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THE ROAD TO INFORMATION
LITERACY: AN ETHNOGRAPHIC
INVESTIGATION INTO THE COGNITIVE
AND AFFECTIVE CHARACTERISTICS
OF KEY STAGE 2, PRIMARY SCHOOL
CHILDREN

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PHD

April 2011

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CHILDREN

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A thesis submitted in partial fulfilment
of the requirements of the
University of Northumbria at Newcastle
for the degree of
Doctor of Philosophy

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the University Ethics Committee on January 2006.

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Abstract

This doctoral study sets out to investigate how Key Stage 2, primary school children (aged between 7 and 11 years) are being taught to develop information seeking skills and strategies that will allow them to become critical and literate users of information.

The methodological approach adopted for this research study is that of interpretivist ethnography. This represents a move away from the traditional quantifiable approaches used in Library and Information Science (LIS) and focuses on gathering data in the natural setting in order to offer a rich picture of the information seeking behaviour of a small group of Key Stage 2 children.

In order to become an integrated part of the natural setting it was necessary to become immersed in the school for an extended period of time, one academic school year. Taking a grounded theory approach meant that it was possible, right at the beginning of the fieldwork, to identify situations as they occurred.

During the field research, a rich picture emerged of the information seeking strategies and skills of the group of children participating in the study. As the field research progressed, themes and patterns were identified which were then examined against previous research in order to identify similarities or differences in the findings of this study with other studies. The themes that unfolded from the data offered an information seeking model that was specific to the group of Key Stage 2 children. Within the model a further theoretical framework is offered that postulates that a zone of optimal learning exists. The theory suggests that there is an optimal cognitive zone that is the place where new information is assimilated so that it can become knowledge. The zone of optimal learning is the place where a child moves from incomprehension of new information to a cognitive understanding of that information.

Investigating the influences upon the children's information seeking behaviour served to highlight both strengths and weaknesses in the ways in which the children developed their information seeking skills and strategies and with this in mind a set of four suggestions are offered that aim to support the way in which information seeking strategies are delivered to Key Stage 2 children based on the children that participated in this study.

Acknowledgements

Dedication

"A teacher affects eternity; he can never tell where his influence stops".

Henry Adams (1838 - 1918)

This research study is dedicated to all the teachers who make a difference in the lives of their students.

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I have heard that if you are lucky you will at some time in your life, find a teacher who sees your potential and inspires you with the confidence to fulfil that potential. I have been doubly lucky in my life to have had two inspirational teachers, although they came into my life nearly thirty years apart and they never met each other, they shaped, changed, motivated and inspired me to become more than I ever thought possible. Mr Richard "Dick" Chapman was the first of these teachers, when I was a young child, he taught me to ask questions and seek the truth and it was his belief in me that made me believe in myself. The second inspirational teacher did not come into my life until I was in my thirties, Dr Alison Jane Pickard is my principal PhD supervisor, my boss and my mentor and it is her unshakeable enthusiasm and passion for her subject as well as her students that motivates and inspires the people around her. It is in no small part due to her conviction and belief in me, and my trust and respect for her judgement that my confidence and self-belief has soared, encouraging me to strive to be the best that I can be.

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Abbreviations

| | |
|--------|--|
| CILIP | Chartered Institute of Library and Information Professionals |
| ICT | Information Communication Technology |
| IL | Information Literacy |
| ISB | Information Seeking Behaviour |
| ISP | Information Seeking Processes |
| ISS | Information Seeking Strategies |
| KS2 | Key Stage 2 |
| SCONUL | Society of College, National and University Libraries |
| MO | Museum Organiser |
| VFW | Victorian Farmers Wife |
| VT | Victorian Teacher |

Keywords

Interpretivist
Ethnography
Information Literacy
Children
Primary School
Information Seeking
Education
Grounded Theory
Key Stage 2

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1 Introduction to the Study

1.1 The Scope of the Research Study

This research study sets out to examine the ways in which Key Stage 2 school children (aged between seven and eleven years old) are taught information seeking strategies, it investigates some of the cognitive and affective accelerators and inhibitors to the information seeking process such as uncertainty, self-efficacy, motivation, choice, need and want. This age group were chosen because it is the point within a child's education when they are moving away from the more structured style of learning that they have received in Key Stage 1, to the more independent and open learning that will be required of them when they enter secondary school.

The term "information literacy" is not yet widely used within an educational context in the United Kingdom, it is a term that is used in an educational context in the United States, although it is only mentioned once in the "No Child Left Behind" Act of 2001. It is, however, a term that is more widely used in the field of Library and Information Science (LIS) to bear this point out Secker, Boden and Price (2007, p.123) believe that information literacy *"is probably more developed among the library profession in higher education (HE) than in other sectors"*.

Terms like "Information Literacy" (IL), "Information Seeking Skills/Strategies" (ISS), "Information Seeking Behaviour" (ISB), "Information Seeking Processes" (ISP) and even "Information Communication Technology" (ICT) appear to be used interchangeably and this can often lead to confusion. Research conducted by Probert (2009, p.28) appears to bear this out. Her research was conducted with teachers in New Zealand and found that *"there appeared to be some confusion with ICT skills and information literacy skills"*.

The Alexandria Proclamation (2005) states that *"Information Literacy lies at the core of lifelong learning"* and the Chartered Institute of Library and Information Professionals (CILIP, 2008) defines information literacy as *"knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner"*. Developing a set of skills necessary to accomplish this are, for the purposes of this study, referred to as "Information Seeking Skills" and it is these skills that children need to develop if they are to become "information literate".

The purpose of this research study is to investigate how Key Stage 2, primary school children are being taught to develop information seeking skills and strategies that will allow them to become critical and literate users of information.

In order to be able to investigate the information seeking behaviour of the children and to examine the strategies that they are taught, the methodological approach for this study needed to be carefully considered.

1.2 Methodology

Examination of the Positivist and Interpretivist paradigms highlighted benefits and challenges in terms of conducting the research for this study. The methodologies associated with each paradigm are concerned with the development of theory; however the way in which theory development is achieved varies quite significantly from one paradigm to another. The quantitative methodology associated with the Positivist paradigm concentrates on testing existing theories, whereas the qualitative methodology associated with the Interpretivist paradigm looks at generating theory from the data. Theory that is grounded in the data is something that is associated with an interpretivist paradigm and is considered in greater detail in the methodology chapter.

The methodological approach adopted for this research study is that of interpretivist ethnography. Interpretivists believe that realities are multiple, constructed and holistic, (Lincoln and Guba, 1985, p.37) and that the multiple realities “*cannot exist outside of the social contexts that create them. Realities vary in nature and are time and context bound*” (Pickard, 2007, p.7). The interpretivist paradigm offers “thick description” (Geertz, 1973) of one person’s (the researcher’s) interpretation of another person’s (the participant’s) view of the world.

The methodological choices adopted for this research focus on gathering data in the natural setting to offer a rich picture of the information seeking behaviour of a small group of Key Stage 2 children.

Adopting an holistic approach, allows the multiple realities that are bound within the time and context of the research study, to be revealed. A rich picture of the children and their information seeking journey will emerge that is grounded in the data. In order to gather the data, an ethnographic approach will be adopted. Ethnographic study is “*derived from the disciplines of cultural anthropology and qualitative*

sociology” (Rossman and Rallis, 1998, p.67)

Ethnographic study offers “*a way of seeing, not **the way***” (Wolcott, 1999, p.137). In the field of LIS, adopting an ethnographic approach is rare; yet, ethnography offers the best possibility to understand and to portray a rich description of this group of children and their experience. There were several considerations that needed to be taken into account at the start of the study. The first of these was the age of the children. The group of children participating in the study were aged between 7 and 10 years old, in order to gain a truly representative picture of the children’s information seeking behaviour, the data needed to be gathered in as natural a setting as possible. It can be very misleading to assume that what we learn from people in a “*limited unusual and often very anxious situation we can make reliable judgements about what they do in very different and more usual situations*” (Holt, 1983, p.8). Because the research involved the participation of young children, careful consideration needed to be given to ethical implications. The head teacher and school policy acted to guide the ethical approach taken to the study and justification is offered for the ethical approach.

In order to become an integrated part of the natural setting it was necessary to become immersed in the school for an extended period of time. For the purposes of this study, observations and informal interviews were conducted over a period of one academic year. In true interpretivist style, no a priori research design was constructed before entering the field. Armed with a pen, an open notebook, an open mind and a general idea about wanting to understand how children are taught to search for information, this neophyte ethnographer tentatively entered the school and allowed the research design to emerge.

Prior to entry into the field it was necessary to read widely around the subject of children and information seeking as a means of finding a starting point for the study, even though, once in the field, the focus of the study changed in order to allow the research design and research questions to unfold as they emerged from the data. With regard to conducting a preliminary literature review Charmaz (2006, p.166) advises grounded theorists that they “*can let this material lie fallow until after you have developed your categories and the analytical relationships between them*”. This proved to be good advice as the preliminary literature review bore little resemblance to the finished literature review presented in this thesis. The preliminary excursion into the literature did raise several questions which were

identified as potential starting points for the study. This investigation of the literature began before any aims or objectives of the study could be formed. The research questions that were identified from the preliminary literature were:-

- How do the children learn to search for information?
- How are they taught to search for information?
- Who is teaching them? Teachers, parents or others?
- Where are they learning to search? Home? School or somewhere else?
- What part does parental input play in the way in which the children search for information?
- Does a digital divide exist for the children that do not have home access to information?

Taking a grounded theory approach means that it will be possible, right at the beginning of the fieldwork, to identify situations as they are *“happening in the setting and make a conceptual rendering of these actions”* (Charmaz, 2006, p.22). A grounded theory approach also helps with making sense of the vast amounts of data that will be gathered, as it will be possible to identify a theme as it emerges from the data and return to the field to discover more about that theme. Fieldwork provides a micro level of information but in order to place the school and the staff and children into context it will be necessary to investigate the macro level of information too. The macro level of information will be gathered by examining previous research.

1.3 Literature

Empirical research into the key concepts of information literacy and children's information seeking behaviour offered a rich knowledge base on which this research study was able to draw. Theoretical frameworks of learning theory provided conceptual bridges, which helped to guide and inform this research study. In order to understand where the school and the research participants sat within the context of the joint English/Welsh education system, it was necessary to investigate external influences that played a part in shaping it. It was necessary to examine educational Acts of Parliament, Bills, green papers and white papers to better understand the environment within which the school functioned. Examining the literature and online websites, such as the Standards site maintained by the Department for Children, Schools and Families (DCSF) and the Qualifications and Curriculum Development Agency (QCDA) raised the questions, what part do the Government, Local

Education Authorities (LEA) and schools play in establishing information seeking strategies amongst children? It also raised the question of whether there were any ICT strategies that might be considered by organisations such as BECTA and OFSTED that might shed light on how children are taught information seeking strategies. In order to provide a macro level of information to support the findings of this study the following two objectives were identified, they were to

- Establish the current ICT outcomes required from the e-learning strategy as outlined by relevant government bodies
- Establish the role of ISS in the government, LEA and school policies

These two objectives served to guide the study by providing a macro level of information, which is discussed in more detail later in this chapter (1.5 Contextual Background Information).

It was also essential to examine previous empirical research. Some of the research offered insight into studies that had investigated children of a similar age to the participants in this study, some research offered insight into information seeking behaviour and some into information literacy. Many of the previous research studies offered contextual frameworks that may only have touched briefly (if at all) on children, yet they served to guide and inform this research study.

The methodological approaches taken by previous research studies also served to offer insight into the most effective way to approach this research study from a methodological viewpoint. As the fieldwork began and themes began to emerge from the data, it was necessary to return to the literature to investigate in greater depth, areas that had previously been unconsidered. It was necessary to keep a watchful eye on the current literature in order to identify any research that was currently being conducted that might offer further insight into this research study. From the literature, conceptual bridges were constructed that guided and supported the interpretation of the data from this research study as well as offering contextual background information on a national and international level that served to inform the study.

1.4 Analysis

Analysing the data commenced at the very beginning of the first observation. This is due to the methodological approach that was taken, whereby *“data collection and analysis proceed simultaneously and each informs and streamlines the other”* (Bryant and Charmaz, 2007, p.1). The first theme to emerge from the data was that of uncertainty, it was then possible to return to the field to investigate whether uncertainty was a one off phenomena or whether it was in fact a theme. *“Moving back and forth between data and analysis also helps you from feeling overwhelmed”* (Charmaz, 2006, p.24). Having identified uncertainty as a possible theme, returning to the literature regarding uncertainty revealed a potential link between uncertainty and self-efficacy which warranted closer scrutiny. In the literature Kuhlthau (1993, p.124) suggests that *“Uncertainty is a cognitive state that commonly causes affective symptoms of anxiety and lack of confidence”* whilst Wilson et al (2002, p.713) believe, *“that uncertainty may have both affective and cognitive dimensions”* Investigating uncertainty and self-efficacy in the context of the children’s information seeking behaviour suggested that these two areas might be cognitive or even affective characteristics of the children’s information seeking behaviour. From this identification of uncertainty and self-efficacy the first of two aims emerged from the data that sought to guide the rest of the study. The first aim identified for the study was

- To investigate the potential impact of developing successful cognitive and affective information strategies in preparing Key stage 2 children to become independent learners.

However, during the midpoint progression (MPP) for this doctoral study, the question was raised as to how impact might be proven or indeed demonstrated. After reading literature that reported how other research studies had investigated impact, or potential impact, it appeared that providing evidence of potential impact in developing successful cognitive and affective information strategies could be construed as too subjective. As the field research continued, it became clear that this piece of research was not about investigating the potential impact of developing successful cognitive and affective information strategies, but rather about investigating the cognitive and affective characteristics demonstrated by the children. Although the wording of the first aim was changed slightly, the focus of the research remained, to investigate the ways in which children are taught strategies for seeking information. The revised wording of the first objective then became

- To investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour.

The second aim of the research was concerned with demonstrating the contribution to knowledge that is required for every PhD, therefore the second aim of the study was initially

- To offer possible suggestions and insight into improving the way in which Information Seeking Strategies are delivered to Key Stage 2 children

As the field work progressed and more data was gathered a model of the children's information seeking behaviour began to emerge, although it was not until the end of the field work during the writing up phase that it became apparent that a set of guidelines were also evident, therefore the wording of the second aim was slightly altered and became

- To develop a framework and set of guidelines for developing and promoting Information Seeking Strategies (ISS) in KS2 children.

As the academic year progressed and data was gathered from the field, several accelerators and inhibitors to the information seeking process were identified. These accelerators and inhibitors were identified as uncertainty, self-efficacy, motivation, choice, need and want and each of them helped to demonstrate the cognitive and affective characteristics being demonstrated by the children which served to inform the research.

As the field work progressed, iterative analysis allowed cognitive signposts to be identified that offered a rich picture of the information seeking behaviour of this group of children. Iterative analysis of the data also allowed further objectives to emerge from the data that sought to guide the study.

Observations identified cognitive and affective accelerators and inhibitors to the information seeking but also raised questions about how the children were being taught information seeking strategies, and whether or not there were gaps in the children's understanding of information use and retrieval. In order to better understand how the children were being taught these skills the following objectives were developed that sought to

- Identify and evaluate the current methods for teaching ISS to KS2 children
- Identify whether there were gaps in the children's knowledge and understanding of information retrieval and use

Observations informed the objectives at different times throughout the field work, for example it was noted that the year 3 teacher taught the children basic information seeking behaviour whereas the year 4/5 teacher was able to teach her class more advanced levels of information seeking skills because she was aware of the skills the children would have received in previous years. The way in which the teachers were able to build upon the teaching that had already gone before, lead to the objective being identified that sought to

- Establish the level of teaching of ISS for KS2 children

The first two objectives of the study were developed from the literature and provided a macro view of the research, whilst the final three objectives developed as the field work progressed and provided the micro view of the study.

In order to highlight themes as they emerged from the data, a simple coding technique using coloured marker pens was utilised that helped to analyse and make sense of the patterns that offered valuable insight into the information seeking journey of the children.

As themes and patterns emerged from the raw data, a rich picture of the children's information seeking behaviour highlighted the strategies and skills that the children were taught. The picture demonstrate the processes that the children went through on their journey towards information literacy and acts to explain the influences that helped to shape that journey.

1.5 Contextual Background Information

Contextual background information is offered to the research study, firstly on a macro level and then on a micro level. The macro level of contextual information sets out to investigate the joint English/Welsh educational system and how the participating school fit within that educational system. The macro level of information was gathered by investigating UK Government green papers, legislation

and curriculum targets, as well as investigating some of the Government bodies that work within the education system and considering how they help to inform decisions on policy. This is briefly compared to the education system in the United States of America in order to offer a global comparison on information literacy.

The micro level of contextual information investigates the local environment, the school and the research participants. Micro levels of information were gathered through fully participant observations and informal conversations with the staff and children.

The need to offer contextual background information is so that if necessary, subsequent researchers can make an informed decision on whether the research setting from this study is comparable with their own research setting and from there, decide whether the findings and themes that emerged from this study are applicable and transferable to their own situation.

1.6 Discussion

A rich picture explains how the themes emerged from the data and then these themes were examined to investigate whether they support or refute findings from previous research. The themes that unfolded from the data offered an information seeking model that was specific to this group of Key Stage 2 children. Comparing the model to previous research findings will help to situate the information seeking behaviour of this group of children and identify whether it is similar to other research findings. Within the model of information seeking behaviour a further theory emerged that suggested that as children cognitively assimilate information they move from a state of uncertainty to a clearer understanding of the information they are gathering. The theory suggests that there is an optimal cognitive zone that is the place where new information is assimilated so that it can become knowledge. The zone of optimal learning is the place where a child moves from incomprehension of new information to a cognitive understanding of that information, where they begin to place the new information into a context that makes sense to them in order to store it as knowledge. Investigating the influences upon the children's information seeking behaviour served to highlight both strengths and weaknesses in the ways in which the children are taught to develop their information seeking skills and strategies.

1.7 Summary

This brief introduction to the research study aims to provide a clear indication of the aims and objectives of the study and how they emerged over a period of time. The reader is provided with a brief outline of the methodological approach taken for this study, how the literature was used to help inform the study and how the research was analysed and then the findings from the research were scrutinised against the findings of previous research to investigate whether the findings from this research study supported or refuted them.

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2 Methodology

2.1 Introduction

Before embarking on a piece of research, it is necessary to consider various factors that will influence the way the research is conducted. The researcher needs to consider the question that the research is attempting to answer; they need also to consider the best way to go about answering that question. Examining the different theoretical underpinnings to research can help to inform researchers on how best to conduct their own line of enquiry. Having considered the methodological approaches appropriate to addressing the aims of this study, it was possible to determine that the research would be conducted as interpretivist ethnography. Justification for the paradigmatic and methodological approach are offered, which serve also to offer insight into how the research was conducted and why this approach was the most appropriate for addressing the aims of the research. Other considerations needed to be contemplated, such as the ethical implications of conducting research with children, how the data would be analysed and how that analysis would be represented in order to offer a rich descriptive narrative that served as a snapshot in time of the children's information seeking behaviour.

2.2 Paradigms

A paradigm is defined by Denzin and Lincoln (2003, p.245) as *"a basic set of beliefs that guide action"*. It is a philosophical viewpoint that is held by the researcher, *"an individual's view of the world that dictates the nature of the research they engage with"* (Pickard, 2007, p.xvi). Seale (1998, p.12) states that paradigms *"provide the concrete puzzle solution or exemplar of how to solve a scientific problem"*, whilst Chalmers (1984, p.90) defines a paradigm as *"made up of the general theoretical assumptions and laws and techniques for their application that the members of a particular scientific community adopt"*.

A researcher's view of the world, their influences, background and beliefs will all impact on how that researcher asks questions of the world and how they set about finding answers to those questions. There are three major research paradigms, positivism, interpretivism and a combination of the two, post-positivism. Denzin and Lincoln (2003, p.245) explain that a paradigm encompasses four concepts, which are:

- Ethics

- Ontology
- Epistemology
- Methodology

Ethics, ontology and epistemology are the philosophical concepts which are applied to describe how researchers view the world in the context of their research. Whilst the methodology is the way in which the researcher sets about finding the answers to their particular research question. Pickard (2007, p.xv) suggests that “*A research paradigm does imply a methodology, it is very often an individual’s view of the world that dictates the nature of the research they engage with*”. This being the case, then the paradigmatic stance that positivists and interpretivists adopt must impact on the ethical, ontological and epistemological approach they take to their research.

2.2.1 Ethics in Research

Ethical considerations should always prompt a researcher to question their own morality. Does the research comply with the researchers own code of ethical values? Audi (1998, p.335) states that

“moral knowledge and justification are grounded in the application of a principle to an action or person morally judged in the light of information gained through ordinary perception or through some other apparently non-moral informational source”

This statement goes some way towards demonstrating the inter-connectivity of concepts that are encompassed within a paradigm and offers an explanation as to how a researcher’s view of the world will impact on their research at least in the context of morality and ethics.

2.2.2 Ontology

Denzin and Lincoln (2003, p.245) suggest that “*ontology raises basic questions about the nature of reality and the nature of human beings in the world*”. Whilst Tom Gruber (1993, p.199) goes as far as to say that “*an ontology is a specification of a conceptualization*”.

The Positivists ontological belief is that reality exists regardless of who is experiencing it, that “*reality is single, tangible and fragmentable.*” (Lincoln and Guba, 1985, p.37). The Interpretivist ontological belief is that there are

“multiple, constructed realities that cannot exist outside of the social contexts that create them. Realities vary in nature and are time and context bound”. (Pickard, 2007, p.7). Post-positivists strive to adopt a stance somewhere between the two.

2.2.3 Epistemology

Epistemology asks the researcher to question the relationship between himself, what he knows and how he comes to know it. Epistemology is defined by Heinecke et al (2001, p.293) as *“the nature of knowledge”*. Denzin and Lincoln (2003, p.18) maintain that epistemology has historically defined standards of evaluation based on how reality and images of the world are conceptualised. This “conceptualisation” means that a Positivist epistemological stance will differ radically from that of an Interpretivist. Positivists believe that *“the inquirer and the object of inquiry are independent; the knower and the known constitute a discrete dualism”* (Lincoln and Guba, 1985, p.37). Whilst Interpretivists take the view that the *“results of the investigation are a product of interaction between the subject and the investigator”* (Pickard 2005, p.15) and that both parties are inseparable.

2.2.4 Methodology

A research methodology is the *“theoretical perspective of the research, that is the overall nature of the research activity”* (Pickard, 2007, p.xvi). Pickard believes that there are only two fundamental methodologies; they are a quantitative methodology and a qualitative methodology. Each of these research methodologies is implied by a research paradigm, for example, positivists adopt the quantitative methodology. Positivists see the world as a tangible reality that can be broken into fragments and studied independently of each other, their approach to research is to employ *“objectivity, distance and control”* and by *“invoking impartiality ...through the deployment of numbers rather than words”* (Denzin and Lincoln, 2003, p.143) they seek to answer their research question. A quantitative methodology would be based on answering questions such as “how many”, “where” or “when”, where numerical quantification is required. This allows for the researcher to remain apart from the “object” under investigation, it does not even require the researcher and the research participant to come face to face. This type of

methodology allows the researcher to identify variables and test hypotheses in a clinical and detached manner.

A qualitative methodology is more concerned with understanding the “how” or “why” of a situation or the feelings of the research participants. This methodology is employed by interpretivists as their ontological stance is that there are multiple realities and that these realities are bound by time and context. A qualitative methodology encourages the researcher to interact with the research participant to gain a deeper understanding of the reality being experienced, at that particular time and in the context of the research question.

2.3 Methodological Approach

The context of this research was to investigate the Information Seeking Strategies (ISS) being taught to Key Stage Two (KS2) children and how these strategies are preparing them to become lifelong learners. Key Stage 2 children are primary school children aged between 7 and 11 years and it is the point within a child’s education when they are bridging the gap from structured learning to the more independent and open learning that will be required of them when they enter secondary school. In the field of Library and Information Science (LIS), measuring performance is not a new concept. In the past, the processes of determining performance concentrated on the quality of the service, efficiency, effectiveness and sometimes, even how comprehensive a collection was. However, in recent years the focus for measuring performance has centred on the user and their experience. While the emphasis may have changed to the user and their experience, the way of looking has not changed. Quantifiable methods are still adopted to determine value and performance. Peter Brophy (2008, p.16) believes that

“Approaches like ethnography, externally-moderated, reflective self-evaluation and narrative-based practice will help library performance measurement to meet the challenges of the future”.

Adopting an holistic approach, revealed the multiple realities that are bound within the time and the context of the study. A rich picture of the user and their experience emerged. In the field of LIS, adopting an ethnographic approach is rare; yet, ethnography offered the best possibility to understand and also to portray a rich description of the users and their experience.

The methodological choices adopted for this research focus on gathering data in the natural setting, in order to offer a rich picture of the information seeking behaviour of a small group of Key Stage 2 children. Careful examination of the researcher's paradigmatic stance determined that this piece of research would be conducted as interpretivist enquiry.

2.4 Axioms of Interpretivist Enquiry

There are five axioms of interpretivist inquiry as defined by Lincoln and Guba (1985, p.37) they are:

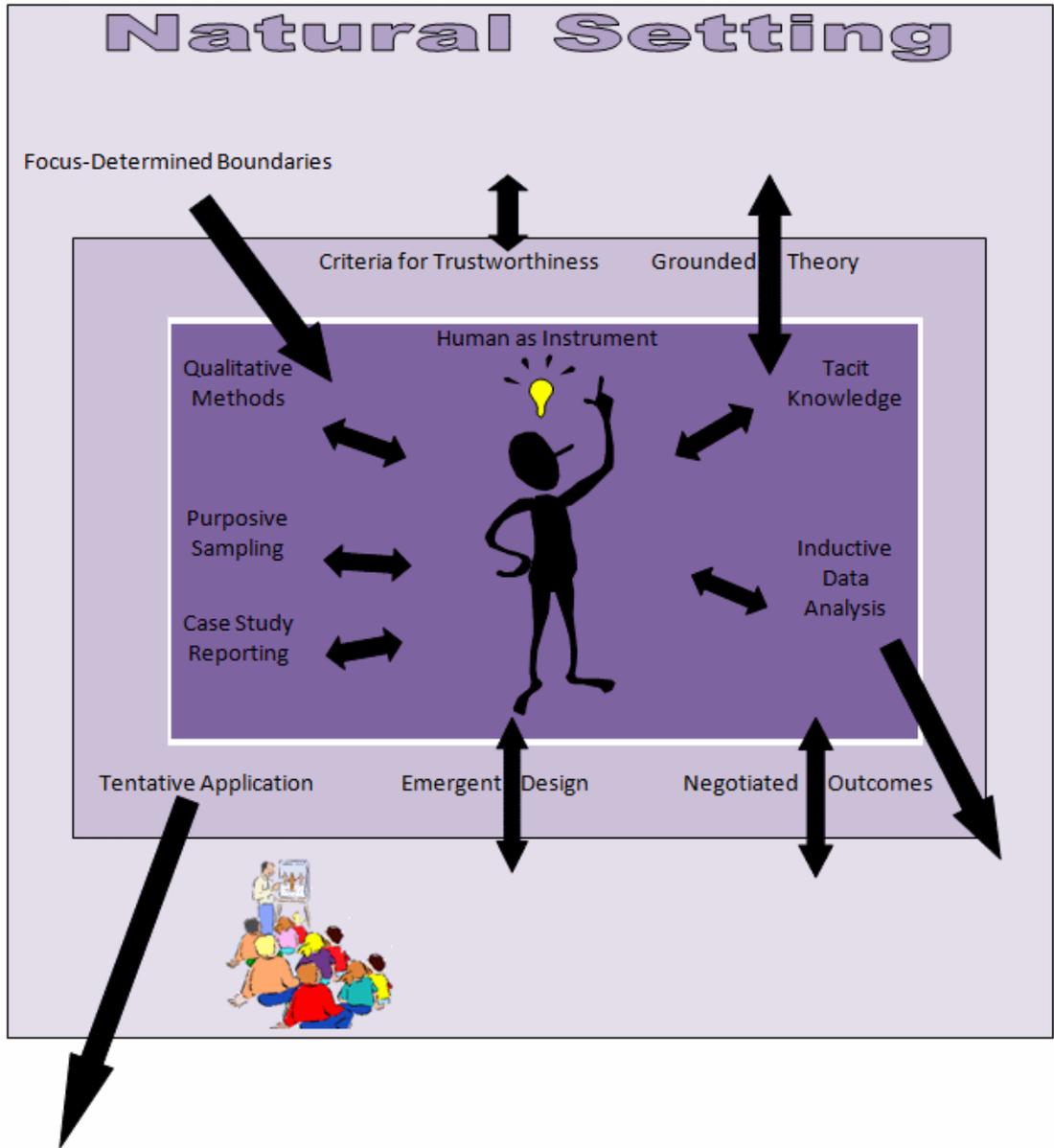
- That realities are multiple, constructed and holistic, (this is the ontological axiom)
- That the knower and the known are interactive and inseparable, (this is the epistemological axiom)
- That only idiographic statements are possible and must be time and context bound
- That all entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects
- That inquiry is value-bound.

Interpretivists believe that there are multiple realities, which *“cannot exist outside of the social contexts that create them. Realities vary in nature and are time and context bound”* (Pickard, 2007, p.7). They also believe that the *“results of the investigation are a product of interaction between the subject and the investigator”* (Pickard 2007, p.7) and that both parties are inseparable.

Darke, Shanks and Broadbent (1998) explain that *“the interpretivist researcher attempts to gain a deep understanding of the phenomena being investigated and acknowledges their own subjectivity as part of this process”* (p.276).

Lincoln and Guba (1985, p.39-43) identified fourteen characteristics of operational interpretivist inquiry which they felt were logically dependent on the axioms and each other. The following diagram illustrates how these characteristics fit within this interpretivist inquiry.

Figure 1 14 Characteristics of Interpretivist Inquiry



The World beyond

| Key | |
|-----|---|
| | the natural setting within which the research will take place |
| | the research study |
| | the researcher and the choices and impact they have on the research |

Research Design (adapted from Lincoln and Guba, 1985, p.41-42) demonstrating the interconnectivity of the 14 characteristics of operational interpretivist inquiry.

Diagram 1 illustrates the 14 characteristics of interpretivist inquiry.

At the heart of the research study is the researcher, using him/herself as the primary data-gathering instrument. The research is conducted in a natural setting. The

researcher acknowledges and makes use of tacit knowledge, selects participants using purposive sampling methods and uses qualitative methods (although not exclusively). The use of inductive data analysis allows the researcher to identify the multiple realities within the natural setting and allows the researcher to return to the field to investigate phenomenon that had not been identified a priori. By adopting a reflexive case study reporting mode, the researcher is able to offer thick description, which allows for “*naturalistic generalizations*” and “*easier transferability to other sites*” (Lincoln and Guba, 1985, p.42). The interpretivist criteria for trustworthiness are credibility, transferability, dependability and confirmability and these are consistent with the axioms of interpretivist inquiry, (unlike the positivist criteria for trustworthiness, which were internal and external validity, reliability and objectivity). Establishing trustworthiness in the context of this study was accomplished by demonstrating how credibility, transferability, dependability and confirmability were achieved. Lincoln and Guba (1985, p. 301) state that there are different ways in which credibility can be demonstrated.

- Activities increasing the probability that credible findings will be produced
- Peer debriefing
- Member checks

Activities that increased the probability of producing credible findings in the context of this research were that a prolonged period of time was spent in the field gathering the data. The data was gathered over a period of one academic school year. This prolonged period provided an opportunity to build trust with both the teachers as well as the children. Persistent observation was another activity that helped to establish credibility. Lincoln and Guba (1985, p. 304) believe that “*if the purpose of prolonged engagement is to render the inquirer open to the multiple influences... the purpose of persistent observation is to identify those characteristics and elements in the situation that are relevant to the problem or issue being pursued*”. Throughout the field work, persistent observation was employed as an activity to produce credible findings. Triangulation was also used as a means of establishing credibility, during the field work triangulating the data that was collected was accomplished by several different methods. In the case of establishing uncertainty as a theme, an instance of uncertainty was identified and compared to other instances of uncertainty to determine similarities or highlight differences. Triangulation was also achieved by comparing uncertainty in the context of this group of children with instances of uncertainty identified within the literature.

Peer debriefing occurred on a regular basis throughout the field work in the guise of tutorials with the PhD supervisory team. The analytical tutorials provided a questioning and probing examination of the interpretations being placed on the data which served to act as a reminder to be vigilant against bias as well as providing a forum to discuss and deliberate on the emerging themes of the study.

The importance and significance of member checking was a mainstay for establishing credibility throughout this study. Member checking was conducted on a formal as well as informal basis. The formal member checking occurred at the end of the observations when it was possible to speak with the teachers and gain further insights and clarification on the events that had been witnessed during the observations. The less formal member checks occurred on a more frequent basis whereby it was necessary to ask a question of a teacher or child as the observation was ongoing. This type of member checking took the form of casual questions amid conversations, it served to correct any misunderstandings or misinterpretations that may have been arrived, thereby going some way to reduce the potential for bias whilst at the same time, establishing credibility.

There is a need to remain vigilant against not only bias but misinterpreting what you are being shown. During an observation, a child asked, *“do you think that the school would need to keep test results?”* For an answer, he was asked, *“do you think it would be important for school to know how well you were doing?”* The possibility that the child was talking about medical test results was not considered until quite a while after the conversation had taken place and the observation was being written up. It was possible to return to the field and ask the child if he had meant medical test results rather than the assumed school test results. The child was able to provide clarification that he had indeed meant medical test results and the misinterpretation was put straight. This observation served as a timely reminder about assuming an understanding and that it is important to be aware of placing a biased personal interpretation on situations.

Lincoln and Guba (1985, p. 316) believe that establishing transferability in a naturalistic inquiry can demonstrated when the researcher sets out working hypotheses together with a description of the time and context. In the context of this study, transferability is established by offering background and contextual description of the research setting as well as by offering a thick description of the interactions within the classroom. The thick description offered throughout this

study enables *“someone interested in making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility”*.

Regarding the dependability of the study, Lincoln and Guba (1985, p. 317) argue that if a study has demonstrated its credibility *“it ought not to necessary to demonstrate dependability separately”* as there can be *“no credibility without dependability”* whilst they acknowledge that this argument has merit they feel that it is a rather weak argument and go on to suggest ways in which dependability might in fact be demonstrated. One suggestion offered by Guba proposes that the inquiry submit to an audit, very like a business would submit to a fiscal audit. For the purpose of this study it would not be possible to obtain an independent auditor to examine all of the data, therefore an audit trail is provided which offers a brief snapshot of the raw data and can be seen as Appendices 3, 4 and 5. Whilst it is not possible to append over 700 pages of typed transcripts for scrutiny, the appended material should help to demonstrate the dependability of the study. The doctoral process of a Viva Voce can also go some way to establishing the dependability of the study. Two examiners, independent of the study are able to ask probing questions to determine whether the data, findings and interpretations are supported by the raw data. Lincoln and Guba (1985, p. 318) believe that establishing the dependability of the study also establishes the confirmability of the study as *“confirmability will be seen to dovetail with the audit process”*.

It would be impossible to identify multiple realities a priori, so theory that is grounded in the data is generated. The research design is allowed to develop and unfold, as it would not be possible to identify beforehand the multiple realities so that an adequate research design could be constructed. To answer the research question and put it into context, the researcher needs to have their understanding verified and confirmed by the people who inhabit the setting, this confirmation and verification is referred to as *“negotiated outcomes”*. Interpretivist inquiry allows the multiple realities to define the focus and so determine the research boundaries. Due to multiple realities, interpretivist researchers are hesitant about broadly applying their research findings, as it may not be possible for others to replicate exactly the conditions in another setting, therefore interpretivist researchers offer tentative application of their findings.

Several research methods were identified that were considered suitable in terms of achieving the aims and objectives of the study. Ethnography and case study

methods were both initially considered. The main difference between the two methods is that ethnography sets out to understand and report on a culture and describe it from both the emic (insider's perspective) as well as the etic (outsider's perspective) over a prolonged period of time, whereas case study methods visit the field in order to examine predefined areas of consideration. Whilst these two methods had many similarities, case study methods required well defined boundaries in terms of the purpose of the investigation, Pickard (2008, p.86) states that a *"student's learning could not be the case; this does not provide sufficient boundaries"*, whereas ethnographic boundaries are provided by the context. Developing a grounded theory method (GTM) was also identified as a research method that would provide valuable insight into the research study. Further discussion is provided later in this chapter on the benefits of adopting a grounded theory method alongside an ethnographic research method.

The methodological approach adopted for this research was that of interpretivist ethnography. There were several reasons for choosing ethnography over any of the other methods. The first was the age of the children that would be involved with the research. Observing the behaviour of the children needed to be in as natural a setting as possible. Holt (1983) believes that it can be misleading to assume *"that from what we can learn about people in a very, limited unusual and often very anxious situation we can make reliable judgements about what they do in very different and more usual situations"* (p.8). Another reason for adopting an ethnographic approach was that ethnography offered the best opportunity for observations on a participant level without drawing attention to their being "another adult" in the classroom, whilst at the same time exploring the multiple realities and allowing themes and patterns to emerge from the data in order to answer the research question, which was to investigate the information seeking strategies being taught to Key Stage Two children and how these strategies are preparing them to become lifelong learners.

2.5 Ethnography

When embarking on an ethnographic research adventure the researcher is taking that first step on a very long journey of discovery. Fetterman (1989) likens ethnography to *"more than a one-day hike through the woods: It is an ambitious journey through the complex world of social interaction"* (p.9). Rossman and Rallis (1998) believe that *"Ethnographies are the hallmark of qualitative research, derived from the disciplines of cultural anthropology and qualitative sociology"*, they believe

that ethnographic work is central to understanding the concepts of culture and they go on to say that *“culture captures the beliefs and values shared by members of a group that guide their actions and their understandings of those actions”* (p.67). Brewer (2000, p.11) states that *“ethnography is not one particular method of data collection but a style of research that is distinguished by its objectives, which are to understand the social meanings and activities of people in a given ‘field’ or setting”*. Hammersley and Atkinson (1995, p.1) take a more liberal approach in interpreting the term ethnography, they see the term *“as referring primarily to a particular method or set of methods”*, they go on to say that ethnography

“in its most characteristic form...involves the ethnographer participating, overtly or covertly, in people’s daily lives for an extended period of time, watching what happens, listening to what is said, asking questions – in fact, collecting whatever data are available to throw light on the issues that are the focus of the research”. (p.1)

Wolcott (1999, (p.17) believes that *“ethnography is more than a method: it is a way of conceptualising as well as a way of looking”*.

Hine (2000, p.5) states that *“the ethnographer inhabits a kind of in-between world, simultaneously native and stranger”*. She believes that an ethnographer must be both capable of getting close enough to the culture being studied to be able to understand how it works, *“and yet be able to detach from it sufficiently to be able to report on it”*. Whilst Silverman (2001, p.45) believes that

“Social scientists do something extra with their data; they write ethnographies. Ethnography puts together two different words: ‘ethno’ means ‘folk’ while ‘graph’ derives from ‘writing’.
Ethnography refers, then, to social scientific writing about ‘folks’”.

Brewer (2000, p.17) refers to what he calls *“big’ and ‘little’ ethnography”* he explains the distinction between the two by referring to the definitions of ethnography, where he states that one definition *“uses ‘ethnography’ as a synonym for qualitative research as a whole”* taking that to mean that any qualitative research is classed as ethnography that *“avoids surveys as the means of data collection”* this he believes is the “big ethnography” whereas he believes that “little ethnography” is often taken *“to mean the same as ‘field research’ or ‘fieldwork’”* (p.18).

One possible research method that was considered at the outset of the study was to conduct the enquiry as a case study. If the research had been conducted as a case

study, rich data would still have been gathered, however case study methods require well defined boundaries in terms of the purpose of the investigation. As the focus of this enquiry was to investigate the cognitive and affective characteristics of a group of key stage 2 children in the context of their information seeking behaviour, ethnography seemed to offer itself as the best approach because prolonged engagement in the field would allow a picture to unfold that offered an emic (insiders) as well as etic (outsiders) perspective.

For the purposes of this study, becoming immersed in the school lives of the children for a year, in order to gather naturally occurring data, offered a rich picture of the information seeking behaviour of the children as well as offering insight into how information seeking skills and strategies were taught to the children.

2.5.1 Context

Ethnographic research should endeavour to be holistic *“covering as much territory as possible about a culture, subculture or program”* (Fetterman, 1989, p.21). *“Ethnography aspires to holistic explanations which focus on processes and relationships...potentially it puts things in context”* (Denscombe, 2007, p.72). An holistic study is not only about looking at the entire situation but more importantly the context. *“Context is something that one can expect (and insist on) from ethnography that is most apt to be stripped away in any more narrowly focused approach”* (Wolcott, 1999, p.79). The importance of establishing the context of the research cannot be emphasised strongly enough, *“it is context that helps make sense of “breaks” or inconsistencies in the information... that often lead to insights that can be turned into new theory”* (Fife, 2005, p.134). As Dervin (1997) says *“Context is something you swim in like a fish. You are in it. It is you”* (p.32).

2.5.2 Macro and Micro levels of research

When collecting data in the field “an ethnographer’s task is not only to collect information from the emic or insider’s perspective, but also to make sense of all the data from an etic or external social scientific perspective”. (Fetterman, 1989, p.21). The goal of ethnography is to *“combine the view of the insider with that of the outsider to describe a social setting”* (Wilcox, 1982, p.462). In order to do this successfully the ethnographer must look at

both the macro and micro environments. Establishing where the macro level ends and the micro level begin really *“depends upon where the researcher decides to create a primary focus for the project”* (Fife, 2005, p.5). Within the context of this research, the macro level of information gathering was concentrated on Government, Local Education Authority (LEA) and School policies and focused on the curriculum targets for information literacy. The micro level of information gathering focused on the activities that were taking place within the classrooms and examined the information seeking behaviour of the children and the ways in which the teachers were teaching the children information seeking strategies.

2.5.3 Retaining the Balance

The success or failure of the research can depend on how well the ethnographer is able to portray the subject of the inquiry and this will depend *“on the degree to which it rings true to natives and colleagues in the field”* (Fetterman, 1989, p.21). To become immersed in the culture of the subjects being observed allows the ethnographer access to information that would almost certainly not come to light using some other forms of data gathering techniques, such as interviews or questionnaires. Hine (2000) warns about the dangers of *“going native”* and losing the sceptical, inquisitory edge, and warns that if ethnographers do then *“their ethnographic edge as a cultural commentator will have been lost”* (p.54). It appears to be a very fine line between *“going native”* and experiencing the culture so that a true representation of the situation can be portrayed. As Wolf (1992) puts it, *“The experience of fieldwork does not produce a mysterious empowerment, but without it, the ethnographer would not encounter the context – the smells, sounds, sights, emotional tensions, feel – of the culture she will attempt to evoke in a written text”* (p.128), or as Willis (2000) puts it *“experience and the everyday are the bread and butter of ethnography”* (p.viii).

Ethnographic researchers set out to investigate cultural or social phenomena. In order to do this they must gather their data from the field in, as unobtrusive a way as possible. Denscombe (2007, p.70) believes that *“naturalism is a key concern of ethnography”* wherein researchers go *“into the field’ to witness events first hand in their natural habitat”*, because they *“wish to preserve the natural state of affairs”*.

2.5.4 Reflexivity

Ethnographic researchers must be aware of their own biases and assumptions all the way through their investigation and attempt to highlight to their reader any areas of bias. Pickard (2007) believes that *“It is far more important to acknowledge and understand one’s own ethnocentric biases and respond to them during the course of the study”* (p.116). Hammersley and Atkinson (1995) believe that both positivism and naturalism fail to acknowledge that social researchers are part of the social world in which they are studying. Their justification for this claim is that *“both positions assume that it is possible, in principle at least, to isolate a body of data uncontaminated by the researcher, by turning him or her either into an automaton or into a neutral vessel of cultural experience”* (p.16). They go on to say that there are elements of both positivism and interpretivism which *“must be abandoned”* if ethnographic research is to succeed, as they believe that ultimately *“the primary goal of research is, and must remain, the production of knowledge”* (p.17), and it is not possible to acquire this knowledge without it in some way “touching” the researcher. Lincoln (2002, p.337) states that reflexivity *“enables the researcher to begin to uncover dialectic relationships, array and discuss contradictions within the stories being recorded”*, she believes that it is the researchers attempts to achieve an *“understanding [of] subtle differences in the personal and psychological states of others”*. Denzin and Lincoln (2002, p.xii) believe that reflexive ethnographers are *“morally and politically self-aware”* that they often write from a first person perspective *“writing in an ongoing moral dialogue with the members of a local community”* (p.1). They go on to explain that the traditional ethnography *“was written under the guise of objectivism and observer neutrality”* (p.2) they point to the texts of Malinowski, Radcliffe-Brown, Margaret Mead and Gregory Bateson to serve as historical records of how fieldwork was conducted, as a way of demonstrating the traditional ethnographic style of writing. Willis (2000) states that he has *“long argued for a form of reflexivity, emphasising the importance of maintaining a sense of the investigator’s history, subjectivity and theoretical positioning as a vital resource for the understanding of, and respect for, those under study”* (p.113).

When writing up an ethnography, the language used and the meanings and significance attached to what is observed, will all be influenced by *“our own*

culture, social background and personal experience”

(Denscombe, 2007, p.68). Rossman and Rallis (1998) believe that the personal biography of the researcher will shape the project and so it is necessary for the researcher to *“ask the questions, become aware of your perspective (your assumptions) with its built-in interests, biases, opinions, and prejudices”* (p.26) and that this questioning of self should be an on-going process. *“In short, we try to be aware of and vigilant about the baggage we carry into the inquiry”*. However Fife (2005) warns that *“while a little bit of reflexivity is a good thing, a great deal of it can be very distracting at best and at its worst can turn into an exercise in self-indulgence”* (p.150). For the researcher, deciding how much “me” needs to be “in the story” for the story to be a true representation and what is simply self-indulgence, is a very fine line.

2.6 Grounded Theory

“The grounded theory method (GTM) comprises a systematic, inductive, and comparative approach for conducting inquiry for the purpose of constructing theory” (Bryant and Charmaz, 2007, p.1)

In 1967, Barney Glaser and Anselm Strauss developed strategies for developing theories that were grounded in the data rather than from testing hypotheses that had been developed a priori. A grounded theory researcher may look at knowing a thing by going around it, however, grounded theory ethnographers *“can go deep into experience to make an interpretive rendering”* (Charmaz, 2006, p.25). One potential problem with an ethnographic study is that the researcher being so deeply immersed in the setting may see *“data everywhere and nowhere, gathering everything and nothing”* (Charmaz and Mitchell, 2001, p.161). Grounded theory helps with this problem. Charmaz (2006) explains that *“ethnographers can make connections between events by using grounded theory to study processes”* (p.23). Grounded theory allows the researcher to compare data as it is being gathered, *“data collection and analysis proceed simultaneously and each informs and streamlines the other”* (Bryant and Charmaz, 2007, p.1) right from the beginning of the study rather than waiting until the end of the study to analyse it, this then allows the researcher to *“compare data with emerging categories”* and also *“to demonstrate relations between concepts and categories”* (Charmaz, 2006, p.23). Timmermans and Tavory (2007, p.499) suggest that *“grounded theory and*

ethnography meet around the concern of interaction with grounded theory providing not just a methodology to analyze interaction but also suggesting orienting theoretical principles to draw out interactional processes. By developing a grounded theory approach to investigating the information seeking strategies of Key Stage 2 children, it was possible to analyse the interactional processes and generate theory that was grounded in the data and context specific to Key Stage 2 children which allowed a rich picture of their information seeking behaviour to develop. The relevance of taking a grounded theory approach in terms of this study meant that a snapshot in time was captured of the information seeking skills and strategies of the children which generated theory that could be tentatively applied to similar situations.

