acceptable	Limited evidence of partial use of sources Elementary presentation	If sources were used, there is little or no evidence in the presentation Ineffective presentation
Planning and organisation of contents	Thoroughly planned according to task, audience, context and format Striking introduction which immediately grasps audience attention Brilliant development of ideas and argument Skilful ending thoroughly drawn together	Very well planned according to task, audience, context and format Very good and appropriate introduction which immediately arouses interest Very good, and sustained development of ideas and argument Very good conclusion	Well planned according to task, audience, context and format Good and appropriate introduction which arouses interest Good, and sustained development of ideas and argument Good conclusion	Satisfactory planning according to task, audience, context and format Reasonably good introduction which still arouses interest Good development of argument which can be followed easily Reasonably good ending, but sometimes lacks cohesion	Adequate planning according to task, audience, context and format Introduction able to rouse moderate interest Moderate development of ideas and argument but has problems with cohesion Moderately acceptable conclusion, but lacks cohesion	Evidence of some planning according to task, audience, context and format Some evidence of introduction, but barely arouses interest Some arguments can be followed, but others are inconsistent / can barely be followed Hardly any evidence of a conclusion	No evidence of planning according to task, context audience or format Introduction poor and arouses no audience interest Cannot sustain argument Shows little understanding of topic Conclusion lacking
Tone, speaking and delivery skills	A skilled and animated presenter, appropriate style and register Eye contact, facial expressions, gestures and body language outstanding, functional and convincing Confident delivery with very little use of notes	Very good presenter natural and fluent presentation appropriate style and register Eye contact, facial expressions, gestures and body language functional and convincing Notes used effectively and with confidence	Good presenter, appropriate style and register Eye contact, facial expressions, gestures and body language largely functional and convincing Notes used effectively	Style and register mostly appropriate Eye contact, facial expressions, gestures and body language reasonably convincing Some dependency on notes but still good contact with the audience	Presentation lacks appropriate style and register Adequate eye contact, facial expressions, gestures and body language but not always convincing Use of notes often detract from presentation	Hesitant, lacks expression - mostly inappropriate style and register Very little eye contact / facial expressions / body language Dependent on notes	Inappropriate tone, style and register Almost non-existent eye contact, inappropriate facial expression and body language Totally dependent on notes
Critical awareness of language usage	Excellent vocabulary and creative language use Excellent ability to manipulate language in order to evoke audience response Exceptional awareness of, and sensitivity to language use on cultural issues	Very good vocabulary and creative language use Very good ability to manipulate language in order to evoke audience response Very good awareness of, and sensitivity to language use on cultural issues	Good vocabulary and creative language use Good language manipulation in order to evoke audience response Good awareness of , and sensitivity to language use on cultural issues	Adequate vocabulary and creative language use Reasonable language manipulation in order to evoke audience response Adequate awareness of, and sensitivity to language use on cultural issues	Moderate vocabulary and language use Some language manipulation in order to evoke audience response Moderate awareness of, and sensitivity to language use on cultural issues	Limited vocabulary and language use Struggles to manipulate language in order to evoke audience response Seldom aware or sensitive or respectful to language use on cultural issues	Very limited vocabulary and language Unable to manipulate language Hardly ever aware of sensitive or respectful language use on cultural issues

Appendix 9: Social science Grade 7 rubric (evolution)