2.7 Emergent Design

Interpretivists allow the research design to “*flow, cascade, unfold*” (Lincoln and Guba, 1985, p.41). It would be impossible to predict at the beginning of the research every possible scenario and prepare for it, “*because what emerges as a function of the interaction between inquirer and phenomenon is largely unpredictable in advance*”, (Lincoln and Guba, 1985, p.41) due to multiple realities. By allowing the research design to emerge as the research is being conducted, the researcher is able to follow cues and leads that may not have been considered at the outset of the research. Ethnographic research begins with “*the big net approach conducive to participant observation*” (Fetterman, 1989, p.42) and then as the research design unfolds the researcher is often able to narrow the focus to particular areas of interest and identify and implement other data gathering techniques which s/he may not have thought of at the outset of the project. The natural classroom setting of this study meant that it was impossible to predict a priori where a lesson might lead. The teacher might lead the children on a path of discovery unconsidered by anyone at the outset of the lesson. In turn, the children’s questions might lead the teacher away from the planned lesson down a previously unconsidered route. The spontaneity of the research participants could not possibly be predicted and therefore could not be prepared for in advance. By allowing the research design to emerge, avenues of exploration were opened up that were deemed worthy of further investigation.

2.8 Data Collection Techniques

There are numerous data collection techniques available for ethnographic researchers to make use of. For example, an ethnographer may choose to conduct observations as a full participant, semi-participant or non-participant. The ethnographer may decide to conduct interviews with participants. Hammersley and Atkinson (1995) believe that the reflexive way in which ethnographers ask questions will differ greatly from the way in which an interview for a survey is carried out, they believe that *“ethnographers do not usually decide beforehand the exact questions they want to ask, and do not ask each interviewee exactly the same questions”* (p.152), although they do say that the ethnographer will usually draw up a list of questions that they would like to have answers to or issues that they would like to better understand. It is this reflexive approach to interviewing that allows the *“discussion to flow in a way that seems more natural”* (p.152). Interviews can range from formal conversations where the participant is aware that the ethnographer’s goal is to gather data, to more relaxed informal chats over a coffee, both of these techniques can provide the ethnographer with valuable insight. Fetterman (1989) believes that informal interviews differ from conversations in that they are a *“mixture of conversation and embedded questions”* (p.49).

Retrospective interviews allow the ethnographer to reconstruct the past, this technique entails the ethnographer encouraging the participants to recount tales from their pasts that may put into context how and why things are a certain way in the present. Folktales are used in much the same way, they offer the ethnographer an insight into *“the secular and the sacred, the intellectual and the emotional life of a people”* (Fetterman, 1989, p.71).

Autobiographies provide ethnographers with rich detailed descriptions, Hannabus (2000) believes that autobiographical accounts are often *“attempts at self-vindication or retrospective clarification, trying to make sense of the past, trying to justify past actions, or trying to make sense of where life went right or wrong”* (p.100). Fetterman (1989) believes that autobiographies allow the ethnographer to discover *“in some depth about one facet of the participants life”* (p.63).

Life histories or biographical accounts may not be accurate but they can still offer the ethnographer valuable insight as they *“capture an individuals perceptions of the past”* (Fetterman, 1989, p.61). Hammersley and Atkinson (1995) state that biographical accounts can be used *“with appropriate caution, for comparative*

purposes. They can furnish information (albeit partial and personal) on groups and settings that are not available for first-hand observation” (p.160).

Fetterman (1989) believes that questionnaires are probably the most rigid of interview techniques *“because of the distance between the researcher and the respondent”* (p.64) , the distance between the researcher and the respondent may give rise to misinterpretation by the respondent as to what it is the researcher wants to know or equally the researcher may misinterpret the answers given by the respondent, *“knowing whether the researcher and the respondent are on the same wavelength, sharing common assumptions and understandings about the questions, is difficult – perhaps impossible”* (p.64). Questionnaires do have their good points as Fetterman (1989) points out *“questionnaires are an excellent way to tackle questions dealing with representativeness. They are the only realistic way of taking the pulses of hundreds or thousands of people”* (p.65).

A diligent ethnographer will use a variety of different methods to ensure the integrity of the data being gathered and to provide as detailed and rich a picture as possible. The human as instrument is not a new concept as Lincoln and Guba (1985) point out *“classical anthropology utilized virtually no other instrumentation”* (p.192), but the responsiveness and adaptability of the human-as-instrument are unrivalled by any other data gathering instrument. Fetterman (1989) would agree with this statement, as he believes that *“relying on all its senses, thoughts, and feelings the human instrument is a most sensitive and perceptive data gathering tool”* (p.41). Relying on tacit knowledge, previous experience and adaptability, the human as research instrument is capable of on-going analysis of a situation and of grasping nuances that other data collecting instruments may miss. The adaptability of the human as instrument facilitates the emergent nature of the research, allowing it to unfold as the researcher notices something that invites closer inspection, something that until that point had not been considered. Due to the nature of emergent design none of the above data collection techniques were chosen a priori, however all were identified and available. At the start of the fieldwork, the human-as-instrument entered the classroom armed only with an open mind and an open notebook and a general idea of wanting to better understand the information seeking behaviour of KS2 children. After arranging when and where the fieldwork would take place in terms of access, no further research design was organised allowing the research design to unfold as the fieldwork was conducted.

2.9 Fieldwork

Entry into the field, along with detailed background information about the local environment, the school and the research participants can be found in Chapter 4. Data was gathered over a period of one academic school year. Attempting to write field notes whilst in the field initially proved problematic, with children asking if their names had been entered into the book (the notebook where field notes were recorded). By developing a unique kind of shorthand it was possible to take notes, with the notebook balanced on a knee, in order to take notes less obtrusively. An example of the shorthand field notes can be seen as appendix 3. The benefits of using a personalised style of shorthand ensured that conversations could be recorded verbatim, and transcribed accurately immediately after the observation had finished. Another benefit of using a personal style of shorthand meant that the field notes could not be read by anyone else but were unique to the researcher, thereby maintaining the confidentiality of the research participants.

2.10 Ethics

Ethical considerations should always prompt researchers to question their own morality. Does the research comply with the researchers own code of ethical values? Audi (1998) believes that

“moral knowledge and justification regarding particulars are subsumptive: they are grounded in the application of a principle to an action or person morally judged in the light of information gained through ordinary perception or through some other apparently non-moral informational source” (p.355)

This demonstrates the inter-connectivity of the concepts that are encompassed within a paradigm and goes some way to explaining how a researcher’s view of the world will impact on the research at least in the context of morality and ethics. Hammersley (1990) believes that there are four issues surrounding ethics where problems may occur, *“deception, privacy, consequences for others and for research”* (p.132). The problem of deception mostly occurs when covert observations are employed as a data gathering technique, the researcher needs to ask of him/herself, is it right to watch people without their consent? If so, then how can the researcher justify the judgements they are making about people and situations without giving those same people the right to reply or explain. Silverman (2010, p.203) believes that research access can fall into two categories, either *“covert’ access without subjects’ knowledge”* or *“overt’ access based on informing*

subjects and getting their agreement, often through gatekeepers". Murphy and Dingwall (2001) point to Beauchamp et al (1982) who offer the following guidelines for ethnographic researchers to consider.

"Non-maleficence": the researcher will avoid harming participants

"Beneficence": that any research carried out with human participants should produce positive benefits and not just be carried out for the sake of it.

These two points are consequentialist approaches which focus on the outcomes of the research.

"Autonomy or self-determination": that the researcher should always respect the values and decisions of the participants

"Justice": that all people within the research be treated equally.

These two points are deontological which focus on the inherent rights of the research participants.

When the research participants are children, the question of ethics seems to become more confusing. As children and their information seeking behaviour are the primary focus of this research, permission was obtained for conducting the research from the head teacher. The researcher asked about gaining consent from the children and their parents in line with the Northumbria University ethics policy which states that *"The assent of parents/guardian must be obtained if participants are under 18 years of age"*. The head explained that student teachers regularly conducted research within the school and that it would not be feasible to obtain written consent from parents every time research was carried out in the school therefore, the school policy was that the head could give consent *"in loco parentis"*. At the beginning of every school year parents sign a form giving the school permission *"in loco parentis"*. This piece of school policy and advice from the head teacher would seem to conflict with advice given to researchers by research experts, that participants in research *"should be informed about the research in a most comprehensive and accurate way, and should give their unconstrained consent"* (Hammersley and Atkinson, 1995, p.264). Whilst Fetterman (1989)

believes that *“in a school district, formal written requests are requisite”* (p.130).

Pickard (2007, p.74) goes as far as to say that

“individuals who are below the legal age of consent, or those not classed as competent, should never be questioned, observed or investigated in any way without the formal written consent of their parents or guardians”

However, the other side of this argument is argued by Punch (1986) who believes that sometimes *“it is physically impossible to seek consent from everyone and seeking it ‘will kill many a research project stone dead’”* (p.36). Denscombe (1998) identified three categories of participation when conducting ethnography in an educational setting. The first being when the researcher’s role is kept secret, he warns that this approach has ethical implications. The second, is that the researcher’s role is known to *“certain ‘gatekeepers’, but may be hidden from most of those in the setting”* and the third is where the researcher’s role is openly recognised (p.150). Pole and Morrison (2003) believe that *“most ethnographies in an educational setting adhere to versions of the second and third categories”* (p.23). In the context of this research study the researcher needed to be guided by the policies of the school. The head teacher was happy to put in writing that, permission to conduct research and to publish findings had been granted, on the understanding that none of the children would be identified by name or photograph (Letter can be seen as appendix 1). At the writing up stage the children were allocated pseudonyms, however the teachers were referred to as “teacher”.

Northumbria University ethics policy also states that *“written consent must be obtained in advance from the children involved in the research and the parents or guardians of each child before any work takes place”*. Due to the ages of the children, the researcher (under advisement from the head) decided that they would not be told directly that they were participating in research. This adheres to the second category identified by Denscombe (1998) that the researcher’s role is known to *“certain ‘gatekeepers’”* however if the children were to ask why the researcher was in school, they would be given an honest answer. During the fieldwork when children asked what the researcher was doing they were always given an honest answer and asked if they were happy to “help with the research” the answer fortunately was always “yes”. Obtaining retrospective permission from the children allowed the policies of the school to be observed whilst at the same time negating the possible accusation of covert observations.

A requirement by law is that anyone coming into regular contact with children needs to have an enhanced disclosure criminal records bureau (CRB) check. National policy required that school governors were CRB checked too. As a governor, the school had already carried out a CRB check so another CRB check was not necessary for entering the school to conduct the research (CRB check can be seen as Appendix 2).

2.11 Sampling

Having identified that the research would be conducted as an ethnography, the matter of sampling was considered. One aspect of ethnographic research which differs from other qualitative methods, is that of sampling. The aims and objectives of the research identified that the research focus would primarily be on KS2 children and their information seeking behaviour. Both classes of children participating in the study were made up of a range of abilities, whilst the data from both the special educational needs children (SEN) and the gifted and talented (GnT) children was included in the analysis it is only there to demonstrate how it affected the teachers' strategies but was not included in the overall analysis as it goes beyond the scope of this investigation.

Geographic considerations determined that the research would be carried out in the North East of England. The school to participate in the study was identified as it was local to the researcher and previous research had been conducted in the school. After identifying the key adults that would participate in the research it became unnecessary to engage in other methods of sampling.

2.12 Access and Gatekeepers

Having identified the most suitable place in which to conduct the research, it then becomes necessary to negotiate access. In order to gain access to the community it is essential to identify "*key people who can grant permission*", and then successfully negotiate "*access to people, places and events*" (Denscombe, 2007, p.71). Brewer (2000, p.83) advises that it is often necessary for researchers to use "*skilful negotiation and renegotiation*" which often requires "*research bargains' or compromises with either the gatekeeper who holds the key to entry or the subjects in the field*". Formal gatekeepers would be identified as "*gang leaders, tribal chiefs and heads of organizations and bureaucracies like headteachers and police chiefs*" (Brewer, 2000, 83). In the context of this study the

formal gatekeeper was identified as the head teacher and later on the acting head teacher, whereas the informal gatekeepers were identified as being the classroom teachers. It was necessary to firstly gain approval for access from the formal gatekeeper (the head teacher). Having received approval from the head teacher it was then necessary to approach the informal gatekeepers (the classroom teachers) in order to negotiate the amount of access that they were prepared to allow. Hammersley and Atkinson (1995, p.55) warn that *“negotiating access, data collection and analysis are not, then, distinct phases of the research process. They overlap significantly”*. Denscombe (2007, p.72) advises that permission from gatekeepers *“should be viewed as an ‘access relationship’ rather than a one-off-event”*.

2.13 Data Collection

In ethnographic study everything that the researcher hears, sees, smells, feels, touches and understands can be interpreted as data as Glaser (2002) states *“all is data”*. Goodall (2000) asks *“Don’t humans acquire information – indeed, understandings – from the multiple influences of the senses working together? He goes on to question whether ethnographers shouldn’t “strive to represent the active presence of these sensory influences more accurately?” (p.76)*. How a researcher chooses to collect data will have a direct impact on *“which phenomena you will see, how, where and when you will view them and what sense you will make of them”* (Charmaz, 2006, p.15). The deeper and richer the data collected, the deeper and richer the picture can be portrayed. At the outset of this research study, the decision was made to be a fully participant observer within the natural setting of the classroom. By means of field notes, snapshots in time captured the children’s day-to-day routines within the context of their information seeking behaviour. Field notes acted as an ‘aide memoir’, Pole and Morrison (2003) note the *“need to make notes where possible in the field as well as making further notes outside the field as soon as possible after the observation” (p.26)*. Field notes transcribed immediately after the observations had taken place, also allowed the utilisation of inductive data analysis. This process allowed themes and patterns of behaviour to emerge whilst still in the field. This in turn pointed to areas of interest that could be the focus of the next visit. Rather than conducting in-depth formal interviews with staff and children, informal “chats” and discussions were adopted as a means of clarifying anything that needed further explanation. Observing the participants singly and within the context of the community *“is crucial to effective fieldwork”* (Fetterman,

1989, p.45) and for a participant researcher, working alongside the members of the community, there is the opportunity to ask questions and respond to the answers as a situation evolves. McKechnie (2000) conducted an ethnography studying the information-seeking behaviour and library use of preschool children, she found that traditional methods of data gathering were inappropriate due to the ages of the children, for example, because the children could not read, then questionnaires were of no use and formal interviews were thought to be too intimidating. She came to the conclusion that

“the techniques of ethnographic observation, which allow exploration of research questions from the perspective of subjects themselves in a manner that may be adjusted to be age appropriate, provide a promising approach to research with young children” (p.61).

Just such an approach has been adopted for this research.

2.14 Member Checking

Ethnographic researchers need to ensure that the picture that they are painting of the research setting and its participants is as accurate as possible, *“the success or failure of...ethnography depends on the degree to which it rings true to natives and colleagues in the field”* (Fetterman, 1989, p.21). Stake (1995) claims that in order to improve the quality of the study and also the credibility of the study, checking findings and interpretations with the participants is vital, he goes on to say *“I can say that all my reports have been improved by member checking”* (p.116). Lincoln and Guba (1985) believe that *“member checking is both informal and formal, and it occurs continuously”* they also say that *“opportunities for member checks arise daily in the course of the investigation”* (p.314). Checking with the participants was carried out informally on a regular basis during the course of this study. It was felt that a more formal process of checking would be inappropriate due to the ages of the children. Due to the amount of time already given to the study by the teachers it was felt that it would be unfair to ask them to make a formal acknowledgement of a situation when they had already clarified a situation on an informal basis.

2.15 Documentation

Before entry into the field, reviews of the current literature in the context of children's information seeking behaviour were carried out. By looking at previous research it was possible to identify models of information seeking behaviour, however, none of

the models of information seeking behaviour that were identified could be applied to the age group of children being studied. Drawing up a literature map made it possible to identify what previous research had taken place and how (if at all) it had an impact on this research. The literature map highlighted the fact that whilst some research has been conducted with 7 – 11 year old children, there are no specific frameworks or models of information seeking behaviour specifically designed for this age group.

By studying the macro and micro environments in the context of children's information seeking behaviour it was possible to offer a rich picture. The micro environment for this study was defined as being the classroom where empirical data was gathered.

In order to explore the macro environment it was necessary to look for information by studying extant texts such as Government legislature, LEA and school policies, reports and previous research. In this way, it was possible to identify areas where this research could offer new insight about children and their information seeking behaviour.

2.16 Data Analysis

“traditional ethnographic case studies focus on description and explanation; their goal is to reconstruct and classify reality in order to integrate data into a set of theoretical constructs”
(Goetz and LeCompte, 1981, p.54).

Iterative analysis of the data collected can begin at the very beginning of the fieldwork. By being open to all the possibilities within the data, a researcher is able to ensure that the categories that emerge from the data are not forced but unfold naturally. This allows the researcher to follow up interesting leads or to ask questions that might not have previously been considered. Fetterman (1989) believes that *“looking for patterns is a form of analysis”* (p.92). By looking at data and analysing it in conjunction with fieldwork rather than at the end of the fieldwork, the researcher is able to employ comparative analysis. In the context of this study, the unit of analysis was the child, by comparing the information seeking behaviour of a child from lesson to lesson and also by comparing child with child, a rich picture of Key Stage 2 children's information seeking behaviour was built. Lincoln and Guba (1985) propose that *“the process of constant comparison stimulates thought*

that leads to both descriptive and explanatory categories" (p.341). An ethnographer should organise their materials around a social process in such a way that they are able to build *"action into the analysis and, thus, give it movement and direction"* (Charmaz and Mitchell, 2001, p.169). Fife (2005) suggests that analysing data begins at a micro information level, he identifies basic or important information and then moves on to build his *"ethnographic case from "the ground up," linking it to larger issues... but always remaining firmly grounded in the primary material of actual human behaviour that forms the core of [my] participant-observation fieldwork"* (p.121). There are several *"computer-assisted qualitative data analysis (or CAQDAS)"* (Fielding, 2001, p.453) applications available for ethnographers to make use of, however, it is one thing to use a computer for writing up and storing field notes and memos and *"quite another to concede it a major place in the analytical process"* (Fielding, 2001, p.453). It has always been and must always be the researcher analysing the data, a computer can only retrieve what it is asked to retrieve and will only store what it is told to store, at no point during the analytical process does the CAQDAS software analyse anything. During the on-going data analysis of this research, no use was made of CAQDAS software.

During observations, as the field notes were being written, it was often possible to identify an occurrence of something that might or might not be a potential theme. For example, during an observation, several children demonstrated what could have been interpreted as uncertainty, a shorthand note was made that highlighted this by means of the letter U followed by a ? (An example of the field notes can be seen as Appendix 3). Wherever these instances occurred it was possible to identify them and follow them up with informal discussions with the children, the follow up conversations occurred as soon as possible after the incident had been identified. In this way what the child had said or done was still fresh in their mind and they were able to offer clarification which helped to ensure that the interpretation being placed on the incident was a correct and true representation of what had occurred. This went some way to establishing the trustworthiness of the interpretation and also acted as a way of negating any potential researcher bias. Field notes were transcribed into a journal (an example of the transcribed journal can be seen as appendix 4) as soon as possible after an observation had taken place. During the transcription process it was possible to determine and identify potential themes. During the early days of the field work themes were identified but were classified as "potential themes" until more evidence was gathered. To supplement the transcribed field notes a separate journal entitled "memo" was also kept. (An

example of the memo can be seen as appendix 5) In this journal, the potential themes and patterns were noted down, this memo journal also served to identify researcher musings or highlight areas of interest that might warrant closer scrutiny back in the field. Very often, these musings focussed on issues or patterns that had been identified in the field, for example in the early days of the field work uncertainty was identified as a potential theme, having identified this potential theme it was recorded in the field notes, transcribed into the journal and then raised in the memo journal as being an area worthy of further investigation. As the weeks unfolded and observations revealed more instances of uncertainty these were recorded in the field notes, transcribed into the journal and upgraded in the memo journal from “potential theme” to “theme”. By the end of the field work, at the end of the academic year, fewer instances of uncertainty were recorded; however, when they were identified they were still faithfully recorded in the field notes to ensure that as complete a representation of the classroom as possible could be demonstrated.

Engaging with comparative analysis whilst fieldwork is on-going meant that *“Subsequently you return to the field to gather further data and to refine the emerging theoretical framework”* (Charmaz, 2006, p.23). The keeping of a journal also allowed reflection on the ways in which data was being collected and analysed, in order to identify researcher bias and remain vigilant against allowing it to distort the findings.

Glaser and Strauss (1967) stipulate that the act of analysing data will lead the analyst to see that they have developed two kinds of category, *“the concepts abstracted from the substantive situation will tend to be current labels in use for the actual processes...whilst the concepts constructed by the analyst will tend to be the explanations”* (p.106).

Transcribed field notes were analysed during the course of the fieldwork by means of colour coding the researcher notes. A sample of the colour coded notes can be seen as appendix 4. When several instances of a theme or pattern were identified they were assigned a specific colour, for example, uncertainty was identified as a recurring theme and was assigned the colour purple. During observations, when an instance of uncertainty was identified, the researcher was able to look at the context within which the uncertainty has arisen and attempt to gain further understanding of the phenomena and how (if at all) it had bearing on any other patterns that had been identified.

Having identified from the observations that uncertainty was a theme, returning to the literature regarding uncertainty and children, provided insight that suggested that self-efficacy was linked with levels of uncertainty. It was necessary to return to the field to investigate whether self-efficacy played a part in the uncertainty levels of the children and to try to determine to what extent. Subsequent observations revealed that self-efficacy did appear to be linked with differing levels of uncertainty. Observations also revealed that when many of the children were given a choice regarding the work they were doing, they appeared to be more motivated. Returning to the literature allowed more exploration of the topics of motivation and choice, it was then possible to return to the field and examine in more detail whether the children's motivation was higher if they had been given a choice. By investigating motivation it became apparent that for some children motivation was high or low regardless of whether choice had been offered. Having wondered why this might be, observations suggested that it was necessary to consider the possibilities of need and want. Once again the literature regarding need and want was able to offer insight into how the children's motivation might be affected by a need or want for information. Returning regularly to the literature offered insight into areas that had previously been unconsidered, returning then to the field armed with fresh insight it was possible to identify the themes of uncertainty and self-efficacy, motivation and choice and need and want as they emerged from the data. This iterative process was cyclical in nature as something would be witnessed in the field and a note made of it, this potential theme would then be investigated against the literature and the fresh insight gained from the literature would serve to open up other potential possibilities within the field that had been previously unconsidered.

Over the academic year, field notes were transcribed as quickly as possible after an observation had taken place whilst the scene was still fresh and detail still vivid. At the end of the year, transcribed field notes amounted to over 700 typed pages of raw data. The transcribed notes were stored onto a personal computer in a word document which was password protected for added security.

2.17 Writing up

In most research it may be presumed that the setting of the research will not always be familiar to the reader and consequently the *"mappings from events to theory are unlikely to seem obvious"* (Hutchins and Klausen, 2002, p.140). It is therefore the role of the ethnographer to describe in rich detail the setting, and demonstrate to the

reader how they have arrived at their theoretical concepts. Ethnographies proffer to their readers a rich narrative in which the theoretical categories are embedded. The ethnographer is telling the reader a story. As Behar (2003) puts it, *“One thing remains constant about our humanity – that we must never stop trying to tell stories of who we think we are. Equally, we must never stop wanting to listen to each other’s stories”*. Polkinghorne (1988) believes that narrative is a type of *“discourse composition that draws together diverse events, happenings and actions of human lives into thematically unified goal directed processes”* (p.5). The story being told in this case is the story of Key Stage 2 children in a classroom setting and how those children were taught information seeking strategies. The ethnographer paints a narrative picture with words and explains to the reader (in the context of children’s information seeking behaviour) what was witnessed and experienced by the ethnographer in order for this information to be contextually transferred to other research settings.

2.18 Summary

Investigating the theoretical underpinnings of research helped to inform the best way of conducting this research study. The methodological choices adopted for this research study were chosen specifically because they allowed for detailed exploration of the information seeking strategies of Key Stage 2 children. It was necessary to consider how to gain access to the research participants and to identify both formal and informal gatekeepers in order to successfully negotiate entry into the field. Ethical considerations were examined and justification offered for the ethical approach that was taken during this research study.

Emergent design allowed theory, grounded in the data, to develop and lead to areas of investigation that had not been considered at the outset of the project. Iterative data analysis allowed salient issues within the research to be identified so that it was possible to return to the field in order to examine the salient issues in greater depth. As Pickard (2007, p.90) points out *“the emphasis must always remain on theory emerging from the data”*.

Consideration was given to the way in which the themes and patterns were coded and analysed. Writing the analysis allowed a richly descriptive narrative to highlight the ways in which the children were taught information seeking skills. From this

descriptive narrative a snapshot in time was captured which offered a rich picture of the information seeking behaviour of the children that participated in this study.

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3 Children, Information Literacy and Conceptual Frameworks

3.1 Introduction

During this chapter, the concepts surrounding information literacy, children and their information seeking influences, along with learning theory were examined in order to offer background information and insight to the research study.

By investigating previous research, it was possible to examine cognitive and affective responses to information seeking. The way in which a person chooses to satisfy an information need may well be influenced by their preferred learning style. Considering the influences that may affect information seeking, such as uncertainty and self-efficacy, motivation and choice and need and want, were considered and examined. It was also necessary to consider the support offered to children, not only by teachers but by their peers.

Investigating the different approaches to information literacy adopted by the educational system in the UK compared with the approach taken in the United States, were also considered.

Empirical research into the key concepts of information literacy and children's information seeking behaviour offered a rich knowledge base on which this research study was able to draw. Theoretical frameworks of learning theory provided conceptual bridges, which helped to guide and inform this research study.

3.2 Every Child Matters

The Education Act (1996) set out to consolidate aspects of the 1944 Education Act (known as the Butler Act). The Education Act of 1996 states that it is the role of the Secretary of State to ensure that Local Education Authorities (LEA) are continually *“improving standards, encouraging diversity and increasing opportunities for choice”*. The Education Act (1996) goes on to state that LEA's should provide *“efficient primary education, secondary education and further education are available to meet the needs of the population of their area”* (Great Britain. Education Act, 1996).

In 2003, the Government of Great Britain published its green paper “Every Child Matters”. In the paper, Paul Boateng (the Chief Secretary to the Treasury) outlined

the need *“to protect children and ensure each child fulfils their potential. Security and opportunity must go hand in hand”* (2003, p.3). Whilst the paper was designed to highlight the need to protect vulnerable or disadvantaged children, the UK Government recognised the fact that all children deserve the right to be safe and happy and given the means with which they can achieve their potential. Ensuring that children fulfil their potential the Government agency BECTA (2008) believe that there is a need *“to utilise the benefits of technology to create a more exciting, rewarding and successful experience for learners of all ages and abilities, enabling them to achieve their potential”*. Following on from the Green Paper “Every Child Matters” the Government then published a paper “Every child Matters: the next steps” and from here passed the Children’s Act (2004). The Children’s Act (2004) put in place legislation that focussed on developing *“effective and accessible services”* that met *“the needs of children, young people and families”* (Great Britain. Children’s Act, 2004). The “Every Child Matters” green papers and the Children’s Act (2004) became the basis for reform of the education system in the UK. In order for the legislation to be effectively implemented at a local level, it is necessary for LEA’s to work closely with school governing bodies, they in turn will work and support the Head Teacher of the school. In this way the legislation is being put into action but it is possible for the governing body and the Head Teacher to tailor the way that the legislation is implemented so that it is used in the most effective way to meet the needs of the community in which it serves.

3.2.1 No Child Left Behind

The United States of America have in place a similar Act to “Every Child Matters”. In 2001, the American Government passed Public Law 107-110, which was an Act that attempted *“To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind”*, Public Law 107-110 was known as “No Child Left Behind” (p.1425). As with the British system, the American education system allows the implementation of the law to be put into practice by the States, LEA’s and schools. The Act states that *“holding schools, local educational agencies, and States accountable for improving the academic achievement of all students, and identifying and turning around low-performing schools that have failed to provide a high-quality education to their students”* is the best way to implement the law to ensure that no child is left behind.

Whilst the structure of educational legislation may be similar between the UK and America, there is one key difference between the two. The American Government acknowledge the importance of developing information literacy and critical thinking skills and explicitly state the need to “*acquire and use advanced technology, incorporated into the curricula of the school, to develop and enhance the information literacy, information retrieval, and critical thinking skills of students*” (p.1570). Whereas, the UK Government appear to attach little relevance to information literacy as it is not possible to locate this term on any curriculum website. The UK Government acknowledge that children need to be able to use information and the Curriculum website states the importance that “*Children have the skills to learn effectively. They can plan, research and critically evaluate, using reasoned arguments to support conclusions*” (The National Curriculum Primary Handbook, 2010, p.15). The newly developed Primary Curriculum (2010) believes in the importance of “*securing the fundamentals of literacy, numeracy and ICT capability. There is a strong emphasis on children’s personal development, including the development of learning and thinking skills, and personal, social and emotional skills*” (p.7), yet nowhere within the National Curriculum Primary Handbook are the terms “information literacy” or “critical thinking” used. Instead the emphasis for developing information literacy skills appears to have become entwined with the need for children to be proficient users of technology.

Sonia Livingstone (2005) conducted the UK Children Go Online (UKCGO) study, which looked at children’s home use of digital information resources, namely the internet and found that

“Children and young people encounter some difficulties with searching, critical evaluation and a range of online skills, partly because they have received only patchy educational support. They lack key skills in evaluating online content” (p.6)

If children are not being taught the skills to search and critically evaluate information resources then it will not be possible for them to realise their potential, it would seem then that developing these information skills is key to allowing children to maximise their potential. The ways in which children engage with information invites closer scrutiny. To do this it was necessary to understand not only how children interact with information but also how they interact with the process of

learning. In order to understand how children interact with the process of learning it was important to consider the different theories associated with learning.

3.3 Theories of Learning

There are three major theories surrounding learning as identified by Malone (2003, p.31). They are known as the Behaviourist, Cognitivist and the Constructivist theories of learning. Malone identifies other learning theories, such as the humanist theory of learning and social theory of learning, however for this study, Behaviourist, Cognitivist and Constructivist theories shall be the focus. It is safe to say that there are some similarities and shared principles within these theories. This is only natural when individuals are exploring ideas and sharing their beliefs, nothing is ever black and white but varying shades of grey. Each of the three learning theories identified here has its own set of rules and beliefs, which explains how the people who subscribe to a theory see the world in the context of learning.

Behaviourists believe that human learning is shaped by the environment, that it can be governed by positive and negative stimuli and that when studying human learning it is the observable behaviour that expresses the way in which the learning is taking place rather than through the internal thought processes of the person (Malone, 2003, p.30). Some of the leading theorists in the field of Behaviourist learning theory include Ivan P. Pavlov, Edward L. Thorndike, John B. Watson, and B.F Skinner. Pavlov is famous for his research with dogs, he would ring a bell and the dogs would salivate because they had been conditioned to expect food when a bell was rung (Pavlov, 1927). Thorndike's theory was that people learn by trial and error and Skinner's theory was termed as operant conditioning. Operant conditioning required that a stimulus was provided and then a response was generated. For every response that was generated there was a consequence. The consequence could either be positive or negative and this consequence would reinforce the response to be chosen the next time the stimulus was provided. (Skinner, 1974, 1987).

Behaviourist theory has four key principles. Malone (2003, p.31) recalls them by the acronym ROAR. Repetition, Objectives, Activity, Reinforcement.

Repetition. Repetition aids memory, so for example learning times tables by rote will (if done often enough) allow them to become engrained into the memory.

Repetition also allows us to practice a new skill and as Malone (2003, p.31) points out "*practice makes perfect*".

Objectives. By setting out objectives a person is given a goal to aim for, this in turn gives them a benchmark by which to measure success or failure.

Activity. Behaviourists believe that people learn best when they are actively learning. This means that people learn by actually doing an activity and then by learning from their experience rather than being passive and non-interactive.

Reinforcement. Behaviourists believe that learning can be controlled by either positive or negative reinforcement. Praise and rewards will be given for success and punishments will be given for failure.

Behaviourism seems to have many limitations in that the study of how people learn focuses on introducing stimuli and then observing the resulting behaviour, it does not take into account the internal thought processes of the person being studied or the different cognitive styles that each person might adopt. The Victorian style of teaching was very much in the style of behaviourism with children learning by rote and being punished for mistakes made.

Whilst Behaviourists believe that the environment shapes the learning, Cognitivists believe that the human mind makes sense of the environment, that it is the interaction between the person and the environment that produces knowledge. Cognitivists believe that the mind interprets, shapes and calculates all of the external stimuli whilst internally processing, storing and learning. They believe that the mind interprets information and then is able to assign meaning to that information based on previous experience, or on possible expectations of what will happen.

Pickard (2002, p.80) believes that Cognitivism has its roots in the work that was carried out by John Dewey in 1916; she does go on to say, however, that "*it is Piaget who is generally seen as the driving force behind the cognitive approach to teaching and learning*". Piaget's background to science was initially focused on biology, although his interest in philosophy lead him to ask the question, how does knowledge come about? Piaget is very often referred to as a "*genetic epistemologist*", *that is one who attempts to get at the problem of the origin and*

development of knowledge" (McNally, 1977, p.2). Because Piaget was interested in finding out about how knowledge was acquired, he naturally focused his enquiry on children and pondered the question of, "*whether all cognitive information has its source in objects*" [or whether] "*the subject possesses from the start endogenous structures which it imposes on objects*" (Piaget, 1972, p.19). Piaget believed that from birth to the age of sixteen an individual will progress through different stages of thought processes, he is quoted by McNally as saying "*the individual progressively gives up erroneous ideas for more correct ones or, more correctly transforms initial inadequate ideas into higher-level more adequate conceptions*" (McNally, 1977, p.3) Piaget theorised that there were four stages that children went through until they reached equilibrium (equilibrium being adulthood). The four stages were defined as:

- Sensorimotor Stage – From birth to two years
- Pre-operational (a) Preconceptual or symbolic – two to four years
 (b) Intuitive or Perceptual – four to seven years
- Concrete operational – seven to twelve years
- Formal operational – twelve to fifteen years

Piaget believed that it was not possible for a child to skip from one stage to another without first passing through the intervening stage. Piaget's principle stated that learning could only become possible when a state of maturation and readiness had been achieved and that it was not possible for the child to incorporate new knowledge until this state was reached.

McNally (1977, p.12) states that Piaget's stages concept has been questioned on the grounds that it does not imply the often necessary fluctuations within a child's intellectual development and portrays the progression as a series of abrupt movements. Piaget was also criticised by Crook (1994) for neglecting to consider the social aspects of a child's development and how these might impact on the child's intellectual growth. While Tizard and Hughes (1986) believe that Piaget "*underestimated the role of verbal exploration – that is puzzling and thinking*" they go on to say that they believe he also underestimated the interest that children show "*in the social world of adults, and the role which adults can play in helping the child towards understanding through dialogue*" (p.254). Tizard and Hughes (1986) agree

with Piaget that a child's thinking will differ from that of an adult but they do not agree that children are incapable of "decentred" or "logical thinking"(p.254). Another Cognitive theorist that looked at the concept of social interaction in the context of learning theory was Lev Vygotsky. Vygotsky differed from Piaget in that he believed that development was grounded in social settings and that complex functions began as social interactions (Vygotsky, 1978). Vygotsky believed that a child's social interaction plays a major part in that child's cognitive development. Lee and Smagorinsky (2000, p.2) point to Vygotsky's principle that "*Learning is mediated first on the interpsychological plane between a person and other people and their cultural artefacts, and then appropriated by individuals on the intrapsychological plane*". Learning on an interpsychological plane can often involve the "learner" being involved with a more knowledgeable person, possibly a peer, elder or teacher. The knowledge is not simply handed down from one to another though as Newman, Griffin and Cole (1989, p.58) point out "*The appropriation process is reciprocal, and cognitive change occurs within this mutually constructive process. While instructional interactions favor the role associated with the teacher, we cannot lose sight of the continually active role of the child*".

Unlike Piaget, who believed that a child could not assimilate new knowledge until it had achieved a state of readiness, Vygotsky believed that in order for a child to internalise new knowledge the child had to first be shown knowledge that was unfamiliar and beyond its state of readiness. He also believed that learning was not finite "*Rather, the potential for learning is an ever-shifting range of possibilities that are dependent on what the cultural novice already knows, the nature of the problem to be solved or the task to be learned.*" (Lee and Smagorinsky, 2000, p.2).

Vygotsky argued that learning takes place within the Zone of Proximal Development (ZPD), Gordon Wells (2000, p.57) explains his understanding of the ZPD as "*the zone in which an individual is able to achieve more with assistance than he or she can manage alone*". Moll (2000, p.262) understands this to mean "*more capable others assisting less capable ones*" and that the more capable ones can be teachers or even peers. Pritchard (2005) states that "*Passing through the zone of proximal development is a process which can be aided by the intervention of another*" (p.31). In the wider context Moll (2000) sees this as a way in which "*human beings use social processes and cultural resources of all kinds in helping children to construct their futures*" (p.262).

Constructivists subscribe to the belief that *“learners construct their own knowledge from their experience, mental models and beliefs”* (Malone, 2003, p.61).

Constructivists believe that knowledge is relative rather than absolute and that new knowledge can, and indeed is, shaped by previous experiences. Although Constructivist theory has much in common with Cognitive theory, John-Steiner and Meehan (2000) point to critics such as Cobb and Yackel who believe that socio-cultural theory is *“unidirectional, focusing on the influence of social practice on individual thought”* (p.33) and that social and cultural sources will minimize the active development of the individual. While Ball (2000) believes that *“knowledge is temporary, developmental, internally constructed and socially and culturally mediated”* (p.230). The Constructivists train of thought is that every human is born with an innate knowledge upon which they later construct subsequent knowledge. Anderson (2005) believes that there are three general characteristics for acquiring skills, which are termed the cognitive stage, the associative stage and the autonomous stage. During the cognitive stage, the learner commits *“to memory a set of facts relevant to the skill”* (Anderson, 2005, p.281) which they then rehearse, mentally and physically. During the associative stage the learner does two things, *“first errors in the initial understanding are gradually detected and eliminated”* and secondly *“the connections among the various elements required for successful performance are strengthened”* (Anderson, 2005, p.282). The third stage of the process is the autonomous stage, *“In this stage, the procedure becomes more and more automated and rapid”* (Anderson, 2005, p.282).

Spelke (1991, p.134) found from her research with young infants that they do possess a skeletal innate framework on which to build further knowledge. This is contradictory to Piaget’s belief in a completely sensori-motor infant that is born with no innate knowledge of the world or its surroundings. It is predominantly this belief that differs between the Constructivist and Cognitivist theories.

Bandura (1977) states that psycholinguists disagree on the extent to which innate knowledge plays a part in human linguistics. Some, he points out, *“believe that the basic grammatical categories are biologically programmed and require minimal environmental input to be activated”*. Whilst yet others *“assume that people are innately equipped with information-processing capacities that enable them to discover the structural properties of language”* (p.176). Either way there are few who would disagree that social learning plays an important part in influencing the rate of language development and yet language also plays an important role in

learning. Vygotsky saw language as *“the primary mediator of knowledge for humans”* which he saw *“as both a socially communicative act and a medium for the internal organization of experience”* (Lee, 2000, p.192).

In recent years, a new approach is gaining popularity. Jarvis (2005) terms it the *“domain-specific approach”* (p.37). This approach suggests that different mental abilities develop independently of one another. Jarvis explains that *“a module is a structure in the brain designed to handle particular types of information”* and there is a module assigned for each domain of cognitive development, for example, language would be one module and social skills another. Fodor (1983) believes that cognitive development is entirely due to modules maturing at different times from one individual to another. He believes that this explains how some autistic children will have highly developed mathematical skills on the one hand, and very poor social and communicative skills on the other. However, Karmiloff-Smith (1995) argues that *“development involves a process of going beyond modularity”* (p.4) and argues *“for a more dynamic view of development than Fodor’s modularity of mind”* (p.5).

In a classroom situation Fosnot (1996) believes that the classroom *“is seen as a minisociety, a community of learners engaged in activity, discourse and reflection”* here the traditional role of the teacher changes *“as teachers assume more of a facilitator’s role and learners take on more ownership of ideas”* (p.ix). The idea that knowledge must be presented in a meaningful way so that learning can be contextual, is paramount to the Constructivist theory. Individuals are encouraged to take responsibility for their own learning and to test their understanding by talking and debating with others within their social setting. Constructivists also believe that the ability to learn is *“influenced by logic, emotion, intuition and motivation”* (Malone, 2003, p.61). One of the principles of Constructivism that differs from Behaviourism and Cognitivism is the belief that teachers are continually learning too as part of the teaching process. They are evaluating what their pupils are doing in the context of what they are being “taught” in order to gain insight into how they might improve the experience for their pupils. This *“calls for an approach to learning and teaching that is both exploratory and collaborative”* (Wells, 2000, p.61). From this perspective it seems that the role of the teacher is to enthuse and motivate children to take ownership of their own learning. Wells (2000) believes that there are *“a number of important implications for the way in which we think about learning and teaching”*

(p.60). He identified six points, which he feels are important to the production of a conducive learning atmosphere.

- *The classroom is seen as a collaborative community.* Each participant working towards a common goal.
- *Purposeful activities involve whole persons.* The learning process becomes about empowering the whole person not just as a means of acquiring new skills or information.
- *Activities are situated and unique.* Although there may be similarities between activities, each participant will bring a new and unique perspective that will affect the way in which the activity is played out.
- *Curriculum is a means, not an end.* The completion of the curriculum should not be the goal but more importantly the skills and knowledge that are achieved by the activities covered within the curriculum.
- *Outcomes are both aimed for and emergent.* Setting the intended goal of an activity is fine but the route taken to achieve the goal may lead to something as yet unforeseen which in turn may lead to the acquisition of new knowledge.
- *Activities must allow diversity and originality.* Solving new problems requires both individuals and communities to explore their diversity and originality, to think outside the box and to push the boundaries of what is accepted.

Whilst it is important to consider how the learning and teaching processes are set up it is equally important to consider what type of learner an individual is, as this will play a part in how that individual learns, this is something that teachers also need to take into consideration when thinking about how to teach information seeking skills to their students.

3.4 Learning Styles

“Learning is the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p.38).

In 1984, David Kolb developed a model of learning which has become known as Kolb’s Experiential Cycle. Kolb places “feeling” and “thinking” at either end of a continuum and maintains that it is not possible for a person to engage with both at the same time, that in the context of learning they must choose to feel or think. In the same way Kolb believes that it is not possible to watch and do at the same time, so these are placed at opposing ends of a continuum. However de Bono (1982) believes that *“in the end all thinking is emotional...In the end our decisions, choices and courses of action are all determined by emotions, feelings and values”* (p.99). Moon (2007) goes as far as to say that *“all human activity is influenced by and influences emotion”* (p.69).

Kolb’s experiential cycle was examined and a representation of the original can be seen as figure 2.

Figure 2 Kolb’s Experiential Cycle

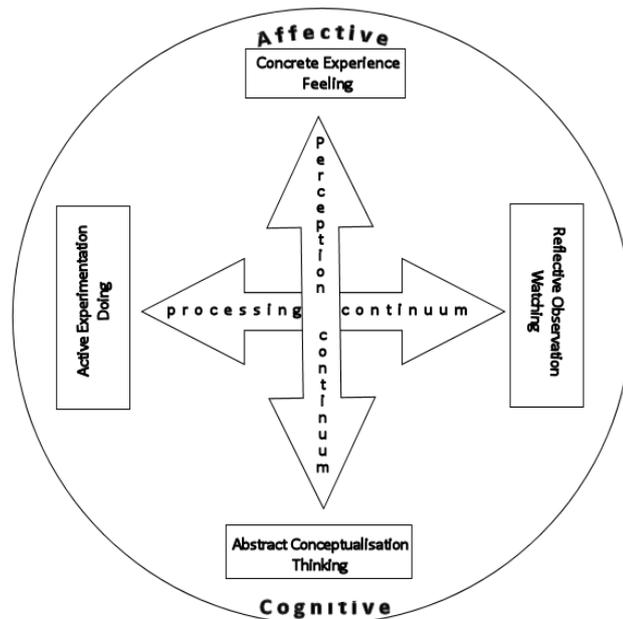


Figure 2 can be seen as a representation of Kolb’s Experiential Cycle (1984).

By using the basis of Kolb's experiential cycle and incorporating cognitive and affective characteristics, a rich picture offering a theoretical framework was created that takes into account influences upon the learner. Influences that may impact on the learning style adopted by the learner, such as self-efficacy, uncertainty, motivation and choice. These influences need to be considered by teachers in order to find the best way of facilitating and developing their student's information seeking skills. The diagram incorporating these influences can be seen as figure 3.

Figure 3 Kolb's Experiential Cycle Incorporating Cognitive and Affective Characteristics

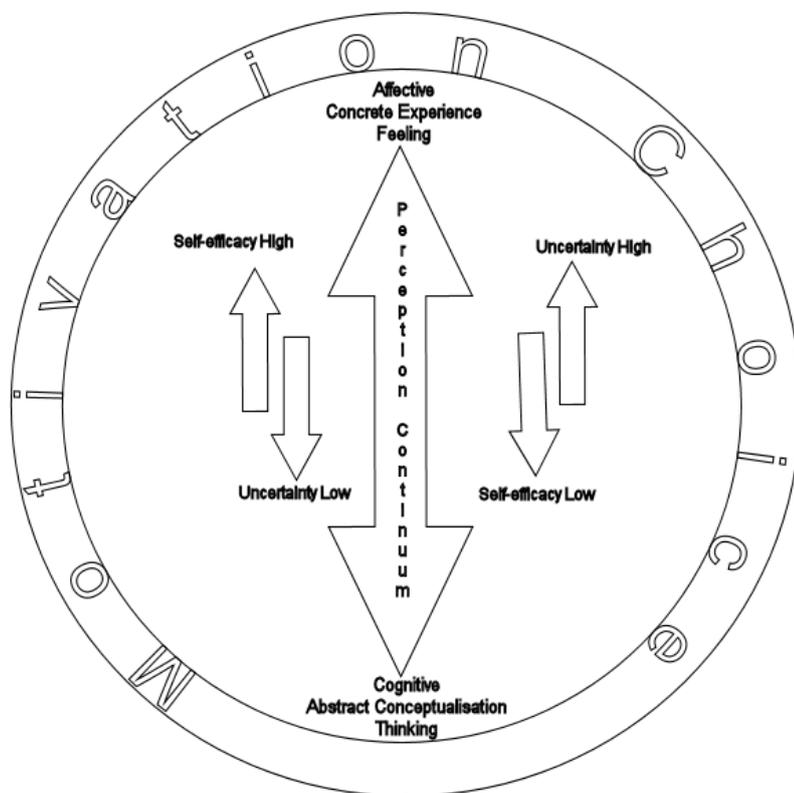


Figure 3 adapted from Kolb's Experiential Cycle (1984) incorporating cognitive and affective characteristics.

Self-efficacy and uncertainty are both characteristics that may influence the way in which a person learns. Whilst motivation is an affective characteristic, it can also be a cognitive characteristic, which means that it can be classed as an inhibitor as well as an accelerator to the learning process. When a learner wants to know more about a topic, then their motivation can be inspired by cognitive as well as affective characteristics. Teachers may motivate their students by offering a reward, this

may range from “*some public display of simple praise*” to “*an end-of-term treat or the awarding of a smiley-faced sticker*” (Pritchard, 2005, p.17). Motivation ties in with the behaviourist principle of repetition, where good work is rewarded.

Pritchard (2005) believes that choice has an impact on “*preferred learning styles which has a bearing on how learning progresses*” (p.54). He found that “*the level of engagement with an activity, and the quality of the work produced as a result is very high...when choice has been allowed*” (p.49). Research conducted by D’Ailly (2004, p.17) found that “*choice had no significant impact on children’s interest, effort, or learning outcome*”. However, Ryan and Deci (2000, p.70) believe that choice will intrinsically motivate because the learner has “*a greater feeling of autonomy*”. This was supported by the findings of Crow (2007, p.50) who found that

“When people have some choice in a task, they buy into doing it. When students help design their own projects, have input and choice in the topic, and are encouraged to ask their own questions as they investigate, they are more willing and interested—and they may learn more, too”.

Hepworth and Walton (2009, p. 78) state that “*the very process of making a choice tends to foster engagement with the process, encourages learners to think more deeply about the problem and gives them a greater sense of ownership of it*” Choice, like motivation can be a cognitive as well as an affective characteristic of learning, implying that it too can be an inhibitor as well as an accelerator to the learning process.

Extensive research has been carried out to investigate different types of motivation. Intrinsic and extrinsic motivation have been looked at in considerable detail and Ryan and Deci (2000, p.54a) believe that “*the distinction between them has shed important light on both developmental and educational practices*”. When considering the effect that motivation might play in children’s information seeking behaviour it is necessary to ponder not only the level of motivation but as Ryan and Deci (2000, p.54) term it, the “*orientation of that motivation*”. They explain that “*orientation of motivation concerns the underlying attitudes and goals that give rise to action*” (p.54) and go on to point out that the distinguishing differences of motivation are “*between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome*” (p.55). Deci and Ryan (1985, p.29) developed what they called “*Self-Determination Theory*”;

they suggest that *“intrinsic motivation will be operative when action is experienced as autonomous”*.

Roth et al (2009, p.1120) state that *“Autonomous motivation refers to acting with a sense of volition and choice”* whereas they believe at the other end of the scale there is amotivation. *“Amotivation refers to a lack of motivation and results from not valuing an activity, not expecting the activity to yield a desired outcome, or not feeling competent to do it”* (p.1120). Research carried out by Gottfried et al (2009, p.729) found that *“from childhood through adolescence, across varied populations, those with higher academic intrinsic motivation are more competent in school, evidencing significantly greater academic achievement, more positive perceptions of their academic competency, lower academic anxiety, and less extrinsic motivation”*. Extrinsic motivation was examined in research conducted by Flink, Boggiano and Barrett (1990, p.916) who set out to discover if *“students would show performance impairment when they were exposed to teachers who were pressured to maximize student performance level and who used controlling strategies.”* Their evidence suggested that *“performance impairment was evidenced when children were taught by pressured teachers who used controlling strategies and the absence of choice options”* (p.922). Crow (2007, p.49) points to the irony of this situation, whereby *“the pressure for schools to perform well on high-stakes tests may actually lead to teaching strategies that create unmotivated learners”*. Research discovered that when children perceived that they were having fun their motivation to learn increased. *“For the children engagement seems to derive from activities that give pleasure, choice or a degree of ‘freedom’ and authenticity”* (Stephen et al, 2008, p.26). This was also found to be the case for Meyers et al (2007) who found that *“designing study activities that engage children not only makes them less tedious for everyone involved, but it helps the children build meaning from the research experience”* (p.326). Whilst Pickard (2002, p.148) found that students were motivated to use electronic information resources because they *“related to the computer being fun to use”*. When faced with something new it is a human response to feel a degree of uncertainty, it is this degree of uncertainty that often motivates people to search for information.

3.5 Uncertainty

“Uncertainty is the critical link between information and decision-making” (Shannon and Weaver, 1949, p.224). It would seem that uncertainty is a key factor in spurring

people to undertake an information seeking activity; Kuhlthau (1993) believes that *“Uncertainty is a cognitive state that commonly causes affective symptoms of anxiety and lack of confidence”* (p.124), she goes on to say that this is to be expected during the early stages of the information seeking process. Wilson et al (2002, p.713) suggest, *“that uncertainty may have both affective and cognitive dimensions”* they found in their study that affective uncertainty was associated *“with the other affective dimensions, such as pessimism/optimism”* and that cognitive uncertainty was associated *“with more rational judgements”* (p.712). Whereas de Bono (1982, p.99) believes that *“all thinking is emotional”*.

In 1991, Kuhlthau studied uncertainty in the context of high school children’s information seeking behaviour and found that they went from uncertainty, confusion and frustration to clearer more focused thoughts with increased confidence and certainty. Wilson (1999a) developed a model which he called his *“problem resolution chain”* which looked at *“uncertainty reduction”* in the context of models of user behaviour, his study looked at how users move from *“problem identification”* (recognising that there is a problem) to *“problem definition”* (what type of problem is it?) to *“problem resolution”* (p.841) (this is the answer to the problem) and finally if the problem is theoretical then (this is the way to deal with the problem). All of these steps lead the user from a state of uncertainty to a problem solution which should result in the user feeling more certain and confident. These steps were developed with adults as the information user and this may explain why children do not always fit into these patterns of user behaviour; possibly, children do not fully understand the problem that they are trying to solve, or they do not understand the best way to find what they need to know. Levels of uncertainty seem to vary from individual to individual. Not only does it vary within individuals but one person may exhibit varying levels of uncertainty depending on what they are looking for. One determinant of the level of uncertainty may be influenced by feelings of self-efficacy.

3.6 Self-Efficacy

Albert Bandura (1997) defines self-efficacy as being the *“beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments”* (p.3). Bandura (1986) believes that a person bases their self-knowledge of personal efficacy on four sources of information *“performance attainments; vicarious experiences...verbal persuasion and allied types of social influences”* (p.399), such as their perceived strengths and weaknesses and the

judgement they hold about their capabilities. Performance attainments when successful will heighten feelings of self-efficacy whereas continual failure will lower them. Vicarious experience can influence self-efficacy. An observer may believe *“that they too possess the capabilities to master comparable activities”* (p.399), however this can also have the effect of lowering a person’s self-efficacy if they witness other people failing despite trying hard. Verbal persuasion can contribute to raised levels of efficacy especially when the person being persuaded has *“some reason to believe that they can produce effects through their actions”* (p.399). Bandura found that *“the more the encouraging feedback in-stills efficacious self-beliefs, the more effort children exert and the more they accomplish”* (p.406). Schunk (1981) found that children who demonstrated low levels of self-efficacy when faced with problems were found to give up on tasks more easily, he believed that *“children’s self-perceptions of their capabilities have an important effect on their subsequent achievements”* (p.104). Kurbanoglu (2003) found a positive correlation between students self-efficacy regarding information literacy and their literacy using a computer and states that *“self-efficacy perception is essential not only for self-regulation but also for information literacy to accomplish lifelong learning”* (p. 638). Schunk and Hanson (1985) believe that *“Self-efficacy can influence choice of activities, effort expended, persistence, and task accomplishments”* (p.313). In short as children’s skills grow, so too do their perceptions of their capabilities, this in turn raises their levels of self-efficacy. If children possess high levels of self-efficacy then they are quickly able to minimise feelings of uncertainty, however if children possess low levels of self-efficacy then they do not expect that they will be able to overcome whatever challenge faces them and so they remain uncertain for longer. This is demonstrated in figure 3 which explains that when feeling of self-efficacy are high, levels of uncertainty are low and conversely when feelings of uncertainty are high, levels of self-efficacy are low. Whilst self-efficacy plays a part in how children approach tasks, the way in which they choose to learn also plays a part. Every individual has a preferred pattern of learning which helps them make sense of what they are learning.

3.7 Patterns of Learning

All individuals have their own cognitive styles. The way information is internalised, sorted and stored will be as unique to each individual as a fingerprint. While the cognitive style of each individual will not necessarily change, the approach they may employ to finding information may vary vastly depending upon the type of

information need the individual has. Entwistle and Ramsden (1983) and Marton, Hounsell and Entwistle (1984) conducted research into how high school and university students approached specific learning tasks and they discovered what they identified as three learning strategies which they categorized as “surface”, “deep” and “strategic” learners. Entwistle’s (1988) first pilot study set out to confirm Marton’s previous research “*that approach to learning was related to the outcome of learning*” (p.27).

3.7.1 Surface Learners

The predominant motivation for students that adopt the surface style of learning is identified by Entwistle (1988) in collaboration with Newbie as “*Concern with the completion of the course [and] fear of failure*” (p.46). Their intention is to reproduce the information in order to fulfil the assessment criteria. Entwistle believes that the students who adopt this method of learning will adopt the process of learning by rote to memorise facts and ideas but focus on these ideas and facts in isolation. If the learning is passive they will have little or no understanding of the topic and may be able to (at best) recite a few unimportant details. If their learning is active, Entwistle believes that the student may have a superficial understanding of the topic.

3.7.2 Deep Learners

The predominant motivation of the deep learner is “*interest in the subject matter [and] vocational relevance*”. Their intention is “*to reach a personal understanding*”. Entwistle (1988) believed that the deep learner would choose to adopt one of three learning processes. One he termed “operation learning” this may have led the student to examine the evidence and possibly learn some aspects by rote. This process he believed lead to “*an incomplete understanding based on detailed knowledge of relevant facts with little integration with broad principles*”. The second process he termed “comprehension learning”. This process allowed the student to understand the concepts but also led to “*incomplete understanding based on relationships between ideas unsupported by evidence*”. The third process was termed “versatile learning”. This process meant that the student related evidence to ideas and the outcome of adopting this process was a “*deep*”

level of understanding [which] integrates principles with facts [and allows the student to] use evidence to develop arguments (p.46-47).

3.7.3 Strategic Learners

The strategic learner appears to adopt a combination of the surface and deep learning strategies. Entwistle (1988) believes their predominant motivation is the *“achievement of high grades [and] competing with others”*. Their intention is to be successful adopting whatever means are necessary. The process that the strategic learner adopts will depend on their perceptions of what will produce the highest grades, they may adopt an operation learning approach or a comprehension learning approach or possibly even learning by rote. The outcome of adopting this style of learning process is *“variable level of understanding depending on what is required by course requirements and methods of assessment” (p.46-47).*

Jarvis (2005) points to the beliefs of Weinstein and van Mater Stone who see strategic learners as having four key areas of knowledge *“awareness of individual characteristics as a learner, understanding of the demands of different academic tasks, knowledge of successful tactics for different learning tasks and situations, and awareness of contexts in which knowledge could be applied” (p. 88).*

It is important to note that external influences such as the time allowed for the completion of a piece of work, the size of the project, or even access to the relevant information may have an impact on the type of learning strategy that an individual adopts and that under different circumstances they may choose a completely different learning strategy.

A learning style model known as VAK (Visual, Auditory and Kinaesthetic) is used to describe how people prefer to learn. Visual learners learn by being shown, this might include pictures, diagrams, films, demonstrations, displays, flip-chart, handouts, or any other type of visual stimulation. Auditory learners learn by being told, or by listening to themselves or others. Kinaesthetic learners learn by doing, this might include physical experience such as touching, feeling, holding, doing or practical hands-on experiences. Teachers are becoming aware that they need to incorporate all of these

different learning styles into their teaching in order for every child to be given the best chance of making sense of the information they are receiving.

3.8 Differentiation

Understanding that young learners have different learning preferences ensures that teachers are able to cater for their pupils learning needs. However, it is not simply a case of teaching the same thing in different ways, teachers now need to ensure that they pitch the level of their teaching so that they provide pupils with information that is neither too hard nor too easy. Teachers now need to differentiate their lessons so that able pupils are challenged and less able pupils are supported. In doing this, teachers ensure that every child is able *“to achieve their potential”* (Every Child Matters, 2003). Convery and Coyle (1999, p.4) point to their definition of differentiation from 1993, which states that differentiation is *“...the process by which teachers provide opportunities for pupils to achieve their potential, working at their own pace through a variety of relevant learning activities”*, or as Kerry (2002, p.81) puts it *“Differentiation is the process whereby the levels of tasks set to students in class or for homework are matched to the known levels of performance and potential of the individual students involved”*.

O'Brien and Guiney (2001, p.x) state that the term differentiation has *“been around in teaching and learning systems for many years”* they go on to warn teachers about devaluing and rejecting the concept of differentiation as being another *“buzzword”*. Kryza et al (2009, p.15) believe that teachers can *“recognise that our students are all different, then continue with the one-size-fits-all teaching we've always done...or we can recognize and respond to those differences”*. Acknowledging these differences requires teachers to differentiate their lessons based, not only on the abilities of their pupils but by matching the pupil to the classroom activity. Convery and Coyle (1999, p.6) believe that teachers need to organise differentiated learning in a variety of ways, such as by outcome, text, task, interest, support, teaching style and learning style as well as by ability.

Teachers can differentiate by outcome, whereby pupils work on a differentiated worksheet where *“some students may complete one or two of the tasks, ticking boxes or completing gap-filling exercises, whereas other students may work quickly through the initial tasks and tackle the more open-ended tasks”* (Convery and Coyle, 1999, p.7). The importance of giving learners a degree of choice is also

raised as a means of differentiating lessons *“learners who are given the opportunity to study something they are really interested in will be more highly motivated”* (Convery and Coyle, 1999, p.9). Lessons can also be differentiated by support. Pupils working together in groups free up the teacher to work with each group in turn. However, by carefully selecting students to work together, the teacher is able to differentiate the support, by encouraging pupils to support each other. This type of support is known as scaffolding and can be used as a very effective tool to promote learning within the classroom.

3.9 Scaffolding and Peer Assisted Learning

Scaffolding is a process whereby assistance is available for learners. Scaffolding support can be provided to a learner either by a teacher or by a peer. In the beginning, the teacher or peer provides help and support, as the pupil needs it.

“Where the learner fails, the level of teacher intervention increases; as they succeed, the level of intervention decreases” (Jarvis, 2005, p.31).

Day and Cordon (1993) found from their research with third graders that achievement of tasks was higher when scaffolding help was present than when it was not. Pickard (2008, p.175) found that *“the acquisition of information skills appeared to be enhanced by peer interaction”*. In fact, for some young learners, being supported by a friend gave them an added confidence. Pickard (2008, p.175) offers evidence of this as she explains that one student *“preferred to work with her peers; she did not always need their input but it gave her confidence to know they were there”*. Research conducted by Coltman et al (2002, p.48) found that children learned *“more effectively through carefully structured joint activity with ‘experienced others’”*. Peer assisted learning can be a powerful tool that teachers can utilise to encourage and facilitate peer collaboration. Topping (2001) believes that *“Peer-assisted learning is one of the most effective methods in education”*. Research conducted by Tsuei (2009) with ten and eleven year old children in Taiwan found that *“They give and receive help, share knowledge, build on each other's ideas and recognise and resolve contradictions between their perspectives and those of other students that emerge during peer learning”*.

Peer assisted learning can be used to support learners in different types of ways, for example, research conducted by Rojas-Drummond and Mercer (2003, p.99) sought to develop a *“practical method for promoting children's effective collaboration, communication, reasoning and learning”* their research investigated *“exploratory*

talk” whereby children were encouraged to *“engage critically but constructively with each other’s ideas”*. Rojas-Drummond and Mercer (2003, p.102) felt that being able to engage in exploratory talk was of great benefit to the children in their study as they believe it *“embodies a valuable kind of ‘co-reasoning’, with speakers following ground rules which help them share knowledge, evaluate evidence and consider options in a reasonable and equitable way”*.

The Social Pedagogic Research into Grouping (SPRinG, 2010) project found that *“In same ability groups (high or middle only) pupils can push each other and come up with ideas that neither would be able to think of alone. But it is well known that low ability groups are unlikely to be successful as there is nowhere for new ideas to come from”*. However, they go on to explain that *“Pupils become demotivated and believe that little can change if their position as ‘low attainers’ is regularly reinforced. Planning that varies groupings is helpful. Mixed-ability pairs and groups can help one another”*. Pairing of mixed ability groups resonates with Vygotsky’s (1978) theory of the “Zone of Proximal Development” whereby more experienced peers are able to help the less experienced. Pickard (2004, p.129) found from her research study that *“peer interaction takes place as a naturally occurring phenomenon”* where the interactions observed were *“rarely, if ever, artificially instigated”*.

Whilst acknowledging the importance of external influences such as lesson differentiation and peer support and scaffolding on an individual’s learning strategy it is also vital to consider the skills they need to employ when implementing their strategy. The skills that an individual chooses to utilise may mean the difference between finding information or not. Developing skills and strategies for finding information leads to a person becoming information literate.

3.10 Information Literacy

The Chartered Institute of Library and Information Professionals (CILIP, 2008) define information literacy as *“knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner”*. Hepworth and Walton (2009, p. 3) believe that *“empowerment is underpinned by information literacy”* and they go on to say that being information literate means *“being able to learn effectively and independently and use the knowledge, data and information”* will result *“in people having more choice”*. More choice means that people are *“usually better informed about their situation and can see alternatives in*

a critical light" (Hepworth and Walton, 2009, p. 3), which allows them to "choose from or create a range of solutions or strategies". Whilst Information literacy seems to be a term that is mostly used within the field of Library and Information Science (LIS) it is not yet widely used within an educational context in the English/Welsh education system, having said this, Secker, Boden and Price (2007) believe that IL "is probably more developed among the library profession in higher education (HE) than in other sectors" (p.123) and considerable research into how people look for information has been conducted in the area of higher education. It is important to note that the Government places huge importance on the way in which numeracy and literacy skills are delivered to primary school children, to the point where frameworks for delivery of these two core subjects have been developed and implemented in classrooms across the country. However, at the present time, it appears that very little importance is attached to information literacy skills at this educational level and yet the importance between learning and information literacy cannot be understated if being information literate equals empowerment. Literacy and information literacy appear to go hand in glove as demonstrated by McTavish (2009, p. 25) who believes that teachers need "to know and understand some of the multifaceted ways in which literacy connects with learning" and how teaching literacy skills now need to take into account teaching information literacy skills and believes that students need to develop "repertoires of literate practices ... in terms of the media, modes and languages required for living in a globalized world" (p. 24).

The government's national curriculum website lists what it terms as "thinking skills" for KS2 children, which are embedded into the national curriculum. The list includes information-processing skills, reasoning skills, enquiry skills, creative thinking skills and evaluation skills. Smith and Hepworth (2005, p.46) point out that the term "information literacy" is not explicitly used in the National Curriculum. To bear this point out, nowhere on the national curriculum website is it possible to locate the term "information literacy". Indeed when Shenton and Beautyman (2009, p.61) approached the Department for Children, Schools and Families with a request for information on national policies or frameworks dealing with information literacy, the letter's recipient believed "the query referred to 'information about literacy'". However, the above mentioned "thinking skills" suggest that the government is aware of the need for KS2 children to be literate in seeking information, reasoning skills, enquiry skills, creative thinking skills and evaluating skills, all of which would suggest that whilst information literacy is not categorically stated in the national

curriculum, teachers and policy makers alike are cognisant of the fact that these skills are necessary in order for children to achieve their potential.

In order to gain a deeper conceptual understanding of information literacy, it is necessary to examine several theoretical frameworks. Whereas in England and Wales importance is placed on literacy and numeracy frameworks, in the United States the importance seems to be placed more on information literacy.

For example, many schools in the United States have adopted the Big6 and super3 frameworks. In 1987, Berkowitz and Eisenberg developed what they termed the Big6. The Big6 sets out a series of steps that a student needs to engage with in order to successfully solve an information need. Each of the six steps is broken down into two sub-divisions.

The first step is task definition, in this step the students are asked to define the information problem and then to identify the information they will need. The second step is developing information seeking strategies, the students are encouraged to determine all possible sources and then to select the best sources available to them. The third step in the process is to locate and access the information, in this step students need to physically and intellectually locate the information sources and then find the information they require within those sources. The fourth step is to use the information, for this step students need to physically engage with the information, for example, read, touch, view or hear it and then they need to extract the information that is relevant to their need. The fifth step is to synthesis the information, the students are required to organise information from possibly multiple sources and then present the information. The final step is to evaluate the information, the two steps required of the students to complete this stage of the process are that they need to judge how effectively they have completed the previous tasks and how efficiently they have completed them. Berkowitz and Eisenberg also developed the super3 template, which is a simplification of the Big6 framework. The super3 uses simpler language and concepts for younger children. There are three steps in the super3, which are to plan, do and review. The idea is to get the children to think about information, where it comes from, what you need it for and then to evaluate it at the end of the process.

In 1994 another framework of information literacy was developed by Christine Bruce which she termed the "Information Literacy Blueprint" within the framework she

identified seven key characteristics of an information literate person, which can be seen as figure 4.

Figure 4 Information Literacy Blueprint

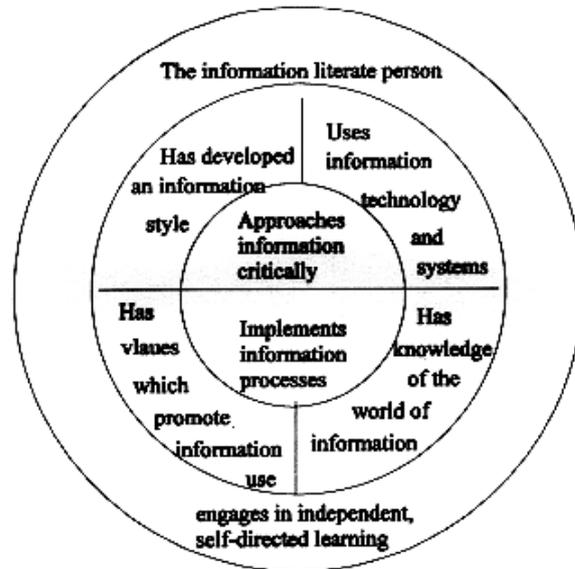


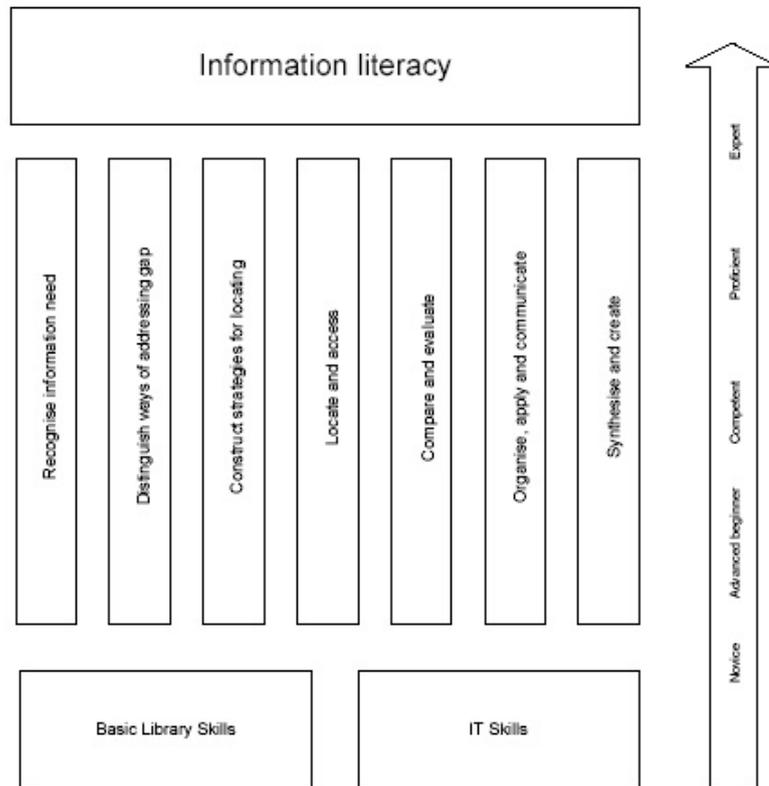
Figure 4. Bruce's (1994) characteristics of an information literate person.

Bruce Identified that an information literate person:

- *engages in independent, self-directed learning*
- *implements information processes*
- *uses a variety of information technologies and systems*
- *has internalised values which promote information use*
- *has a sound knowledge of the world of information*
- *approaches information critically*
- *has a personal information style which facilitates his/her interaction with the world of information*

Then in 1999 the Society of College, National and University Libraries (SCONUL) developed an information literacy model, which can be seen as figure 5

Figure 5 SCONUL (1999) Information Literacy Model



The seven pillars highlight the steps necessary for a person to become information literate. *“The ‘pillars’ show an iterative process whereby information users progress through competency to expertise by practising the skills”* (SCONUL, 1999). It may be possible for a person to become expert in one pillar whilst still being a novice in another. SCONUL believe that basic library skills and IT skills are the fundamental building blocks upon which information literacy is based. They do stress that the first four pillars are what undergraduate students should be aiming to achieve, *“whilst postgraduate and research students will aim to be towards the expert end, and will be aspiring to the seventh”*.

The research relating to both SCONUL’s seven pillars of information literacy and Bruce’s Information Literacy Blueprint was conducted by investigating higher education students, which supports Secker, Boden and Price’s (2007, p.123) argument of information literacy being more developed in the library profession of higher education than other sectors. The need for children to develop sound information seeking strategies was first explicitly stated by Lubans as far back as 1978. He recognised the significance of information seeking skills in education and

believed that once a child had developed a sound research strategy then there was no other part of their academic curriculum that they could not go and find out about. Utilizing technology may be one answer to encouraging youngsters to engage with the skills they need.

Rather than being discouraged from over-dependence on the internet, what learners need are the tools to allow them to use the internet to their best advantages, these tools are not ICT skills, navigating a keyboard is vastly different from navigating the choppy waters of cyberspace. Information Literacy is the key to efficient and effective use of the vast store of information now available to anyone with internet access”
(Pickard, 2008, p.170)

A study carried out by Kuiper, Volman and Terwel (2008) looked at *“the need for incorporating Web literacy, or, more broadly speaking, information literacy”* into the school curriculum. Their study found that student’s lack *“adequate search skills, as well as the necessary skills for critical evaluation of Web information”*.

BECTA (2008) also believe that *“teachers should critically evaluate websites when selecting resources for use in the classroom, and pupils should also be taught the value of this process as part of their core digital literacy skills development”*.

Williams and Wavell (2007) conducted an investigation into secondary school teacher’s conceptions of their student’s information literacy. Their study found *“that overemphasis on mechanistic skills development without local debate and understanding hinders the alignment of information literacy with independent and lifelong learning”* (p.199). Williams and Wavell acknowledged that teacher’s understood the complexities of learning and information literacy but *“tended to discuss information literacy development as separate from subject content”* and did not necessarily connect the two.

Making the connections between information literacy and learning appears to be an area that would warrant closer scrutiny, yet it seems that there is a paucity of literature regarding this subject in the context of children and the development of their information literacy skills. One reason for this may be because *“information literacy is not greatly developed amongst school children”* (Hepworth and Walton, 2009, p. 30). Hepworth and Walton (2009) investigated the teaching of information literacy and explored some of the theories surrounding learning. They surmised that *“learning is an incremental process”* and that teachers need to *“have a clear*

understanding of what learners already know". In order for learners to acquire new knowledge they must *"build gradually on pre-existing knowledge"* (p. 50). However, they acknowledge that *"young children are likely to find the relatively abstract process of 'defining an information need' difficult because they have not fully developed their language ability"* (Hepworth and Walton, 2009, p. 44). A reduced vocabulary would seem to impede the information seeking process, especially in an electronic environment, where *"the computer, generally, depends on the user to think of terms to search for"* (p. 44). Smith and Hepworth (2007) found that school children saw information as something that was given to them in order for them to complete a task rather than an exercise that they needed to engage with. Having said that Epstein (2008, p. 40) believes that *"young children are capable of planning and reflecting, key aspects of critical thinking"* she goes on to say that *"children begin with a goal and decide where to work, what materials to use, how to manipulate them... When reflecting, children do more than remember what they have done: They apply the lessons learned"*. Heider (2009, p. 517) believes that even *"preschool students are capable of developing the critical thinking skills they will need to become lifelong learners"*, this being so then it begs the question why it is that information literacy skills are not explicitly being taught in schools in England and Wales? The need for students of all ages to develop sound information literacy skills in order to become lifelong learners would seem to be fundamental to coping with the vast range of information available, (Kuhlthau, 1991, Grey, 2000, Herring, 2004, Epstein, 2008, Heider, 2009, Hepworth and Walton, 2009, Chu, Tse & Chow, 2011) therefore the importance of the link between learning and information literacy needs to be a message that is clearly sent out to Governments, Local Education Authorities and practitioners in order for these crucial life skills to be taught to our children.

Information literacy is not just for students though, the Alexandria Proclamation (2005) states that *"Information Literacy lies at the core of lifelong learning"* and teaching the skills that allow people to become lifelong learners must be one of the founding principles of information literacy.

The available literature for Information seeking and Information literacy seem to differ somewhat with IS usually written from the perspective of the user or the learner as with Kuhlthau (1991 & 2004) and Limberg (1999) and IL from a teaching perspective as with Bruce (2000). That these two areas are treated and even viewed from such different perspectives may be cause for deeper investigation, as

Limberg & Sundin (2006) point out *“An understanding of information literacy would benefit from being based on an understanding of information seeking: information seeking and information literacy are two sides of the same coin”*.

Bowler et al (2001) say that *“simple fact-finding skills will not suffice in the knowledge society.”* They go on to say that *“in order for learners to be critical users of information and creative producers of knowledge, they must have opportunities to use information creatively and effectively in order to gain a deeper understanding of it”* (p.205).

Matthew Lipman was originally a university philosophy professor in the United States; Lipman became increasingly unhappy at what he saw as poor thinking skills in his students. It was his opinion that something was wrong with the way his students had been taught in school when they were younger. He realised that they had been *“encouraged to learn facts and to accept authoritative opinions, but not to think for themselves.”* [DfES Standards site, 2008]. Bent and Stockdale (2009) found that even 2nd year university students assignments still frequently referenced websites. Bent and Stockdale believed that as professionals, they had *“probably failed to encourage the students to find and make sense of scientific, rather than popular literature”* (p.45). Keene et al (2010) also found that *“there was still a tendency for students to rely heavily on websites, many of which were of questionable quality”* (p.7). But is it fair to expect a level of information literacy when students get to university? If they have not been shown these important skills earlier in their academic lives are they meant to somehow acquire them *“from an academic community by osmosis”*? (Bent and Stockdale, 2009, p.44). Crawford and Irving (2007, p.23) believe that *“Information literacy needs to be explicitly included as a key life skill in the learning and teaching that takes place in school”*.

Little wonder then that with academics and library practitioners the world over, bemoaning the information literacy skills of their students, it becomes necessary to investigate how and what information literacy skills are being taught to children at the start of their academic journeys.

Lipman believes that children are natural philosophers, *“in the sense that they view the world about them with curiosity and wonder. That is all that is needed as a starting-point for enquiry, which can legitimately be termed 'philosophical'”*. Pickard et al (2010, p.i) believe that *“search habits tend to be formed early in the*

educational process” so teaching good information literacy “habits” early in a child’s academic journey would seem to be the way forward. Encouraging children to develop their innate curiosity, to ask questions, rather than just learn facts would be a step towards fostering the important critical thinking skills that children need to develop in order to become critical and independent lifelong users of information. Dubber (2008, p.3) believes that *“Cultivating curiosity in our young children is one of the most important things that we can do for them”*.

The first step would be to introduce the children to basic information seeking skills. Grey (2000) explains that *“the best balance of learning comes from an initial teaching of basic information skills followed up by these skills being used in the context of subject teaching”* (p.72). In this way, children are learning how to find information and developing their information seeking skills whilst they are learning a particular subject. Herring (2004) explains how one of the key aspects of teaching information skills to students is to first teach them how to evaluate the information that they have found. Herring looked at how selected schools provided guidance for their students when it came to evaluating information that the students had found on the web and he encouraged the staff to look at the ways in which they utilised their own information seeking skills to locate and evaluate information. In today’s learning environment teachers are being called upon to integrate the teaching of information literacy skills alongside IT skills into the regular curriculum (Kuhlthau, 2004, Scott & O’Sullivan, 2005).

In order to help children to become information literate it is necessary to consider how they interact with information. However, in order to do this it is first necessary to attempt to get to grips with some of the terminology that is used when discussing children and information.

3.11 Children and Information

As previously stated, there are many different terms used to describe how children interact with information, for example terms like “Information Literacy” (IL), “Information Seeking Skills/Strategies” (ISS), “Information Seeking Behaviour” (ISB), “Information Seeking Processes” (ISP) and even “Information Communication Technology” (ICT) are used. Very often these terms are used interchangeably which can lead to confusion. This point is confirmed in the findings of Probert (2009, p.28) who discovered that *“there appeared to be some confusion with ICT*

skills and information literacy skills” with 25% of her participants believing that ICT skills and information literacy skills were the same thing and a further 27% that were not sure.

There is a good deal of crossover between the definitions of these terms, for example Information Literacy is defined as “*the set of skills needed to find, retrieve, analyze, and use information*”(American Library Association, 2008), these set of skills are the “Information Seeking Skills” that children need to develop if they are to become “Information Literate”. The North Central Regional Educational Laboratory Association (2008) define Information Literacy as being “*the ability to evaluate information across a range of media; recognize when information is needed; locate, synthesize, and use information effectively; and accomplish these functions using technology, communication networks, and electronic resources*”. For children, mastering these “*technology, communication networks and electronic resources*”, would seem to fall within the bounds of Information Communication Technology (ICT). The terms “Information Seeking Processes” (the systematic series of actions directed to some end) and “Information Seeking Strategies” (a plan, method or series of manoeuvres for obtaining a specific goal) could well be describing how the children think about getting the information, whereas the term “behaviour” in the context of children and information would suggest that the means of gathering information has become a pattern.

Preparing children to become independent lifelong users of information means equipping them with these skills which will allow them to make informed decisions based on the evidence they have available to them. The first step in this process is identifying that a need exists.

3.12 Information Needs and Wants

There has been much research conducted into how a person may recognise an information need and how they would go about satisfying that need. Researchers such as Choo (2000), Ellis (1989), Ellis et al (1993), Fourie (1995), Kuhlthau (1988 & 1993), Marchionini (1989), Pitts (1994) and Wilson (1999b) have all researched differing aspects of information seeking behaviour whether it is in the context of developing models of information seeking behaviour, Ellis (1989) and Ellis et al (1993), Kuhlthau (1988 and 1993), and Wilson (1999a) or studying the information strategies of the users, Choo (2000), Fourie (1995), Marchionini (1989) Pitts (1994) and Westbrook (1993). Marchionini and Kuhlthau both conducted their

research by observing the information seeking patterns displayed by children. However, even the terms “need” and “want” are subject to debate. Many authors have attempted to define the difference between the two terms. Chatman and Pendleton (1995) believe that the absence of a need may put *“our current state of affairs in jeopardy”*, whereas a want simply leads to an *“enhancement”* that would provide *“an added benefit if we possessed it”* (p.136). Whereas Roberts (1975) states that

“a “need” may or may not be a “want”; a “want” may or may not be a “need”. Both a “want” and a “need” may be appropriate, or inappropriate, to an individual’s information situation and may or may not be expressed in some consequent form of demand action” (p.309).

It would seem that the two terms are used interchangeably which can often lead to confusion. When a person states that he or she “needs” something this can be contested, however if they state that they “want” something then who is to say that they do not?

Melissa Gross (2006) explains the discrepancy of need and want by referring to goals. She argues that when a person expresses a need, they are motivated to achieve a goal, however, *“when we say we want something it is a statement of how we feel, and our feelings do not need goals to substantiate them”* (p.24). This argument is backed by Brown (2004) who outlines that a child who has been set a school assignment may need information to satisfy an academic obligation yet *“have no interest in the topic at all”* and does *“not personally really want the information”*.

Walter (1994) asserts that children, with their limited *“experience of the world, lack the frame of reference to articulate many of their most pressing information needs. Adults must articulate those needs for them”* (p.113). Green (1990) questions how ethically sound it is for one group to define the information needs of another group, *“there are grounds for viewing with suspicion the view that the professional or expert should be the only identified and arbiter of needs”* (p.69). However, in the context of young people, Abbas (2005) believes that it is important to guide children towards *“age-appropriate and topic-specific materials”* so that they can *“search with less time and less confusion”* (p.1515). Beautyman and Shenton (2009, Appendix 6, publications) looked at when a school inspired need for information became a

“want” for information and found that the teacher played a critical role in the children’s information seeking processes.

With the enormous amount of information available today at the push of a button, teaching children to develop sound information seeking strategies has never been more important, as pointed out by Todd (1998) who believes that *“empowering learners to be creative, critical and constructive users of information is a key challenge in today’s classroom”* (p.17).

The first three points of the ICT National Curriculum (2006) desired outcomes state that children *“talk about what information they need and how they can find and use it”* and then go on to *“classifying it and checking it for accuracy”* and then finally to *“interpret information, to check it is relevant and reasonable and to think about what might happen if there were any errors or omissions”*. Grey (2000) explains that *“the best balance of learning comes from an initial teaching of basic information skills followed up by these skills being used in the context of subject teaching”* (p.72). However, Kuhlthau (1991) feels that schools should interact more with pupils and encourage the pupils to interact more with teachers and other students to develop their information researching skills so that they are better able to interact with information resources.

Lawson and Comber (2000) found that the traditional role of teachers was changing and that one of their roles now was *“to give students the skills to evaluate the usefulness and appropriateness of particular items of information”* (p.427). It is necessary to acknowledge that parental input into children’s information seeking behaviour can play a significant part, however, parental contribution falls outside the remit of this research study and was not considered in any great depth. Back in 2001 the then, Secretary of State for Education, Charles Clarke explained his vision for schools that are *“confidently, successfully and routinely exploiting ICT alongside other transformational measures. By doing so they will be delivering an education that equips learners for life in the Information Age of the 21st century”*. Empowering children to become independent, autonomous learners will prepare them for the skills that they will need when they go out into the workplace, the National Association of Advisors for Computers in Education (NAACE) (2001) believe that *“Schools can impart the knowledge, teach the methods and routines, and develop the skills and competencies in formal settings”* (p.3)

In order to better understand how children interact with information it is necessary to look at previous research that has investigated children in the context of information seeking.

3.13 Information Seeking

Shenton and Dixon (2003) did a comparative study of how youngsters use CD-ROMs and the internet as information resources. Shenton and Dixon looked at the information needs that the children had and what responses they employed to meet those needs. The study showed that the children were generally surface learners; they retrieved sufficient information to satisfy their immediate need as long as it did not inconvenience them too much. Pickard (2002) found that the students she studied rarely expanded their search to investigate above and beyond what they had been told to do, *“If the homework requested ten facts, then they identified ten facts and made no effort to investigate this any further”* (p.132). Shenton and Dixon (2003) were surprised that none of the children attempted to verify as correct any of the information that they had gathered, either on CD-ROM or the internet. This is a point that was noted by Bilal (2002), she also comments on the fact that children do not plan their search strategies but that most times they simply browsed for the information, and find no need to verify what they have found. Schacter et al (1998) made the same observation, the study found that although children could operate the systems they were using, they seemed to lack the skills necessary for seeking information and they didn't appear to understand the concept, *“they don't plan their searches or employ systematic search strategies”* (p.841). From the research, Schacter et al concluded that the internet may not be the best place for children to search, *“children need to be educated in planning searches, organising and structuring so that they can use it in a purposeful way”* (p.848).

Cooper (2002) studied the information seeking behaviour of a group of 7 year olds and she found that their preferred method of information seeking was to browse for information, one reason that she gives for children adopting this type of search strategy is

“Children in the early stages of concrete operational development tend to rely on visual information if it is available to them rather than using textual information.” (p.904-922)

Before children are able to read they find out about the world around them by looking and asking questions, it is this habit of looking for information and

responding to visual stimuli which prompts them to search visually rather than searching text based information systems which they may or may not understand.

Bilal (2002) came to the same conclusion, however she suggests that system designers should re-evaluate search engines so that they are more able to support the children's information seeking habits. This very same point was raised by Large et al (1999), who asked the questions

“Do systems that have been designed for adults work just as well for children? Should cognitive skills and knowledge bases of children demand information systems that have been designed with them in mind?” (p.31).

In 1993 Solomon conducted a study which looked at and tried *“to understand the variety, uncertainty and complexity that are inherent in children's use of information retrieval”* (p.247). His study highlighted the fact that children use natural sentences to query systems and in his particular study found that the Online Personal Access Catalogue (OPAC) was unable to understand the form in which the query was made. Marchionini (1989) found something similar in his research when he compared two different age groups of children. His study showed that the younger group of research subjects were more likely to use sentences to query systems and were not always successful, whereas the older group had much better success with their searches and they were quicker and more efficient in the ways in which they conducted the search process.

Bowler et al (2001) found that in order to use information technology efficiently and effectively, *“students must have prior knowledge of how a computer works and how to conduct an online search. Weaknesses in technical literacy skills hampered the students in this study”*, the authors then go on to say that *“educators should be aware that these skills provide a foundation for the proper use of information technology”* (p.219). Beamon (1997) observed that, *“teachers can strategically use questioning to stimulate young adolescent thinking by posing questions at different cognitive levels, probing and challenging with clarification and follow-up questions, and encouraging students to ask questions themselves”* (p.49–50). Large, et al (1998) noted that children had a tendency to use search terms that were *“usually directly linked to the project, and in many cases students searched only on the terms used by their teachers to present the project objectives”* (p.357). The influence that teachers can have on their pupil's information seeking behaviour is

more important now than ever before due in no small part to the vast amount of information available. With a seemingly endless supply of information at children's fingertips, Herring (2004) believes that the first aspect of teaching information seeking skills is to teach the students how to evaluate the information they have found he believes that *"Information literacy is now regarded by governments across the world as a core educational and life skill, and schools have a key role to play in developing their student's information literacy"* (p.91). As Bowler et al (2001) comment *"teaching that takes into account twenty-first century information literacy skills and encourages critical thinking is necessary to the development of students"* (p.221), this must surely be the case if the education system is to encourage students to become lifelong learners, *"people who display an attitude and ability that prompts them to learn across their life spans"* (Crow 2006, p.23). Information literacy should not be seen as a set of off the shelf skills or even as a standalone subject but as *"the foundation of lifelong learning because it promotes a multifaceted literacy supported by critical and reflective learning"*. (Andretta, 2007, p. 12).

3.14 Summary

This review has highlighted the significance of information literacy in preparing children to become lifelong critical users of information and has identified the importance that every child reach their potential. It has investigated the similar structures and approaches to education adopted by both the joint English/Welsh educational system and that of the United States and has investigated the different approaches adopted by both countries in relation to information literacy.

Examining the link between learning and information literacy demonstrates that *"trainers, teachers and facilitators of information literacy have a lot to take on board if we wish to develop effective learning interventions"* (Hepworth and Walton, 2009, p. 123). It is necessary for teachers to consider a multitude of different aspects when considering how best to proffer information seeking skills to young learners. For example teachers need to consider the patterns of learning demonstrated by their students, whether their students are visual, auditory or kinaesthetic learners, their uncertainty and self-efficacy levels when faced with new information and how they can offer choice and motivate their students. Teaching information literacy skills needs to be underpinned by an understanding and knowledge of how people learn.

By investigated previous research, it has been possible to understand how children interact with information, how they develop information seeking strategies and how they are taught these strategies. By scrutinizing empirical research, it has been possible to develop a deeper understanding of children in the context of their information seeking behaviour. It has been possible to examine how influences such as need and want, self-efficacy, uncertainty, motivation and choice might play a part in how children search for information and has investigated how support is offered to children by not only their teachers but also their peers.

Underpinning the empirical research into children and information are the theoretical frameworks that demonstrate an isomorphic relationship between conceptualisation and reality. During this chapter, it has been possible to investigate the higher concepts of learning theory in relation to learning patterns and has considered how these concepts fit within the context of children and information literacy.

By considering Kolb's (1984) experiential cycle as a theoretical starting point and applying the concepts of self-efficacy, uncertainty, motivation and choice, it became possible to investigate how children learn information seeking strategies. To identify the inhibitors as well as the accelerators to the learning process and develops a theoretical framework to guide and make sense of the data collected during the fieldwork stage of the research study.

Contextual information is offered in the next chapter, which will offer the reader a clearer insight into the environment and participants of the research study.

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4 Background and Context

4.1 Introduction

In order to be able to place the following chapters into context, it is necessary to offer some background information about the research participants as well as the school environment in which they were being studied. Fife (2005, p.1) believes that context should be “*whole enough*” that the reader can gain a proper understanding of the environment being studied. The need to offer contextual background information is twofold. Firstly, it offers the reader insight into the world that is being scrutinised and secondly, should subsequent researchers wish to generally apply the research findings of this research study, context and background information will help them to decide if this research environment is similar enough to their own research environment for them to be able to draw comparisons. This will allow for “*naturalistic generalizations*” and “*easier transferability to other sites*” (Lincoln and Guba, 1985, p.42).

In order to be able to place the school and the research participants into context it is necessary to examine them within the larger picture. Within the context of this research study, the macro level of information gathering concentrated on UK Government green papers, legislation and curriculum targets, as well as investigating some of the Government bodies that work within the education system, offering advice and helping to inform decisions of policy.

The micro level of information was gathered by means of observations and conversations with the staff and children within the school environment and investigated the way in which Key Stage 2 children are taught information seeking skills.

4.2 The Macro Level

In order to understand where the school participating in this study sits within the larger joint English/Welsh education system it was necessary to look at Government green papers, legislation and the associated Government bodies that help to inform policy decisions.

In 2003, the UK Government passed a green paper called “Every Child Matters”; the paper was a response to the horrific death of a young child called Victoria Climbié. Within the green paper, the Government acknowledged that every child has the right to

- *“be healthy*
- *stay safe*
- *enjoy and achieve*
- *make a positive contribution*
- *achieve economic well-being”*

(Great Britain, Chief Secretary to the Treasury, 2003)

The green paper initially set out to protect vulnerable or disadvantaged children but recognised that all children deserve the right to be safe and happy and given the means with which they can achieve their potential. Following on from “Every Child Matters” the Government published “Every child Matters: the next steps” and from here passed the Children’s Act (2004) which put in place legislation that focussed on developing *“effective and accessible services”* that met *“the needs of children, young people and families”* (Great Britain. Children’s Act, 2004). The “Every Child Matters” green papers and the Children’s Act (2004) became the basis for reform of the education system in the UK. The hierarchical structure of the education system within the UK offers contextual reference at a macro level. The Education Act (1996) states that one of the roles of the Secretary of State is to *“exercise his powers with a view to (among other things) improving standards, encouraging diversity and increasing opportunities for choice”*. (Great Britain. Education Act, 1996). It falls to the Local Education Authority (LEA) to ensure that they

“(so far as their powers enable them to do so) contribute towards the spiritual, moral, mental and physical development of the community by securing that efficient primary education, secondary education and further education are available to meet the needs of the population of their area”
(Great Britain. Education Act, 1996).

Working in conjunction with, but separate to the LEA, is the Funding Agency for schools; part of the Funding Agency’s role is to examine *“the economy, efficiency and effectiveness with which the governing body of the school have, in discharging their functions”* (Great Britain. Education Act, 1996). The Governing Body of a

school then has a responsibility to work with the Head teacher of the school to ensure that the school complies with Government legislation in terms of school policies. In order to ensure that school policies and procedures are in place and maintained, the Government Office for Standards in Education (OFSTED) “*inspect and regulate to achieve excellence in the care of children and young people, and in education and skills for learners of all ages*” (OFSTED, 2010). OFSTED are an impartial and independent regulatory body who assess the competencies of schools. Schools are rated by OFSTED, the rating falls into one of four categories, these being unsatisfactory, satisfactory, good and outstanding. However, it is not just how schools are performing that interests the Government but whether the schools are making effective use of the resources that are available to them.

The Government understands the importance that technology plays in education and has in place a Government body known as the British Educational Communications and Technology Agency (BECTA). BECTA (2010) believe that their role “*is to ensure that technology is used at its best in the British education system. We work to make sure technology is used effectively – maximising the gains to our teachers and learners*”.

In order to measure pupil’s progression, the Government Department for Children, Schools and Families (DCSF) sets out the learning outcomes that will be achieved by the end of a key stage. By examining the Key Stage 2 “*overview of learning*” (DCSF, 2010) it is possible to ascertain the level that children are expected to have achieved when they enter Key Stage 2 and the level they are expected to achieve when they finish Key Stage 2. The overview of learning only sets out goals on a very general level. For more detail it is necessary to look to the Qualifications and Curriculum Development Agency (QCDA). The QCDA (2010) believe that they are “*at the heart of England’s education system*” and that it is their job to ensure that “*everyone can get the knowledge, skills and qualifications they need for life in the 21st century*”. The QCDA supports the broad aims identified in the 1996 Education Act (section 351) whereby a school provides a balanced and broadly based curriculum that

“a) promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society, and

b) prepares pupils at the school for the opportunities, responsibilities and experiences of adult life.”

(Great Britain. Education Act, 1996).

The QCDA sets out a specific programme of learning for all curriculum topics as well as attainment targets for each topic. It is from the QCDA website that schools and teachers are able to access educational resources such as the curriculum design tool which allows teachers to plan high quality teaching that addresses the needs of the children within the school. The tool offers teachers the resources to “develop detailed medium-term plans that fit within the whole-school process of curriculum design” (QCDA, 2010).

The teacher’s participating in this research study were able to make use of the curriculum design tool in order to tailor the learning outcomes of the national curriculum to the learning needs of the children within their class.

4.3 The Micro Level

The school in which the field research took place is a state funded, community primary school, situated in *North Tyneside*, which is a metropolitan *borough* of Tyne and Wear in the North East of England. At the time that the field research was carried out there were 430 children on the school roll. The children ranged in age from three years to eleven years of age. This figure includes a seventy-eight place nursery, which runs separate morning and afternoon sessions. The area is predominantly working class, as indeed are the families from which the school’s pupil population are drawn. The families are a mix of single and two parent families.