	Sosiale Wetenskappe **Geskiedenis** **Die Evolusie** **Graad 7 A B C Naam:**_____			**Totaal**_____**/42**
	5 tot 6	4 tot 5	3 tot 4	1 tot 2
1	**Bevraagtekening (Questioning)**			
	Leerder kan onafhanklik tot n besluit kom aangaande die vraagstuk	Leerder kan vrae formuleer en hulp van onderwyser tot n slotsom kom	Leerder is baie afhanklik van onderwyser se hulp	Leerder poog nie om vrae te vra of antwoorde te soek nie
2	**Beplanning (Planning)**			
	Leerder kan onafhanklik soek vir bronne wat taak spesifiek is	Leerder kan met n bietjie hulp op die regte pad kom om bronne te soek	Leerder is baie afhanklik van onderwyser om bronne wat gepas is te soek	Leerder wend nie n poging aan om self bronne te soek nie
3	**Versameling (Gathering)**			
	Leerder kan onafhanklik die regte informasie soek en organiseer	Leerder kan die regte bronne opspoor en met n bietjie hulp die informasie te versamel	Die leerder benodig die onderwyser om die inligting uit te wys	Leerder wend n flou poging aan om informasie te soek
4	**Sorteer inligting (sorting)**			
	Leerder kan die inligting sorteer sodat dit maklik verstaanbaar is en n eenheid vorm	Leerder het n bietjie hulp nodig om die inligting te sorteer	Die leerder is afhanklik van die onderwyser om die inligting te sorteer	Die leerder wend n flou poging aan om die inligting te sorteer
5	**Sintese (synthesizing)**			
	Leerder gebruik die inligting en kom tot n oorspronklike insig	Leerder kombineer verskillende sienings en gee dit weer	Leerling het hulp nodig om verskillende sienings te identifiseer	Leerder kom nie agter dat verskillende groepe/mense verskillende sienings het nie
6	**Evaluasie (Evaluation)**			
	Leerder het genoegsame informasie om gevolgtrekking te staaf	Leerder het bietjie hulp nodig om verband te sien tussen informasie en gevolgtrekking	Leerder het besluit geneem sonder om informasie in ag te neem	Leerder kan glad nie tot slotsom kom nie
7	**Verslaggewing (Reporting)**			
	Leerder het geskrewe werk, plakkaat en aanbieding van hoogstaande gehalte gelewer	Leerder het goeie geskrewe werk, plakkaat en aanbieding gelewer	Leerder het goeie poging aangewend met geskrewe werk plakkaat en aanbieding	Leerder se geskrewe werk, plakkaat en aanbieding wys dat geen moeite gedoen is nie

Appendix 10: Social science Grade 7 rubric (population growth and change)

Learners: 1.
2. .....
Grade 7 3.....
4. .....
5. .....

L.A. Social Science

Topic: Population Growth and Change
Worksheet: 3.1.1 FORMATIVE ASSESSMENT
Ass. Rubric – Ass St. G1 – 1,2,5,6
Group Assessment – Group Assess Group

Due Date:

	5 - Weak	**4 – Needs more work**	**3 - Sound**	**2 – Very good**	**1 - Excellent**
Use of explanatory dictionary	Poor use of explanatory dictionary	Has not produced sufficient of using the dictionary	Some evidence of understanding and use of the explanatory dictionary	Is able to read, understand and use explanatory dictionary correctly	Could use information effectively and accurately
Production of explanations based on concepts and questions	Could not read or understand concepts and questions	Has a slight understanding of what is asked in the questions and concepts	Could partially understand what was asked and could report on concepts	Could understand and record explanations given based on the questions and concepts	Used the research information extensively and accurately for defining the questions and concepts
Select and interpret information on questions and concepts	Poor use of interpreting research information.	Is unable to produce sufficient evidence and interpreting explanations	Some evidence of recording and interpreting accurate information	Is able to produce adequate and acceptable evidence of interpretation on information	Interpreted, used and recorded information accurately and effectively
Used information to draw up report on research information	Could not use information accurately to compile a report	Limited information to compile an intensive report	Is able to use some information in a limited way	Could report and compile information accurately.	Clear evidence of effective and intensive compiling on information
	49- Weak	50+ Needs more work	59+ Sound	69+ Very good	75+ Excellent

Appendix 11: Research assignment Grade 4 rubric (diets)

3

Research Assignment

Grade 4 Learning area: **1st Additional Language.**

LO: Writing. Ass std: Creative Writing

TASK: Draw up a balanced diet in the form of a day menu for a friend which you must present in class.