Overwhelmingly, the children attending the school would be ethnically categorised as White British. English is the first (and in most cases, only) spoken language of the pupils.

The school is ranked within the bottom third of the league tables for North Tyneside. The school’s Standard Assessment Tasks (SAT’s) results are slightly below average, both for the Local Education Authority as well as nationally. However, the Senior Management Team are aware of the problem and have put in place remedial strategies, such as running ‘booster’ classes for children in Years Five and Six for the three core subjects of English, Maths and Science.

4.3.1 The Staff

Nine months before the field research was due to start, the Head Teacher was approached to ask if it would be possible to conduct the research in the school. She asked what would be involved both for the staff and for the children and said that she was happy for the research to take place in her school. She even went so far as to offer to speak to the two teachers who were to be approached to participate. Unfortunately in July, just two months before the field work was to commence, the Head Teacher took early retirement on the grounds of ill health. It became necessary to approach the acting Head Teacher to ensure that it would still be all right to conduct the research within the school. She also was happy for the research to go ahead as planned but requested that the children would not be identifiable by photograph or name. When asked if it would be possible to send out participation slips for parents and children to sign (in line with Northumbria Universities ethics policy) I was informed that this went against the school policy. The acting Head Teacher was happy to write a letter giving consent for the research to take place, which can be seen as appendix 1.

The Acting Head Teacher also suggested that it would be more appropriate that I contact the two teachers to seek their participation. Identifying the formal gatekeepers for access to research participants is not always easy. Hammersley and Atkinson (1995) state that it is *“not always obvious whose permission needs to be obtained”* (p.64). Whilst Lincoln and Guba (1995) believe that *“the keys to access are almost always in the hands of multiple gatekeepers”* (p.253).

Initially the two year 3 teachers had been identified as the teachers to ask to participate as one teacher was the school library teacher and the other was the ICT teacher. It took several attempts to set up a meeting with both teachers in order to explain the purpose of the research and to ask the teachers to be involved. Both teachers asked many questions regarding how much access would be required, how often and for how long. As the meeting went on, it became apparent that the ICT teacher was not particularly keen to be involved, offering up the fact that OFSTED were due to visit, which would be a stressful experience for the staff, possibly made more stressful by having another adult in the classroom. At the end of the meeting both teachers said that they would think about whether they wanted

to participate in the research study and would let the acting Head Teacher know their answer by the next day.

The following day the acting Head Teacher informed me that the Library teacher was happy to be involved with the research, but that the teacher had asked if I would possibly consider starting my research in October so that she would have a month to get to know the children and get them settled into a routine, especially as this was a new year group for her. The acting Head then told me that the ICT teacher did not want to be involved in the research. Having discussed with my supervisor, the possibility of this happening, I asked the acting Head Teacher if it would be possible to approach another member of staff (the science teacher, who had previously been involved in my undergraduate research project). Fortunately, when approached, the science teacher said yes, but she also requested that I start my research at the beginning of October as she was teaching a new year group and she too wanted some time to get to know the children before I joined them. Being guided by the gatekeepers as to the amount of access that a researcher can reasonably expect to have, was in this case, a rather delicate balancing act. Defining what is a reasonable amount of access versus an intrusive amount of access is something that needs to be agreed from the beginning so that all parties concerned understand what is expected of them. As Hammersley and Atkinson (1995) comment

“Negotiating access is a balancing act. Gains and losses now and later, as well as ethical and strategic considerations, must be traded off against one another in whatever manner is judged to be most appropriate, given the purposes of the research and the circumstances in which it is to be carried out” (p.74).

Both teachers participating in the study were informed that they were welcome at any time to read what I had written and that all parts of my work were available to them if they wished to see it. Establishing a basis of trust between the teachers and myself was of paramount importance. Lincoln and Guba (1995) believe that *“the development of trust, then, is something to which the naturalistic inquirer must attend from the very inception of the inquiry” (p.257).*

4.3.2 The Pupils

The children participating in the research were all in Key Stage 2. The Year 3 children were all between 7 and 8 years old. The first class of Year 3

children consisted of twenty-three children, six of whom were girls and seventeen boys. Within this class, the teacher and special needs co-ordinator had identified four children as having special educational needs (SEN). The second class of year 3 children consisted of twenty-five children. Of these twenty-five, eight were girls and seventeen boys. This class had three children who had been identified as having special educational needs. None of the remaining children in either class had been identified as being gifted and talented (G&T) although several children were considered by the teacher to be 'brighter than average' pupils.

During the first term of the year (the autumn term), the children were observed studying history, the focus of which was the Tudors. In the second term (the spring term), the focus of the lessons switched to geography and lessons investigated the Island of St Lucia. In the third and final term (the summer term), the children studied the Aztecs. At this point, a student teacher who had temporarily joined the school took responsibility for the first class and the regular class teacher taught the same Aztec topic to the second class.

Observations of the year 3 children took place on Wednesday afternoons. For the first part of the afternoon the library teacher would teach her class and then half way through the afternoon her children would go along to the ICT suite for their ICT lesson and the ICT teachers class would come along for their history or geography lesson with the library teacher. In this way, it was possible to observe the entire year group.

The year 4/5 class were a mixed year, mixed ability class of children. The children in this class were aged between 8 and 10 years. The abilities of the children ranged from four children who were identified (by the teacher and special needs co-ordinator) as having special educational needs (SEN) to three children who were identified as being gifted and talented (G&T). The majority of the class fell somewhere between these two extremes.

The year 4/5 class had the same teacher for all of their lessons throughout the year.

Observations of the year 4/5 children took place every Monday afternoon. The first part of the afternoon was dedicated to ICT so the children were situated in the ICT suite. Over the academic year, the children studied how to use software packages such as Microsoft Word and Microsoft Excel. They also learned how to search the internet for information as well as storing and retrieving information.

The second part of the afternoon concentrated on science, for this the children re-located back to their regular classroom, and investigated topics such as the water cycle, the solar system and how sound travels.

At the start of the field research the children were not explicitly told that they were involved in research, (at the request of the acting head teacher) The Head Teacher was happy that if the children were to ask about my role in the school then it would be fine to tell them that I was doing some research. The children did ask why I was in school and what I was writing in my book (field notes) and I always gave them an honest answer and asked them if they would like to help me, fortunately the answer was always “yes”. Obtaining retrospective permission from the children allowed the policies of the school to be observed whilst at the same time negating the possible accusation of covert observations.

4.3.3 Rewards and Consequences

The school operates a dual system for rewarding good work and good behaviour. Superstar stickers and house points are awarded by the class teacher to acknowledge when a child or group of children have done something praiseworthy.

Each child had a superstar sticker book, the children worked individually towards collecting superstar stickers for their book, when they had collected ten they received a reward from their class teacher. When they had collected twenty superstar stickers they received recognition from the Deputy Head Teacher. If the children collected a thirty superstar stickers they were then presented in assembly with a “Head Teacher’s Certificate”. The children then started collecting again, however when they received their second “Head Teachers Certificate” they also received a letter home to their parents celebrating their good work.

A child could receive a superstar sticker for producing a good piece of work or for listening attentively in class and answering the teacher's questions correctly. Superstar stickers were awarded for good academic work.

House points were a reward system whereby children could win points for their school house for good behaviour or being kind. It was used as a way of promoting good behaviour in class and throughout the school.

In reception, the children were placed into groups, which were referred to as "houses". Each house was assigned a colour, red, green, blue and yellow. As the children progressed through the school, they remained in the house that they had been assigned to in reception class. At the end of the week the total points for each house were added up and during Friday assemblies the winning house for that week were presented with a trophy.

The school also operated a three tier consequence system. At lunchtime, the dinner ladies and playground supervisors could issue a child with a "green card", this was a verbal warning. However, if the lunchtime supervisors felt that the child's action was more serious they could inform a teacher who could then raise the level of the warning to a "yellow card". The consequence for receiving a yellow card was that the child would miss one outdoor break time and would be required to stay in the hall. Yellow cards were handed out for behaviour that was deemed to be dangerous or overly silly (for example, pushing and shoving each other whilst coming down the stairs, or being rude to an adult). A teacher could also hand out "red cards" for more serious offences. Red card consequences meant that an offender would receive a break and lunchtime detention and the child's parents would receive a telephone call informing them of the offending behaviour. Exclusion from school was considered by the Head teacher to be a last option and was rarely implemented.

On Friday afternoon, every child in the school was given half an hour at the end of the day for a treat. The children could choose from a variety of different treats such as to have an extra half an hour playing outside, or they could have a "popcorn and movies" party. The half hour treat was referred to as "golden time". However if the children were silly in class or needed to be spoken to by the teacher about their behaviour (for example, chatting

when they had been asked to listen or not getting on with their work) the teacher could take away five minutes from their golden time. If a child lost golden time then, for the amount of time that they had lost they were expected to do written work whilst their peers enjoyed the golden time treat. (i.e. five minutes of lost golden time equalled five minutes of written work). It was possible for children to win back their golden time if their behaviour improved significantly but this was at the teacher's discretion.

4.4 Time in the Field

There are thirty-eight teaching weeks in an academic school calendar. Observations began in October, (at the request of the teachers) and finished at the end of the academic year in July. This meant that there were only thirty-four teaching weeks available for observations. Of these thirty-four weeks, teacher absence from school and researcher absence meant that the number of weeks available for observation was reduced to thirty-two. Thirty-two afternoons were spent with the year 3 class and thirty-two afternoons with the year 4/5 class. However, I was asked on one occasion to spend an extra full day in school with the year 3 children, helping with a special project. I was also asked to spend two full days with another year 4/5 class, helping them with a project. I was also able to accompany the children on three school trips, which lasted for the whole of the school day. One school trip was with the year 3 children and the other two trips were accompanying the year 4/5 children.

The regularly planned school observations began at 1.pm and finished at 3.15.pm on a Monday and Wednesday. These observations naturally fell into two sessions. The first year 3 class would spend the first part of Wednesday afternoon with the library teacher then at 2.10.pm they would go along to the ICT suite for their ICT lesson and the second class of year 3 children would come along for their history or geography lesson. For the year 4/5 class, the first part of Monday afternoon was spent in the ICT suite, the second part of the afternoon was back in the children's regular classroom for the science lesson.

4.5 Summary

The purpose of this chapter is to offer contextual background information to the research study, it begins by looking at the wider picture of the education system in the UK, this is the macro level of information gathering. The investigation on a

micro level looked at the school, the local environment within which the school operates and the staff and pupils engaged in the research study. It is necessary to offer this detailed information in order to allow subsequent researchers to make an informed decision on whether the research setting from this study is comparable with their own research setting and whether the findings and themes that emerged from this study are applicable and transferable to their own situation.

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5 The Road to Information Literacy

5.1 Introduction

Iterative analysis of the data provided the opportunity to explore previously unconsidered phenomena. It also allowed themes to “*flow, cascade, unfold*” (Lincoln and Guba, 1985, p.41) from the data without being forced. Identifying themes within the data allows a researcher to examine the situation being studied and allows them to make conceptual inferences based on their understanding of that situation. “*The concepts abstracted from the substantive situation will tend to be current labels in use for the actual processes...whilst the concepts constructed by the analyst will tend to be the explanations*” (Glaser and Strauss, 1967, p.106).

Observations were carried out over the course of one academic school year. During this time, vast amounts of data were collected. In order to make sense of all the data being collected, themes were identified and when a particular instance was noted, it was examined to see if it fit within an existing theme or whether it was an emerging theme.

As demonstrated in the methodology (chapter 2) the vast amounts of data collected meant that there were many similar examples of the children demonstrating behaviour associated with the different themes. For example, one theme that emerged early on in the study was that of uncertainty. There were many instances of the children demonstrating uncertainty throughout the academic year. It would not be feasible to include every example of the children demonstrating uncertainty; therefore, it became necessary to highlight the instances of uncertainty that best demonstrated and supported this theme.

In order to guide the reader through the analytical maze that is the children’s information seeking journey, a rich picture has been created, (figure 6) the picture demonstrates the processes that the children went through on their journey towards information literacy and acts to explain the influences that helped to shape that journey.

5.2 The Road to Information Literacy

Figure 6 The Road to Information Literacy

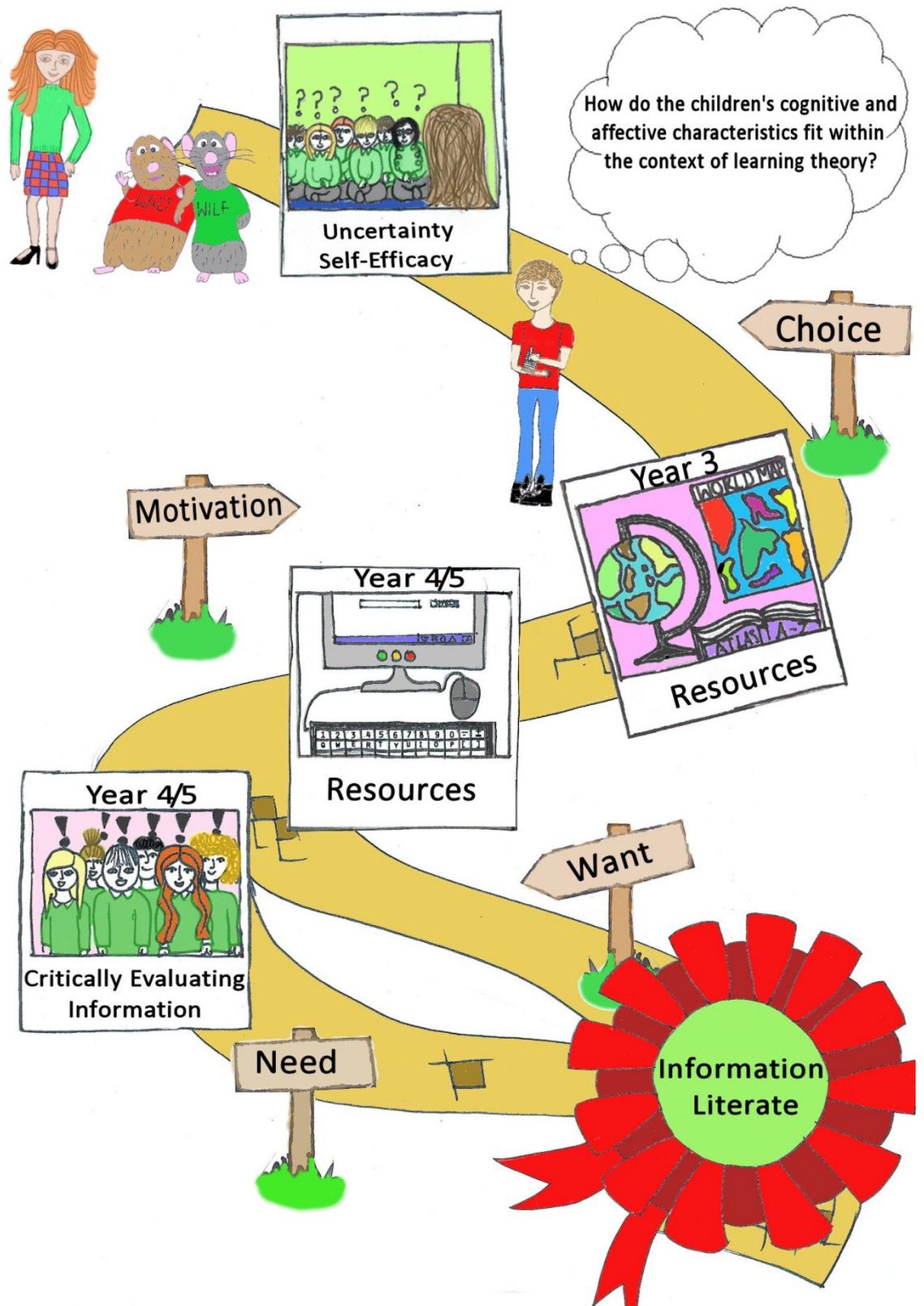


Figure 6 This rich picture demonstrates the information seeking journey undertaken by the children towards becoming information literate.

(Illustrations courtesy of Kirsti Beautyman, 2009).

In order for the children to understand what they were being taught, each lesson began with the teacher outlining the learning outcomes and learning objective for that lesson. The learning outcomes and objectives were known as WALT and WILF. WALT is an acronym for What I Am Learning Today and WILF is an acronym for What I am Looking For. At the end of each lesson, the children, guided by the teacher, revisited WALT and WILF in order to both consolidate what they had learned in the lesson and also to raise any questions they might have about what they had learned. The concepts of WALT and WILF fit within Berkowitz and Eisenberg's (1987) Super3 template of information seeking. The Super3 template identified three steps to information seeking for young children, they identified these steps as *"plan, do and review"*. The children were identifying what they were going to learn (plan), they were learning it (do) and then they were revisiting it at the end to examine what they have learned (review). While the teacher was outlining WALT and WILF for the children, she was in effect defining their information need for them. The rich picture demonstrates how it was possible to identify emerging themes and question how those themes fit within existing theories and frameworks in the context of the children's information seeking behaviour and learning theory. In order to gain an understanding of the isomorphic relationship between conceptualisation and reality, it was necessary to consider inhibitors and accelerators to the information seeking process. These accelerators and inhibitors emerged from the data and were identified as uncertainty and self-efficacy. Kuhlthau (2004, p.7) believes that when examining information seeking as a process then uncertainty is to be *"anticipated and expected as part of the process"*. She goes on to point out *"that we each enter the process with a system of personal constructs built on past experience"* these *"personal constructs"* and *"past experience"* help to shape the way we interact with information and internally help to form levels of self-efficacy.

Other accelerators and inhibitors to the information seeking process were identified as motivation, choice, need and want. These accelerators and inhibitors emerged from the data as themes and were examined to see whether they were cognitive or affective triggers to the information seeking process. This meant that it was possible *"to investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour"* which was the initial aim of this research study.

As the children progressed through the academic year, they were introduced to information seeking strategies and shown how different resources could be utilised

in order to gather information. Some of the children in the study were as young as seven, whereas some of the oldest were almost eleven years old. The younger children were taught how to gather information from different resources at a basic level, whereas the older children were expected to adopt a higher level of information seeking behaviour, building on the skills that they would have learned when they were in year 3. This helped to establish the level of teaching of information seeking strategies to the children, which was an objective of the study. The year 4/5 children were also taught how to critically evaluate information as well as how to store and retrieve information.

The final step on the journey is depicted in the rich picture as being that of information literacy, as the children progressed through the previously identified stages, they were gathering skills and strategies that they could develop and build upon. This will allow them to bridge the gap between the structured style of learning that they received in Key Stage 1, and allow them to move towards the more independent and open learning that will be required of them when they enter secondary school.

The rich picture demonstrates the children's learning of information seeking strategies as a linear progression starting with the teacher defining the children's information need and then moving through the accelerators and inhibitors to the information seeking process, until finally the children were on their way to developing information seeking skills and strategies that will allow them to become literate users of information. The rich picture demonstrates how the children's information literacy journey unfolded over one academic school year. However the children's journey was not a linear progression. For instance, the children demonstrated uncertainty at the start of each new topic but for many of the children, their uncertainty appeared to decrease as the term progressed and they gathered more information. At the start of the new term when a new topic was introduced, the children's uncertainty appeared to return. This pattern of children's increased uncertainty at the beginning of a new topic demonstrates how the children's progression towards information literacy was not linear but cyclical in nature.

5.3 Supporting the Information Seeking Process

The rich picture only demonstrates one example of the teachers defining the children's information need for them; however, from the data collected the fact was

highlighted that both teachers defined the children's information need at the beginning of every lesson and this was witnessed during every observation. With the aim of contextualising the learning outcomes for each lesson, the teachers used the concepts of WALT and WILF. In order to support the children's information seeking behaviour, not only did the teachers define the children's information need at the start of every lesson, they also differentiated the lessons so that the children were gathering information that was specifically tailored to their abilities. The teachers were also aware that within their class, they could have children with different learning styles, therefore it was necessary for the teachers to use a variety of different teaching styles in order to accommodate, visual, auditory and kinaesthetic learners. The teachers demonstrated how their underpinning knowledge of the children allowed them to aid the children's learning in order for each child to get structured support.

Encouraging the children to support each other as well as receiving additional adult help was another way that the teachers were able to support the children as they gathered information. Examining these four aspects of support, which took place continually throughout the academic year, offered valuable insight into the ways in which the children were taught information seeking strategies. Identifying and evaluating the current methods for teaching Information seeking strategies to Key Stage 2 children was an objective of the study.

5.3.1 WALT and WILF

WALT and WILF are acronyms for What I Am Learning Today and What I am Looking For. The year 3 teacher had brought into school two soft toys (mice) and had named them WALT and WILF. The children associated the soft toys with the concepts of what they were learning. At the beginning of every lesson, the teacher would display pictures on the Interactive Whiteboard (IW) of WALT and WILF and talk with the children about the lesson objectives and the learning outcomes for that lesson. By starting each lesson with WALT and WILF, the teacher was able to encourage the children to prepare themselves for what they would be learning in that lesson. The children were taught to think about the lesson objectives and although the teacher was defining the children's information need for them, she was preparing them for the types of information they would be looking for during the lesson. This fits within Berkowitz and Eisenberg's (1987) Super3 template of information seeking behaviour for younger children.

Teacher: Right let's quickly go over WALT and WILF so that we can get on. Firstly, WALT, well, today we are learning about the Aztecs. So what about WILF, well, we are looking for information about where the Aztecs built their city, why they settled there, we are looking for information about their gods.

Having established the lesson objectives and the learning outcomes for the lesson the teacher was outlining for the children what they would be doing for that lesson. In effect, she was giving the children a list of the information that they were going to be looking for during the lesson. The children gathered what they thought were relevant pieces of information from the resources provided to them by the teacher, in this instance the resources the children used were worksheets put together for them by the teacher along with reference books. Some of the reference books came from the school library and some of the books had been brought into school by the children. The children searched the resources for information relating to where the Aztecs had built their city, why they had settled there and gathered as much information as they could find about the Aztec gods. This information seeking behaviour falls under the "do" part of Berkowitz and Eisenberg's (1987) Super3 template of information seeking behaviour. At the end of the lesson, the children gathered again on the carpet area and revisited WALT and WILF. This allowed the teacher to ascertain the level of the children's understanding of what they had been learning for that lesson, it also allowed the children to share the information that they had found with each other.

Teacher: ok quickly now we don't have much time, right what have we been learning today?

Lisa: today we have been learning about the Aztecs

Teacher: yes, and what were we looking for?

Alan: we were looking for information about where they built their city, Tenochtitlan

Teacher: yes very well done, what else were we looking for?

Laura: we found out about their gods and how Huitzilopochtli liked human sacrifice

The children were recounting the information they had gathered during the lesson and were demonstrating how much they have learned. This demonstrated to the teacher that the learning outcomes for the lesson had been met. There was also the opportunity for the children to see how much information they had gathered and how much they had learned from that information, a point that the teacher was eager to reinforce.

Teacher: so look at how much we have learned today, we have learned that the Aztecs built their village in the middle of the lake, we learned that the sign they received from the gods telling them where to build was an eagle sitting on a cactus eating a snake. We have learned about Huitzilopochtli and his preference for human sacrifice.

The teacher was recapping on all that the children had learned in that lesson. Doing this served several purposes, it served to ensure that all of the children had the same information and it demonstrated to the children just how far they had come from the beginning of the lesson. It was also a chance to repeat what the children had learned which supports the behaviourist's belief that repetition aids memory. The teacher is also able to build on the understanding and knowledge that the children have already developed, demonstrating how *"learning is an incremental process"* (Hepworth and Walton, 2009, p. 50). Whilst not explicitly stating that the children are being taught information seeking strategies, the teacher is embedding the teaching of those skills within the context of the topic they are learning, this demonstrates how skills can be integrated into the curriculum as suggested by Kulthau, (2004) and Scott and O'Sullivan, (2005).

The year 4/5 teacher used WALT and WILF in very much the same way as the year 3 teacher, she talked with the children at the beginning of the lesson, outlining their lesson objectives and learning outcomes for that lesson. She returned to WALT and WILF at the end of the lesson so that the children could demonstrate that they had understood what they had been learning, share the information that they had found and see how far they had come. By recounting the information that they have gathered the children are engaging in the final step of Berkowitz and Eisenberg's (1987) Super3 template of information seeking behaviour, which is to "review".

Although WALT and WILF were not initially identified as a theme, reflecting on the data that had been gathered highlighted the fact that both teachers defined the children's information need for them at the beginning of every lesson. The year 3 teacher defined the need firstly for her class and then when the classes swapped over, she defined the need for the second class too. The year 4/5 teacher defined the children's information need for their ICT class and then again, when they started the science strand of their lesson.

Whilst it was very important for the children to be able to consider the lesson objectives and learning outcomes for each lesson, for the teachers there was much more to consider. Both year 3 and year 4/5 were mixed ability classes and it was necessary that the teachers ensured that the less able children were not left behind, whilst the gifted children were challenged and not bored. Setting different levels for differing abilities is called differentiating and both teachers needed to do this in order that every child in their class was able to fulfil their potential.

5.3.2 Differentiating

When planning lessons, the teachers needed to consider the abilities of the children in their class and needed to ensure that the learning needs of the varying levels were catered for.

Both teachers demonstrated how they were continually differentiating the work for the children. The year 3 teacher would often gather the less able children onto one table to work together. In much the same way as scaffolding, the teacher would guide and support the less able children with their work. This meant that they were able to work at a slower pace than the more able children, the teacher had designed different levels of information for the two groups

Writing key works on the interactive whiteboard for the rest of the class, the teacher instructed the children

Teacher: I want you to write a paragraph into your books using all of the key words that I have put up on the board for you, put as much

information as you can into your paragraphs please.

Sitting at the table with the less able children, she handed them a worksheet.

Teacher: right what I would like you to do is to carefully read this paragraph, now you can see that some of the words are missing from the sentences, there is just the first letter of the word there to give you a clue. You need to look at the list at the bottom of the page and decide which word you think fits into the sentence.

These children were searching for information but at a much lower level than the more able children. Both children had been given a list containing all the information (in the form of keywords) they needed to complete their worksheets, however the more able children were asked to think about the information and to add as much detail as they could. The less able children were also supplied with information (also in the form of keywords) however they only needed to identify missing words from a sentence. Their information seeking required them to find the missing word and as a clue, they were given the first letter of the word they were looking for. By separating the children into ability groups, the teacher was supporting the less able children and by engaging them in an easier task, the children could gain a sense of achievement and in so doing build up their levels of self-efficacy. As Schunk (1981) observed, "*children's self-perceptions of their capabilities have an important effect on their subsequent achievements*" (p.104).

The year 4/5 teacher used a similar approach with her less able children, giving them separate worksheets from the other children with less challenging work. The year 4/5 teacher had a larger group of children with special educational needs (SEN) in her class and on several occasions, I was asked to sit with the SEN children and help them with their work.

Teacher: Would you mind helping that table to write up their experiment, let them tell you what they want to say and if you could write it down on a small whiteboard for them that would be great.

The children verbalised what they wanted to put into their books, I wrote it down for them and they then copied it into their books. This allowed the children to impart the information that they had gathered in an environment that would still allow them to cognitively assimilate the information into knowledge without worrying about spelling or handwriting.

Not only did the teachers need to differentiate each of their lessons for the varying levels of ability but they also needed to consider, when planning their lessons, the different learning preferences of the children and whether a child is a visual learner, an auditory learner or a kinaesthetic learner.

5.3.3 Visual, Auditory and Kinaesthetic Learning

During an informal chat after class one day, the year 3 teacher mentioned that the latest buzzword in education is “teaching to VAK preferences”. She explained to me that when planning lessons she needed to consider the learning preferences of the children. She explained that every lesson needed to contain an element of visual, auditory and kinaesthetic learning (something that she had always included into her lessons anyway).

Because she knew the children so well she was able to identify the children that learned best by being shown, those that preferred to hear and those that learned best when they were able to have a go for themselves. Examples of VAK teaching was witnessed on a regular basis.

Teacher: today we are going to watch a video, you need to look and listen carefully to what the man on the programme is saying because you are going to be having a go at being detectives once the video has finished.

The children that preferred to learn visually were able to watch the video, those that preferred to learn by listening were able to listen both to the teacher and to the video and for the kinaesthetic learners they knew that they were going to be given the opportunity to experience what they were learning in a hands on way. In terms of information seeking behaviour, the visual learners watched the video carefully, looking for information that would help them to understand. The auditory learners listened for the information, occasionally asking questions of the teacher for clarification. When the video was finally finished, the kinaesthetic learners were able to have a go at solving a puzzle and being a detective. It made sense that if a

child had a visual learning preference then it would make sense to assume that when seeking information they would adopt a visual method of obtaining information. Likewise, for auditory learners it would be sensible to assume that they would listen for information. Kinaesthetic learners would in all likelihood gather information if it were presented in such a way that they could adopt a hands on approach. Taking into consideration these three different preferences not only for learning but for gathering information, it seemed rather strange that for the most part when information is captured it is generally set down in text form either in books or on a website.

When speaking to the year 4/5 teacher about VAK learning, she said that she too had always incorporated elements of all three learning preferences into her lessons. She emphasised the need to keep the children engaged with the topic and the best way to do that was to mix things up a little.

Teacher: you can't keep them sitting too long on the carpet because you can tell they are not listening to you anymore, you have to get them thinking, trying things out, having a go for themselves, that way they don't get bored

It seemed that before information seeking could take place effectively, the children needed to be prepared for what it was they would be looking for in order to obtain the correct information (WALT AND WILF). Their level of ability needed to be considered so that their information seeking behaviour was in line with that ability (differentiating). Their learning preferences and information seeking preferences had been considered and catered for (VAK). These are just some of the aspects of learning that teachers need to *"take on board"* in order *"to develop effective learning interventions"* (Hepworth and Walton, 2009, p. 123) for their students.

5.3.4 Scaffolding

Observations demonstrated that all of the children participating in the study were involved in one way or another with supporting each other. This process is known as scaffolding and is defined as *"more capable others assisting less capable ones"* (Moll, 2000, p.262) in this context the "more capable others" may be teachers, adults in the classroom, or peers.

In the beginning, the teacher or peer provides help and support, as the pupil needs it. *“Where the learner fails, the level of teacher intervention increases; as they succeed, the level of intervention decreases”* (Jarvis, 2005, p.31). Day and Cordon (1993) found from their research with third graders that achievement of tasks was higher when scaffolding help was present than when it was not.

In order to make sense of the ways in which the children supported each other it was necessary to determine whether their behaviour fit within existing theoretical frameworks, for the purposes of this research study, the theoretical frameworks that were identified were those of Kolb’s Experiential Cycle (1984) alongside Vygotsky’s (1978) Zone of Proximal Development. Kuhlthau conducted several investigations into children and their information seeking processes. From her findings Kuhlthau developed *“a model representing the user’s sense-making process of information”* (1991, p.362). She tested the model by looking at academically capable high school seniors. Attempting to apply Kuhlthau’s (1991, p.361) *“model of the information search process”* to the children from this research study proved difficult, largely in part to the age of the children in this study and their academic experience and capabilities. Kuhlthau (2004, p.128) also investigated *“the concept of a Zone of Intervention”* which was modelled on Vygotsky’s concept of a “zone of proximal development”. Vygotsky (1978, p.86) theorised that there was a “zone of proximal development” where learning took place, where *“an individual is able to achieve more with assistance than he or she can manage alone”* (Wells, 2000, p.57).

Kolb (1984, p.38) believes that *“learning is the process whereby knowledge is created through the transformation of experience”*. Kolb’s experiential cycle places feeling and thinking at opposite ends of a perception continuum. It is this perception continuum that a person must theoretically travel along, in order to move from the emotional to the cognitive in the context of learning.

Applying Kolb’s experiential cycle to the children in this research study went some way to explaining how the children moved from uncertainty to a more cognitive understanding of the information, yet it did not appear to completely explain how the children moved from an affective reaction to

information towards a cognitive understanding. It was necessary to consider whether there were other theoretical frameworks that explained the progression from affective to cognitive, which was being witnessed. Examining other theoretical frameworks allowed the identification of Vygotsky's zone of proximal development. It too went some way to explaining the children's move from an affective to a cognitive response to information. Identifying that some aspects of Kolb's theory and some aspects of Vygotsky's theory offered an explanation for the children's response to information, it was possible to combine the two theories which ultimately led to a new theory being developed which is one of the contributions that this study makes to existing knowledge.

By considering Vygotsky's (1978, p.86) zone of proximal development in conjunction with Kolb's (1984) experiential cycle, a theoretical framework began to emerge from the data which allowed the isomorphic relationship between conceptualisation and reality to be demonstrated.

At the start of the geography project the year 3 children were given work sheets, they needed to identify and colour St Lucia in red and the rest of the Windward Isles as well as Cuba and the South American coastline in green.

Alan began to colour in his sheet but he got confused and coloured everything on the sheet in red.

Beautyman: Alan, you only need to colour in St Lucia in red

Alan: Oh, um I can't find it, where is it?

Lisa: Look, it's that little bit there (indicates it on the map)

Alan: So do I do this bit in red too? (indicates the rest of the South American coastline)

Lisa: No, look that bit's gotta be done in green

Alan: Which bit is that then?

Lisa: its Cuba and South America

Alan: ok cool

Alan was given another work sheet and was able to successfully complete his work. When the children gathered together on the carpet later on Alan was able to successfully identify Cuba on the teachers map. Alan demonstrated that he had moved from a position of not understanding what was required, and with Lisa's help, he had been able to sufficiently comprehend the information available to him. In fact Alan's comprehension of the information was twofold, he not only understood the information with regard to the colouring task he had been set but also he was able to comprehend the information which underpinned the learning outcome which was to be able to correctly identify St Lucia, Cuba and the South American coastline. He demonstrated that with the aid of a friend, he had entered Vygotsky's (1978, p.86) zone of proximal development and progressed along Kolb's (1984) perception continuum from an affective to a cognitive state.

During the same observation, Cathy also struggled with the worksheet, stating firmly that she couldn't "find St Lucia anywhere", her partner Rita asked her whereabouts on the map she was looking. Cathy pointed to an area of the map and was instructed by Rita to "look further over this way", once Cathy had located St Lucia she was able to continue with the rest of her work without further help. Later the following week when asked if she could find St Lucia on another map, she was able to correctly identify it straight away.

On a different occasion the year 3 children were working on Tudor Dictionaries, Matthew, (unable to attract the teacher's attention) turned to his friend who was sitting next to him in order to verify that the information he had was correct.

Matthew: Is the skillet the frying pan thing?

Lee: Yeah, the other thing was the spit

Matthew: ok, so err... what are the fire dogs?

Lee: them things there [points to a picture of the fire dogs]

Matthew: oh ok [he writes it into his book]

Lee was able to support Matthew and by working with him, guide him through the zone of proximal development. By working with Lee, Matthew was able to cognitively assimilate the information that he had.

The levels of support seemed to vary from child to child as did the time it took individuals to move from a state of not understanding to comprehension. Alan required more assistance as he moved from uncertainty and non-understanding, he asked questions until he seemed comfortable that the information he had was correct. He was even comfortable enough to volunteer to answer the teacher's questions later in the day. For Cathy, her uncertainty at being unable to locate St Lucia was quickly rectified with some assistance from her friend and she was then able to complete the task without further help. Matthew initially just wanted to check that the information he had was correct and that the skillet was indeed "the frying pan thing", he was then able to gather more information from his friend Lee on something that he was less sure about. These examples highlight how scaffolding can assist the information seeking behaviour of young children. By considering these observations in the context of Kolb's Experiential Cycle (1984) and Vygotsky's Zone of Proximal Development (1978), it is possible to demonstrate the isomorphic relationship between the reality of the classroom and the conceptual theoretical frameworks.

Scaffolding was witnessed regularly in the year 4/5 class. During ICT lessons the children were put into pairs, the children were usually allowed to pair up with a friend but occasionally the teacher would pair up children of varying abilities. The children were using Microsoft Word to create plans of their perfect playgrounds. This involved the children creating shapes, grouping shapes together and colouring shapes in. The teacher demonstrated the different tools that the children could use before she let them have a go themselves.

After several minutes Abigail calls to me

Abigail: look I have made a face

Beautyman: that's very clever

Abigail: yeah, 'cept it keeps moving and I want it over there but then I have to put the eyes and mouth on again

Beautyman: shall I show you a trick to stop it doing that? (Abigail nods) you get your mouse pointer and draw an imaginary box around all of your picture, then right mouse click and go down to group, do you see it there? Click on that and there you go your picture is one solid picture that you can move around, and if you decide that you want to change something you just do the same thing but click ungroup instead, go on you have a go.

Abigail has a go and laughs delightedly when she gets it right first time, she then demonstrated what she has learned to her friend Tammy who was sitting next to her. As I moved around the classroom, Josh waved to me for help.

Josh: I dun all the stuff that Mrs T said but it keeps on moving and I want it to stay there, it takes ages if you have to keep on redoing it all the time.

I show Josh the trick of grouping just as the teacher passes. Josh proudly showed her his new "trick". The following week during ICT Josh is able to demonstrate that he has cognitively assimilated the information on how to group objects as he is able to show his friend Andrew how to do it. Josh needed to show Andrew how to do it several times, with Andrew asking questions as they went along, by the end of the class Andrew too was able to group objects together.

In a very short space of time both Abigail and Josh were able to demonstrate their new skill with their friends. They were able to support their friends by sharing the information that I had shared with them. These observations demonstrate how "*an individual is able to achieve more with assistance than he or she can manage alone*" (Wells, 2000, p.57). As part of the learning process the children are in the zone of proximal development and are being shown information which is beyond their current level of understanding, from this point they are able to move forward and assimilate new knowledge even to the point where they are able to pass on that newfound knowledge. These observations indicated that children seem to move backwards and forwards along the perception continuum, that their progress is not always a

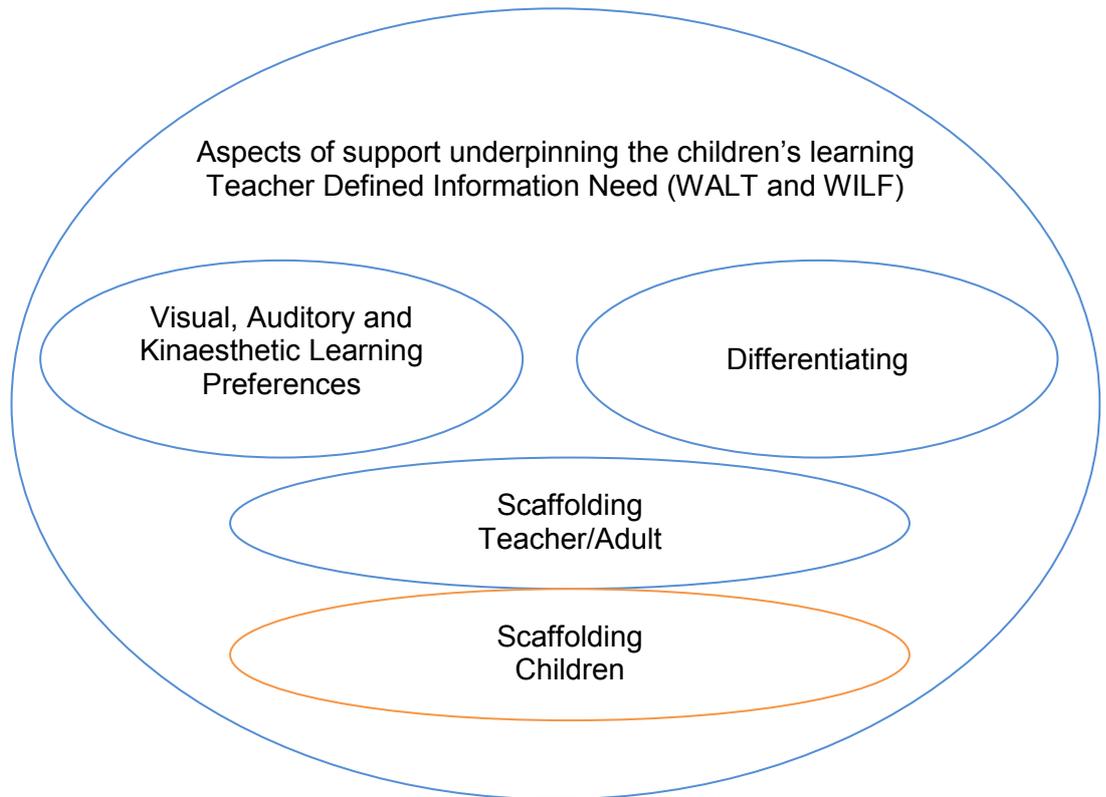
linear progression. For Andrew, his understanding could only be achieved by asking questions until he had removed uncertainty and progressed to a state of understanding, it seemed as though he needed to make sure that the information that Josh was giving him was correct. For Abigail the progression along the perception continuum appeared to be smoother and more linear and this could have been because the learning process was being physically demonstrated to her, she was able to watch and then have a go herself. It could be that Abigail's preferred learning style was either visual or kinaesthetic and she was able to cognitively assimilate information when she was either having a go for herself or having it visually demonstrated to her rather than being told how to do it.

5.3.4.1 The Learning Process

From the data, four aspects of support emerged that appeared to underpin the children's learning. Observations demonstrated how throughout the academic year, the teachers were defining the children's information need for them at the beginning of every lesson. They also highlighted how the teachers differentiated their lessons so that the varying abilities of the children were taken into account. Observations also highlighted that the teachers incorporated visual, auditory and kinaesthetic learning styles into every lesson in order for the children's learning preferences to be catered for. The adults in the classroom, as well as the children, all played a part in supporting each other by means of scaffolding. Regardless of the topic that the children were learning about, the underlying support was a constant throughout the academic year.

The data demonstrated how these four aspects of support underpinned the children's learning process and can be seen as figure 7.

Figure 7 Four Aspects of Support Underpinning the Children's Learning



Key. Blue ellipses denote teacher support. Orange ellipse denotes children's support.

The data demonstrated how these four aspects of support were constant throughout the academic year and underpinned the children's learning. The teacher defined the children's information need using the concepts of WALT and WILF in order to encourage the children to understand the information need. She then tailored each lesson to encompass aspects of visual, auditory and kinaesthetic learning in order to meet the differing learning styles of her pupils. The teacher differentiated the lessons so that each child was able to work at a level that was within the boundaries of their abilities, allowing the more able children to attempt more challenging work whilst ensuring that the less able pupils didn't fall behind their classmates. Not only did the teacher offer scaffolding support but she also facilitated the children supporting each other by pairing up children with different abilities in order for the more able pupils to support the less able pupils.

However, the children's learning was twofold, they were gathering information in order to satisfy the lessons learning outcomes but they were also developing their information seeking strategies, for example, consulting with a friend, asking an adult, looking, listening or having a go for themselves or investigating the information provided for them by the teacher. This seems to support Grey's (2000, p.72) belief that *"the best balance of learning comes from an initial teaching of basic information skills followed up by these skills being used in the context of subject teaching"*.

Although the children's information need was being defined for them by their teacher, their lessons differentiated in accordance with their abilities, their learning preferences accommodated and support available from both their peers and the adults in the classroom, to varying degrees, all of the children demonstrated uncertainty at the beginning of a new topic. Within the first two weeks of observations, uncertainty had been identified as a possible theme. Investigating uncertainty as a theme led to an examination of the different types and levels of uncertainty. From here, it was necessary to consider whether levels of self-efficacy might play a part in uncertainty and if so what effect this might have on the children in the context of their information seeking behaviour.

5.4 Uncertainty and Self-Efficacy

Having identified uncertainty as a theme, over a period of several weeks, it was possible to return to the field to explore to what extent uncertainty played a part in the children's information seeking behaviour. Shannon and Weaver (1949, p.224) believe that *"Uncertainty is the critical link between information and decision-making"* and that uncertainty is a key factor in stimulating people to undertake an information seeking activity.

Kuhlthau (1993, p.124) believes that *"Uncertainty is a cognitive state that commonly causes affective symptoms of anxiety and lack of confidence"* whereas Wilson et al (2002, p.713) suggest, *"that uncertainty may have both affective and cognitive dimensions"*.

As the weeks progressed, tactics were identified that had been adopted by the children. Demonstrating these tactics suggested that the children had developed strategies for dealing with uncertainty. Having identified that the children had developed strategies for dealing with uncertainty, it was necessary to consider other possible influences on their information seeking behaviour such as self-efficacy. Schunk (1981) believes that “*children’s self-perceptions of their capabilities have an important effect on their subsequent achievements*” (p.104).

5.4.1 Uncertainty, Self-Efficacy and Year 3

From the very first observation, the children were witnessed demonstrating varying levels of uncertainty. The year 3 children were studying the Tudors and at the start of every class the children sat on the carpet area whilst the teacher recapped what they had been doing in the previous lesson and what they would be covering in that lesson. The children finished off the lesson by sitting back on the carpet, this gave them to chance to ask any questions or to discuss as a group interesting things they had discovered. This demonstrated how Berkowitz and Eisenberg’s (1987) Super3 template fit within the context of the children’s information seeking behaviour. The teacher defined the children’s information need for them by explaining that they would be looking at the Tudors.

The children were able to plan what they were going to gather information on, (in this case they were learning about the Tudors) they were then gathering the information and finally they were reviewing it.

During the first observation, the teacher used my presence in the room to encourage the children to recall the information they had gathered from the previous lesson by suggesting that “*we tell Mrs Beautyman about what we have been doing for the past few weeks*”. The teacher went on to ask the children some questions about the Tudors that they had learned from their previous lesson.

Teacher: Who was Henry VIII’s first wife?

Lisa: Was it Catherine of Aragon?

Teacher: Yes it was, well done, and why did Henry divorce Catherine?

Matthew was she the ugly one and the painter made her look pretty but she was ugly and Henry divorced her?

The first thing that I noticed from this exchange was the way in which Lisa, although answering the teachers question correctly, phrased her answer as a question. This seemed to suggest that Lisa was either uncertain about the information that she had or that she was not confident enough to commit to her answer. As Matthew was speaking I noticed that he spoke very quickly, his words tumbling together in an effort to tell the teacher what he knew, however as he was speaking Matthew was blushing and fidgeting and it seemed that he was uncomfortable. It may well have been that Matthew was uncertain about the information that he was giving the teacher. However, it might just have been that Matthew was not comfortable speaking out in front of his classmates and me. The teacher kindly explained to him

Teacher: you are thinking of Anne of Cleves, there was another reason that Henry divorced Catherine

Katie: was it cos she only had a baby girl?

Like Lisa, Katie has correctly answered the teachers question; however, she too phrased her answer as a question. As the weeks went by, the children were witnessed responding to the teacher's questions and it seemed that the children regularly phrased their answers as questions. I wondered whether this was a tactic that the children had adopted in order to cope with their feelings of uncertainty. It was possible to identify that the children exhibited different levels of uncertainty. For example, Lisa and Katie both demonstrated a surface uncertainty, whereas Matthew demonstrated a deeper uncertainty. As the weeks progressed it was possible to see that the level of surface uncertainty diminished for many of the children as they became more certain about the information that they, this led them to rely less on the tactic of answering the teacher's questions phrased as questions of their own. In fact, by the end of the term many children were answering the teacher's questions directly, even if the answers they were giving were wrong. One particular observation clearly demonstrated this fact. At the end of the term, the teacher decided to give the children a class quiz on the Tudors. The teacher and I took it in turns to ask questions based on what had been covered in the previous classes. The children were allowed to

work in teams of four. At the end of the quiz the children took turns in calling out the answers to each question. The majority of the children no longer employed the strategy of answering a question phrased as a question but gave the teacher a straightforward answer, even if the answer they gave was incorrect.

Teacher: in Tudor times, which people were allowed to wear the colour purple?

Megan: it was rich people

Teacher: no, not rich people, who were the only people to dress in purple?

Rita: it was the merchants.

Teacher: no, not the merchants either. Did nobody get that question right? It was the King and his family, did you all forget?

By the end of the first term, many of the children had abandoned the tactic of answering a question with a question, once they had gathered more information and their uncertainty levels had reduced.

Another tactic that was observed involved only one child, she employed the tactic of not responding. Georgia was filling in her Tudor family tree and as I was passing she called to me

Georgia: Miss? Who comes after Anne Boleyn?

Beautyman: Can you remember the name of Henry's favourite wife?

Georgia: was that the one who gave him the son?

Beautyman: yes that's right, can you remember her name?

Georgia: Jane... umm Jane?

Beautyman: yes that's right, go on

Georgia sat and looked at her page until I prompted her further

Beautyman: Jane, Jane S...?

Georgia still said nothing and just looked up at me.

Beautyman: Jane Sey...?

Georgia: Jane Seymour?

Beautyman: yes that's right, well done

Georgia: who came next?

Beautyman: [laughing] I was just going to ask you that

Georgia: [shrugs] I dunno, I can't remember.

Beautyman: she was the ugly one

Georgia said nothing.

Beautyman: do you remember, the painter made her look beautiful in her portrait and so Henry divorced her.

Georgia just shook her head and looked down at her work sheet.

Beautyman: A...? Anne?

When Georgia still said nothing I finally ended up giving her the answer. As the teacher passed by she explained that often Georgia needed extra help doing her work and asked if I would mind sitting with Georgia so that she didn't fall behind the rest of the class. So for the remainder of the lesson, I sat next to Georgia and we worked through the rest of the sheet with me prompting her to find the answers from the list of names at the bottom of the sheet, finally Georgia was able to finish the work sheet. Georgia occasionally adopted a tactic of not responding. She had learned that by sitting quietly and not responding to my prompts I would eventually give her what she needed which were the answers she required. It seemed that because Georgia needed extra help doing her work both she and the teacher had low expectations of what she was capable of, it is possible that by helping Georgia and giving her the answers she needed to finish her work, I too was perpetuating Georgia's belief that she could not complete her work without assistance. Bandura (1997, p.175) believes that "*Sorting students into ability groupings further diminishes the perceived self-efficacy of those cast into lower academic tracks where little is expected of them*". Georgia had learned that by not responding to prompts she would eventually be given the answer she needed to complete her work. This strategy of not responding to prompts, coupled with the information given to me by the teacher, was so effective on this occasion, that I spent the rest of the lesson

sitting with Georgia helping her to locate the information she needed to complete her work.

Observations highlighted the varying levels of uncertainty demonstrated by the children. The year 3 teacher had gathered together a small group of four of the less able children in order to be able to work with them and give them some additional support, while she set work for the rest of the class, the four children sat quietly waiting for the teacher to return to them. The teacher had differentiated a work sheet for the less able children that required them to fill in the missing words from a sentence (they were given the first letter of the missing words to help them). Although the children had been given the worksheet before the teacher went to set the work for the rest of the class, none of the children attempted to start until the teacher returned. It appeared that the children in this group demonstrated high levels of uncertainty, they needed to be prompted and guided by the teacher, none of the children offered an answer to the teacher's questions unless they were directly asked to by the teacher. However, during a separate observation, Alan, one of the four less able children was witnessed working alongside one of his more able peers, he asked questions of her and he appeared to be less uncertain. It could be that Alan was more comfortable with the topic he was investigating when he worked with his friend, or it is possible that he felt more comfortable asking questions of his friend, which may have led to a reduction in his feelings of uncertainty.

For some children, their uncertainty did not appear to lessen regardless of the amount of information they gathered and for Matthew it seemed that the more information he gathered the more uncertain and confused he became. The children were given Tudor family tree work sheets to complete in class, at the bottom of the page was a list of the names that the children needed to put into the tree. The teacher told the children to "raise your hand if you get stuck and Mrs Beautyman or I will come and help you". Matthew raised his hand and I went over to speak to him

Beautyman: Do you need help Matthew?

Matthew: yeah who came after Anne of Cleves?"

Beautyman: can you remember who got her head chopped off?

Matthew: [panicking] I already got Anne Boleyn, is that wrong?

Matthew demonstrated low levels of self-efficacy; he lacked confidence in his academic abilities and therefore doubted that he had the correct answers to complete his work. Schunk (1981, p.104) states that "*children's self-perceptions of their capabilities have an important effect on their subsequent achievements*". Matthew responded affectively when he was asked a question, for example, he panicked when I asked him who got her head chopped off "Matthew: [panicking] I already got Anne Boleyn, is that wrong?" Matthew had such low levels of self-efficacy that he did not believe that he had the correct answers even when he did. I tried to encourage Matthew

Beautyman: no that bit's right but who else got her head chopped off?

Matthew: I can't remember which one she is, is it Howard or Parr? [looking at his sheet to see who is left]

Beautyman: it was Catherine Howard

Matthew: ok, hmmm I've nearly finished

Later in the year, I was to witness Matthew responding emotionally, when he was required to locate a piece of information for another topic. Matthew again demonstrated feelings of low self-confidence and low levels of self-efficacy as he struggled to create an information pamphlet as part of his schoolwork.

Matthew: I don't know what to write

Beautyman: maybe you could write something about the Jacquot parrot

Matthew: ok

Matthew copies word for word all the information he can find about Jacquot parrots and then brings it over to show me.

Matthew: Is this ok? Can I have the picture now?

I give him the picture of the parrot and he sticks it into his book.

- Matthew: what should I write about next?
Beautyman: I don't know Matthew, what do you want to write about next?
- Matthew: [shrugs] I dunno [he sits and waits to be told what to do next]
- Beautyman: have a look at the pictures and see which one you would like then go and write something about that animal and then you can have the picture
- Matthew: ok [he looks through the pictures] I would like the turtle please
- Beautyman: ok you read the information that Mrs C put on the sheet and see what you can find out about Turtles.

Matthew quickly scanned the animal sheet before turning back to me in a panic and proclaiming that he couldn't find any information on turtles. I assured him that there is some information on the sheet because I had read it, he just needed to look more carefully. With tears welling up in his eyes Matthew returned to tell me

- Matthew: I can't find anything in here about turtles... not anything.
- Beautyman: Look there is some information about turtles here [I point to the paragraph]
- Matthew: It only says that they swim off the coast of St Lucia around the coral reef, and they can live for hundreds of years, that's all it says.
- Beautyman: well if that's all it says then that's all you can write about isn't it?

Matthew wrote down the information (again word for word) and took his turtle picture to stick into his book. Matthew's low self-confidence and low self-efficacy even extended to his participation in group work. During the end of term quiz on the Tudors, Matthew was called upon by the teacher to answer a question, even though the answer had come from his team, he still demonstrated feelings of uncertainty and responded affectively

- Teacher: Matthew, what game did sailors play on board ship to pass the time?
- Matthew: Umm, well, was it...? [he turns to his team mates for confirmation] was it dice?

Teacher: yes it was dice, well done.

A possible reason for Matthew's lack of self confidence and low self-efficacy when locating information was observed during a note taking exercise that the children had been given. The children watched videos and made notes on small handheld whiteboards. Many of the children had made bullet pointed lists or written sentences to describe what they were seeing, however Matthew had made his notes by drawing pictures. During the Tudor video, the children needed to note that one of the chores was to collect eggs, Matthew drew a basket of eggs instead of writing the words and during the St Lucia video, he needed to note down that people picked bananas and so he drew a bunch of bananas. Later on I had the opportunity to ask the teacher about this and she informed me that Matthew struggled with the written word, both reading and writing, this made it difficult for him to locate pieces of information if they were only presented in the written form. Matthew demonstrated that this was so, as he was very good at locating information by using the maps and atlases and even by using his picture notes as a resource.

Matthew responded affectively when engaging with the information seeking process, his response to information seeking seemed predominantly to be an emotional response rather than cognitive. It may have been a combination of uncertainty, low levels of self-efficacy and the fact that Matthew struggled to gather information when it was presented in the written form that contributed to Matthew's affective response to information seeking. As I observed Matthew, I did not feel as though his behaviour were a tactic that he had adopted, but a genuinely emotional response.

Having observed the year 3 children demonstrating varying levels of uncertainty and self-efficacy, I wondered whether the year 4/5 class responded in a similar way to new information and whether they too adopted similar tactics.

5.4.2 Uncertainty, Self-Efficacy and Year 4/5

Having identified various levels of uncertainty as a pattern within the year 3 class, I wondered whether the same pattern existed with the year 4/5 children. Observations revealed that the year 4/5 children did still exhibit

signs of uncertainty, however, they did not employ the same strategies as the year 3 children. They did not phrase their answers as questions, if the teacher asked them a question and they were uncertain of the answer they either responded by saying that “they did not know” or they lowered their heads and said nothing at all. Responding to a question by saying “I do not know” seemed to me to be a very mature response. My feeling was that it would take courage to admit to a class of your peers and two adults that you did not know the answer. It is possible that the children that answered in this way understood that it was all right not to know the answer. These children often demonstrated high levels of self-efficacy and very often volunteered answers to the teachers questions. The second response of lowering the head and not saying anything would suggest that these children have learned that if they do not make eye contact with the teacher she will move on and ask the question of someone else.

Over the course of several weeks, during information communication technology (ICT) classes, the children were occupied with designing their dream playgrounds. Using Microsoft Word the children were shown by the teacher how to send an object to the back or bring it to the front so that it could be seen more clearly. At the beginning of the topic, many of the children demonstrated feelings of uncertainty

Megan: Ooh help, what’s happened, what did I do? My whole picture has disappeared [laughs]

Beautyman: It’s ok, look, just click on the undo button here and your picture will come back again

Don was also working on his playground picture when he called to me for help

Don: aw no, my picture’s disappeared, where’s it gone?

Beautyman: have you clicked the undo button?

Don: yeah, I done that but it just vanished, I dunno where it’s gone

Beautyman: Oh hang on, look you just need to scroll up, your work is at the top of the page

Don: ha ha, phew, I thought I’d lost my picture then [laughs]

The teacher demonstrated to the children how to save their work to a specific folder on the school hard drive so that they would be able to access it again the following week and asked them to give their work a name that they would remember. The following week many of the children were uncertain about where they needed to go to find their work (even though the teacher had demonstrated it to them again at the beginning of the lesson). Some children were uncertain about the name they had given their work, and considerable time was spent attempting to locate individual children's work. At the beginning of the playground topic, the teacher and I were to spend most of our time reminding the children of how they had done something the week before.

However, as the children practiced the different steps required to create their pictures their confidence levels increased and their uncertainty appeared to diminish. This move away from uncertainty to a more cognitive understanding appears to demonstrate that the children were moving along Kolb's perception continuum from uncertainty to cognition and that this progression from uncertainty to cognition was often aided by support offered by an adult or another child which suggests that they were also learning within Vygotsky's zone of proximal development.

As with the children in year 3, self-efficacy also played a part in how the year 4/5 children tackled their work.

Allan had special educational needs, he found it hard to listen in class, his behaviour was disruptive and he struggled with reading and writing, however, he enjoyed being on the computer and found that he was good at ICT topics.

Beautyman: I really like your playground Allan,

Allan: yeah it's cool, I put a football pitch over this side

Beautyman: I see that, was it hard to do?

Allan: nah, it's easy with Word, anyone can do it

Beautyman: it's not easy for everybody

Allan: nah but I'm really good on the computer

Beautyman: yes you are

Allan had a high level of self-efficacy when it comes to working with a computer, his confidence in his computing skills allowed him to create some excellent work. This was in complete contrast to the way he behaved in a science class that was observed. He was required to make notes on photosynthesis but he stated that he “couldn’t do it” and refused to even try. Bandura (1997) believes that *“perceived self-efficacy refers to beliefs in one’s capabilities or organize and execute the courses of action required to produce given attainment”* (p.3). Allan believes that he is good at using the computer and so he has a high level of self-efficacy, he applies himself and is capable of producing good work. However, he believes that he is no good at reading and writing, he has low levels of self-efficacy and so he does not even attempt the work. *“If people believe they have no power to produce results, they will not attempt to make things happen”* (Bandura, 1997, p.3).

Katie was an average ability student but she allowed her feelings of self-efficacy to colour her perceptions of her technological capabilities.

Katie: What’s gone wrong? My picture keeps going wrong, I’m rubbish on the computer

Beautyman: you’re not rubbish, you just need more practice

Katie: no nothing ever comes out properly on the computer

Katie had low self-efficacy levels when working on the computer, she had previous experience which she had perceived as a failure *“nothing ever comes out properly on the computer”*, which had led her to the perceived assumption that she was *“rubbish on the computer”*.

Perceived self-efficacy will play a part in how hard a person will persevere with a task, Bandura and Schunk (1981) found that *“Children who doubt their capabilities quit sooner than those who believe they can eventually master the task should they persevere”* (p.594). Katie’s negative perception of her skills with a computer had reinforced her belief that she was *“rubbish on the computer”*, her previous experiences working with a computer had (in her eyes) been a failure, *“my picture keeps going wrong”*, she had low expectations of her capabilities. Bandura (1977) believes that *“Performance*

accomplishments provide the most dependable source of efficacy expectations because they are based on one's own personal experience" (p.81). By supporting Katie and working with her on her playground picture, I was able to help Katie to complete her work. By the end of the topic, Katie had mastered several skills and seemed to be a little more comfortable using the computer. This mastering of skills appears to demonstrate that Katie had moved along Kolb's perception continuum, where she had initially started with an affective response, however with support (Vygotsky's zone of proximal development) she was able to cognitively assimilate the information as new knowledge which she could choose to draw on at a later date.

5.4.2.1 Comparing the Uncertainty of Year 3 and Year 4/5

During the observations of both groups of children, it was possible to witness all of the children demonstrating uncertainty to some extent. The uncertainty demonstrated by the year 3 children appeared to be more emotional, with one child almost reduced to tears because he could not find a piece of information he was looking for. As a group, the year 3 children demonstrated more uncertainty and had even devised strategies for coping with their uncertainty. Their strategy for answering a question with a question of their own was not a strategy that was employed by the year 4/5 children. The year 4/5 children demonstrated feelings of uncertainty too but their uncertainty appeared to be less obviously emotional, for example Megan "Ooh help, what's happened, what did I do? My whole picture has disappeared [laughs]" and Don "ha ha, phew, I thought I had lost my picture then [laughs]" which seems to be quite a way away from the year 3 child who was nearly in tears as he stated that *"I can't find anything in here about turtles... not anything"*.

The year 4/5 children had also adopted strategies for dealing with uncertainty; they either lowered their heads or stated that they did not know the answer. Many of the year 4/5 children appeared to demonstrate a less affective approach to dealing with uncertainty, very often these children realised that they had done something wrong and they were uncertain about how to put it right, "ooh help, what's happened?" and "my picture has disappeared, where's it gone?"

At the start of a new topic, the children from year 3 and year 4/5 exhibited feelings of uncertainty to some degree, however as time progressed, many of the year 3 children were witnessed moving towards a less emotional response to uncertainty. They relied less and less on the tactic of answering a question with a question of their own.

The theme of uncertainty was identified early on in the study because it was exhibited by all of the children to some degree. The start of a new topic appeared to cause the children to demonstrate feelings of uncertainty and this made it necessary to consider other influences such as self-efficacy. It was possible to observe the strategies that the children employed and examine how the strategies differed between the year groups. It was also possible to investigate the differences between the emotional way in which some of the younger children responded to seeking information and the more cognitive style adopted by the older group.

5.4.2.2 Levels of Uncertainty and Self-Efficacy

Observations demonstrated the varying levels of uncertainty amongst the children and it was possible to identify that levels of uncertainty and levels of self-efficacy appeared to be linked. The children who had been identified as having special educational needs (SEN) in year 3 all demonstrated low levels of self-efficacy in relation to their academic work and they were the children that demonstrated the highest levels of uncertainty. During a lesson on the Tudors, the teacher had gathered together the four SEN children from her class and was working with them as they attempted to compile a dictionary of Tudor words

Teacher: we are going to continue to add to our dictionaries today, let's look at some of the words that the Tudors used in the kitchen, who can remember some of the names for the things they used in the kitchen?

Colin: there was a frying pan thingy

Teacher: yes there was can you remember what it was called?

Colin: [shakes his head] um, the er...

Teacher: it begins with a sk sound

Colin: [fidgets and looks uncomfortable]

Teacher: it is the skillet

The children all write the word skillet into their books.

During the second class of year 3 children (with the ICT teacher's class) the teacher again takes aside the three SEN children to work with them on their Tudor dictionaries. The children in this group also demonstrated behaviour that suggested that they were uncomfortable such as fidgeting and stammering when answering the teacher's questions.

After the class, it was possible to ask the teacher about the SEN children, the teacher stated that the children were not always very confident in their own abilities which was why she had decided to work with them, so that they didn't fall behind the rest of the class, she believed that, *"if I just leave them to get on with it themselves they will fall behind and not finish their work"*. In contrast to this, some of the more able pupils demonstrated that even though they were experiencing uncertainty they believed that they had the capabilities to find out what they needed to know.

Carol: can you remember what them things were called, the things they used in the kitchen to get the fire going?

Rita: the pumpy things you mean?

Carol: yeah, what's the name for em?

Rita: I can't remember, is it not in the book [gestures towards the reference book on the next table]

Carol: oh yeah, let's have a look

Carol gets the book and together she and Rita look through it until they find what they are looking for.

Carol: here it is, they are called bellows

In this instance, both girls demonstrated uncertainty at not remembering the name for the bellows, however they demonstrated that their levels of self-efficacy were high as they understood where they could find out the information they needed, they were confident enough to look in the reference book rather than asking the teacher for the answer.

The year 4/5 children also demonstrated how uncertainty and self-efficacy were linked. Allan was a child with SEN his levels of self-efficacy were high and his uncertainty levels were low when he was producing work on the computer. However, when he was expected to do work that was more academic, he did not believe that he was capable of doing it, he demonstrated high levels of uncertainty and he refused on many occasions to even attempt the work. When working with two SEN children, I was to witness how high levels of uncertainty appeared to be linked with low levels of self-efficacy.

Beautyman: we need to write down all we can remember about the water cycle, can you remember what comes first?

Katie: um, well, er, not really

Beautyman: let's look at the picture, that will give us a clue

Abby: I can't remember the names for what it's doing

Katie: this is so hard, I can't do it

Abby: me neither, I'm rubbish at science

Neither of the girls believed that they had the capabilities to complete their work, their uncertainty levels were high and their levels of self-efficacy were low.

Having examined how uncertainty and self-efficacy influenced the children's information seeking behaviour, it became necessary to investigate other themes that had emerged from the data in order to identify whether they were cognitive or affective triggers to the information seeking process. By examining motivation and choice in the context of the children's information seeking behaviour, it was possible to investigate whether they were

cognitive or affective triggers to the information seeking process. This supports the initial aim of the research study which was *“to investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour”*.

5.5 Motivation and Choice

During observations, motivation and choice were considered both accelerators as well as inhibitors to the information seeking process. Motivation can be extrinsic as well as intrinsic. An example of extrinsic motivation may be that of a teacher motivating students with *“some public display of simple praise”* or motivation may take the form of *“an end-of-term treat or the awarding of a smiley-faced sticker”* (Pritchard, 2005, p.17). Motivation can also be intrinsic, for example, love of the topic being studied may motivate a person to want to find out more. Choice also plays a part in how children engage with the process of information seeking. Ryan and Deci (2000, p.70b) believe that choice will intrinsically motivate because the learner has *“a greater feeling of autonomy”*.

5.5.1 Motivation

As was explained in the Background and Context chapter (chapter 4) the school offered the children incentives and rewards for good behaviour.

At the start of a science lesson, the year 4/5 children are settling down, the teacher waits patiently for the children to stop chattering before finally getting their attention

Teacher: David, Carly, Colin, Stella, Abigail, right if I just read out your name then one house point to each of you for sitting smartly and quietly

The rest of the children quickly fall quiet and the teacher is able to begin the lesson. By rewarding the children that were sitting quietly the teacher was able to gently remind the other children that they too should be sitting ready to begin the lesson.

During the lesson, the children were naming things that are necessary for staying healthy

Stella: you need lots of sleep to stay healthy

Teacher: yes that's right, you do, what else do we need?

David: don't eat sugar

Keith: drink milk

Teacher: yes both of those are good

Jake: did you know that milk has calcium in it and that makes bones grow strong?

Teacher: very well done Jake, one superstar sticker for you

Jake had volunteered information that had until that point, not been covered in class, he had drawn upon previous knowledge and was able to share it with the class, when asked by the teacher how he knew this information Jake was unable to remember. He demonstrated that previously gathered information had been cognitively assimilated and he was able to draw on this knowledge and was able to apply what he knew to the present learning situation. This supports the constructivist theory that new knowledge is shaped by previous experiences.

I was able to witness the way in which Lee (a year 3 child) was able to support his friend Josh in the classroom. Lee was also able to talk his friend through a complicated series of information seeking steps, explaining to him how, he had found information about banana spiders on his computer at home. Lee had identified that one of the photographs I had brought into school was a picture of a banana spider

Lee: that's a picture of a banana spider that is.

Beautyman: how do you know about banana spiders?

Lee: I looked it up at home on Google, me and Dad found out loads of stuff 'bout 'em, you know the spiders lay their eggs in the bananas so the people have to wash them first, you wouldn't want spiders in your bananas would you?

Beautyman: no you certainly wouldn't

Josh: how did you find out? What did you do?

Lee: we went to the top bit [address bar] and typed in www dot Google dot com, then in the middle bit [the search bar] we typed in banana spiders and St Lucia, then we pressed "I'm feeling lucky" and we looked at the list and clicked on some of them

Josh: cool I'm gonna try when I get home, I'm gonna look for banana spiders and geckos

Lee: the other thing that we did was click on a bit at the top of Google and it said pictures or summik like that

Beautyman: you mean the images button?

Lee: yeah and we got to see loads of pictures of banana spiders, it was really cool. That's how I know what they look like.

Lee was able to recount to his friend what he had done with his Dad. The depth of the explanation that Lee was able to give would suggest that he was familiar with this way of searching for online information and that he had in turn been supported by his Dad on previous occasions. He did not know the correct names for the address bar or search bar but he was able to give enough instruction that his friend would be able to copy the way he had found the information. Later on when Josh asked him again how he had found the pictures, Lee was able to repeat his instructions and Josh repeated what he was being told until he was happy that he had understood and would be able to find the information for himself. This could suggest that Josh is moving backwards and forwards along the perception continuum, checking and re-checking that the information he has and his understanding of it are correct, until he is satisfied that he has all the information he needs to be able to go and find the images for himself.

Lee's motivation for finding information was his interest in what he called "*creepy crawlies*". Josh's motivation was less clear, it could have been that he was interested in insects too but he could also have been motivated by the fact that Lee was more knowledgeable and he wanted to be like his friend.

Occasionally it was the topic being studied that provided the motivation or, as was the case with David, the lack of motivation. David had previously demonstrated high levels of self-efficacy in searching for information. He was confident using a variety of different resources. He often used the public library with his dad in his spare time and was motivated to find information on historical topics that interested him. However when studying the geography topic of St Lucia, David did as much work as was required and no more, he made no effort to investigate beyond what he was told in school. David had demonstrated that he had the skills, however for this particular topic he chose not to employ those skills.

5.5.2 Choice

Motivation and choice would appear to go hand in hand, *“freedom of choice can be an important motivator by itself”*.

(Malone, 1981, p.365). When the children were offered choices within their lessons they were generally more engaged with the lesson, this was certainly true for both of the year 3 classes being studied. The children were creating information booklets on St Lucia, however they were allowed to choose what aspects of life in St Lucia they wanted to include in their booklets. The teacher created ten information sheets covering a variety of topics relating to St Lucia and the children were to select a minimum of three topics that they would include in their booklets. Many of the children chose the minimum three topics to investigate whilst only three children chose to do more than three topics. Being given a choice allowed the children to research the topic of St Lucia whilst allowing them the freedom to investigate the parts that they found most interesting. Several of the boys chose to investigate volcanoes and hurricanes whereas some of the girls chose to concentrate their research on schools and food. Both boys and girls appeared to be interested in the wildlife of St Lucia. The children worked enthusiastically on their booklets and were happy to explain to me what they had included.

Beautyman: This looks interesting Lisa, what are you putting in your booklet?

Lisa: I wanted to find out about the food they eat

Beautyman: what did you find out?

Lisa: buying food's really expensive so most of 'em grow their own in their gardens. I found out that they grow lots of bananas and then they sell them all over the world.

When I asked Eric about his booklet he was eager to tell me about the volcanoes that he was including.

Eric: Do you see these mountains here?
[points to his picture of the Piton Mountains]

Beautyman: yes

Eric: well they were once volcanoes but they are not alive any more

Beautyman: no they are extinct now

Eric: yeah, it's a shame

Beautyman: [laughing] I'm sure the people of St Lucia are happy they are extinct

Eric: Well, yeah I guess so but volcanoes are more fun if they are shooting out lava and stuff

In this instance, being given a choice of what areas to include in their work seemed to motivate and inspire the children to greater effort. During the four weeks where the children were working on their booklets, it was clear to see from the observations that both classes of year 3 children were absorbed with their work, there was lots of excited chatter amongst the children as they discussed what they were putting into their booklets and compared what they were doing with what their friends were doing. Although the noise levels were quite high, it was noticeable that the children were engaged with their work, it is difficult to say whether the children were intrinsically or extrinsically motivated by creating the booklets, it may be that for some of the children, motivation was intrinsic because they wanted to understand more about the topic, or it could be that they were

extrinsically motivated because they had been given the freedom to choose what went into their booklets and so they were eager to do a good job. At the end of the project, the teacher commented to me that she was really impressed with the quality and effort that the children had put into their work. This could have been because the children were given the choice to research the parts of the project that they found most interesting. It might also have been the way the teacher set out the information for the children, by breaking it down into topics for them the children were quickly able to identify the topic that they were interested in and easily locate pieces of information that they could include in their booklets. David, who had previously shown little interest in the topic, really appeared to engage with the task, he creating a detailed booklet on the history of St Lucia. It could be that being given the choice to concentrate his work on the history of St Lucia was enough to intrinsically motivate David. During science, the year 4/5 children were using the interactive whiteboard, they were looking and listening to different sounds. The teacher allowed the class to choose different sounds to investigate. Initially, the children sat eagerly and attentively until it was their turn to choose.

Teacher: Annie, you are sitting smartly, choose a sound

Annie: running water

Keith who is helping the teacher typed into the search box “runing water” and hit the search key. He received an error message and his classmates are quick to point out that he has spelled “running” incorrectly. He tried again and this time the class are able to listen to the sound of running water, the teacher pointed out to the children the visual representation of sound on the screen and gets them to predict whether a sound will be loud or quiet. The teacher was using an external website to look for the sounds and some of the sounds were filtered by the school system. This led to frustration for the children who had picked the sound.

Teacher: what sound would you like to hear Adam?

Adam: a pig please

The school system puts up a message informing us that the sound has been blocked.

Teacher: oh dear it won't let us hear that,
choose something else Adam

Adam: why won't it let me listen to the pig?

Teacher: I don't know, there doesn't seem to be
any rhyme or reason to what we can
listen to

After several minutes of various sounds being blocked by the school system, some of the children begin to lose interest and start to fidget and talk amongst themselves. The teacher was trying to keep the children motivated and excited in what she was showing them but unfortunately she was being thwarted by the filtering system. Eventually the teacher decided to abandon the website and opened up an interactive programme on the school intranet that allowed the children to choose musical instruments and explore the sounds that each made. Because the programme was running on the intranet the filtering system did not block any of the sounds and the children quickly became engaged again with the lesson. The teacher commented to me after the lesson that she had had to think quickly when the website started blocking the sounds, *“as long as they are engaged and having fun then there is no problem, it's when they start getting frustrated that you start to lose them”*. Moyer (2002, p.186) found in her study that the teachers believed that the children were *“really learning by having fun”* and Pickard (2002, p.148) found that there was a connection between students being motivated to use electronic information resources and the fact that the computer was *“fun to use”*. It would seem then that it is important to build an element of fun into the lessons and also into the information seeking process. The teacher was attempting to engage the children in seeking information by offering them the choice of which sounds they would like to investigate, when it worked, the children were attentive and eager to find out more but when the system blocked their choices, they quickly disassociated themselves from the process.

During a year 4/5 ICT observation the children were attempting to gather information about Egypt, they were using the internet and although many of the children were having difficulties finding information they were trying. However, one child appeared not to be engaged with the task at all. Earlier in the lesson the teacher had acknowledged that Keith had been on holiday to Egypt and suggested that he would “*know all about Egypt*”. Whilst the other children were looking for information, Keith was doing nothing; I went over to see if he needed any help.

Beautyman: are you stuck on something?

Keith: no, I know all the answers already, I bin there on holiday

Beautyman: really? What is the population of Egypt?

Keith: 55 million

Beautyman: ok, well how long is the river Nile?

Keith: [shrugs his shoulders] I dunno

Beautyman: I think the idea is that you look for the information on the internet, it's not really about what you already know, you could check and see if what you know is the same as the information you find on the websites.

It is possible that because the teacher had acknowledged that Keith would “*know all about Egypt*” Keith not motivated to use the internet to look for information and was in fact quite resistant to looking for any information about Egypt as he seemed to believe that he already had the answers. When he was questioned it seemed that some of the information that he had was not correct, he believed the population of Egypt to be 50 million and was unsure how long the river Nile was. He went as far as to say that the information about the language spoken in Egypt was not Arabic as stated by a classmate but “*Hebrew, I know cos I bin there on holiday*”. Keith had been observed on previous occasions, competently using the computer, so it was not necessarily a lack of technical skills that hampered him. It may have been that he was not comfortable using

the online search sites recommended by the teacher, although it was more likely that he saw himself as the class expert on Egypt and did not feel it was necessary to investigate what he felt he already knew, this opinion may have been fostered by the teacher's comment "*Oh well you will know all about this then*".

5.5.2.1 Fun in the Classroom

Incorporating an element of fun into lessons as a means of engaging children was demonstrated regularly within the classes observed. However, Stephen et al (2008) found that pupils and teachers had very different opinions where engagement and fun were concerned, they found that "*For the children engagement seems to derive from activities that give pleasure, choice or a degree of 'freedom' and authenticity*" whereas the teachers saw fun "*as 'hooks' to draw the children in to the subject content rather than as primary learning opportunities*" (p.26).

The year 3 children were studying the Tudors in their history lesson. In order to consolidate what the children had learned so far the teacher explained to them that they were going to create a three-dimensional model village. The children drew patterns on card, coloured them in black and white, and then stuck them to the front of suitably sized boxes. This idea was that when all of the children's boxes were lined up they would resemble a Tudor street. The children worked hard to make their designs interesting and took care when colouring in their "house front" designs. Every child created his or her own house and once they had all completed them the children were put into groups to work on other aspects of the Tudor village. Some worked on cutting out and colouring in the people that would live in the village, whilst others worked on trees and animals. With the help of the teacher, a small group of children helped to create the road that would run through the centre of the village.

Teacher: I have mixed together some glue into the paint for our road and then we can sprinkle some sand on top to make it look like a cobbled street.

Lewis: why do you need to put sand on?

Teacher: we are trying to make it look like a cobbled street.

Lewis: what's cobbles?

Teacher: cobbles are stones. They are put down to make a bumpy road.

Lewis: why did they make the road bumpy and not smooth?

Teacher: Hmm. That's a good question. I think it was to help the horses to walk on it more easily. The stones fit inside their hooves and stopped them from slipping.

Lewis: Oh, cool.

Initially Lewis wanted to understand why the teacher would add sand to the paint, this then led him to question why the Tudors would have made bumpy roads. Lewis had identified that there was a mismatch between what he already knew about roads and what the teacher was telling him. He needed clarification from the teacher as to why it would be that someone would deliberately make a road bumpy. Lewis had drawn on his personal knowledge of roads and had realised that he must be missing a vital piece of information that would explain to him why in medieval times the roads would have been bumpy. For Lewis, the easiest information resource available to him was his teacher, he asked her "*why did they make the road bumpy and not smooth?*" The teacher was able to satisfy Lewis's information straightaway by offering a possible reason for medieval roads to be bumpy. The explanation appeared to satisfy Lewis and he did not ask any further questions regarding bumpy roads.

The rest of the children in the group were listening attentively to the teacher and Lewis although they did not venture to add anything to the conversation. At the end of the day, the teacher informed the children that if there was time the following day they could put the finishing touches to their village "*once the paint has dried*". Unfortunately I was not able to return to the school until the following week but upon my arrival I was taken by the hand by a group of

children and taken into the library next door to see the completed Tudor street. The children were able to point out to me the different parts of the village and which bits they had done. They were able to talk confidently about the designs on the house fronts and how *“in real life they would’ve been made of wood”* and they were able to point out to me the different styles of clothing worn by the people in their village. As the children had been creating their Tudor street they were gathering pieces of information regarding Tudor times and were able to recount that information when questioned.

Rita: this one here is Henry VIII you can see that cos he’s wearing gold on his clothes

Tina: this one is a merchant, I did this one

Rita: these ones over here are peasants so they are just wearing old brown things, they couldn’t afford nice clothes

Tina: no, Mrs C [the teacher] says that they couldn’t always afford food never mind posh clothes.

The children were eager to share with me the information they had gathered and talked in a confident way about life in Tudor times. They were able to demonstrate an understanding of what it would have been like to live in those times and many of them felt that they would prefer to live now than in Tudor times. This would suggest that they were able to critically analyse and compare life in Tudor times with life in modern times and that this critical analysis had led them to believe that they were better off now.

On another occasion, the year 3 children had a visitor from outside school. Mr Wilton had come to help the children to create felt pictures. He worked with the children showing them how to card wool, how to spin it into thread, how to roll it out and make felt pictures and had brought looms into school so that the children could have a go at weaving. The teacher decided to tie the felt making activity to the geography topic that the children were studying. The children were told that they needed to create a felt picture about

something to do with St Lucia. The group of children that I was working with decided that they would like their picture to be of the St Lucian flag. Carl, Eric, Liam and John look in the St Lucia reference book to find a picture of the St Lucian flag and then work out how they will recreate this in their felt picture. Initially the boys had asked me what the St Lucian flag looked like and when I had been unable to help they had asked the teacher who suggested that they might want to look for the information in one of the reference books for the answer. Carl and Eric looked in one book while Liam and John looked in another. As soon as Eric identified that he had found a picture of the flag the other boys immediately stopped looking.

In order to create felt the wool had first to be doused in hot tap water and rolled up inside bamboo mats. The boys chattered away as they worked, they took turns in rolling the bamboo mats and counting as they roll. When they had finished rolling they had a piece of felt that they could cut shapes from to create their picture. The boys appear to be totally absorbed in their task and were intent on deciding the best way to cut out the shapes they would need to construct their flag picture. With guidance from the teacher on where to look for the information, the boys between them decided that the fastest way to get the information they needed was for them to look for it in twos. They had been told that they would probably be able to find what they needed in the reference books so two boys each looked in two books. They were not engaging in complicated information seeking behaviour and as soon as Eric said that he had found the flag the other boys abandoned their search as there was no need for any of them to look any further.

On the next table to me, Georgia was standing with nothing to do.

Beautyman: Georgia why don't you have a go and see if you can spin some of this wool?

Georgia: how do I do that?

Beautyman: take one end here like this and gently pull it and twist it at the same time, you tie one end to the bobbin and let it spin

- Georgia: that was what that girl was doing on that video, do you remember?
- Beautyman: do you mean the Tudor video that we watched last term?
- Georgia: yeah, the boy was collecting eggs and the girl was doin' this
- Beautyman: yes I remember that, you're doing the same thing, spinning the wool like she was
- Georgia: yeah, this is fun [she laughs as she is spinning]

Georgia was recalling information that she gathered during the previous term, she was able to directly relate what she was doing in this class with what she had seen in the Tudor video. This would suggest that she had understood the information presented to her during the video and that she had internalised it and was now drawing on that reference in order to make sense of the task she was currently engaged in. Within a few minutes, Georgia was showing a small group of girls how she was able to spin wool into yarn. At the end of the lesson, the children were able to explain how you make wool into yarn and how you can also make it into felt which you can then use to create pictures. They had asked questions for clarification as they had learned this new skill, they had gathered together the information that they needed to have in order to understand why it was that before you rolled the wool with bamboo mats you must first douse it with hot soapy water. At the beginning of the class none of the children had know how to create felt pictures but by the end of the class the children had listened, watched and had a go for themselves, demonstrating that visual, auditory and kinaesthetic learning was taking place. This had enabled them to gather sufficient information to be able to confidently make their own pictures and be able to talk about the process they had gone through to create their pictures. They were able to describe in detail why they had chosen to create the picture that they had and how it related to St Lucia. The children were given a certain amount of freedom when they were creating their felt pictures (the only proviso being that the picture must be in some way linked to St Lucia). This freedom and

possibly the fact that the lesson was different to usual lessons appeared to extrinsically motivate the children. Whether the children were creating felt pictures, weaving or spinning yarn, they all appeared to be engaged and enjoying their lesson.

The year 4/5 class that I was observing were one of the first classes to have an interactive whiteboard installed in their classroom. The children got very excited when they were allowed to do things on the interactive whiteboard.

Teacher: today we are going to do something really fun, we are going to do some virtual experiments on the whiteboard.

I noticed that a small group of boys that generally sit in the middle of the class or if they can get away with it, at the back of the class, are today sitting right at the front. The reason for this became apparent once the teacher started the virtual experiments.

Teacher: this experiment is looking to see which toothpaste will clean teeth most effectively, who would like to come and choose a toothpaste?

The small group of boys all sat up as tall as they could and raised their hands to be picked. The teacher picked Josh and handed him the interactive pen. He selected a virtual toothpaste and drag and drops it onto the virtual toothbrush. Josh was confident when using the whiteboard and although it was a fairly recent addition to the classroom, the children have already been shown what to do and have begun to master some of the skills. I noticed that all of the children (with the exception of Beth and Karen) are looking at the board and are listening and engaged with what they are doing. Beth and Karen are fiddling with each other's hair and whispering to each other, they only paid attention when directed to by the teacher. This demonstrated that not all children were motivated or excited by technology, the majority of the class were attentive and engaged but these two girls were definitely uninspired, either by the technology or by the actual experiments. The teacher allowed the children to

choose which experiment they would like to investigate next. She allowed every child that wanted to, to have a turn on the whiteboard. Once the children have completed the experiments, they sat at their tables and wrote up in their books what they have learned from the experiments. I sat at one of the tables and asked the children,

Beautyman: so do you like doing experiments on the whiteboard?

Don: oh yes, it's really good fun

Dean: yes it's good fun and we get to do cool stuff on it

Beautyman: so which is easier? Experiments on the whiteboard or real experiments?

Don: [thinks about it for a minute] Hmm well I'm not really sure, because on the experiment on there [indicates the whiteboard] it makes it more fair, if we did it for real then we would have to have the same amount of toothpaste and brush with the same amount of hardness, it would be too hard to do all that. Anyway, it's dead fun changing all the things on the whiteboard.

Dean: yeah, it's like quicker and easier on there than doing it for real cos then you don't have to put everything away at the end [laughs]

In terms of information seeking then it would seem that in the eyes of the children it is quicker to gather information virtually and certainly they thought that it was more fun than actually conducting the experiment manually. They were able to justify scientifically why it was better and fairer to conduct their enquiry virtually "*if we did it for real then we would have to have the same amount of toothpaste and brush with the same amount of hardness, it would be too hard to do all that*" as well as from a timesaving perspective "*then you don't have to put everything away at the end*". The majority of the children appeared to be engaged and motivated by using the interactive whiteboard but it was certainly not the case for all of the children.

Not all of the fun finding information took place in the classroom. It was possible to be able to accompany the children on several field trips to museums in the local area, to investigate how having fun finding information helped to motivate the children.

5.5.2.2 Fun Outside the Classroom

The first of the field trips was to the George Stephenson Railway Museum (GSRM). I was given responsibility for looking after ten children (eight boys and two girls) from the year 4/5 class. The focus for the trips for year 4/5 was for the children to find as much information as they could about the Victorians.

We were met at the entrance by the museum organiser (MO), she handed out worksheets to the children and told them that they were free to wander around the museum to find the answers to the questions on the sheet. The MO has defined the children's information need for them but has then offered them a choice as to how they will go and search for the information. This supports Pritchard's (2005) belief that *"the level of engagement with an activity, and the quality of the work produced as a result is very high..when choice has been allowed"* (p.49). This was demonstrated by the children as they eagerly sought to find the information required for the worksheet.

The first question required the children to locate the display that contained the miner's lamps and to draw a picture of one of the lamps. The information accompanying the display said that Stephenson had been concerned about the safety of the miners and had invented a lamp that was safer than the normal candles that they used.

Dan: [holds up a miners lamp to examine it more closely] how come these are safer than candles?

Beautyman: In the old days the miner's only had candles and sometimes the candles would ignite the gasses in the mine and cause an explosion. These

lamps keep the flame hidden behind the glass so that the gasses don't blow up.

Den: they used to have birds too, they took 'em down the mines and when there was bad stuff the birds fell over.

Dan: canaries

Beautyman: that's right, you seem to know an awful lot already

Den: we did some of this in class with Mrs T [the teacher]

Both Den and Dan were able to demonstrate previously acquired information and apply it to the present situation, they have assimilated information and have been able to store it as knowledge. They were then able to add the new piece of information that they have gathered to what they already knew. The children worked their way through the worksheet, looking around the museum to gather information and fill in the correct answers on their worksheets. There were several interactive displays where the children were able to hypothesise and then test out their hypothesis to see if it was correct. One such display required the children to examine two miniature trucks. The trucks were connected by a rope, which looped around a pole at the top of the hill, one cart was at the top of the hill, the other at the bottom. The children were given a collection of stones and asked how they could get the truck at the bottom to the top without pushing it. The children experimented with placing all of the stones in the top truck and watched as the truck moved down the hill, as it did so it pulled the empty truck to the top of the hill. The children then wanted to investigate what would happen if the trucks both had the same amount of stones in them.

Tom: It's only gone half way down and now it's stuck next to the other one

Adam: What happens if we put all the stones in the bottom one?

They gave it a try to see what would happen.

- Adam: nothing [he gives the truck a push with his finger] why won't it move?
- Beautyman: does anyone know why it won't move?
- Tom: cos it's not moving down hill anymore
- Den: the weight of the stones in the top truck make it move down, it's gravity
- Beautyman: absolutely right

The children then decided to see how few stones they could place in the top truck and still get it to move to the bottom. After several minutes of testing out different combinations, the teacher called the children to another part of the museum. The children were motivated by their interest in experimenting with the different combinations of stones and they were enjoying themselves, they were applying previously acquired knowledge to their experiment and were able to explain, using the correct scientific terminology, what was happening to the trucks and why.

As the rest of the group moved away Den turned and commented "I love science, it's such good fun". The children were all engaged with finding the information they needed to complete the worksheet and this supports the finding of Stephen et al (2008) who stated that "*For the children engagement seems to derive from activities that give pleasure, choice or a degree of 'freedom' and authenticity*" (p.26).

During the next task, the children were asked to become detectives and my group of ten children were split into a group of four and a group of six. The six children were given the clue "CANDLE" and they were asked to think about what type of person might have made use of a candle as part of their job in Victorian times. The children were told to go off into the main part of the museum and see if they could find a suitcase with a candle on it. They located the suitcase with the candle on top and returned to their table to investigate more fully. Inside the suitcase were clothes, a pickaxe, a leather helmet and leather kneepads and at the bottom of the case there were two letters. The children eagerly dressed up in the clothes whilst I kept a

hold of the pickaxe (for health and safety reasons, at the teacher's request) and let the children hold it one at a time. The children discovered by reading the letters that the suitcase belonged to a young miner called James who worked at Beamish but was on his way to Tynemouth to look for less dangerous work. They also found out that he had brothers who were out of work due to the tin mine closing down and that he had recently become an uncle when his sister had given birth to twins. The children gathered all of the information by reading the letters and taking clues from the clothes and the items they had found within the suitcase.

The group of four children were given the clue of "BONNET", they eagerly raced into the museum to look for their suitcase but after several minutes of fruitless searching, they returned to say that they had found the bonnet but that there was no suitcase with it. Somebody had removed the bonnet and put it down somewhere else, the MO explained where the suitcase could be found and I went with two of the children to locate it. Once we had returned with the suitcase the children began to examine the items inside and try to figure out who the case had belonged to. As with the other group the children enjoyed dressing up in the clothes that they found. The MO approached Dan and asked him "what sort of clothes do you think you are putting on?"

Dan: it's a pink waistcoat...isn't it?

MO: actually what you have there is a pair of ladies bloomers, they don't go on your arms, they go on your legs, the ladies wore them as underwear.

There was lots of laughter and Dan laughing too, hastily removed them from his arms. There were also two letters in this suitcase and items such as a needle case. From the letters the children discovered that the suitcase belonged to a ladies maid called Bella who had been lucky enough to be chosen to accompany her employers on the grand tour of Europe. The children were given twenty minutes to dress up in the clothes and to gather as much information about their suitcases owner as they could.

The MO asked each group to draw a picture of how they thought their person would have looked and to write as much information about that person as they could. When they had done this one person from each group stood up and explained to their classmates what information they had found out about their person, why the person had been travelling and in some cases where the person had been travelling to, and what they did for a living. During the lunch break that followed, the children were overheard discussing the exciting things they had been doing that morning

Katie: the best bit was dressing up in Bella's long skirt, it was mint.

Keith: I liked the pickaxe and the helmet

Den: playing with the trucks and rocks was the bit I liked best

The children were developing their information seeking skills and their analytical skills, they were able to investigate different scenarios and by analysing the information that they had gathered they were able to put together a picture of life in Victorian times. Occasionally their information or analytical skills were not quite correct, for example, Dan "it's a pink waistcoat...isn't it?" but for the most part the information that the children gathered and fed back to their classmates was correct.

During the afternoon activities, the children were given boxes of artefacts and asked to imagine what it might have been like to be a child in Victorian times. The children were asked to examine the artefacts and write a diary as if they were a child that would have used the artefacts. The teacher, the MO and I moved around the room helping the children to identify what some of the artefacts had been used for, this then helped the children to decide what sort of a person might have used this artefact. Some children wrote about being cabin boys or boot makers, several children found that the items in front of them indicated that they were "well-to-do" children from wealthy households and they wrote about how they filled in their day and what they ate and drank. When the children had finished

writing their diaries several children were selected to read out their diaries for everyone to hear. This caused quite a debate as one “well-to-do” child had written that he was going out to build a tree house. The other children were quick to point out that his parents and nanny would not have let him go out and climb trees in case he spoilt his lovely clothes. This demonstrates that many of the children had gathered information on what “well-to-do” children would and would not have been allowed to do in Victorian times and they had identified an anomaly in their classmates account.

The teacher commented to me that she was surprised and delighted that some of the children who were not keen in school to sit and write were actually putting in a lot of effort to make their diaries interesting. The children were engaged with the activity and were having fun and this may well have contributed to the amount of effort that they were putting into their work. This supports the research conducted by Meyers et al (2007, p.326) who found that *“designing study activities that engage children not only makes them less tedious for everyone involved, but it helps the children build meaning from the research experience”*.

The situation of children engaged and having fun was also witnessed with the year 4/5 children on another school trip. This time the trip was to the Beamish museum. Beamish employs people to dress as 19th Century characters. The characters then explained what life would have been like in the 19th centuries. For this trip I was given responsibility for eight children, (three of the children had been in my group at the GSRM). The class teacher informed me that we had forty-five minutes to explore the home farm because at 11.30 am we were to be treated to a Victorian style lesson in the schoolhouse. We wandered around the home farm looking at the animals and then made our way into the farmhouse.

In the farmhouse was a lady dressed in Victorian costume, she was cleaning the brasses around the fire place, as we gathered around, the Victorian farmer’s wife (VFW) told the children that in Victorian times the brasses would have to have been cleaned with soot and

water to make them shine. Mark asked her about the pancake type things hanging over a rack on the ceiling and she explained that these were oatcakes and they were made because they lasted such a long time after they had been made.

VFW: I could make these at the beginning of the six week school holiday and still eat them on the last day of the holiday

Annie: did they taste nice?

VFW: I think they may have been a bit tough by the end of the six weeks

The VFW was relating the information that she was giving the children and placing it into a context that they would understand, "*I could make these at the beginning of the six week school holiday and still eat them on the last day of the holiday*" The children all agreed that they did not think they would like to eat cakes six weeks after they had been made.

Keith: why didn't you just put some in the freezer?

VFW: there was no electricity in those days, therefore no freezers, dishwashers or televisions.

The children gasp in mock horror. We thank the Victorian farmer's wife and make our way out into the yard. As we made our way through the farmyard the children discovered the ash closet,

Alan: what's an ash closet?

Beautyman: go and have a look and see if you can tell me

Michael: it's a toilet why is it out here?

Beautyman: indoor toilets are a fairly recent invention, the toilets were always outside because they smelt so bad.