Name: ..... Due Date:

1. Complete all the worksheets to help you find research material which you need for your assignment.
2. Draw a brainstorm .
3. Use the information to draw up a balanced diet.
4. Draw up a day menu.
5. Present it to the class. Presentation should not be longer than 5 minutes.
6. Presentation can be done in a group or as an individual.
7. Hand in your written presentation with a bibliography.
8. All marks will count as part of your final assessment mark for writing.
9. ASSESSMENT

Criteria	Level 1	Level 2	Level 3	Level 4
Research	No or little evidence of research. 1	Satisfactory level 2-3	Good level of research 4	Outstanding level of research. 5
Brainstorm	Unable to use information to draw a Brainstorm 1	Satisfactory use of information to draw a Brainstorm. 2-3	Good use of information to draw a Brainstorm. 4	Outstanding use of information to draw Brainstorm. 5
Use information	Unable to draw up menu 1	Satisfactory use of information to draw a menu 2-3	Good use of information to draw a menu 4	Outstanding use of information to draw a menu 5
Presentation	Try to make oral presentation 1	Satisfactory level of oral presentation 2-3	Good level of oral presentation 4	Outstanding level of oral presentation 5
Bibliography	No or little evidence of research. 1	Satisfactory level of Bibliography 2-3	Good level of Bibliography 4	Outstanding level of Bibliography 5

Appendix 12: Assessment rubric for a research project

Assessment Rubric for Research Project

Total: 20

Assessment criteria	Inadequate	Partial adequate	Satisfactory	Outstanding
Mark	0-2	3-4	5-7	8-10
Purpose	The difference between African Traditional Religion and a Major religion is not clearly stated or explained	The difference between African Traditional Religion and a Major Religion is only partially stated and explained	The difference between African Traditional Religion and a Major Religion is satisfactorily stated and explained	The difference between African traditional Religion and a Major Religion is clearly stated and explained
Mark	0-2	3-4	5-7	8-10
Content	The information is not relevant , informative and meaningful	The information is only partially satisfactory	The information is good and relevant	The information is relevant, informative and meaningful
Mark	0-2	3-4	5-7	8-10
Evidence of research	The learner has not conducted any research. Incorrect and poorly expressed ideas	The learner has conducted only a ltd amount of research. The topic is dealt with slightly	The learner has researched the topic well, providing some good insights into the topic. Most facts are correct and well expressed.	The learner has researched the topic very well, providing comprehensive and thoughtful insights into the topic. All facts are correct and clearly expressed.
Mark	0-2	3-4	5-7	8-10
Bibliography	Only **ONE** source	**TWO** sources. Incomplete	**THREE** sources. Incomplete.	**FOUR** and more sources. Complete well planned.

Total: 40/2= 20

Appendix 13: Project assessment rubric

PROJECT ASSESSMENT RUBRIC

Learners:.....

Topic:.....

Grade:..... Date:..... Educator:.....

Assessment criteria:	1	2	3	4
Locating, accessing information	The learner is unable to locate and access information independently.	The learner is able to locate and access a limited amount of information	The learner is able to locate and access information independently.	The learner is able to locate and access a number of different types of media for information.
Accuracy and relevance of selected information	The learner is unable to select information. He chooses information that is inaccurate and irrelevant.	The learner is able to select information that is limited.	The learner is able to select information that displays accuracy and relevance.	The learner is able to select information that displays a high degree of accuracy and relevance.
Organization of information	The learner is unable to synthesize information.	The learner is able to produce information that shows synthesis but is not always clear and logical	The learner is able to synthesize information in a clear and logic way	The learner is able to synthesize information in a clear and logic way showing competency
Presentation	The learner is unable to present information a structured logical manner.	The learner is able to present information in a limited way, clarity and structure are weak.	The learner is able to present information in a clear, fairly structured and concise manner.	The learner is able to present information I a very clear, structured and concise manner.