In both of these instances, the children had recognised that they were missing some vital piece of information that would allow them to

make sense of what they were seeing. Mark could not understand why people would hang their food from the ceiling and Michael could not understand why the toilet would be outside and across the yard from the house. By asking questions the children were able to gather pieces of information and put them into a context that they could relate to. Meyers et al (2007, p.326) believes that "*Children are not context-less objects*" rather that "*children's preconceptions and social norms are important considerations*". Children may well make sense of information if they are able to place it into a context that fits within their own spheres of experience.

As we made our way down to the Victorian schoolroom, a lady dressed as a Victorian teacher (VT) was waiting for us. She explained that boys used one entrance to get into school and the girls used another entrance, the VT takes the boys through the front door and the girls walk around the back of the school and enter that way. Once in the classroom the VT tells the children to leave their coats and bags at the back of the classroom,

VT: Boys will sit on this side of the classroom and girls sit on this side.

The children sit down at their desks, on each desk there is a dip pen and pencil and a worksheet, each desk has an inkpot sunk into the desk. The seats are bench seats and the children slide along the seats to sit down, giggling and laughing. The Victorian Teacher gets the children to count out aloud from one to ten and then explains that they are now visiting the year 1897, she goes on to explain that in Victorian times the boys and girls would have been kept separate from each other in class. The Victorian teacher had been given a class list by the children's class teacher.

VT: when I call out your name you will stand up say "present ma'am" and then sit down again.

Her tone of voice was sharp as she called out the surnames of each child in the class, once she had done this she indicated the eight times table which had been written on the chalkboard.

VT: all together you will say your eight times tables... off you go

The children begin to recite their eight times table, when they reach the end, the VT makes them do it again. Once they had done it, she made them recite it backwards from 12 times 8 and then once again from the beginning. Once the times table had been completed the VT moved on to the handwriting exercise.

VT: using your dip pens you will write uuuuu then hhhhh then ddddd then eeeee and make sure that you join them up and DO NOT blot your books.

As the children worked on their handwriting exercise the VT moved around the classroom swishing the cane that she was holding. She explained to the children that in Victorian times children were caned not just for bad behaviour but also for getting answers wrong or even for inkblots on their work or on their hands as ink was expensive and it was considered wasteful. Looking at my own ink-stained hands, I was glad I was not a Victorian schoolchild.

The VT told the children that in 1897 the currency was pounds shillings and pence. There were some sums on the board and the children were asked to work out how much they would have been in pounds shillings and pence and explained that there were 12d in a shilling and 20 shillings in a pound.

VT: can anyone tell me what 7d and 5d were?

Josh: (Raises his hand) 7d and 5d is 12d or one shilling

The class teacher who is sitting at the back of the classroom with me whispers under her breath to me "oh well done Josh, he's doing really well".

VT: (pointing to Den) 10d and 5d?

Den: 10d and 5d is 15d or 1 shilling and 3d

VT: yes, very good.

As the Victorian lesson draws to a close the VT gets the children to count backwards from ten

VT: congratulations you are back in the present day and you have experienced what it would have been like to be in a Victorian classroom.

The children were given the opportunity to look in the display cases that were around the classroom, there were pickled snakes in jars and bird eggs in nests. The VT explained that textbooks were expensive and so the teachers would have taught the children by showing them whatever they were learning about.

The Victorian teacher demonstrated how learning would have taken place in the 19th Century. The Victorian style of teaching was very strongly associated with the behaviourist style of learning. The children repeated several times their eight times table and repetition again played a part in the handwriting exercise. The handwriting exercise also tied in to the two behaviourist principles of reinforcement and activity. The VT explained that children were caned not just for bad behaviour but also for getting answers wrong or for getting inkblots on their work or hands, the children were also given the opportunity to practice writing with a dip pen and ink, which ties in to the behaviourist principle of activity, learning whilst doing. The maths part of the lesson gave the children clearly defined objectives, allowing them to measure their success. The current education system has moved away from the stricter aspects of behaviourist learning, such as caning for messy work or wrong answers. However, behaviourist principles are still embedded in the way in which teachers help children to learn. For example giving praise and rewards for good work. The learning outcomes for each lesson, WALT and WILF, are the modern day equivalent of the behaviourist principle of objectives, by setting out objectives a person is given a goal to aim for, this in turn gives them a benchmark by

which to measure success or failure. The children are told at the beginning of each lesson what they are learning and what they are looking for and at the end of the lesson, WALT and WILF are revisited so that the children are able to see if they have achieved the learning outcome for the lesson.

The year 3 children were also taken on a school trip to the Centre for Life in Newcastle. As on previous school trips I was given charge of a small group of children, on this occasion there were six children in my group. On arrival at the Centre for Life we were met by one of the guides, the teacher and I were informed that our group could have twenty minutes to wander around the “our world” area of the museum before being taken to another part of the museum. The children were free to explore the different exhibits. Being given a choice as to the parts of the museum they wanted to investigate allowed the children to investigate and gather information on topics that they were interested in which supports Ryan and Deci’s (2000, p.70) belief that choice will intrinsically motivate because the learner has “a greater feeling of autonomy”.

Eric and Callum were experimenting, they were standing on a weighing scale plate, when they stood on the plate, rows of bottles lit up demonstrating how much water is in the human body. Eric calls me to come and see

Eric: have you seen this? It’s cool, look when Callum stands on it then only this many bottles light up [he points to the bottles] but when I stand on it there’s three more than Cal

Beautyman: why do you think that is?

Eric: hmmm, is it cos I’m taller than Cal?

Beautyman: well it might be because you are a little bit heavier than Callum

Callum: you stand on it, you’re heavier than me and Eric

Beautyman: ok

Eric: wow look at all those bottles you lit up

Beautyman: hmmm yes

Eric: why is it bottles that light up?

Beautyman: it is demonstrating how much water is in the average human body, based, I think, on how heavy we are

Callum: that is so cool

Initially it seemed that the boys were just interested in making the lights on the water bottles light up but as they investigated, they were motivated to find out the reasons behind why the bottles were lighting up.

I noticed a small group of girls who had headed over to what appeared to be a large sand tray. On closer inspection, I found that there were scrapers and brushes in the sand tray, the children began to use the brushes and scrapers to move the sand away to investigate what lay below

Beautyman: this looks interesting, what have you found?

Carol: there are bones underneath the sand, can you see them?

Beautyman: yes I can, how exciting

Carol: yes just like on Time Team

Beautyman: I love that programme

Carol: me too, me and my mum watch it, did you see it this week, they uncovered a mostix or sumthin

Beautyman: a mosaic, yes I saw that programme, it was very beautiful

Carol: it had been covered over with dirt for hundreds of years, my mum said she wouldn't have wanted to clean that [she laughs]

Beautyman: is that something you would like to do as a job when you get older?

Carol: Oh yeah I want to be an archaeologist

Carol carefully removed the sand from the bones with a small brush just the way she had seen it done on Time Team, her interest in the subject and possibly because she had been allowed to choose the activity for herself, had prompted her to investigate the sand tray first and after the twenty minutes were up Carol was still working eagerly on uncovering the bones, even though by then her companions had moved on to look at the other areas of the museum.

The next part of the museum that we were taken to was the dome. The children were asked to try and think about what they thought the earth would look like a million years from now. Once inside the dome, we were shown a short film on what scientists predict the world may look like in a million years. After the film, the teacher asked a group of boys what they had thought of the scientists predictions

Teacher: well what did you make of that?

Eric: well, it was ok [he sounds dubious]
but where were all the people and the houses and stuff?

Teacher: I don't know, maybe we have turned
into some other creatures by then

Eric: maybe it was like the dinosaurs and a
meteor hit the planet and we all died

Teacher: Hmm well, that's a cheery thought!

Eric was recalling his previous knowledge of how dinosaurs became extinct and was applying it to try to speculate and make sense of why there had not been any people on the film set a million years in the future. After viewing the film, we are escorted by a guide who takes us to one of the labs where the children are going to investigate transparent, translucent and opaque materials. Liv is the name of the session leader and makes the children welcome in the lab. She asks the children if they can tell her about sources of light. The children say electricity, torches, and the sun.

Liv: can anyone think of another source of
light?

Molly: the moon?
Callum: the moon just reflects the light of the sun, it doesn't have its own light
Liv: that's absolutely right

The children are recalling information that they have gathered in class and are applying it to the present situation in order to answer Liv's questions.

Liv keeps asking questions and prompting the children until Jaynie remembers that fire is also a source of light. Half of the children are given torches and an assortment of objects and asked to complete a worksheet drawing the shadows they see. The other half are experimenting with shining torches through different materials to see if they are transparent, translucent or opaque, after 10 minutes the children swapped over so that they could have a go at both experiments. The teacher confided to me that the children had already covered "all of this stuff in class" but felt that it would be good revision for them to go over it again.

To finish off the session the children were asked to make shadow puppets and put on a little play with Liv reading the story from a book, something which the teacher told me the children had also done in school. The children appeared to be enjoying themselves and worked hard at making their puppets look good.

There was a distinct contrast between the field trips with the year 4/5 children and the trip for the year 3 children. The timing of the trips could have had something to do with it, the year 4/5 trips both took place in October, right at the beginning of the academic year, whereas the year 3 trip took place at the end of April, near the end of the academic year. The year 4/5 trips were specifically geared to what the children would be doing in their classes and the theme for both trips was the Victorians. Whereas the year 3 trip did not have a specific theme and felt, more like a nice treat for the children.

Observations suggest that motivation and choice play a part in how children engaged with the information seeking process. By examining how children are motivated, it has been possible to highlight examples of when the children were engaged with the information seeking process and when they were not. The observations clearly highlighted the fact that when children are having fun, they are more fully engaged with the process whether that was in a classroom environment or outside it. The observations also demonstrate how being given an element of choice helped to strengthen the children's level of engagement with the information seeking process.

When the children were engaged and having fun, they were more engaged with the information seeking process but I wondered whether there was a time when they might be prompted to delve further into a subject and seek deeper levels of information, even when they were not required to do so for school. To explore this in more depth it was necessary to consider need and want in the context of the children's information seeking behaviour.

5.6 Need and Want

The children were observed having fun and engaging in a variety of different ways with gathering information, considering this then led me to wonder whether the children were ever inspired to go and find out more information for themselves, even if they were not required to do so as part of a school or homework activity.

Wondering about this then led to the question, if the children were inspired to seek information for themselves then how did they go about it?

The terms "need" and "want" are still used interchangeably within the current literature, being unable to find a definitive definition for the terms "need and want", for the purposes of this research study the distinction between the terms need and want is as follows, a need may be contested, a want however, is incontestable. Or as Chatman and Pendleton (1995) state, a lack of a need may put "*our current state of affairs in jeopardy*", were as a want would simply be an "*enhancement*" to our current state of affairs (p. 136).

During the course of the observations different levels of need and want were identified that highlighted the ways in which the children searched for information.

5.6.1 Needing Information

The year 3 children were studying the Tudors and were watching a video called the “Time Detectives”, the children were given small whiteboard and marker pens and instructed by the teacher

Teacher: I want you to watch the video and gather as much information as you can by jotting down notes, you don't need to worry about spelling or capital letters or full stops, this is just to remind you about what you are seeing. Remember that we are interested in the children in the video

She wrote on the chalkboard “What did the children do?” to serve as a reminder for the children of the focus of the exercise. The video started and the children watched. The children had not taken notes before so the teacher prompted them

Teacher: oh the boy is feeding the animals, we might need to remember that.

The children noted that on the video the Tudor children had to collect eggs and spin yarn and help their families with the chores.

The video then showed how the more “well-to-do” children would have attended school and demonstrated how strict teachers had been in Tudor times. When the video had finished the teacher talked with the children about what they had been watching and answered any questions that the children had.

Joe: why did the teacher hit the boy's hand with the twigs?

Teacher: that was a punishment back then, it was called birching and children were punished for all sorts of things

Lisa: what did they get punished for?

Teacher: well in school they got punished for untidy work or for getting the answers wrong

The teacher handed out worksheets to the children and instructed them to answer the questions on the worksheets

Teacher: I would like you to concentrate on the poor children, you have to use your whiteboards to remind you of the things you saw on the video and put as much information down about the poor children as you can remember

Lee: how many things do we have to write down?

Teacher: as many as you can remember but at least five things.

The children began their worksheets and using their whiteboards they jotted down the information that they had gleaned from watching the video. As the children worked on their worksheets, they chatted about the information that they had gathered.

Carol: I got that the boy gathered eggs and fed the animals and the girl did the spinning thing and helped her mam with the cooking. That's four things, I need one more.

Rob: Did you put that the boy helped his dad in the field and the girl helped making the beds and cleaning the house?

Carol: no [laughs] I forgot those, [she writes that the girl helps to clean], finished, that's five.

With the two facts that Rob gave Carol she had six facts in total but she only added one more fact to her worksheet, giving her a total of five facts, possibly because the teacher had suggested a minimum of five facts, Carol did the minimum that was required and no more. When the children had been creating their St Lucia booklets the majority of the class chose to investigate the minimum three topics required to complete the assignment. This supports Pickard's (2002, p.132) research findings that when doing work "*If the homework requested ten facts, then they identified ten facts and made no effort to investigate this any further*". This would imply that although Carol needed the information to complete her schoolwork, she did not necessarily want the information. A point that was also observed by

Brown (2004) who found that while a child may need information to complete a school assignment they “*have no interest in the topic at all*” and does “*not personally really want the information*”.

This was also found to be true of the year 4/5 children, during a science lesson they were given a worksheet on the water cycle. To complete the worksheet, the children were required to cut up a list of things that happen during the water cycle and place them in the correct order. The children were allowed to work together but many of the children struggled with this exercise, there were lots of sentences that were similar, for example, water falls on the roof, water falls on the grass, water falls on the playground, water gets soaked up by the trees, the similarity of the sentences were confusing the children.

Stella: uh it says which comes first, well that’s got to be evaporation right?

Tammy: yeah I guess, then what?

Stella: well it goes up in the clouds and then it condenses and that turns to rain

Tammy: uh huh, so which one of these is right? water falls on the roof, or is it the playground or the grass first?

Stella: [shrugs] I dunno,

Neither girl attempted to identify the next step in the process, they simply sat and chatted about a television programme they had both seen the night before. Eventually the teacher realised that the children were struggling and got them back on task by talking them through the water cycle, the class completed the worksheet as a group. Tammy and Stella could have looked at the worksheet, as there was lots of information about the water cycle there, however, it appeared that their lack of interest in the topic, once it became a little bit hard, was enough for them to stop the task completely. This point was born out because when the class completed the worksheet together both Tammy and Stella contributed to the class discussion, this seems to suggest that it was a lack of interest in the topic that had prompted them to abandon the work when it became a little bit hard rather than because the girls were experiencing low levels of self-efficacy.

5.6.2 Wanting Information

Equipping children with the skills that will allow them to successfully seek information does not necessarily mean that the children will always be inspired to use those skills. This very point was observed with one particular child in year 3. During the Tudor topic, David had been actively seeking information, both in the classroom and in his own free time outside school. He brought books about the Tudors into school that he and his Dad had borrowed from the local library, he could talk in detail about the Spanish Armada and appeared to have a good understanding of the different information resources that he could access to find out what he wanted to know. He and his Dad spent time together searching the internet and looking at books and pictures. When I spoke to David, I found that his love of historical topics was what motivated him to search for information

Beautyman: So, David, how do you know so much about the Spanish Armada?

David: Me and Dad went to the library and... we found stuff on it, books and pictures. There was loads of stuff on the Internet too.

Beautyman: When did you first find out about the Spanish Armada?

David: Well, Mrs C [he indicates the teacher] was talking about how Elizabeth had only had to fight one war and it was with Spain with ships. My Dad knows loads 'bout ships so we looked it up on the internet

Beautyman: Why did you look for more stuff at home?

David: [shrugs] I dunno, it's just like, well, it's really cool, I wanted to find out about the ships and sailors. The Spanish had loads more ships than us you know, but we still beat 'em

Later in the academic year David showed the same enthusiastic interest when the topic being studied was the Aztecs, he brought books and DVD's into school to share with his classmates, he could explain about the different gods worshipped by the Aztecs and again was motivated to do most of his information seeking outside school. David appeared confident when searching for information using books and resources such as CD-ROMs and the internet and was able to demonstrate this in class. He and his Dad had

found a particularly good website on the Aztecs, when searching at home and David, using the class computer, was able to find the website so that the other children could see. This seems to imply that David had regular access to the internet as an information resource and was confident and competent in using this resource as a means of finding information.

However, when the class topic switched to geography and the children began investigating St Lucia, David did just as much as was necessary to complete his work and no more. He did not bring any information in from home and only answered questions in class if he was requested to do so by the teacher. When the children were creating their information booklets about St Lucia, David chose to investigate the history of St Lucia for his booklet and he then demonstrated that he was able to use the reference books and information sheets to gather information for his work. This demonstrated the importance played by motivation in the learning process and on information seeking and confirms the point that children can and should be taught information seeking strategies and skills. If they have the skills, they can then choose to make use of them or they may choose not to use them.

Wanting information did not always entail the children searching outside of the classroom environment, occasionally the children would be inspired simply to ask another person as they were passing by, as was the case with Rob as I passed by his table

Rob: Mrs Beautyman, if you had to choose how to have your head chopped off, [referring to Anne Boleyn] how would you choose to have it done?

Rob's interest had been piqued in class by a gruesome story told by the teacher about how Anne Boleyn requested that she have her head chopped off with a sharp sword rather than with a blunt axe. Rob's curiosity was enough to prompt him to ask the question, although he did not attempt to look further for more information after asking his question.

Consulting an adult was not the only way the children were able to find information, on several occasions the teacher, when asked a question,

would direct the child to “go and have a look in the reference books” which were situated at the back of the class. In one particular instance, the reference books in the classroom did not have the information that was required and so the teacher instructed the two girls

Teacher: I think you will have to pop next door and have a look for the book you need, I am sure there is one on Elizabethan clothing in the library

The girls located the book and spent some time looking at it and discussing how uncomfortable it must have been to wear tight corsets. Having located the reference books in the school library they did not look anywhere else for more information seemingly satisfied with the information that they had found.

Similar situations were observed in the year 4/5 class. In science, the class were investigating the solar system, Aiden was very interested in the planets and spent time stargazing with his grandfather in his spare time. He too, knew that he could have access to lots of reference books by going to the local library and talked knowledgeably about the things that he had found. His interest in the solar system had prompted him to want to seek more information for himself. He and his brother were also able to locate information using different resources. I was able to ask both boys about how they looked for information

Beautyman: if you were looking for information on say, the solar system where would you look?

Aiden: well, I would look in my books first, I have lots of books at home, but then if I couldn't find it I would probably have a look on Encarta

Tony: yeah, I would look in books or Encarta

Beautyman: what if you still couldn't find it, what would you do then?

Tony: I would probably ask Mum and Dad and then we would look on Google or we would ask Jeeves

Aiden: yeah me too but mostly you can find it on Encarta, it's really good

From this exchange, it seemed clear that the boys had developed an information seeking strategy that worked for them. They would consult their books in the first instance and then if that failed, they would turn to the electronic encyclopaedia Encarta. Should both of these strategies fail they would then turn to their parents for help and guidance. Developing an information strategy would imply that the boys were used to searching for information, so much so that they had devised a plan for finding information and then had a backup plan if the first plan did not work for them. This exchange seems to suggest that the boys wanted information about the solar system and had developed information seeking strategies that would allow them to gather the information they wanted.

Occasionally the year 4/5 children would, like the year 3 children, simply ask questions of the nearest adult if they wanted more information.

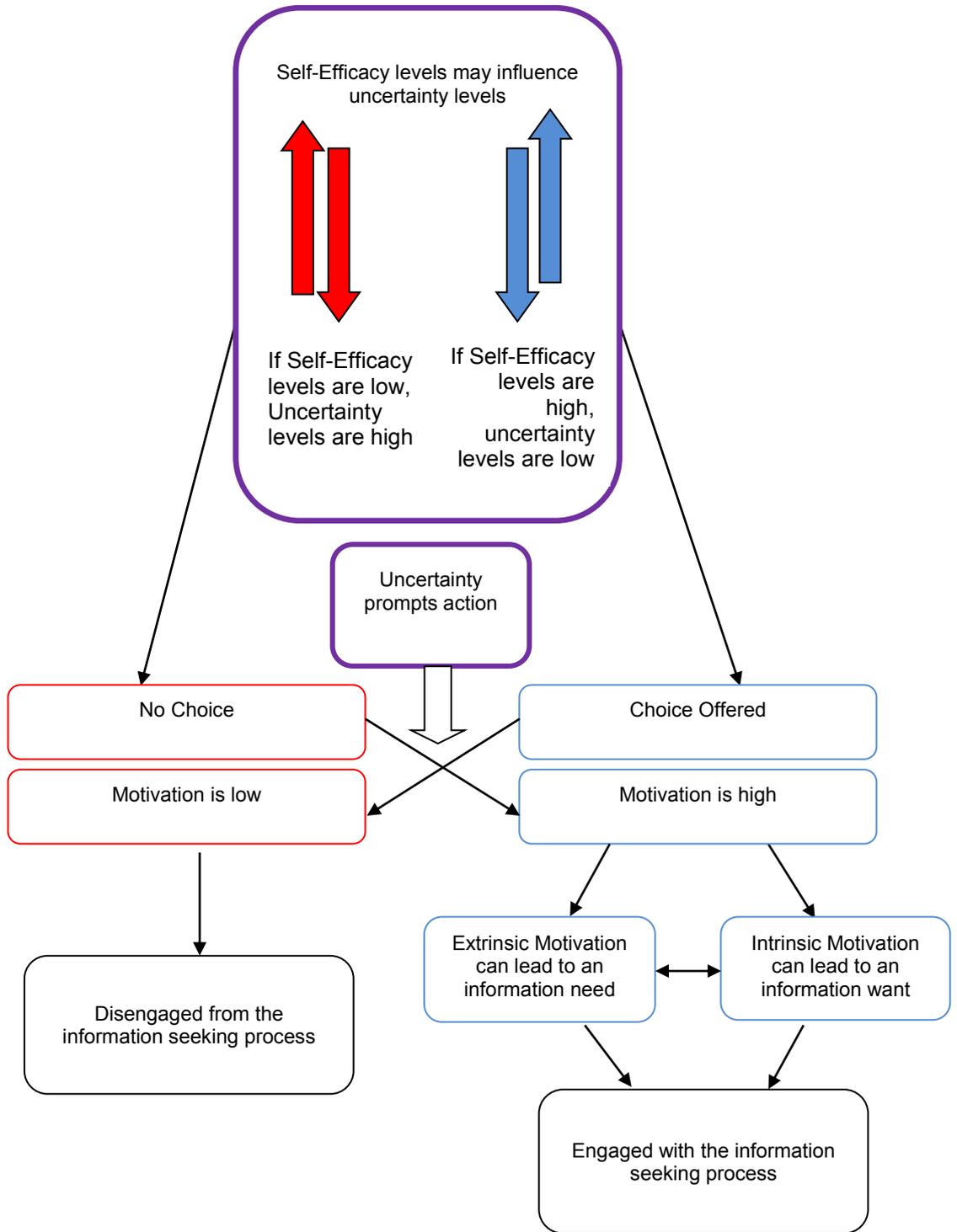
Don: why do sounds sound different under water?

As Lipman (2008) pointed out on the DfES Standards site, children have an innate curiosity about the world around them and getting them to ask questions "*is all that is needed as a starting-point for enquiry*", which he believes will encourage the children to become critical thinkers.

The observations clearly demonstrated the difference between when a child is required to find information for their work and when they want to find information for themselves. The children demonstrated clear examples of need and want, needing information in order to satisfy an academic obligation on the one hand and wanting to find more information to satisfy a personal interest in a topic, on the other. The observations also highlight the importance that motivation and choice play in engaging children with the information seeking process.

Uncertainty, self-efficacy, motivation, choice, need and want all emerged from the data as themes that were either cognitive or affective responses to information that either accelerated or inhibited the information seeking process, diagram 8 illustrates how these accelerators and inhibitors fit together to influence the information seeking process.

Figure 8 Accelerators and Inhibitors to the Information Seeking Process



Key. Inhibitors are in red, accelerators are in blue, instances of both are in purple.

The diagram represents how feelings of self-efficacy and uncertainty may

have influenced a child's engagement with the information seeking process. For example, if a child experienced low levels of self-efficacy and high levels of uncertainty they may not engage with the information seeking process because they do not believe that they will be able to find what they are looking for. Children who had high levels of self-efficacy and low levels of uncertainty believed that they would be able to find what they are looking for and so they engaged with the information seeking process. This supports Bandura's (1997, p.3) belief that *"If people believe they have no power to produce results, they will not attempt to make things happen"*. For this reason uncertainty and self-efficacy were viewed as both accelerators and inhibitors to the information seeking process. Where children's levels of self-efficacy were high, it appeared that uncertainty levels were low, this supports Schunk's (1981, p.104) statement that *"children's self-perceptions of their capabilities have an important effect on their subsequent achievements"*. Uncertainty is viewed as both an accelerator and an inhibitor to the information seeking process. Without uncertainty in some degree, people may not feel the need to look for information *"Uncertainty is the critical link between information and decision-making"* (Shannon and Weaver, 1949, p.224), the spark that ignites the information seeking process. The diagram demonstrates how when choice was offered, generally but not always, motivation was higher and when choice was not offered or was not available (as with the year 4/5 experiment with sound) the children became de-motivated and disengaged from the information seeking process, although again not exclusively. Being offered choice appeared, for the most part, to motivate the children in this study and the motivation they experienced appeared to fall into two categories. The children were either extrinsically motivated, for example, they wanted to emulate a friend or receive praise from the teacher, or complete a piece of work. Extrinsic motivation appeared to lead to an information need, whereby the children were engaged with the seeking information process in order to fulfil an academic commitment. Although there was only one instance observed, David appeared to move between extrinsic and intrinsic motivation, he appeared not to engage with the geography topic of St Lucia until he was given the choice to investigate the part he wanted to. David chose to investigate the history of St Lucia and when he was allowed to do this, he appeared to be intrinsically motivated to find information because he wanted to know more about the topic.

Some of the children were intrinsically motivated, they appeared to be engaging with the information seeking process because they wanted to find information because they loved the topic and not simply to fulfil an academic need.

The importance of getting the children to engage with the information seeking process cannot be stressed enough, because once they are engaged with the process, if they are given the skills they need, they are truly on their way to becoming literate users of information. Engaging the children with the information seeking process whilst relating it to the topic they are studying demonstrates the importance of developing information literacy skills within a learning environment and reiterates the importance that Kulthau (2004) and Scott and O'Sullivan (2005) place on integrating information seeking skills within the curriculum.

Providing the children with the skills necessary to become information literate means that they must understand what information is available to them and be taught the basic skills for retrieving that information and making use of it in a topic specific context.

5.7 Teaching Basic Skills

As the children attempted to move from an uncertain response to new information, to a cognitive understanding of that information, they were building up a repertoire of information seeking skills. By investigating the ways in which the children were taught these information seeking skills it may be possible to offer guidelines that will aid the teachers to help the children to become information literate. Examining how the children were taught information seeking skills was one of the five objectives identified at the outset of the research study which was to, *"Identify and evaluate the current methods for teaching ISS to KS2 children"* this will help to *"establish the level of teaching of ISS for KS2 children"* which is also an objective of the research study. How the children move from uncertainty to a cognitive assimilation of information was examined through observations, the findings from the observations were scrutinised and examined using Kolb's experiential cycle framework. In light of the fact that many of the children were given support by either an adult or a peer, Vygotsky's zone of proximal development was also used as a theoretical framework

to examine how the children assimilated new information into meaningful knowledge.

The importance of developing the skills to find information cannot be underestimated, as Lubans (1978) pointed out, once they have mastered the skills to find information, there is no other part of their academic curriculum that they cannot go and find out about if they choose to.

Teaching children the skills that will allow them, to discover for themselves, whatever they want to know more about, would seem to be an important life skill, once learned, the world is their oyster. Embedding information literacy skills within other topics allows the children to learn transferable skills and this was observed regularly throughout the course of the fieldwork.

The year 3 children are starting a new topic in class, they had previously been studying the history topic of the Tudors but the teacher informs them “now we are going to do some geography”, she first tries to establish that the children understand what is meant by “geography”

Rob: Is it things we have never seen before?

Teacher: no, not quite

Eric: it's places in the world

Teacher: yes, it's the study of different countries, clothes, the food they eat, the things they grow, the way other people live

The teacher had next to her a globe, an atlas and a map and she demonstrated to the children how each of these things holds different levels of information.

Teacher: now I am sure you will all remember from year 2 that the world is a sphere (she holds the globe up for the children to see) if we split it into two halves we have the top and the bottom, does anyone know what the imaginary line is called that runs around the middle of the world? No? Ok well it is called the equator. Now half of a sphere is called a hem? hem? anyone? no ok it is called a hemisphere, that is what we call half of a sphere [pointing to the globe the teacher demonstrates] this is called the northern hemisphere and this is called the southern hemisphere. We live in the ... no I am not going to tell you, I am going to

set you a challenge in a little while to find out which hemisphere we live in.

The teacher opens a brightly coloured atlas for the children to look at, there is very little text on the atlas, just the continents but no country names. The atlas has pictures of the animals that are native to that particular area of the atlas.

Teacher: Who can find the United Kingdom on this atlas?

Callum is chosen and points to the UK straight away. The teacher next asks Eric to point to Spain on the atlas, which he is able to do and finally she asks Lewis if he can locate France, he hovers his finger over southern Europe before finally correctly identifying France.

Rob: How come there is water between the UK and that bit (he indicates the rest of Europe)

Teacher: in the ice age the ice melted and when ice melts it turns into water, the water level rose and the UK was cut off from the rest of Europe, it is still part of Europe

Rob: I don't get it

Teacher: I am going to explain now. The world is split into continents. Continents are great big groups of land, there is Europe, Asia, Africa, Australia and North and South America

As the teacher names each continent, she points it out to the children on the atlas.

Rob: how come you need to look at the globe to see where on the hemisphere the continent is? Why can't you use the atlas?

Teacher: do you mean so that you can see which hemisphere the continent is in? (Rob nods) It's quite difficult to see whether a continent is in the northern or southern hemisphere when the page is laid out flat but much easier to see when it is on a globe

Rob: So, like how can you see where Newcastle is on a atlas?

Teacher: I was just coming to that Rob, there is not enough detail on an atlas, certainly not on this atlas, so we need to look at maps, that gives us more information again.

Rob nods his head that he has understood.

Teacher: Right now listen carefully your first job is to take this worksheet and go and label the UK.

The teacher hands out worksheets to all of the children and sends them to sit at their tables where I help to hand out the globes (one globe to every three children).

Teacher: once you have found the UK on your globe, have a look for it on the worksheet, you can see that there is an atlas drawn on to your worksheet, when you have done that, see if you can find these others too

On the chalkboard the teacher writes, North America, South America, Africa, Australia, Asia and Europe. The children begin by locating the UK on the globe and then looking to see where that is on the worksheet. The worksheets are consolidating what the children have learned in that lesson, the children were practicing seeking information by using the globes and transferring what they have found onto their worksheet. The teacher gives the children ten minutes to work on their sheets before calling them to tidy up and sit back on the carpet.

Teacher: now I set you a challenge earlier, which hemisphere is the UK in?

The teacher goes around the class asking the children which hemisphere they think the UK is in. The majority of children think that it is in the northern hemisphere.

Teacher: is there anyone that thinks that the UK is in the southern hemisphere? [a few children raise their hands] well I can tell you that if you said the UK was in the Northern hemisphere then you are r r r r r r r ...[she keeps the children guessing as to whether she will say wrong or right] ...right!

The children who got it right give a huge cheer, those that got it wrong remain quiet. This class line up quickly at the door and go down the corridor for their ICT lesson, while the ICT teacher's children come up the corridor for their geography lesson. The teacher confided that sometimes it was difficult recalling whether she had told both classes something or whether she had just covered it with only her class. The children sat quietly on the carpet area waiting for the lesson to begin. As with her class, the teacher tried to establish whether the children understood what was meant by "geography".

Carol: it's when we learn about places in the world

Teacher: yes good girl, it's about places and people and the climate, what people do, what they wear what they grow, what they eat, what they make, it is people's customs, does anyone know what customs are?

Carol: is it what they do?

Teacher: yes well done. Some of the customs in our country are the things we do at Christmas, like the trees and turkeys and things like that. (holding up the globe for the children to see she asks) can anyone tell me what shape this globe is?

Georgia: it's a sphere

Teacher: very well done Georgia.

The teacher goes on to explain to the children how the globe is divided into the northern and southern hemispheres.

Teacher: can anyone name a country in the southern hemisphere?

Luke: Brazil

Teacher: yes Brazil is in the southern hemisphere, I was thinking of another country, a country that is not very popular with us at the moment.

Carol: Australia?

Teacher: yes that's the one I was thinking about, why are they not popular here at the moment?

Carol: because they beat us at the cricket

Teacher: yes they did, we did not win one single game against them this time. Now we can see the world with the globe but there is another way to look at the world, if we were to cut down this side and flatten it out we would have an atlas. This atlas here shows us all the big areas of land, who can tell me what the big areas of land are called?

Lee: Russia?

Teacher: no not Russia they are called continents. You can see here that there are lots of different countries within the continent of Africa. In the South American continent there are lots of countries such as Peru, Argentina and Brazil. Can anyone name a country in North America? Listen carefully to the name, North AMERICA.

Jim: the USA?

Teacher: yes well done, now you can see on the Atlas and the globe that the UK has sea all around so what does that make us?

Jenny: an Island?

Teacher: yes good girl, can you find it on the atlas? (Jenny finds it straight away) excellent, well done. Now a very long time ago The UK was joined to the rest of Europe.

Jim: how did it get separated?

The teacher explains to this class, as she did to her class, about the ice age and the water levels rising and then goes on to explain the equator.

Jane: why is this white rabbit on the atlas?

Teacher: up here is called the Arctic Circle, (she points to it on the atlas) it is very cold. The white rabbit is probably an Arctic hare, why do you suppose a rabbit would need to be white? Hares in this country are brown.

Lee: so it can't be seen in the snow

Teacher: that's right, it is white because it is using the snow to hide it, this is called c c c? anyone?

Georgia: camouflage?

Teacher: well done Georgia, yes it is called camouflage, you have answered lots of questions today have two house points. We can see here that this bit by the North Pole is called the Arctic but what is the bit by the south called?

Lee: the Antarctic

Teacher: brilliant, you can have a house point too. You have been sitting here for a long time now so I want you to take a worksheet and find the UK on the globe and then see where it is on your atlas.

The children move to their tables and do the same work on the sheet that the class before had done.

As with the class before them, they were consolidating what they have been taught in the lesson and were using their information seeking skills to search the globe and the atlas for different levels of information. During the following weeks, I witnessed

the children from both classes, confidently using globes, atlases and maps to gather varying levels of information. During an observation I witnessed a small group of children working their way through another worksheet, deciding which information resource would give them the information they needed.

Rob: we need to find London

Carol: well it won't be on the globe will it?

Rob: no because the globe doesn't have enough information on it

Lewis: I think we should look on the map that has got the names of the places on it.

Rob and Carol agree with this. They look on a map of the UK and find London.

Rob: yes there it is, down the bottom

Moving to the next question, they find that they have to identify which continent Portugal is in, this time they all agree that the atlas is the best place to look for this information. I decided to ask them a question

Beautyman: if you wanted to know whether Antarctica is in the northern or southern hemisphere where would you look?

All three children tell me that that is an easy question, they would look on a globe and Rob goes on to show me that Antarctica is in the southern hemisphere by pointing it out to me on the globe.

The teacher was teaching the children basic information seeking skills by demonstrating how different levels of information could be gathered from the different resources. Whilst she was doing this, she was at the same time embedding those skills making them specific to the context of the geography lesson. The teaching of information literacy skills within the context of geography supports Grey's (2000) view that *"the best balance of learning comes from an initial teaching of basic information skills followed up by these skills being used in the context of subject teaching"* (p.72), however, in this case the basic skills were being taught alongside the subject teaching and the children did not receive *"initial teaching of basic information skills"*. The children were analysing which resource would give

them the information that they needed, when I asked the children what they were doing, they responded by telling me that they were “just looking for stuff about geography” but what they were actually doing was developing their information literacy skills whilst they were “looking for stuff about geography”. The children were engaging in information seeking behaviour which follows part of the Big6 template developed by Berkowitz and Eisenberg (1987), the children had defined and identified the information that they needed, *“we need to find London”* (this is the first step in the Big6 framework). They had identified the most appropriate resources that would supply them with the information they required, *“I think we should look on the map, that has got the names of the places on it”* (the second step in the Big6 framework). They had physically located the information, *“yes there it is”* (this is the third step in the Big6 framework). Intellectually they had discounted the resources that they felt would not help them in their search. The children were physically engaging with the information by touching the map and seeing that London was *“down the bottom”* (this is the fourth step in the Big6 framework). Berkowitz and Eisenberg (1987) believe that the two final steps to the Big6 process are synthesising and organising information from multiple resources and evaluating how successfully the previous steps have been completed. During this observation, there was no evidence to support these final steps. The children identified that the map was the best resource to identify London, they found London on the map and they then moved on to the next question. This observation provided clearer insight into the different levels that the year 3 teacher taught her class, beginning with a basic teaching of the different levels of information that can be gleaned from different information resources. The observation also demonstrated how the teacher was building on the previous knowledge that the children had acquired in year 2 *“now I am sure you will all remember from year 2 that the world is a sphere”* she is reminding the children that they already have this piece of information, this observation helped to establish how the teachers were able to build on the children’s previous experience, which helped to establish the levels of information seeking being taught to the children, which was an objective of the study.

The year 4/5 children were being observed during an ICT class and the teacher wanted them to use different websites and search engines on the internet to gather information about Egypt. She started the lesson by getting the children to think about what things they would like to know about Egypt.

Teacher: today we are going to be doing ICT but with a geography flavour to it, we are going to be using the internet to discover more about Egypt. There is a lot of information on the history of Egypt but what if we want to know about Egypt now, what if the questions we want answered are, what sort of place is Egypt right now? What sort of questions might we ask?

Carla: are there mummies there?

Teacher: that is more of a history question, you wouldn't ask are there mummies in England would you? We want to know about Egypt now, what could we ask?

Keith: are the people there rich or poor?

Teacher: yes good one, you went there on holiday didn't you?

Keith: yeah it was brilliant

Teacher: Oh well you will know all about this then

Dan: what are the people like?

Aaron: What language do they speak?

Teacher: now your getting the idea, yes what language do they speak?

Tammy: what are their schools like? Oh and what food grows there?

Kimmy: what are their houses like?

Tim: what kind of food do they eat?

Teacher: these are all excellent questions. I have a sheet here with some questions that you need to find answers to but you can write your own questions on the back and find the answers to them. The first question on here is, what is the population of Egypt? Does anyone know what population means?

Tammy: does it mean popular?

Tim: no, it means how many people live there.

Teacher: yes population means the number of people, what type of currency do they use? What is the capital city called? How long is the river Nile? What language do they speak and what is their religion? Now on the top of the sheet there are some web site addresses, which you can type into the address box here (she indicates the address box on the interactive

whiteboard screen for the children to see) or what else can you do?

Aiden: Google it

Teacher: yes or you could go to ask.com. This site here is particularly good it is a school website, you could look at Snaith primary schools website for answers too (she demonstrates the Snaith school site on the interactive whiteboard for the children to see)

The children take one worksheet between two and move to the computers to begin their work.

I walk over to watch Tim and Don working on their computer. Tim has typed in www.google.com to the address bar and then types into the search bar "wot is the poplation of Egypt" he gets some very unhelpful links. Although Google offered the suggestion "do you mean 'what is the population?'" , Tim either did not notice it or did not know that he could click on it to change his spelling. I suggested that he might want to try spelling "what" and "population" correctly and see what happened, he tried again and got better results.

At this point, I am called over to help Josh who has run into a few difficulties.

Beautyman: what's up?

Josh: I don't know what I done, it keeps saying enter your details here

Beautyman: can I have a look? Ah I see what has happened you have somehow clicked on a link to book a holiday to Spain, how would you like to pay for that Josh?
[laughs]

Josh: oh whoops [laughs] that wasn't meant to happen, how do I get out of it?

Beautyman: just keep clicking the back button until you get back to where you want to be.

Josh: ok ta.

It seemed as though Josh were not the only pupil having problems accessing the information that he wanted.

Katie was also having problems. She was trying to access the Snaith Primary school website, the web address was long and she had made several spelling mistakes as she had been copying it into the address bar, when she pressed enter she received an error message. The teacher realised that Katie was not the only one having problems accessing information on the internet, there were several groups of frustrated children around the classroom. The teacher decided to stop the class and gather the children together on the carpet.

Teacher: Now some of you seem to be having a few problems, I know that the Snaith school address is quite long and you have to type it in correctly so I would like you to type in www.ask.com that's nice and short and then when you have done that you get this page (she demonstrates on the interactive whiteboard) you can then type in a question, like, what is the population of Egypt?

The teacher demonstrated to the children the way to look for information by using ask.com.

Teacher: There you see, it says here that the population of Egypt in 2006 was approximately 77 million, oh look if you look at this bit it tells us that the capital city is Cairo. There is a lot of information here but we must be careful that we only get the information that we want.

The children return to their computers and I noticed that by using the search strategy shown to them by the teacher, the children are having more success in locating useful information. The children were making less spelling mistakes and were receiving fewer errors.

Aaron: look Mrs Beautyman, it says on here that the language of Egypt is Arabic, do you think that's right?

Beautyman: that sounds reasonable to me.

After twenty minutes of searching the teacher calls for the children to stop and they are gathered together on the carpet area to discuss the information that they have found.

Teacher: that was much better, once you started asking the questions in ask.com you were finding out lots of things, I'm very impressed. Now let's go through

some of the answers that you found. The population of Egypt is between 77 and 78 million people, their money is called?

Stella: pounds

Mark: they have pounds but they also have piastres too

Teacher: how many piastres in an Egyptian pound Mark?

Mark: 100

Teacher: well now, I have learned something new because I knew the Egyptian currency was pounds but I didn't know what else their currency was called and I didn't know how it was broken down. We all know that the Capital city is Cairo, how long is the river Nile?

Abby: it is 4,184 miles long

Teacher: what language do they speak?

Aaron: Arabic

Tammy: I found out about some food that they eat in Egypt, they eat, pigeon and duck and chicken and fish and fruit and vegetables and they like meat but it is expensive so they don't eat it very often.

Teacher: very well done everyone, you have found a lot of very interesting things about Egypt.

At the beginning of the observation, the teacher was getting the children to think of the sorts of information they would like to find. She had defined the information need for them by informing them that they would be looking for information about Egypt and she had also defined the resource that the children would be using, however she offered the children the choice of which parts of Egypt they would like to find out about.

The children were given an open and loosely defined strategy for finding the information, they could choose to look on Google, or ask.com or the Snaith school site. The choice of site was up to the children as to where they would like to look for information. The third step in the Big6 framework is that of locating and accessing information and initially, this was where the children struggled, they were hampered by an inability to select the correct way to access information, such as Josh inadvertently clicking on a link that would book him a holiday in Spain. This confirms the findings of Bowler et al (2001) who found that "*Weaknesses in*

technical literacy skills hampered the students in this study" (p.219) and it appeared that it was not just a weakness in technical literacy that was the problem, many of the children struggled to find information because of a weakness in literacy skills, with numerous spelling mistakes returning errors that the children found frustrating. This supports the findings of Hepworth and Walton (2009) who suggest that a limited vocabulary can impede the search for information. Once the teacher identified that the children were struggling with the task, she gave them more detailed instructions about how they could find the information that they needed "*I would like you to type in www.ask.com that's nice and short*". The children were given a demonstration and were then able to go on and find information for themselves. The children were able to physically engage with the information and extract useful information "*it says on here that the language of Egypt is Arabic*" this is the fourth step in the Big6 framework. The children were able to synthesise the information that they found, as later in the lesson they were able to feedback the information to their classmates "*they have pounds but they also have piastres too*". This is the fifth step of the Big6 framework, however when it came to the final step of evaluating the previous tasks the children did not overtly demonstrate this step, however the teacher did draw it to their attention by saying "*once you started asking the questions in ask.com you were finding out lots of things, I'm very impressed*".

It was possible to observe the ways in which information seeking skills were taught to the year 3 children and then compare the ways in which information seeking skills were taught to the year 4/5 children. In both of the year 3 classes, the teacher explained about the topic and ascertained what the children already knew about the subject. She then went on and showed the children the different resources available to them and went on to demonstrate how each of those resources offered a different level of information "*there is not enough detail on an atlas ... so we need to look at maps, that gives us more information again*". The children are familiarising themselves with the different resources, i.e. maps, atlases and globes and they are also being shown that each of these resources can deliver different levels of information. The children practiced as a group, locating countries on the teacher's atlas before they were asked to do the work on their worksheets. The first worksheet required the children to locate continents on the globe and then to locate them on their worksheet. However, the later worksheet required the children to consider which resource would provide them with the information that they needed. This encouraged the children to think about the level of information that they needed and to consider which resource was the most likely to provide them with that

information. The children were working in small groups and were able to support each other as they worked, by the end of the observation the children were able to critically examine several different resources and decide which resource would be best to meet their need. There appeared to be a natural progression within this class that seemed to indicate that the children were moving from simply locating information and transferring it from one place to another, for example finding the UK on the globe and then locating it on to the worksheets, to a more critical examination of the information resources *“well it won’t be on the globe will it?...no because the globe doesn’t have enough information on it”*.

The year 4/5 children were also asked to consider what information they needed to find. The teacher asked the children to think, *“what sort of place is Egypt right now? What sort of questions might we ask?”* The children are identifying the types of questions they would like to find answers to, they are in effect identifying their information need. The children were told that the information resource that they would be using was the internet, however, the children were allowed to choose different websites and search engines to locate the information. In this instance, however, the teacher needed to remove some of the choices that she had given to the children because they were beginning to get frustrated by their lack of success in locating information. She demonstrated how the children could find relevant information and, once this was done, the children began to have more success and began to find useful information. The children were also able to synthesise the information and feed it back to their peers later in the class.

By comparing the observation of the year 3 teacher demonstrating the different levels of information available on a globe, atlas and map with the observation of the year 4/5 teacher instructing her class on how to locate information using the internet, it became possible to identify how each teacher was able to incrementally build on the existing knowledge that the children had, this helped to establish the different levels of teaching information seeking skills to the children, which was an objective of the study. The observation also highlighted how the children at the start moved from uncertainty to a clear understanding of the different resources available to them (Kolb’s experiential cycle) and how working in small groups they were able to support each other (Vygotsky’s zone of proximal development).

5.7.1 Critical Thinking Skills

During an observation of an ICT lesson, the teacher was encouraging the year 4/5 children to consider information. The lesson was specifically geared to getting the children to consider what sorts of information might be held about them personally.

Teacher: we are going to talk about data today, more importantly data which is kept about you, who knows what I mean by data?

Katie: it's like a spreadsheet

Teacher: a spreadsheet is what we put our data in but what is it that we put into a spreadsheet?

Carly: is it information?

Teacher: yes it is, so can you think about what sort of information might be kept about you?

Abby: birth certificate

Teacher: absolutely right, you can go down to the civic centre in town and they will have a record of the day you were born and all of your names and your parent's names. What other types of information is kept about you?

Georgia: passport?

Teacher: yes, why do you suppose we would need that sort of information?

Ronnie: so's when ya go on holiday yous can prove where you come from

Josh: school keeps information on us too

Teacher: yes school does keep information on you, why do you suppose the school needs to keep information on you

Josh: cos if you get sick they can phone your mum to come and get you

Teacher: so school would have your phone number, what else?

Den: personal details

Teacher: ok personal details, what sort of personal details? Would you put in that Mark loves

chocolate aero bars better than any other chocolate?

The class chorus “no”

Teacher: why not? That’s personal information, but you’re right the school doesn’t need to know. I have worksheets here and working in two’s I want you to go and cut out the words and sort them into two groups, one group for information that school would need to keep about you and one group that they would not. You need to think carefully about what information school needs to have about you and consider why school might need that information.

The class got into pairs and started their work. After a minute I am approached by Tim

Tim: do you think that the school would need to keep test results?

Beautyman: do you think it would be important for school to know how well you were doing?

Tim nods and goes back to his partner. I am then approached by Sean, who asks me

Sean: are age and date of birth the same thing?

Beautyman: well if you know somebody’s date of birth then you can work out how old they are, I think maybe school would need to know your date of birth.

The teacher gave the children ten more minutes before calling them back to sit on the carpet

Teacher: put your hand up if you think the school would need to know your name and to keep that information

About half the children raise their hands, the teacher pretends to look shocked

Teacher: I would have thought to see everyone's hand up for that one, if the school doesn't know your name then how would I take the register, come in number 4? (the class laugh) your name is the most important piece of information about you. Right then what about your height?

Den: no, school wouldn't need to know that because it would change every day

Teacher: yes it changes often, would I teach you differently if you were 10 foot tall? No, so your height does not matter to school. Should the school keep information on what class you are in?

The children seemed divided on this question, with some children saying yes and others saying no.

Teacher: how would I know if you were meant to be here in my class Alan if the school did not have that information? Right Bethan what about your date of birth, does school need that information?

Bethan: yes

Teacher: yes we do, how about your age?

Again, opinion is divided amongst the children

Teacher: we already have your date of births, so we don't need your age too. How about test results?

Don: yes so you know what sets to put us in

Teacher: yes so we can see you're getting better and better each year

Katie: you can see how much we have learned from last year

Teacher: yes absolutely. Now can you see that it is important to know what information is being kept about you and what it is being used for?

During this lesson, the teacher was getting the children to consider information that was held about them, she was asking them to critically consider whether information that was held about them was relevant and

she puts it in the context of the school environment. The children were asked to think about the purpose for which the information was being used. The teacher was getting the children to consider the varying levels of personal information held about them, the children all agreed that knowing what someone's favourite chocolate bar was, was not something that school needed to know, however not all of the children felt that it was important that school have information about their name, the teacher tells them that "*your name is the most important piece of information about you*". During this lesson, the teacher was encouraging the children to think critically about information and contextualised it by making it about them personally and school. The children were asked to consider whether school would need to hold various pieces of information about them and they were also asked to consider why it was important that the school hold that piece of information. Getting the children to consider why the information is being held and why it is important that school has it, is the first step in encouraging critical thinking. The children need to be able to identify between relevant and none relevant information and even go so far as to question why some information is more important than others.

During this observation, the teacher encouraged the children to consider the importance of knowing "*what information is being kept about you and what it is being used for?*"

By observing the teachers and the children, it became possible to "*Identify and evaluate the current methods for teaching ISS to KS2 children*", and to then "*establish the level of teaching of ISS for KS2 children*". It was also possible to "*identify gaps in the children's knowledge and understanding of information retrieval and use*". These are the first three objectives identified at the outset of this research study.

It was possible to clearly identify the way in which both of the teachers embedded information literacy skills within the topics that they were teaching, as suggested by Kulthau (2004) and Scott and O'Sullivan (2005). So, as the children were learning about geography and ICT they were also learning how to identify that they had a need for information, decided on the best way to locate the information they needed, find the information and decide if it was relevant to their need. Both year 3 and year 4/5 children

carried out the steps to this point, however only the year 4/5 children continued on to synthesise and then feed it back the information to the rest of their classmates. None of the children evaluated how successfully they had completed the previous information seeking steps and the reason for this may be summed up by the small group of year 3 children that I was speaking to, it is possible that they did not evaluate the steps they had taken to find the information simply because in their eyes they were “*just looking for stuff about geography*”. This may suggest that there is a greater need to impress upon the children the importance of looking back at the way they had gathered information to evaluate whether it was the best way of obtaining that information. As the children are taught to critically evaluate information they also need to be shown that they can apply that same critical evaluation to their own information seeking behaviour.

5.7.2 Storage and Retrieval

In order to establish whether there were gaps in the children’s knowledge and understanding of information retrieval and use (an objective of the study) it was necessary to observe how the children were taught to store and retrieve information.

The year 4/5 children were having an ICT lesson and the teacher is getting the children to recap what they were doing in the previous lesson.

Teacher: who can remember what we were looking at last lesson

Den: we were looking at data

Teacher: that’s right and can you remember what we put the data in?

Katie: a database

Teacher: that’s right, now here comes the tricky question, can anyone tell me what data is?

Keith: it’s information

Teacher: yes, data is information, we looked at a database and we searched the database for certain things

The application that the teacher was using with the children was called Information Workshop 2000 and it has been specially designed with children in mind. The text was bold and the colours used in the application were bright primary colours.

Teacher: what do we need to do first so that we can view all of the entries in the database?

Tammy: click on the eyes

Teacher: no that is when we are searching

Colin: click on the button over there (points to the left hand menu) the one above the picture

Teacher: yes that's right (she clicks on the button and the full 82 entries are displayed). Right now we want to search for just the girls, how do we do that?

Den: click on the eyes

Teacher: yes and a box opens now in this box here there are a list of things we can choose from, name, age, so which one would we need to choose to separate the boys from the girls?

Nobody seems to know and the children have a few guesses, eventually the teacher tells them.

Teacher: if we want to know if someone is a boy or a girl we say we want to find out their sex, it's nothing rude it just means whether you are a boy or girl. In the box here we select the word sex. These buttons allow us to choose what we are looking for, we want to choose "the same as" button and then in the box underneath we select girl, if we were wanting to select the boys we would choose boys by clicking on the arrow

As she was talking, the teacher was demonstrating what the children needed to do in order to access the information they needed.

Teacher: then we click ok and then ok again and there we go, we have our list of just the girls in our database.

The teacher picked up some laminated cards and held them up to show the children

Teacher: now supposing I want to select a clown that has green hair and a blue nose, I could search the database to look for those two things

She sorted through the pictures and selected four cards, two with clowns with green hair and two other cards with clowns with blue noses.

Teacher: it looks like there isn't a clown with green hair AND a blue nose but I could say, find a clown with green hair OR a blue nose and then the database would find these four pictures. Do you see we can use the terms AND as well as OR. Let's have a look how we would do that

The teacher demonstrated to the children how to use the "AND" and "OR" buttons. As a class, they have a go at finding girls with blue eyes on the database. After practicing this as a group, the children are given worksheets with a list of queries they can make and are sent off to have a go for themselves. Katie and Kelly seemed to be having a few problems so I went over to see if I could help.

Katie: we done this once but we must've done summik wrong cos it's not showing us anythin'

Beautyman: what are you trying to find out?

Kelly: how many children who have birthday's in December prefer roast dinners

Beautyman: show me what you did

Kelly: we went and clicked on the eyes, then we went to the box thing and clicked on birthdays and then on December

Beautyman: so far so good

Katie: then we went to the eyes again and clicked food and then roast dinners then we clicked the find button and it said none, what did we do wrong?

The girls had been repeating their steps as they were describing what they had done, we clicked on the search button again, and again a result of zero was returned.

Beautyman: hmm I don't think you did anything wrong, you know what we could do just to be on the safe side, we could just check for December birthdays again and as there are only five of them we can look and see if any of them like roast dinners.

The girls do this and notice that from the five December birthdays there is no one that prefers roast dinners. Just then the teacher was passing by and overheard the conversation.

Teacher: yes that was a bad question to ask for the first one, I didn't realise that there were no December birthdays that liked roast dinners, it gives them a chance to check their results though especially when they get results back which they were not expecting.

Katie: we went back and looked in the December birthdays to see but none of them liked them (the roast dinners)

Teacher: that's a very good way to do it.

The children were learning strategies for retrieving information, although the teacher did not set out to make the first question difficult for the children she was able to see the merits when the children received back results that they were not expecting. As with Kelly and Katie, the other children in the class initially thought that they had done something wrong which was why they were getting back the results that they were, it prompted many of the children to attempt to verify whether there were in fact any December birthdays that preferred roast dinners. Having verified that they had done everything correctly, Katie and Kelly went on to the next questions and were confidently querying the database for information.

During another ICT class the year 4/5 children were using Microsoft excel, the teacher was getting the children to think about data and how it can be stored. On the interactive whiteboard the teacher has open an excel document with a list of Newcastle United footballers names in it.

Teacher: We need to get some information into the goals column, how many goals do you think Shay Given scored last year?

Alan: He's a goalie

Teacher: yes I know he is so how many goals do you think he scored last season?

Alan: none

Teacher: right so if we put a zero here next to Shay Given's name that will be right

The teacher goes on to ask the children to estimate how many goals each player scored last season and enters the information into the boxes.

Teacher: now how do we make a chart or graph using this information?

Charlene: you have to click on the bar chart button at the top and then keep clicking next then finish.

Several children raise their hands because they think this is wrong. The teacher carried out Charlene's instructions and when she clicked on the finish button an empty white screen appeared.

Teacher: oh dear, something seems to have gone wrong, what did we do that was wrong with that?

Annie: you have to highlight everything first

Teacher: ok let's try that

The teacher highlights everything on the page and the chart that is produced appears meaningless.

Teacher: oh well that's not much better, what went wrong that time?

Charlene: no, no you need to highlight the names of the players.

Teacher: right well tell me how do I do that then? Please use the proper cell references to explain it to me

Abby: you have to drag from Shay Given down to Michael Owen

Teacher: are those proper cell references? Please give me the proper cell references.

Abby: you click on A2 and drag down to G2.

Teacher: ok let's see what happens

A chart is produced that only has the footballers names in it but no other information.

Teacher: what happened here?

Don: you have to add the scores as well as the names

Teacher: so what are the cell references that I need to have in total?

Don: A2 to G2...um no hang on it has to be A3 to G3

Teacher: right let's see what happens this time

On this occasion, a chart was produced that had meaningful information in it and the children recognised that the information was being displayed in a way that they could understand. By carrying out the exact instructions given to her by the children the teacher was able to demonstrate not only the need for instructions to be given carefully and thought out first but she also demonstrated to the children what would happen to the charts if steps were missed out.

Teacher: oh look (she points to a name on the chart) I have spelt Olivier Bernard's first name incorrectly (it was spelt Olivia) how do I change this if I need to?

Kelly: you have to click into the bit at the top (she points to the place on the screen) and you can change it in there

Teacher: yes well done Kelly, one house point for you. Right supposing that Damien Duff scores another two goals and Titus Bramble scores one, how do we change the information?

Ronnie: you click in the box by his name and put two

Teacher: I just put two in do I?

Ronnie: yeah that's right

Teacher: whoops something went wrong, look now it looks like Damien Duff has only scored two goals all season

Stella: you have to add the two together

Don: you have to put 21 in

Teacher: 21? what is 20 add 2?

Shouts from the other children confirm that the teacher needs to put 22 in the box next to Damien Duff's name. Once she has done this the teacher sent the children to their computers to work in pairs on creating charts. The teacher was getting the children familiar with making changes to the data. The following week the teacher had made a few changes to the data and was attempting to get the children to think critically about what they were seeing.

Teacher: now looking at this chart can anyone tell me where there is a problem?

The children sit quietly and say nothing

Teacher: ok, well can you tell me is there a player called 45? No of course not so that must be a mistake can anyone else spot a mistake? Goodness me you are all sleepy heads this afternoon, what about this column here? (she indicates a column in the chart that is much bigger than the other columns) Is Damien Duff really that good? Has he scored 456 goals this season?

Alan: he wishes he did

Teacher: I'm sure he does, but look at the graph it looks silly with this huge column here, it stands out that there is probably a mistake somewhere in the data, the graph is showing us that there is a problem. Remember data must be correct. There are all sorts of times when we need to check that the data about us is correct. Now I am going to give you some data and a graph and there will be a mistake in it and you have to find the mistake.

The children moved to their computers and began trying to find the mistakes in the data by looking at the charts to see if there were any anomalous results. By getting the children to identify anomalies in the data, the teacher is able to determine whether the children have understood the need for data to be correct but she is attempting to highlight any gaps in the children's understanding of how information can be stored and how it can be used.

It would have been most desirable to have been able to observe the year 3 children during an ICT lesson to see how they were taught about storing and retrieving information electronically, and to be able to compare the year 3 children with the year 4/5 children. Unfortunately, due to the ICT teacher not wishing to participate in the research study, this was not possible.

Observations provided detailed information about the cognitive and affective triggers that the children faced when searching for information. They offered rich insight into the school lives of the children in the context of their information seeking behaviour. Observations allowed me to witness first-hand the methods adopted by the teachers for teaching the children information seeking skills, and how the children reacted, first affectively and then cognitively to being shown new information. When these observations were considered in the light of Kolb's experiential cycle and Vygotsky's zone of proximal development it was possible to gain a clearer understanding of how the children's cognitive and affective characteristics had a bearing on their information seeking behaviour.

Identifying how the children were being taught information literacy skills provided rich insight into the teaching of information skills specific to this group of children. It was possible to identify and evaluate the ways in which the teachers taught information seeking skills to the children and how different levels of information literacy needed to be taught which were dependant on the age of the children. For example, the year 3 children were taught basic information seeking skills. Examples of this were noted when the children were asked to consider the information need that they had and then, were shown how to satisfy that need. Whereas the level of information seeking skills were more advanced for the year 4/5 children, there appeared to be a natural progression from simply locating information and replicating it, (year 3) to critically analysing what resource would be the most

appropriate and then using it (year 4/5). This critical analysis of information continued with the year 4/5 children as they considered what information would be relevant for school to hold about them and to think about why the school might need it. This continued with the teacher guiding the children to critically consider how information should be presented so that it is meaningful. However, the children did not critically evaluate their own information seeking behaviour or indeed the process that they had engaged with whilst gathering information. These observations did offer insight into the progressive levels of information seeking skills that the teachers taught the children with each teacher building on the information seeking skills that had been developed by the teacher in the year below.

5.8 Summary

At the beginning of this chapter, a rich picture was introduced that sought to guide the reader through the analytical maze that is the children's information seeking journey. The children's information seeking journey, in the context of this study, began at the start of the academic year and one of the first themes to emerge from the data was that of uncertainty. Identifying uncertainty as a theme led me to consider what effect self-efficacy might have on the information seeking process.

Introducing the children to the learning outcomes for each lesson in the form of WALT and WILF, the teachers were able to prepare the children for what sort of information they would be looking for in that lesson. This relates to the "plan" part of the Super3 template developed by Berkowitz and Eisenberg (1987). By revisiting WALT and WILF at the end of each lesson, the teachers were able to identify that the children had correctly identified the information required and also allowed the children and the teacher to identify any areas where the children might have further questions. This relates to the "review" part of the Super3 template by Berkowitz and Eisenberg (1987).

As an ethnographic researcher, it was necessary to gain an understanding of the isomorphic relationship between conceptualisation and reality. In order to do this, it was necessary to consider accelerators and inhibitors to the information seeking process. These accelerators and inhibitors emerged from the data and were identified as motivation, choice, need and want. Observations demonstrated how these accelerators and inhibitors affected the way in which the children engaged with the information seeking process. Identifying these accelerators and inhibitors

meant that it was possible to examine whether they were cognitive or affective triggers to the information seeking process. This relates directly to the initial aim of the research study, which was *“to investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour”*.

The objectives of the study were to

- Identify and evaluate the current methods for teaching ISS to KS2 children
- Identify whether there are gaps in the children’s knowledge and understanding of information retrieval and use.
- Establish the level of teaching of ISS for KS2 children
- Establish the current ICT outcomes required from the e-learning strategy as outlined by relevant government bodies.
- Establish the role of ISS in the government, LEA and school policies

In order to *“identify and evaluate the current methods for teaching ISS to KS2 children”* it was necessary to examine how the children were taught to gather information using a variety of different resources. Observations were able to highlight the ways in which the children were taught information seeking strategies.

“Identify whether there are gaps in the children’s knowledge and understanding of information retrieval and use” was possible by observing the ways in which the year 4/5 children interacted with data, and examining the way that the teacher encouraged the children to identify anomalous results when searching for information. It was not possible to ascertain whether there were gaps in the year 3 children’s knowledge and understanding of information retrieval and use as it was not possible to observe the year 3 children being taught information storage and retrieval skills.

To *“establish the level of teaching of ISS for KS2 children”* it was necessary to investigate whether there was a difference between the way in which the year 3 children were taught to search for information and the way in which the year 4/5

children were taught. Again observations were able to demonstrate the development of more critical information seeking skills as the children progressed through Key Stage 2.

The information seeking journey of the children as demonstrated by the rich picture, allowed themes and patterns of the children's information seeking behaviour to emerge from the data. It became possible to see how the accelerators and inhibitors fit within the context of learning theory and how they influenced the information seeking behaviour of the children. The other influence on the children's information seeking behaviour was the way in which they were taught by their teachers to look for information. As the different elements of the rich picture were explored, a model of the children's information seeking behaviour began to emerge from the data. This model will be examined and explained during the next chapter. Within the model there exists a theoretical zone that may be the optimal place to assimilate new information and this will be examined and considered within the children's information seeking model. In order to bridge the isomorphic relationship between what was being witnessed in observations it was necessary to consider conceptual frameworks that examined a move from uncertainty to cognition (Kolb's 1984 experiential cycle) and how peer and adult assistance was used to support the children's information seeking behaviour (Vygotsky's 1978 zone of proximal development). Considering these two theoretical frameworks in the context of the observations of this group of children provided a model of the children's information seeking behaviour that was specific to this group of children.

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6 Discussion of Findings

6.1 Introduction

During the previous chapter, several themes emerged that were grounded in the data, during this chapter these themes will be examined to investigate whether they support or refute findings from previous research and whether they can be considered as a contribution to new knowledge.

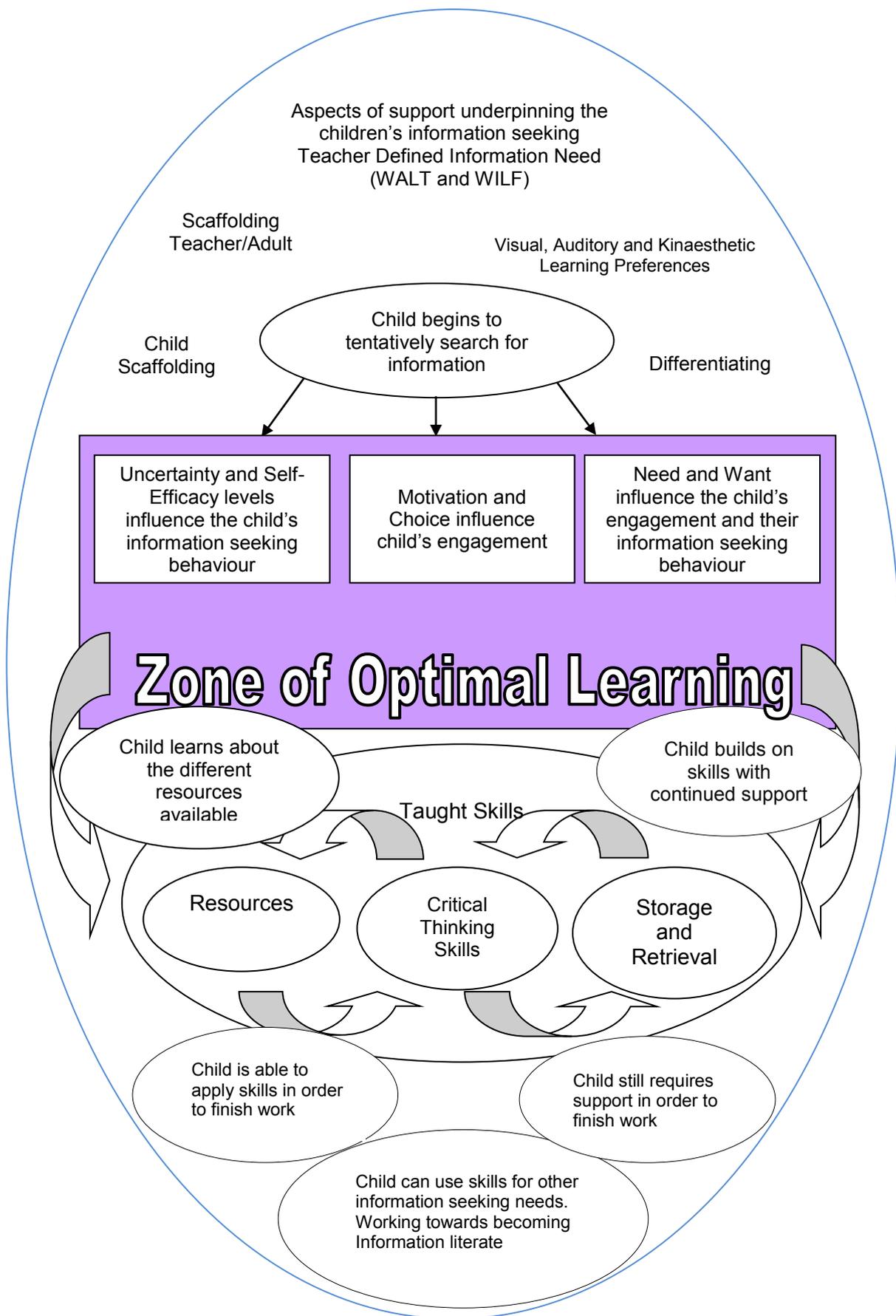
This research study has highlighted areas of both strength and weakness in the way in which Key Stage 2 children are taught information seeking strategies.

One theme that emerged from the data was a model of children's information seeking behaviour, this model offers a guideline based on the children's information seeking behaviour over one academic school year. The model of information seeking behaviour is based solely on the children who participated in this research study. It would be inappropriate to apply wholesale, the findings from this study to another setting or group of children, however it may be possible for other researchers to tentatively apply the findings of this study to their own situation should they find a similarity between the background and context of the setting for this study and that of their own.

It became clear that as this model of information seeking unfolded from the data, there was within the model a further theory that considered the children's internal cognitive development of information. This theory posits that there is an optimal cognitive zone that is the place where new information is assimilated so that it can become knowledge. It is the place where a child moves from incomprehension of new information to a cognitive understanding of that information. The zone of optimal learning is the place somewhere between these two extremes, where the child has moved away from an affective response to new information but has not yet reached full cognitive understanding of the information. It is the place where understanding is beginning to dawn and is theoretically the optimal place to assimilate new knowledge.

A model of the cognitive and affective characteristics of children's information seeking behaviour and the theoretical zone of optimal learning can be seen as figure 9.

Figure 9 A Model of the Cognitive and Affective Influences on Children's Information Seeking Behaviour Including the Theoretical Zone of Optimal Learning



Key

The ellipses demonstrate where something physical is happening, whereas the rectangular boxes represent a cognitive or affective response by the children to seeking information. The large blue ellipse demonstrates aspects of support that are continuous throughout the information seeking process.

The purple rectangular box represents the Zone of Optimal Learning

The diagram represents a model of the cognitive and affective influences to information seeking behaviour demonstrated by the children, however it is at the point where the child begins to tentatively search for information that they enter the zone of optimal learning. By investigating the model, it will be possible to demonstrate how uncertainty, self-efficacy, motivation, choice, need and want all play a part in not only the children's information seeking behaviour but also their cognitive development of new information.

6.2 The Model of Information Seeking

Observations took place over one academic year, over this time a picture emerged of the way in which the children learned and were taught information seeking skills. The first area of the model considers the support that was available to the children as they began their information seeking journey. The support underpinned the children's information seeking, and took the form of support from the teacher, such as the teacher defining the children's information need for them, teaching to different learning styles as well as differentiating the lessons. Teachers provided scaffolding support as well as encouraging scaffolding support between the children.

Recognising that an information need exists is the first pillar in SCONUL's (1999) seven pillars of information literacy. It is also the first step in Berkowitz and Eisenberg's (1987) Big6 framework, whereby students were encouraged to define their information need and then identify the information they need. During observations for this research study however, this was not the case. For the year 3 and year 4/5 classes, the teachers defined the children's information need for them at the beginning of each lesson. By using WALT (What I Am Learning Today) and WILF (What I am Looking For) the teachers were defining the children's information need for them and preparing the children to think about the pieces of information

they would need to look out for as the lesson progressed. There were several reasons why it was necessary for the teachers to define the children's information need for them.

6.2.1 Defining the Information Need

Firstly, the teachers needed to work within the confines of the national curriculum. The national curriculum sets out guidelines for schools with regard to the level of skills children should have attained at the end of the year. Schools then develop a curriculum tailored to meet the needs of the pupils within the school. The teachers are able then to differentiate the content of lessons in order to meet the needs of individual children within their classrooms.

Secondly, the age of the children needs to be taken into consideration. Kuhlthau's (1991) research investigated the information seeking behaviour of high school seniors where she identified that the first stage of information seeking was to recognise that an information need existed. Berkowitz and Eisenberg's (1987) Big6 framework begins with encouraging the students to identify their information need. However, the Super3 framework, which was developed for younger children, encourages the children to "plan" as the first step in seeking information. Observations of the children in this study would suggest that the children are at the Super3 "plan" stage rather than at the Big6 stage of defining their own information need. Therefore, it was necessary for someone else to identify the information need for them.

Finally, another reason for the teachers to define the children's information need is that of timescale. Each topic needs to be covered within the 12-14 week school term, too much time would be lost if the teachers were to allow the children to define their own information need for every topic in the curriculum.

Therefore, taking these three points into consideration,

1. the teachers need to match the learning outcomes for the lesson to the curriculum requirements,

2. the children's age in being able to determine their own information need
3. the amount of time given to cover the topic, it became necessary for the teachers to define the children's information need.

The model of information seeking behaviour that emerged from the study began with the teacher defining the children's information need.

Teacher: Right let's quickly go over Walt and Wilf so that we can get on. Firstly, Walt, well, today we are learning about the Aztecs. So what about Wilf, well, we are looking for information about where the Aztecs built their city, why they settled there, we are looking for information about their gods.

It was necessary for the year 3 teacher to define the children's information need for them. However, the year 4/5 teacher would occasionally guide her class to define part of their information need for themselves. During an ICT lesson, the children were identifying questions about what sort of a place Egypt is now. The teacher prompted the children to think about what they would like to know about modern day Egypt, "We want to know about Egypt now, what could we ask?" The children wanted to know "what language do they speak?" and "what are their schools like? Oh and what food grows there?" The teacher provided the children with feedback, "these are all excellent questions. I have a sheet here with some questions that you need to find answers to but you can write your own questions on the back and find the answers to them". Although the teacher had already partly identified the children's information need for them, she had provided them with the opportunity to define areas that were of interest to them and then gave them the chance to investigate those areas of interest.

6.2.2 Teacher Support

In order to support the children, the teachers regularly handed out worksheets that had exercises on for the children to complete. This allowed the children to make sense of the information they had been given and allowed them to build up their information base in small steps with each lesson building on information they had acquired in the last lesson. Completing the worksheets demonstrated to the teacher that the children were starting to gather information and cognitively assimilate it. It also gave

the children the chance to interact with the information, as the children worked through the worksheet, they were able to sort it and put it into a context that made sense to them. This interaction with the information allowed the children to be actively learning, which is one of the behaviourist principles, behaviourists believed that people learn best when they are actually involved with an activity, they then learn from their experience rather than being passive and non-interactive. It also demonstrated that the children were moving from uncertainty to cognitive assimilation of the information along Kolb's (1984) perception continuum.

As the term moved on, the children were introduced to different information resources, for example, the children were introduced to the internet, reference books, maps, globes and atlases. Each new resource that the children were introduced to, helped to build upon the existing information seeking skills that the children had acquired. The support offered by the teachers varied from teacher to teacher, the year 3 teacher needed to introduce the children to the information resources possibly for the first time, whereas the year 4/5 teacher was able to build on the skills that her class would have learned when they were in year 3. The teachers were further able to support their pupils by means of differentiation. Each teacher knew which of the pupils in her class needed more help and support and which pupils were more able. In order to support the less able children, the teachers differentiated the lessons, providing less challenging work for the less able children and work that was more challenging for the more able pupils. Differentiating the lesson allowed the teachers to fulfil one of the criteria set out in the Government's 2003 green paper "Every Child Matters", whereby the teachers are working to "*ensure each child fulfils their potential*".

6.2.3 Scaffolding

Scaffolding is defined as "*more capable others assisting less capable ones*" (Moll, 2000, p.262) and the definition fits within the explanation used by Wells (2000, p.57) to describe Vygotsky's (1978) zone of proximal development which Wells believes is when "*an individual is able to achieve more with assistance than he or she can manage alone*". Very often more able children were paired up with less able children in order for the able children to support the less able. The benefit of this is that for the less able

child they are getting one-to-one instruction and support from a more knowledgeable peer, where they may feel more comfortable asking questions than if they were working with an adult. The benefit to the more able pupil is that they are consolidating what they already know. Repetition is one of the behaviourist principles of learning and in this context when the more able child was helping the less able child, they were repeating and sharing knowledge which helped them to cognitively reinforce their own understanding of the information. During observations there were many examples witnessed, of children supporting each other during the information seeking process and these observations provided valuable insight into how children attempt to make sense of information. As previously demonstrated, Alan was supported by Lisa, Cathy was supported by Rita and Josh was supported by Lee. During the observation of Lee and Josh and their discussion about how to locate pictures of banana spiders on the internet, as Lee talked Josh through the complicated series of steps, Josh asked questions and then repeated Lee's instructions to ensure that he had understood them correctly. Vygotsky (1978, p.128) believes that cognitive development occurs on two levels, *"first, between people as an interpsychological category, and then inside the child, as an intrapsychological category"*. The observation of Lee and Josh supports this belief. The interaction between Lee and Josh demonstrated that cognitive development took place for Josh firstly due to his interaction with Lee and then, as Josh asked questions and put the information into a context that he could understand, on an intrapsychological level.

Asking questions for clarification or to further understanding was one of the steps identified in this model of the children's information seeking behaviour.

6.2.4 Questioning

The children asked questions as a means of clarifying information that they were unsure about or to further their understanding, asking questions helped them to place the information into a context that makes sense to them. Contextualised learning is paramount to the Constructivist theory of learning, Constructivists believe that information must be presented in a meaningful way in order to become knowledge. Asking questions allows children to place information into a context that makes sense to them.

Occasionally, the children asked questions because they believed that they had information that did not appear to fit within the context of what they already knew to be true, an anomalous piece of information that required further explanation before it could be considered correct. Lewis discovered what he considered to be an anomalous piece of information provided to him by his teacher. Whilst building a model of a Tudor village, the teacher deliberately made the road bumpy, Lewis's knowledge of roads made him question why it would be that people would deliberately make roads bumpy and not smooth like they did today,

Lewis: why did they make the road bumpy and not smooth?

Teacher: Hmm. That's a good question. I think it was to help the horses to walk on it more easily. The stones fit inside their hooves and stopped them from slipping

Once the teacher was able to explain that there was a logical reason for making the road bumpy, Lewis was able to contextualise the information, thereby adding this piece of information to his knowledge of roads.

For some children asking questions was a way of reducing uncertainty, for example, "*Miss, who comes after Anne Boleyn?*" and "*Is the skillet the frying pan thing?*" In order to contextualise the information, the children needed to reduce their uncertainty and ensure that they had the correct information, the easiest way to do this was to consult with either an adult or a more knowledgeable peer.

Having asked questions and placed the information within a context that makes sense to them, it was often at this point that the child decided that they had gathered sufficient information and ended their search. If the child had fulfilled their academic requirement, they would often end their search at this point. Their information need had been met and so they did not search beyond what they have been asked to do. However, some children were inspired to find more information for themselves. Although their academic information need had been met, they wanted more information. Their motivation for wanting more information may have been intrinsic, because they were interested to find out more about the subject for their own personal satisfaction, this was certainly the case for David, who searched beyond the academic requirement when he was studying both the Tudors

and the Aztecs. David's love of historical topics inspired him to independent enquiry, he had information seeking skills that he was able to utilise and he was motivated to want to find information for himself.

As the teachers guided and supported the children, the children were able to begin tentatively to search for information. As the children began their search for information, their initial response to their information need was one of uncertainty, it was necessary to consider inhibitors and accelerators to the information seeking process such as uncertainty, self-efficacy, motivation, choice, need and want.

6.3 Accelerators and Inhibitors as Cognitive and Affective Influences on the Information Seeking Process

By examining the themes that emerged from the data it was possible to determine that there were cognitive and affective influences that were acting as either accelerators or inhibitors to the information seeking process.

Observations revealed that to varying degrees, all of the children participating in the study demonstrated uncertainty at the start of a new topic. The children's initial uncertainty meant that they relied on the support of the teacher. The teachers would give the children information and then attempt to put it into a context that the children would be able to understand. By introducing the children to WALT and WILF at the beginning of each lesson, the teacher had already set out some of the criteria for the children in terms of what they were going to be investigating in that lesson. By identifying the criteria for the lesson, the teacher was setting the children learning objectives. Setting objectives is one of the four fundamental principles of the behaviourist learning theory, whereby a person is given a goal to aim for, this in turn gives them a benchmark by which to measure success or failure.

Investigating what those different levels of uncertainty were and how they fit within the context of learning theory allowed this model to develop as it emerged from the data.

Kuhlthau (2004, p.92) believes that "*uncertainty is a cognitive state that commonly causes affective symptoms of anxiety and lack of confidence*". However de Bono (1982, p.99) believes that "*all thinking is emotional*". Wilson et al (2002, p.713) suggest, "*that uncertainty may have both affective and cognitive dimensions*" they

found in their study that affective uncertainty was associated “*with the other affective dimensions, such as pessimism/optimism*” and that cognitive uncertainty was associated “*with more rational judgements*” (p.712). It seemed in this study, that children that had low levels of self-efficacy were more likely to respond affectively because they did not believe that they had the “*capabilities to organize and execute the courses of action required to produce given attainments*” (Bandura, 1997, p.3), whereas the children with higher levels of self-efficacy were more rational in their uncertainty, this would suggest that their uncertainty was that of cognitive uncertainty.

6.3.1 Cognitive Uncertainty

The data from this research study would seem to suggest that the uncertainty being demonstrated by the year 3 children was that of both cognitive uncertainty and affective uncertainty. Many of the children responded cognitively as well as affectively to being shown information beyond their current comprehension. During the field research, I was to witness the year 3 children responding both cognitively and affectively when they were uncertain about information when it was first presented to them. Their uncertainty appeared to stem from a lack of understanding of the information that was available to them. Many of the year 3 children had developed a cognitive tactic of answering a question with a question of their own. Reasons for this could have been because they did not want to give the teacher an incorrect answer, or possibly, that they were genuinely uncertain of the information that they had and they were sounding out the teacher to see if they had the correct answer. The children that employed this tactic appeared to demonstrate only a surface uncertainty that appeared to diminish as the term went on and the children became more confident about the information they had gathered. It appeared that the children that employed this tactic were demonstrating cognitive uncertainty. This conclusion was reached because the children had obviously thought about the information they had. They had considered whether that information might be right or wrong and decided to employ the tactic of answering the teacher’s question with an answer that was phrased as a question. The teacher would then either confirm the child’s answer or correct them if they had the answer wrong.

The year 4/5 children also demonstrated uncertainty, the uncertainty that they demonstrated also appeared to be cognitive. For instance, when asked a question by the teacher, the year 4/5 children did not adopt the same tactic as the younger children of answering the question with a question of their own. They had however, developed several tactics, one tactic they employed was to lower their heads and not make eye contact with the teacher, it seemed that they had learned that if they did this the teacher would usually move on and ask the question of somebody else. The other tactic demonstrated by the year 4/5 children was simply to say that they did not know the answer to the question, it is possible that the children that answered in this way understood that it was all right not to know the answer. This seemed like a cognitive and mature response to their uncertainty about answering the question.

6.3.2 Affective Uncertainty

There were children who demonstrated deeper levels of uncertainty and one child in particular whose response to searching for information was overwhelmingly affective. Being unable to locate any information about turtles, Matthew returned to me and with tears welling in his eyes, proclaimed, *"I can't find anything in here about turtles... not anything"*. On a separate occasion when questioned about some information he had gathered he again responded affectively *"Matthew: [panicking] I already got Anne Boleyn, is that wrong?"* The uncertainty demonstrated by Matthew was that of affective uncertainty, this conclusion was reached because Matthew's immediate response when asked about information he had was either to panic or well up with tears, both are emotional responses rather than a cognitive or more considered response.

6.3.3 Self-Efficacy

It was discovered through the literature (Bandura, 1986, Schunk, 1981, Schunk and Hanson, 1985) and confirmed by the observations of the children, that when self-efficacy levels were high, uncertainty levels were low and conversely when self-efficacy levels were low, uncertainty levels were high. Matthew had such low levels of self-efficacy that he did not believe that he had the correct answers even when the answers he was offering had

come from his classmates. *“Matthew: Umm, well, was it...? [he turns to his team mates for confirmation] was it dice?”*

Schunk (1981, p.104) believes that *“children's self-perceptions of their capabilities have an important effect on their subsequent achievements”* and Bandura (1986) believes that *“the more the encouraging feedback in-stills efficacious self-beliefs, the more effort children exert and the more they accomplish”* (p.406).

By examining self-efficacy and uncertainty in the context of the children's information seeking behaviour it was possible to theorise that as the children moved from an affective response to new information, along Kolb's (1984) perception continuum, towards a cognitive understanding, the ease and speed with which they moved along the continuum would be either hindered or aided by the level of self-efficacy that each child experienced.

The children's perceived levels of self-efficacy coloured their perceptions of their own capabilities. Katie was an average ability student, yet she perceived her skill levels with a computer to be below average and therefore believed that she was *“rubbish on the computer”*. She struggled to master basic computer skills and needed a lot of adult support when she was doing work on the computer. Katie's perceptions of her skill level could possibly have been the reason she struggled, she did not believe she was any good so it was harder for her to do. It appeared that Katie was amotivated by her ability to use the computer. Roth et al (2009, p.1120) believe that *“Amotivation refers to a lack of motivation and results from not valuing an activity, not expecting the activity to yield a desired outcome, or not feeling competent to do it”*. It appeared that in Katie's case it was not that she did not value the activity but rather that she did not feel that she was competent to do it.

Conversely, Allan (a child with special educational needs) believed that he was *“really good on the computer”*, he approached work involving the computer with confidence, he believed he had good computer skills and was able to produce some good quality work. Allan was intrinsically motivated, he had high levels of self-efficacy in relation to computer work and enjoyed working on the computer. This was completely opposite to the way he

tackled his other academic work, he believed that he could not do academic work and refused even to try. This supports Bandura's (1997, p.3) opinion that *"If people believe they have no power to produce results, they will not attempt to make things happen"*.

6.3.4 Motivation

Motivation can be seen as a powerful driving force because if a child is motivated by an interest in a topic they are investigating, then it seems reasonable that will engage more fully with the information seeking process, this in turn will move them more quickly along Kolb's (1984) perception continuum towards cognition.

Ryan and Deci (2000a) believe that there are many different types of motivation, they believe that intrinsic motivation reflects *"the natural human propensity to learn and assimilate"* (p.54), whereas they believe that extrinsic motivation *"can either reflect external control or true self-regulation"* (p.54)

Examples of intrinsic and extrinsic motivation were witnessed regularly, one particular observation highlights this. Lee and his friend Josh were talking together, Lee was explaining how he and his Dad searched the internet for information about banana spiders. Lee was able to recount a series of complicated information seeking steps that suggested that he was confident using this method to search for information. Josh asked his friend questions and repeated the instructions back to Lee in order to clarify and understand what he had been told so that he too could search the internet for images of banana spiders. Lee's motivation for finding information appeared to be intrinsic, he was motivated by his interest in what he termed *"creepy crawlies"*, with support from his Dad, Lee had developed good information seeking strategies and had high levels of self-efficacy regarding his information seeking behaviour. Josh's motivation for seeking information was not so clear, it is possible that he was motivated to find information because he was interested in insects too, but it may have been that Josh's motivation was extrinsic, his motivation may have been because Lee was more knowledgeable and Josh wanted to be like his friend. Finding information about insects using the internet appeared to have been secondary to Josh's motivation to be as knowledgeable as Lee.

6.3.5 Choice

An example of how motivation and choice can play a role in children's engagement was witnessed when David, motivated by his love of history, would seek further information on the topic outside of the school environment; he brought books into school that he and his Dad had borrowed from the local library. David could explain in detail about the Spanish Armada, demonstrating his knowledge and understanding of the topic. David had well developed information seeking skills, yet when the focus of the lessons changed from history to geography, David chose not to engage with the subject and did only what was required of him and no more. When David was given the choice to investigate the history of St Lucia his interest returned and he engaged more fully with the information seeking process.

Carol also demonstrated how her interest in archaeology influenced her choice of activities on a school trip, she was happy to work in the sand tray, uncovering bones with small brushes long after her friends had moved on to other activities. The literature supports the idea that when children are given choice, they engage more fully because they have "*a greater feeling of autonomy*" (Ryan and Deci, 2000b, p.70), whereas Pritchard (2005, p.49) found that "*the level of engagement with an activity, and the quality of the work produced as a result is very high..when choice has been allowed*". These examples would seem to support the idea that the children engaged more fully when choice had been offered to them.

6.3.6 Need

As stated previously the teachers were defining the children's information need for them. In most instances, this meant that the children were required to search for information to satisfy an academic need. Gross (2006, p.24) believes that a person who expresses a need is motivated by the pursuit of a goal, which she believes may be of questionable importance. The goal, in the case of this study, were the learning outcomes identified by the teachers and it may be that to the children, the pursuit of such a goal was indeed of questionable importance. This supports the findings of Brown (2004), who reports on how a child who has been set a school assignment may need information to satisfy their academic obligations yet "*have no interest in the topic at all*" and does "*not personally really want the information*". This point

was born out by Carol who was listing facts that she had gathered by watching a video, the teacher requested the children list a minimum of five facts, although Carol had six facts that she could have written down, she chose to list the minimum number of facts. This seems to suggest that Carol did not want the information but that she needed it in order to complete her work.

6.3.7 Want

For some children, the bare minimum of information was simply not enough, these children wanted more information, not just to satisfy an academic need but because they wanted to gather more information. Gross (2006, p.24) believes that "*when we say we want something it is a statement of how we feel, and our feelings do not need goals to substantiate them*". David wanted to know more about the Spanish Armada, so much so that he went to the library with his Dad and searched the internet in his own time in order to satisfy his want for more information. The data seemed to suggest that when a child was interested in a topic they were motivated to want to go and look for more information on it for themselves outside of the school environment.

As the academic term progressed, the children gathered more information, for many of them their uncertainty reduced. The children that demonstrated low levels of self-efficacy, however did not appear to reduce their levels of uncertainty significantly even when they had gathered more information. These children still required support from the teacher. The teachers provided all of the children with feedback and encouragement, offering words of advice and support regularly. This type of support and feedback could be interpreted as "reinforcement" which is a behaviourist principle of learning; the teacher was providing the children with praise to reinforce successful behaviour. Equally this sort of support offered either by the teacher or by a peer demonstrates how the children were able to achieve more with the aid of a more experienced "other" than they could have done alone, suggesting that they were learning within Vygotsky's (1978) zone of proximal development.

The cognitive and affective influences of uncertainty, self-efficacy, motivation, choice, need and want, when examined in the context of learning

theory supported a further theory that a zone of optimal learning existed in which a child is able to move away from uncertainty towards cognitive assimilation of new information.

6.4 Learning Theory

As the model of information seeking unfolded from the data it was examined against literature from previous research and it was whilst examining the accelerators and inhibitors to the information seeking process, in relation to learning theory, that the theory of a zone of optimal learning emerged.

The zone of optimal learning is a theoretical, cognitive place where new information is assimilated to create new knowledge. The theory is based on part of Kolb's (1984) theoretical framework of the Experiential Cycle in conjunction with Vygotsky's (1978) Zone of Proximal Development.

By examining the children's different levels of uncertainty and by examining how they fit within Kolb's (1984) perception continuum, it was possible to place the year 3 children (at the start of their information-seeking journey) at the affective, "concrete experience/feeling" end of the continuum. The year 4/5 children were also at the affective, "concrete experience/feeling" end of the continuum but slightly further towards the cognitive, "abstract conceptualisation/thinking end of the continuum, as their response appeared to be less emotional and more cognitive. Although observations revealed that the children demonstrated varying levels of uncertainty, to some extent all of the children observed, displayed some feelings of uncertainty.

Having identified Kolb's (1984) perception continuum as one possible theoretical framework for examining the way in which the children assimilated new information, further reading suggested that Vygotsky's (1978, p.86) zone of proximal development also offered a theoretical framework for considering how the children made sense of what they were learning as they moved towards a cognitive understanding of the information that they have gathered.

Vygotsky (1978, p.86) theorised that in order for a child to assimilate new knowledge, the child must first be shown knowledge beyond his current state of understanding. Vygotsky's zone of proximal development is the theoretical state

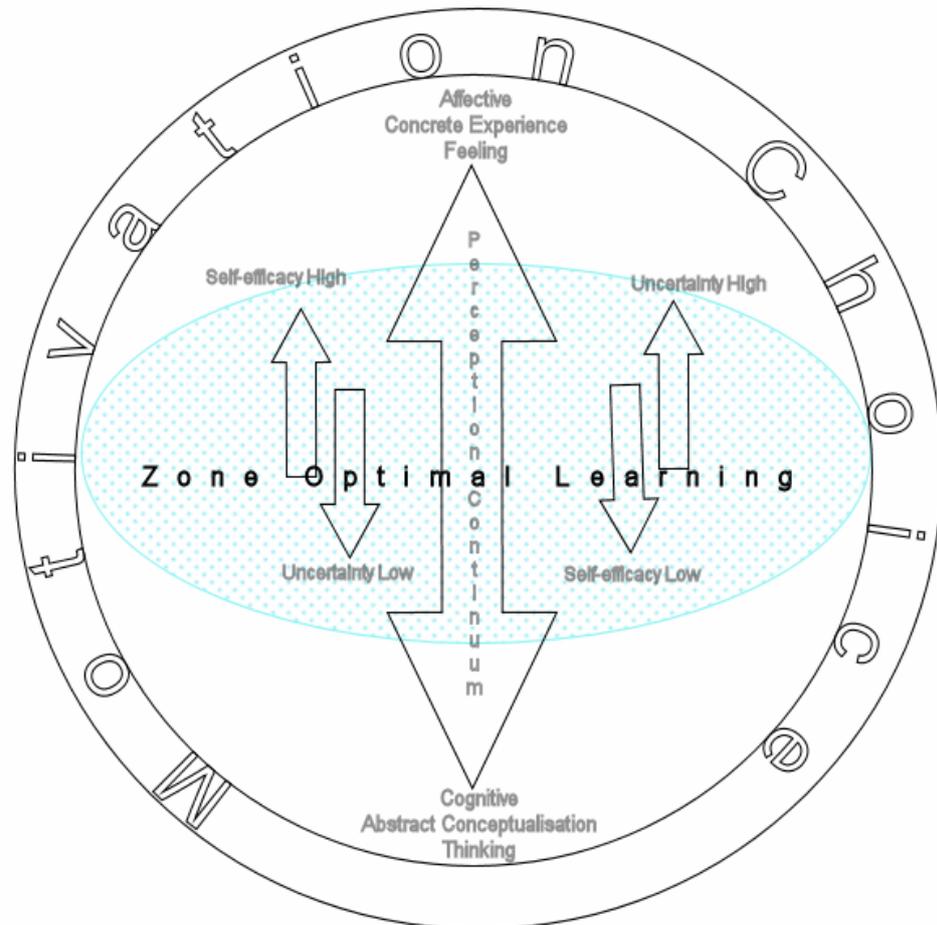
whereby a more experienced peer could guide another person to accomplish more than they could manage alone. Gordon Wells (2000, p.57) explains his understanding of the zone of proximal development as *“the zone in which an individual is able to achieve more with assistance than he or she can manage alone”*. In the context of this study it was possible to witness the children supporting each other as they moved from uncertainty to cognitive understanding of the information they were receiving.

6.4.1 The Zone of Optimal Learning

By considering Vygotsky's (1978, p.86) zone of proximal development together with Kolb's (1984) experiential cycle, in the context of this group of children's information seeking behaviour, a pattern emerged from the data that supported the theory of a zone of optimal learning exists. A zone where a child moves away from a non-understanding, emotional response to information and progresses towards a cognitive understanding of the information that they are gathering. Vygotsky's and Kolb's theories did not take into consideration all of the factors that faced this group of children whilst they were searching for information, which is why it was necessary to consider the cognitive and affective accelerators and inhibitors to the children's information seeking behaviour.

A diagram of the zone of optimal learning can be seen as figure 10

Figure 10 The Zone of Optimal Learning.



As a child moves away from their initial uncertain response to new information, but before they have reached full cognitive understanding of the information, they enter the zone of optimal learning. This is the optimal place for them to begin to assimilate the information, the place where they are able to draw on past experience, social interaction and previously acquired knowledge, the internal place where they can sort the information they have gathered and put it into a context that makes sense to them. Unlike the zone of proximal development that needs the support of a more experienced person, the zone of optimal learning is an internal place where uncertainty starts to recede and understanding begins to dawn. In short, it is the place where “the penny has dropped” and the child has begun to cognitively assimilate the information they have gathered, in order to add it to what they already know to be true. The child may ask further questions to test whether, what they believe to be true, is in fact correct. How quickly a child progresses into the zone of optimal learning will depend on the

cognitive and affective accelerators and inhibitors. For example, a child may move swiftly through the zone of optimal learning if they have high levels of self-efficacy and low levels of uncertainty. They may progress more quickly if they have been intrinsically motivated to find the information in the first place. Choice may have been offered to the child, which extrinsically motivated them.

It is possible that a child may progress more slowly towards the zone of optimal learning if they are reliant on support from a teacher or peer, or are experiencing low levels of self-efficacy and high levels of uncertainty.

The theory of the zone of optimal learning suggests that as a child moves away from uncertainty, they will gather information, draw on past experiences and place the new information into a context that makes sense to them.

Once they have done this, the child will have cognitively assimilated the information and mentally stored it as new knowledge. It may be that the child is helped along the perception continuum through Vygotsky's (1978, p.86) zone of proximal development as was the case with Alan. He struggled to locate the island of St Lucia and the South American coastline and was supported by his friend Lisa. Alan asked questions of Lisa until he was happy that the information he had was correct. Alan demonstrated that he had cognitively assimilated the information when he was able to volunteer an answer to the teacher's question later on that day. During the same observation one of Alan's classmates, Cathy was also struggling to locate St Lucia on her map, with the aid of her friend, she was able to complete her task and assimilate the information. During an observation of the year 4/5 class, Abigail demonstrated how she was assisted through the zone of proximal development, when she watched how to group and ungroup items in a word document. She then had a go at doing it for herself and when she got it right first time, she was then able to demonstrate her newfound knowledge to her friend Tammy. During the same observation, Josh was shown the same grouping technique and was able to assimilate what he had learned, he was then able to demonstrate his new skill to his friend Andrew. Andrew demonstrated that he too was cognitively assimilating the information that Josh was giving him, however, Andrew needed Josh to

demonstrate the skill several times with Andrew asking questions of Josh to ensure that he had understood the information correctly. This supports the idea that as Andrew was moving away from uncertainty, he was placing the information into a context that he could understand, he asked questions and watched Josh carefully before he too mastered the skill of grouping objects together, by the end of the class Andrew was able to group objects together too.

Moving from non-understanding to understanding (along Kolb's perception continuum), the children in this study demonstrated how with the aid of a more knowledgeable person they could do more than they would have been able to do alone, (Vygotsky's zone of proximal development). However, internal cognition only came when the children were able to place what they had learned into a context that made sense to them. As they moved from non-understanding, they sometimes asked questions for clarification, as understanding began to dawn, they had entered the zone of optimal learning before continuing on to full cognitive assimilation of the information to create new knowledge.

As the children were cognitively assimilating information to create new knowledge, they were building up a repertoire of information seeking skills. The information seeking skills that the children were learning were helping them along the road to information literacy. Once the children had acquired their new found skill they were then in a position to reuse that skill if they chose to do so.

6.5 Information Skills

Examining the ways in which the children were taught information seeking skills was an objective of the study which was to, "*Identify and evaluate the current methods for teaching ISS to KS2 children*" this will help to "*establish the level of teaching of ISS for KS2 children*" which is also an objective of the study.

The data highlighted the fact that there was a progression in the ways in which information seeking skills were taught between the year 3 and the year 4/5 classes.

Observations demonstrated that it was necessary for the year 3 teacher to start with very basic information seeking steps, for example, explaining to the children the different levels of information that could be obtained by using a globe, an atlas and a map and getting the children to decide which resource would offer them the level of information that they required. Many of the year 3 children were able to critically examine information resources in terms of their relevance to the information need *“well it won’t be on the globe will it?...no because the globe doesn’t have enough information on it”*. As a start, the teacher was encouraging the children to think critically about the information resource they were using rather than critically examining the information.

The year 4/5 teacher was able to teach information seeking skills to the children that built on the skills she knew they would have learned when they were in year 3. Observations demonstrated how the year 4/5 teacher was able to encourage her class to further develop critical information seeking skills.

6.5.1 Critical Thinking Skills

Motivating children to want to find information is an important part of the information seeking process. Getting the children to want to find information and then getting them to think about it critically is another thing. Bowler et al (2001, p.205) believe that *“simple fact-finding skills will not suffice”*.

Teaching children to become critical users of information at an early age may well help to alleviate the problem identified by Lipman [DfES Standards site, 2008] of poor thinking skills in his students. In year 3 the children were being taught how to gather information but they were not taught to think critically about the information they were gathering, rather as a start the year 3 children were thinking critically about the resource they were using.

However, the year 4/5 teacher spent time with her class encouraging them to think about information that might be kept about them personally. The teacher was able to joke with the children about the personal information that school held about them *“Would you put in that Mark loves chocolate aero bars better than any other chocolate?... why not? That’s personal information, but you’re right the school doesn’t need to know”*. By getting the children to think about information that related directly to them the teacher was encouraging them to question not only what information might be held about them but also why it was necessary for that information to be held about them. It seems that if children are to become critical users of

information then it is the role of the educators to move away from the traditional behaviourist teaching principles of learning by rote and repeating back information parrot fashion. Children now need to question information, examine it against what they already know to be true, in short, they need to learn to be more critical. Teaching children to spot anomalies in information is another way of encouraging them to think critically. The year 4/5 teacher was working with her class on databases, the teacher had built in to the database some deliberate mistakes and she was getting her class to look for the mistakes. The teacher indicated a column in the chart that was much bigger than any of the other columns *“Is Damien Duff really that good? Has he scored 456 goals this season?”* She demonstrated how by examining the chart, mistakes could be identified and corrected, however she is also getting the children to question the information that is being presented to them. The children agreed that it was unlikely that Damien Duff had scored 456 goals in a season and the teacher was able to explain that in all probability the information in the chart was incorrect, *“it stands out that there is probably a mistake somewhere in the data, the graph is showing us that there is a problem. Remember data must be correct. There are all sorts of times when we need to check that the data about us is correct”*. This observation served not only to reinforce the need for children to develop critical thinking skills but was fulfilling one of the objectives of the research study which was to *Identify whether there are gaps in the children’s knowledge and understanding of information retrieval and use*. If children are to become information literate then it is necessary for them to be able to critically evaluate information, teaching children to be critical users of information allows them to determine for themselves whether the information they have gathered makes sense to them, in the context of what they already know to be true. By identifying that there were sometimes gaps in the knowledge and understanding of information retrieval and use served to highlight the need and importance for children to develop critical information seeking skills.

6.5.2 Storage and Retrieval Skills

To determine whether there were gaps in the children’s knowledge and understanding of information retrieval and use (an objective of the study) it was necessary to observe how the children were taught to store and retrieve information. It would have been desirable to have observed and ICT lesson

in which the year 3 children were taught to store and retrieve information, unfortunately this was not possible, therefore no comparison can be drawn that would highlight whether there was a progression of the children's skills in information storage and retrieval.

It was, however, possible to examine the ways in which the year 4/5 children were taught strategies for storing and retrieving information. Observations demonstrated how the year 4/5 children were able to correctly identify when there was a problem with the way in which information was presented to them. They were able to talk the teacher through the steps necessary for her to search for information on a database. The teacher was able to guide the children to critically consider how information should be presented so that it is meaningful.

Observations also revealed that although the children were thinking critically about the information that they were gathering they did not critically evaluate their own information seeking behaviour or indeed the process that they had engaged with whilst gathering information.

6.6 Summary

During this chapter, it has been possible to explore the findings of the research study and look at them in the context of previous research. A model of information seeking behaviour emerged that was grounded in the data. This model was then examined to see how it fit within the context of previous research findings. Within the model of information seeking behaviour a further theoretical framework was considered, a cognitive theory of learning that considered how new information was assimilated in the creation of new knowledge. This theory posits that between the places of non-understanding and full understanding of information, a zone of optimal learning exists in which children move from an uncertain response to new information to cognitive understanding of the information. As the child moves from one extreme to the other, they enter a place that is the optimal place to learn.

The model of information seeking considered the inhibitors and accelerators faced by the children as they gathered information. Uncertainty, self-efficacy, motivation and choice, need and want, were examined in the context of the children's information seeking behaviour.

The research study was able to highlight strengths and weaknesses in the way in which Key Stage 2 children were taught information seeking strategies. As a way of promoting information seeking strategies to Key Stage 2 children, the following chapter will reiterate the major research findings of this study and offer suggestions that aim to support the way in which information seeking strategies are delivered to Key Stage 2 children based entirely on the children that participated in this study.

The next chapter highlights the major research findings of this study and offers suggestions for promoting information seeking skills to Key Stage 2 children and also offers suggestions for future research.

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7 Major Research Findings and Suggested Ways Forward

7.1 Introduction

During the preceding chapters it has been possible to highlight strengths and weaknesses in the way that information seeking strategies are taught to Key Stage 2 children. Based on the themes that emerged from the data, a model of information seeking behaviour emerged that was specific to this group of children. It became clear that a further theory existed within this model, that considered the internal cognitive development that a child might go through in order to assimilate information into new knowledge.

In light of the research findings it is possible to offer four guidelines for delivering information seeking skills to Key Stage 2 children, in order to better prepare them to become lifelong literate users of information. In this research study it was possible to examine aspects of children's information seeking behaviour and the influences that surround it. However, as the study progressed it became clear that for many children, school was not the only influence on their information seeking behaviour. In order to acknowledge the other information seeking influences, suggested areas for future research are identified that may offer insight into aspects of children's information seeking behaviour that were on the peripheral edge of this study.

The research methods adopted for this study were those of ethnography and grounded theory, taking a grounded theory approach meant that no a priori assumptions were made at the start of the study, the research findings emerged from the study and seek to offer a working hypothesis that future researchers may be able to apply to their own settings

7.2 The Model

The model of the children's information seeking behaviour is a major research output and fulfils one of the aims of this study which was *"to develop a framework or set of guidelines for developing and promoting Information Seeking Strategies (ISS) in KS2 children"*. Wilson (1999, p. 250) states that *"a model may be described as a framework for thinking about a problem and may evolve into a statement of the relationships among theoretical propositions"*. He goes on to say that these *"statements, often in the form of diagrams, ... attempt to describe an information-seeking activity, the causes and consequences of that activity, or the relationship among stages in information behaviour"*. The model that emerged during this study

demonstrates the different aspects of the children's information seeking behaviour and attempts not only to describe the information seeking behaviour but also to demonstrate the different stages of the children's information seeking behaviour. The model demonstrates how the teacher's defined the children's information need for them and then offered the children scaffolding support throughout the information seeking process. The teacher was also able to differentiate the levels of difficulty of the task set for each child. In this way it was possible to further support the less able children whilst ensuring that the more able children were offered more challenging work. Teachers also needed to make sure that their teaching took into account the different learning preferences that would be present in their class, teaching to encompass visual, auditory and kinaesthetic learners. From the model it is also possible to see that the children regularly supported each during their information seeking. These aspects of support underpinned the children's information seeking behaviour throughout the information seeking process. The model can be seen again as figure 9 on page 209 .

As the children begin tentatively to search for information, cognitive and affective influences were identified that acted as either accelerators or inhibitors to the information seeking process. In order to place the children's information seeking journey into context, it was necessary to examine their behaviour by utilising the theoretical frameworks of Kolb (1984) and Vygotsky (1978). As the children move from uncertainty to understanding, a theory was developed that postulates that the children enter a zone that is the optimal place for them to assimilate new knowledge.

Based on a combination of Kolb's Experiential Cycle (1984) and Vygotsky's Zone of Proximal Development (1978) as conceptual frameworks, the Zone of Optimal Learning is a theory that proffers that as a child encounters new information, they move from initial uncertainty (whether that be cognitive or affective uncertainty) towards a cognitive assimilation of that information. How quickly they progress from uncertainty to cognitive assimilation may well depend on other cognitive and affective influences such as self-efficacy, motivation, choice, need and want.

Starting at the affective end of Kolb's perception continuum, the theory of the zone of optimal learning posits that as a child moves along the perception continuum they will enter a zone that is the optimal place to begin assimilating the information into new knowledge. It is the place where a child has begun to cognitively assimilate the

information they have gathered. The child may ask further questions to test their understanding of the newly acquired information so that they can fit it into a context that makes sense with what they already know to be true. The Zone of Optimal Learning can be seen as figure 10 on page 225.

The speed with which a child may pass into the zone of optimal learning will differ from child to child and will depend on the cognitive and affective accelerators and inhibitors. For example, a child may move swiftly through the zone of optimal learning depending on their levels of self-efficacy and uncertainty. If they have high levels of self-efficacy and low levels of uncertainty, they may progress quite quickly into the zone of optimal learning. They may progress more quickly if they have been intrinsically motivated to find the information in the first place. If choice has been offered to the child, they may be extrinsically motivated. These accelerators enable the child to move more quickly into the zone of optimal learning.

Conversely, it is possible that a child may progress more slowly towards the zone of optimal learning if they are reliant on support from a teacher or peer, or are experiencing low levels of self-efficacy and high levels of uncertainty or if they are not motivated by the topic or not offered a choice.

The theory of the zone of optimal learning is an output of the study which demonstrates that *“the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour”* have been investigated, which was one of the aims of this research study.

As the child began to cognitively assimilate the new information, they were also learning about the different resources available to them, where they could gather information. The model demonstrates how the children were learning about the different resources. They were able to build on the skills they already had with continued support from adults in the classroom and their peers. The way in which the children were taught to decide upon the most appropriate resource to meet their information need, built on skills they had learned previously. The study was able to highlight that there was a progression in the ways in which information seeking skills were taught between the year 3 and the year 4/5 classes, with the year 4/5 teacher building on skills the children would have learned in year 3. The year 4/5 teacher was then able to further develop the children’s skills by encouraging them to think critically about information and even to consider how information could be stored and then retrieved. Preparing the children to identify information resources that

would meet their information need and then build upon the skills they were learning demonstrates how it is possible to link the children's learning to becoming information literate. The children were supported by either peers or an adult and as they moved from uncertainty of the information being shown to them, they were moving towards a cognitive understanding of the information and were developing skills that they could transfer to other situations in the future if they chose to do so.

Examining the ways in which the children were taught information seeking skills was an objective of the study which was to, *"Identify and evaluate the current methods for teaching ISS to KS2 children"* this will help to *"establish the level of teaching of ISS for KS2 children"* which is also an objective of the study.

7.3 Ways Forward

The Alexandria Proclamation (2005) states that *"Information Literacy lies at the core of lifelong learning"*, however the UK Government appears to attach very little importance to information literacy skills at primary school level, preferring it seems to concentrate on developing children's numeracy and literacy skills. Thinking skills are briefly acknowledged on the national curriculum website, with most information seeking skills being categorised as part of ICT learning outcomes. Within the national curriculum "essentials for learning and life" document, digital information is only mentioned once whereby children are encouraged to make *"full use of the nature and pliability of digital information"*.

This research study has highlighted some areas of strength and weakness in the teaching of information seeking strategies to Key Stage 2 children. Four guidelines for promoting information seeking strategies to Key Stage 2 children are offered here.

1. As far as is possible, children should be encouraged to define their own information need.

For children to become literate users of information, they must first develop the skills necessary for them to identify that an information need exists. The teachers in the study did this effectively by introducing the information need to the children. Both teachers used WALT and WILF to outline for the children the objectives for each

lesson. The year 4/5 teacher even gave her class the opportunity on occasion to identify their own information need. Dubber (2008, p.3) believes that

“Cultivating curiosity in our young children is one of the most important things that we can do for them. Their enthusiasm for learning, for finding out about themselves and the world around them is at the heart of human development, a basic tenet of evolutionary psychology”.

It may be possible that even the younger children could be given the opportunity to identify their information need. The topic would still need to be investigated in order to meet the learning outcomes set out by the national curriculum. However, it could be that as the teachers are differentiating the lessons, greater autonomy is given to the children. For example, the topic being investigated may be the Tudors, the children could identify what they would like to know about the Tudors and the teacher could guide them and make suggestions so that all relevant areas of the topic were covered. Giving the children a greater choice in what they were learning would help to motivate them and keep them interested.

2. Information seeking skills and strategies should be embedded within topics

Teaching children the skills they need to locate information may help to lessen their feelings of uncertainty, if the children are able to feel that they have sound information seeking skills, their levels of self-efficacy regarding information seeking will be higher which in turn will help to motivate them. Embedding information seeking skills within other curricular topics will allow the children to learn and practice their information seeking skills whilst, for example, learning about Egypt. *“The best balance of learning comes from an initial teaching of basic information skills followed up by these skills being used in the context of subject teaching”* (Grey, 2000, p.72).

Having provided the children with sound information seeking skills it may be necessary to show them that the skills they have are transferable to other areas of their learning. Embedding information seeking skills within the curriculum would allow the children to practice their skills until using those skills became part of the natural process of learning.

3. Children need to be taught to develop their critical thinking skills

Encouraging children to become critical thinkers appeared to be one area that was only touched on very briefly by the year 4/5 teacher, when she got the children to think about the kind of information school would need to keep about them. In most instances, for most topics, the children responded to the teacher's questions with answers that the teacher had provided them with previously, this supports Lipman's (2008) [DfES Standards site, 2008] opinion that students were "*encouraged to learn facts and to accept authoritative opinions, but not to think for themselves*". In order for children to become critical and independent lifelong literate users of information, it is necessary that they are encouraged to ask questions and develop their innate curiosity, rather than just being taught a series of facts which they are expected to regurgitate in order to demonstrate their understanding. That is not to say that it is not necessary for the children to demonstrate their understanding, simply that learning facts and repeating them does not necessarily imply understanding.

4. Understanding should be demonstrated contextually

Demonstrating understanding is necessary but it would be most appropriate if understanding were demonstrated in a contextual way rather than as a list of acquired facts. For example, whether the children were learning about history, geography, ICT or science, they could learn facts in isolation that would demonstrate that they had achieved the national curricular learning objectives, or they could be taught that what they are learning has an effect on their lives today, whether that be in a global, economic or personal context.

Providing children with information seeking skills both on a physical and intellectual level seems to be a huge mountain to climb but by taking it step-by-step, it is not only possible but necessary if the education system is to produce critical lifelong learners.

7.4 Contribution to Knowledge

Although the disciplinary focus of this study is that of Library and Information Science, due to the nature of the research setting and that of the research participants, it may be possible that the findings of this study could be used by practitioners and researchers from an educational discipline. There is the possibility that the cross-disciplinary nature of this study can inform more than just the Library

and Information Science discipline that it initially set out to inform and may provide an opportunity to share research findings with other disciplines.

This research study set out to investigate the cognitive and affective characteristics of Key Stage 2 children with the aim of providing a framework and set of guidelines for developing and promoting information seeking strategies to Key Stage 2 children. The research findings of this study offer a contribution to knowledge that can be utilised by educationalists as well as researchers within the field of LIS.

Within LIS the methodological approach taken for this study is rare and offers future researchers insight into how an ethnographic investigation can offer a deeper understanding and richer picture of a social phenomenon. Having reviewed the methodological approach taken for this study, researchers may decide to adopt some or all of the methods used in this study to gain a more meaningful understanding of their own research environment. This study seeks to clearly set out how methodological choices were made and offers justification for those choices, which may help to inform the choices that future researchers make. By examining this study from a theoretical and methodological viewpoint, it is possible to see that combining a grounded theory approach with an ethnographic approach produces findings that offer a micro-level understanding of children and their information seeking behaviour which may inform how future research investigates children and their information seeking behaviour.

From an educational viewpoint, this research study offers a snapshot in time of a group of children and offers a framework on a theoretical level as well as a set of practical guidelines that can be utilised by practitioners.

The four guidelines offered in this study are for promoting effective information seeking strategies to children and are also an output of this study which was *“To develop a framework or set of guidelines for developing and promoting Information Seeking Strategies (ISS) in KS2 children”*. Making no a priori assumptions at the beginning of the study, it was not possible then, to determine whether the research findings would produce a framework of the children’s information seeking behaviour or whether it would produce a set of guidelines as the major research output. As the study progressed it was possible to determine that the major research output would offer both a framework and a set of guidelines that future researchers and practitioners may use as a working hypothesis within their own settings.

The research findings are specific to this particular research setting, nevertheless, it may be possible for the model and the four guidelines to be tentatively applied to other research settings should future researchers and practitioners find that their context be similar enough to the context of this study. The model of the children's cognitive and affective influences on their information seeking behaviour seeks to offer future researchers insight into the way in which this group of children sought information. Because the theory that emerged from this study was grounded in the data that was gathered and no a priori assumptions were made at the start of the study, a snapshot of the children's information seeking behaviour was captured that may offer insight to researchers. It is possible that educators from Key Stage 2 right through to educators in Higher Education may find a resonance with the findings of this study and their own setting, regardless of the age of their students and will be able to adapt or tailor the suggestions offered to suit the information literacy needs of their students.

Application of the research findings of this study to an educational situation would help to inform practitioners of the importance of being information literate and help them to develop their own understanding of information literacy. By implementing some or all of the guidelines outlined in this study, practitioners would be better equipped to support their students on the road to information literacy.

There is a need to disseminate the findings of this study as widely as possible and this will be done in several ways. Firstly disseminating the findings to the LIS community will take place by means of writing articles for peer reviewed journals. Findings will also be disseminated by delivering papers at conferences such as the Librarians' Information Literacy Annual Conference (LILAC). Due to the cross-disciplinary nature of this research study it is necessary to disseminate findings to practitioners. There are several ways that the findings of this study can be disseminated to practitioners. Eve and Schenk (2007) highlight the "culture gap" that exists between academics and practitioners in relation to research, it is therefore important to find other ways of engaging and disseminating to practitioners. Practitioners from an educational background are unlikely to be found with copies of information science journals, therefore it is important to disseminate findings in educational journals. Another way of disseminating findings to practitioners is by means of workshops. Workshops would allow the dissemination of findings from this study to practitioners in a way that would allow them to develop their understanding of information literacy as well as providing them

with practical guidelines for enhancing the information seeking strategies of their students. It may be possible to develop an “information literacy” module for trainee practitioners that would allow them to embed information literacy skills and strategies as a matter of good practice before they enter the educational arena. As stated at the beginning of this thesis, the need for children to be information literate has never been more important. However, there is a need to educate the educators in the importance of information literacy. It is then possible to offer them solutions for integrating information literacy skills into their everyday classroom routines.

7.5 Future Research

Initially this research study set out to investigate varying aspects of children’s information seeking behaviour and took “*the big net approach*” (Fetterman, 1989, p.42) examining issues such as how the children were taught information seeking skills in school, how the children were supported by their parents in their information seeking behaviour and whether a digital divide existed in terms of whether the children had access to electronic resources outside of school. As the study progressed it became apparent that the focus of the study needed to be more deeply centred on one of these areas. Access to the school environment had been organised and so it was this line of enquiry that was pursued. However as the research developed, it was not always easy to separate what some of the children had been taught in school from what they had been taught at home. Evidence from this study demonstrates that parental input into children’s information seeking behaviour played a part in developing the skills and strategies that will help lead children towards becoming information literate. Examining how much influence parental input into children’s information seeking behaviour has, is an area that requires much deeper scrutiny. It may not be easy to separate how information seeking skills are taught in school from how they are taught in the home but it would help to expand upon the picture of the children’s information seeking skills painted in this study. Future research may perhaps wish to investigate information seeking behaviour by examining the child and all of their information seeking influences in a more holistic way. A study that examines the whole child may be able to offer valuable insight into the numerous ways in which children interact with information.

It may be possible that further research could demonstrate whether a digital divide exists between the children who have access to resources at home and those who don’t and this is an area that would benefit from further investigation.

Constraints placed upon this study in terms of time, depth of data gathered and resources meant that it was not possible to follow these lines of enquiry even though to do so would have painted a richer and more rounded picture of the children's information seeking behaviour.

7.6 Summary

During this chapter it has been possible to demonstrate the major research findings of this study. Based on the themes that emerged from the data in previous chapters, it was possible to identify a model of information seeking behaviour that was specific to this group of children. Within this model, a further theory is posited that considers the internal cognitive development that a child might go through in order to assimilate information into new knowledge.

In light of the research findings it was possible to offer four guidelines for delivering information seeking skills to Key Stage 2 children. Both the model of information seeking behaviour and the guidelines fulfil an aim of the study which was *“to develop a framework or set of guidelines for developing and promoting Information Seeking Strategies (ISS) in KS2 children”*.

The first aim of the study, *“to investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour”* was achieved and demonstrated and supported by the theoretical supposition that a zone of optimal learning exists in which children are able to cognitively assimilate new information to create knowledge.

Suggested areas for future research were identified, that may offer insight into aspects of children's information seeking behaviour that it was not possible to investigate during this study due to time, scope and resources.

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8 Reflection

8.1 Introduction

This chapter sets out to explain how the study evolved over time as the research design unfolded, and to reflect on the process from a methodological viewpoint as well as a personal viewpoint. It examines the study in the context of the initial aims and objectives and offers an explanation as to why the original aim and objectives needed to be revised. During this chapter, reflecting on the adequacies and inadequacies of the research process help to explain and justify why the study was conducted in the way that it was. Reflecting on ethical considerations, the sample that was identified, the gatekeepers and the personal as well as methodological approach will offer the reader insight into not only how the research study was conducted and will offer an explanation as to why the study was carried out this way.

8.2 Aims and Objectives

At the beginning of the study, it was necessary to adopt "*the big net approach*" (Fetterman, 1989, p.42) however, as time went on it became necessary to narrow the focus of the study. As the research study unfolded and the academic year progressed however, it became clear that it would not be possible to achieve all of the objectives initially set out in the study.

Referring back to the initial aims and objectives serves to demonstrate how the research design developed.

At the outset of the research study two aims were identified, which were:-

- To investigate the potential impact of developing successful cognitive and affective information strategies in preparing Key stage 2 children to become independent learners.
- To offer possible suggestions and insight into improving the way in which Information Seeking Strategies are delivered to Key Stage 2 children

In order to understand the impact of Information seeking strategies on Key Stage 2 children the following seven objectives were identified

- 1 Identify and evaluate the current methods for teaching ISS to KS2 children
- 2 Establish the current ICT outcomes required from the e-learning strategy as outlined by relevant government bodies
- 3 Establish the role of ISS in the government, LEA and school policies
- 4 Identify whether there are gaps in the children's knowledge and understanding of information retrieval and use
- 5 Identify if a digital divide exists and influences information behaviour (e.g. demographics)
- 6 Consider parental input into teaching ISS to the children
- 7 Establish the level of teaching of ISS for KS2 children

As the study progressed, it became clear that investigating whether a digital divide existed and if it did, how it influenced information seeking behaviour would be far too big a topic for this doctoral study, as a doctoral study need to examine a context in "*mile deep intensity*" (Pickard, 2006). It also became apparent that whilst for some children, parental input into their information seeking behaviour played an important role, it too was too big a subject to be investigated within the boundaries of this doctoral study. In order to gain a deeper understanding of how parents support and teach their children information seeking strategies, it may be necessary for further research to be carried out whereby parental input into children's information seeking behaviour is the main focus. It therefore became necessary to scale down the original objectives in order to do justice to the areas that were being scrutinised. This meant that the two objectives that set out to

- 8 Identify if a digital divide exists and influences information behaviour (e.g. demographics)
- 9 Consider parental input into teaching ISS to the children

would not be considered in the context of the children's information seeking behaviour which was the focus of the study. That is not to say that these two areas

are not of considerable interest or importance, and that they do not have any relevance to this study but simply that they were not for this study at this time.

Regularly revisiting the aims and objectives of the study meant that the focus of the research was always kept to the forefront whilst the data was being gathered, this meant that there was less likelihood of being lured away from the original focus of the study by interesting but irrelevant (in the context of LIS) pieces of information.

8.3 Interpretivist Ethnography

It is important to reflect on why ethnography was the most suitable way to conduct the research study. In the field of LIS, ethnographic investigation is rare, yet Brophy (2008, p.16) believes that *“Approaches like ethnography ... will help library performance measurement to meet the challenges of the future”*. Interpretivists believe there is no single truth to the way in which people live their lives as *“there are multiple constructed realities that can be studied only holistically”* (Lincoln and Guba, 1985, p.37). Ethnography was chosen because it offered several advantages that other methods did not. For example, the children chosen to participate in this study were young children aged between 7 and 10 years old, to have an adult who came into the classroom on a regular basis was at first a little disruptive but after a few weeks, the children grew accustomed to this regular intrusion and carried on with their work without comment. This allowed the data to be collected in as natural a setting as possible, gathering data in a natural setting is one of the fourteen characteristics of interpretivist enquiry identified by Lincoln and Guba (1985, p.39). Ethnography also offered the best possibility for gathering rich contextual data over a prolonged period of time in order to build up a picture of life in a Key Stage 2 classroom.

One frightening aspect, however of conducting interpretivist ethnographic research was that of entering the field armed with a notepad, a pen and a general idea that the research was investigating children and how they are taught information seeking strategies. In true interpretivist style there was no research design constructed a priori, the reason for this is that *“it is inconceivable that enough could be known ahead of time about the many multiple realities to devise the design adequately”* (Lincoln and Guba, 1985, p.41), it was initially an uncomfortable feeling with the neophyte researcher feeling that she was gathering *“data everywhere and nowhere, gathering everything and nothing”* (Charmaz and Mitchell, 2001, p.161). However

as the year progressed and themes and patterns began to emerge from the data, the initial feelings of discomfort were soon forgotten. Developing a grounded theory approach to the research meant that it was possible to sit, watch and listen and allow theory to be generated from the data that was being gathered. As analysis of data can start right at the beginning of the data collection process, it is possible to analyse it as it unfolded from the raw data. Comparative data analysis was conducted throughout the data collection process, which meant that it was possible to “*compare data with emerging categories*” (Charmaz, 2006, p.23) and to return to the field to investigate more fully any phenomena that warranted closer scrutiny.

8.4 Ethics

As the methodology chapter highlighted, there were several issues associated with entering the field and the ethical considerations needed to be examined.

Northumbria University has a coherent and extensive ethics policy, which its students need to understand and adhere to. However, the school participating in the study also had a policy and the school policy did not fit within Northumbria University’s policy. When asked if it would be possible to get permission slips for the children to participate in the study, filled in by the children and their parents (in line with Northumbria’s ethics policy) the answer from the school was “no”, the school were however, prepared to write a letter saying that permission was granted for the research study to take place within the school (appendix 1) and findings from the study could be published, on the understanding that the children could not be identified by name or picture. In consultation with the Director of studies for this doctoral study, it was decided that it was best to adhere to the school’s policy rather than insist that the Northumbria policy be applied. It was felt that if the Northumbria policy were insisted upon, the school may well decide that I was not welcome to enter the school and carry out the research there, Punch (1986, p.36) states that “*it is physically impossible to seek consent from everyone and seeking it ‘will kill many a research project stone dead’*”. In order to comply with the school’s policy, each child was given a pseudonym and no photograph’s were taken that could identify the children. The children were also not advised that they would be participating in research, this conflicted with my personal ethical beliefs, that research should be open and honest, allowing participants the right to explain their views without prejudice or bias. The Head Teacher was happy that if the children were to ask about my role in the school then it would be fine to tell them that I was doing some

research. This meant that it was possible to obtain retrospective permission from the children and thankfully all of the children were happy to be involved.

Another ethical consideration, which is also a requirement in law when working with children, was that of the criminal records bureau (CRB) checks. Anyone who works or does voluntary work with children is required by law to have a CRB check carried out before they are allowed to have contact with children. As a governor of the school a CRB check had been carried out, this can be seen as appendix 2.

8.5 Gatekeepers

Identifying whose permission needs to be sought and who the formal gatekeepers are within any organisation is not always evident. In this instance, the formal gatekeepers were identified as the Head Teacher and the participating classroom teachers. Once permission had been granted from the Head Teacher, it was then necessary to negotiate the amount of access that the teachers participating in the study were willing to grant.

Initially a request had been made for access to be for one full day a week in each classroom, however both teachers felt that this was too much especially as access was being granted over a prolonged period of an academic year. They were however happy to grant access for half a day each but requested before the start of the research that the fieldwork did not commence until the beginning of October, in order for the teachers to get to know the children in their class. Half way through the academic year (February) I again broached the subject of possibly gaining more time with each class but was politely informed that this would not be possible. As it turned out the extra access was not necessary, as saturation point had been reached by the end of the academic year, whereby no new themes were emerging from the observations.

8.6 The Sample

Having identified that the research would be conducted as an ethnographic investigation, the aims and objectives were used to highlight the sample group which were identified as being Key Stage 2 children. Geographical considerations meant that the research would be conducted in a primary school in the North East of England. The school was selected for several reasons; firstly, it was local to me and was where my children went to school. Secondly, previous research had been

carried out in the school, which provided me with tacit knowledge of the school as well as many of the children participating in the study but also meant that the gatekeepers as well as many of the participants knew me too. This could have proved to be a drawback if the participants (teachers or children) had felt that the information being gathered about them could be used to their detriment. Fortunately, this was not the case and I was able to assure the children that I would not discuss with their parents anything that happened in class and assure the teachers that my intentions were only to investigate how information seeking strategies were being taught to the children. Developing a basis of trust *“is something to which the naturalistic inquirer must attend from the very inception of the inquiry”* (Lincoln and Guba, 1985, p.257).

Ethnicity was not considered to be relevant when considering the sample and was only discussed as a means of offering background and contextual information, for example, the majority of the children in the study were ethnically categorised as being white British. Another aspect of the sample that was not taken into consideration was affluence. I was asked by another researcher what percentage of the children received free school meals, I had to admit that I did not know the answer to that question and believed that it would only have been relevant to the study if one of the objectives had been to consider whether a digital divide existed. As this objective had been discarded fairly early on in the study, I considered that it was not pertinent to the remaining objectives.

8.7 Reflecting in the field

Researchers should always be aware of any bias that they bring to their research, however it is even more important that ethnographic researchers remain vigilant against bias because they are reporting on people’s everyday lives. Rossman and Rallis (1998, p.26) believe that we should *“try to be aware of and vigilant about the baggage we carry into the inquiry”* while Pickard (2007, p.116) believes that *“It is far more important to acknowledge and understand one’s own ethnocentric biases and respond to them during the course of the study”*.

Because I had carried out research in the school previously and because many of the children were known to me through my own children, it was extremely important to not be swayed by personal feelings. Developing a professional but approachable attitude was not only necessary but crucial, personal feelings about individual

children had to be firmly put to one side in order not to skew the data. Developing a professional exterior was quite a challenge as not only did I know many of the children quite well but they knew me too. Some children knew me out of school from the local karate group, others knew me because they came to my house and played with my children, these children knew me as Wendy. However, in school all adults were known by their title. In discussion with a teacher I stated that I did not mind if all of the children called me Wendy, however the teacher thought it would be better if during school time the children called me Mrs Beautyman. It took a little while for the children who knew me well to remember that in school they must call me Mrs Beautyman.

During my time in the field at the end of the school day, I would stay behind and have informal chats with the teachers, often clarifying things that I had seen and checking my interpretation of the observations. During one of these chats at the beginning of the field research, the teacher asked me about some notes that I had taken. She had seen me pick up my pen and make a note about something that she had said to her class and she wondered what it was that I had seen. I was able to tell her that I had been reading about triadic and didactic teaching methods and she had demonstrated a really good example of triadic teaching, whereby a teacher asks a question, the children responds and the teacher replies giving the child immediate feedback. The teacher appeared satisfied with my explanation but it reminded me that I needed to be less conspicuous about the way I took notes. The informal chats with the teachers at the end of the observations proved to be invaluable, very often they were able to provide background detail and context that helped make sense of what was being witnessed. It was also the time where I was able to offer my interpretation and have the teachers either confirm my understanding or correct it. This was important because the success or failure of an ethnographic study *“depends on the degree to which it rings true to natives and colleagues in the field”* (Fetterman, 1989, p.21).

8.8 Exploring the Literature

There is a vast array of literature that investigates how people look for information, there are huge amounts of literature that investigate children and their learning and it was all too easy for a neophyte researcher to be lured down avenues that ultimately would not inform this piece of research. There were times when delving deep into the literature, it was necessary to revisit the aims and objectives of the

research in order to get back on track. Occasionally the avenues would not be complete dead ends but would lead to interesting areas that would provide insight. For example whilst reading about motivation, the area of choice was recognised as being an area that warranted further investigation. For the most part, it was necessary to draw back from the literature and refocus on the aims and objectives.

It was necessary to keep a watchful eye on current literature in order to ensure that the research remained relevant. Other researchers are in the field, conducting research and disseminating their findings and it is possible that their research will help to inform this study. It was necessary to also keep an eye on changes to Government legislation. Huge changes to the joint English/Welsh education system are currently being implemented, with particular reference to the new primary framework and the implementation within this framework of the numeracy and literacy strategies. As changes within the education system take place, Government bodies such as the DCFS, Becta and OFSTED monitor and report on the changes and these reports offer valuable insight that help to inform this study. Literature from a variety of sources needs to be gathered to ensure that nothing important is omitted from this study, for example, literature has been gathered from Government green papers, white papers, bills and Acts of Parliament, Government websites, journal articles, books, theses, conference proceedings and papers.

8.9 Reflecting on the Process

Developing a critical and reflexive approach to the methodology has allowed me to mature as a researcher. Reflecting on this has helped me to develop and expand the way I think about the doctoral process as a whole. I am now able to consider situations from a theoretical and philosophical perspective rather than from just a practical position. I have needed to ask questions when meaning has not been clear to me and by doing so I have come to the realisation that I will not appear foolish by asking questions. I now understand that questioning what I see and questioning what I believe are part and parcel of the process of maturing as a person and as a researcher. I am no longer afraid to make changes where necessary, even when sometimes making those changes is painful. This is particularly true of the writing process for this thesis, occasionally it was necessary to crop or even remove large passages of the text, either because they needed to be more succinct or when they simply were not relevant to the story being told. There were so many instances of wonderful vignettes and stories that could have been included but were left out because they were simply reiterating what had

already been said. Letting the stories go was quite possibly the hardest part of writing. I have learned that I am a terrible procrastinator, even when I know that time is running short and deadlines are looming and there is a real need for me to press on, I still feel the need to do some mundane chore before guilt finally gets the better of me and I return once again to my keyboard to write.

8.10 Summary

This chapter has offered explanations and justified the methodological as well as personal approach taken for this research study. It has demonstrated the need and importance of returning regularly to the aims and objectives of the study in order to maintain the focus and has explained why sometimes changes needed to be made in order for the research to develop. Highlighted within this chapter is the understanding that it is all right to make changes and even to take out aspects when they are proven to be hindering the research rather than aiding it. One important aspect raised and discussed in this chapter is the need to be critical, most importantly of myself, questioning and critiquing my own beliefs, widening my horizons and pushing the boundaries of what I considered possible.

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9 Conclusion

9.1 The Study

The research study set out to investigate the cognitive and affective characteristics of key stage 2 primary school children in the context of their information seeking behaviour. It sought to investigate the cognitive and affective triggers to the information seeking process and examined how the children were taught information seeking skills and strategies as part of their regular academic lives. This age group were chosen specifically because it is the point within a child's education where they are leaving behind the structured learning styles that they were taught in Key Stage 1 and are moving towards the independent and more open style of learning that will be required of them when they enter secondary education.

The British Government understand the importance of every child reaching their potential and explicitly states in their green paper "Every Child Matters" (2003, p.3) the need "*to protect children and ensure each child fulfils their potential*". In order for a child to fulfil their potential they need to be given the skills and strategies so that they can make sense of the world around them and achieve their potential. Examining how these skills and strategies are being taught to Key Stage 2 children was the focus for this research study. To this end, the following two aims and five objectives were identified.

The aims for this research study set out

- To investigate the cognitive and affective characteristics of Key Stage 2 (KS2) children in the context of their information seeking behaviour.
- To develop a framework or set of guidelines for developing and promoting Information Seeking Strategies (ISS) in KS2 children

In order to achieve these two aims the following five objectives were identified

- Identify and evaluate the current methods for teaching ISS to KS2 children

- Identify whether there are gaps in the children's knowledge and understanding of information retrieval and use.
- Establish the level of teaching of ISS for KS2 children
- Establish the current ICT outcomes required from the e-learning strategy as outlined by relevant government bodies.
- Establish the role of ISS in the government, LEA and school policies

Achieving the aims and objectives of the study allowed a rich picture to emerge that was grounded in the data and was specific to this group of children.

9.2 Methodology

The research study set out to investigate the cognitive and affective characteristics of a group of Key Stage 2 children in the context of their information seeking behaviour. In order to understand how these cognitive and affective characteristics influenced the children's information seeking behaviour an appropriate methodological approach needed to be identified. Having ascertained that the paradigmatic stance would be Interpretivist, careful consideration then needed to be given to the methodological approach to the research. There appeared to be several research methods that were suitable in terms of achieving the aims and objectives of the study. Ethnography and case study methods were initially considered, however upon further investigation it was apparent that whilst these two methods had many similarities, case study methods required well defined boundaries in terms of the purpose of the investigation, as the focus of the study was to investigate the cognitive and affective characteristics of the children, it was felt that out of the two methods ethnography offered the best option for gathering naturally occurring data. A ground theory method (GTM) was also identified as a research method that would provide valuable insight into the research study, and it was found from the literature that an ethnographic method would work well being conducted alongside a grounded theory method. Grounded theory allows the researcher to compare data as it is being gathered, "*data collection and analysis proceed simultaneously and each informs and streamlines the other*" (Bryant and Charmaz, 2007, p.1). Iterative analysis allowed themes and patterns to emerge from the raw data, as they were identified, it was possible to return to the field to

investigate the themes in greater depth. Returning to the field to investigate in greater depth was possible because of the prolonged period of time spent in the field.

Investigating current literature and examining documented accounts of previous research, allowed this study to explore findings and examine them in light of the data that was being generated for this study. Investigating the literature was an on-going part of the research that helped to inform this study.

The research study aimed to be holistic in nature. An holistic study is not only about looking at the entire situation but more importantly the context. *“Context is something that one can expect (and insist on) from ethnography that is most apt to be stripped away in any more narrowly focused approach”* (Wolcott, 1999, p.79). Understanding that context is an important aspect of the study it was necessary to offer contextual background information about the school and how it operates within the national setting of the joint English/Welsh educational system as well as offering contextual background details on the research participants.

9.3 Information and the National Curriculum

The importance of developing good information seeking skills has long been advocated, (Lubans, 1978, Kuhlthau, 1991, Grey, 2000, Herring, 2004) and yet the term “information literacy” still does not appear anywhere within the UK Primary Curriculum. To add to the confusion there appears to be interchangeable use of the terms, information communication technology (ICT) and information literacy (IL) a point borne out by Probert (2009, p.28) who found that there appeared to be *“some confusion with ICT skills and information literacy skills”* amongst the teachers she conducted her research with. The Government agency Becta (2008) believes that that there is a need *“to utilise the benefits of technology to create a more exciting, rewarding and successful experience for learners of all ages and abilities, enabling them to achieve their potential”*. The newly developed Primary Curriculum (2010) states the importance of *“securing the fundamentals of literacy, numeracy and ICT capability. There is a strong emphasis on children’s personal development, including the development of learning and thinking skills, and personal, social and emotional skills”* (p.7) yet fails to use the terms “information literacy” or “critical thinking”. So it would seem that the emphasis for developing information literacy skills appears to have become entwined (at least as far as the Primary Curriculum is

concerned) with the need for children to be proficient users of technology. As observations from this research study highlighted, not all information resources used by the children were technological resources.

Contextual background information offers other researchers a glimpse into the setting of this research study. The findings of this study cannot and should not be transferred wholesale to any other setting or group of children. This is due to the “*multiple realities*”, (Lincoln and Guba, 1985, p.37) however in true interpretivist style, should other researchers examine the context and background to this study and find that there are suitable similarities between this study and their own, they may be able to make “*tentative application*” (Lincoln and Guba, 1985, p.42) of the findings from this study with those of their own study. Offering contextual background information serves to paint a picture of the national education system in the UK, the local community within which the school operates and the teachers and the children who participated in the study. Contextual background information also serves to establish how the research was allowed to unfold. It demonstrates the number of times observations occurred and explains what lessons were observed, how many children were in each class, how many of them were boys and how many were girls. Getting into the minutiae of the context it examined how many of the children had special educational needs and how many were gifted and talented. All of this information serves to paint the clearest picture possible of the context of the study.

9.4 Observations

Observations conducted over a prolonged period of one academic school year led to themes being identified, these themes allowed a picture of children’s information seeking behaviour to emerge from the data. No a priori assumptions had been made about what would be witnessed in the classrooms. Early on in the observations uncertainty was identified as a possible theme. Returning to the field it was possible to examine how the children responded to new information. It was possible to determine that the younger group of children exhibited signs of both cognitive as well as affective uncertainty. This finding supports the belief of Wilson et al (2002, p.713), “*that uncertainty may have both affective and cognitive dimensions*”. As the term progressed, it became clear from the data being gathered that for many of the children, their uncertainty decreased. Observations also highlighted the fact that the following term, at the start of a new topic, the younger

children's uncertainty returned and that the levels of uncertainty witnessed, varied from child to child. Observations were able to demonstrate cognitive and affective influences that acted as either accelerators or inhibitors to the children's information seeking behaviour. As these themes emerged from the data, it was possible to explore them in detail and discover how they fit together to influence the children's information seeking behaviour. A rich picture of the children's information seeking behaviour began to emerge from the data that considered the cognitive and affective influences. Having identified early on in the study that uncertainty was a theme, it became necessary to consider whether self-efficacy played a part in the different levels of uncertainty. Observations revealed that when a child had low levels of self-efficacy, they demonstrated high levels of uncertainty and conversely when a child had high levels of self-efficacy they demonstrated low levels of uncertainty.

Other themes emerged from the data and were identified as being motivation and choice and need and want and these themes were scrutinised closely to see if they were cognitive or affective influences and whether they helped or hindered the children as they developed information seeking skills and strategies. Although it was not immediately identified as a theme, it was noted that both teachers always defined the children's information need for them, returning to the field it was possible to explore this in greater depth. Both teachers used WALT and WILF (acronyms for what I am learning, and what I am looking for) as a means of defining the children's information need. Another theme that then emerged was that of the support offered to the children by the teachers and from this it was possible to identify how the children supported each other. The support the children gave each other was referred to as scaffolding, and it was witnessed on a regular basis. The support offered by the teachers ranged from differentiating the lessons in order that each child was working at a level that was suited to their ability. This meant more challenging work for the more able pupils and less challenging work for the less able pupils. Another form of support that the teachers gave their classes was to teach the lesson accommodating the different learning styles of the children. This meant that it was necessary to consider the theory of learning styles and examine whether visual, auditory and kinaesthetic learning styles influence how a child interacts with information. It was necessary to consider the information resources that were available to the children and how they were taught to use these resources in order to extract the information that they needed.

As the academic year progressed, it was possible to witness phenomena, then whilst writing up researcher notes explore the theoretical concepts around that phenomena and then return to the field to examine whether the theoretical concepts in any way supported what had been witnessed. The themes were also examined in light of previous research studies to determine if there were similarities between the findings of previous studies and the findings of this study.

As the academic year progressed, it was possible to build up a rich picture of the ways in which the children were taught information seeking skills and strategies.

9.5 The Picture and the Theory

As the rich picture of the children's information seeking behaviour emerged from the data it was necessary to examine it and determine whether the findings from this study supported or refuted findings from previous research studies. By examining how the cognitive and affective influences of uncertainty, self-efficacy, motivation, choice, need and want shaped the children's information seeking behaviour, a model of information seeking, based on this group of children's information seeking behaviour, began to emerge. It was possible to examine this model in the context of Berkowitz and Eisenberg's (1987) Big6 and super3 frameworks and SCONUL's (1999) seven pillars of information literacy. Examining the model from this study, in the context of these other frameworks allowed similarities and differences to be highlighted, and explanations for these similarities and differences offered.

It was also necessary to examine the findings from this study in relation to other existing theoretical frameworks. It was possible to identify that there was some resonance between the findings of this study and the theoretical framework offered by Vygotsky (1978) who theorised that a "Zone of Proximal Development" existed whereby a child can be helped beyond the realms of what they could achieve alone, by the aid of a more experienced other. This theory resonated with the scaffolding support that was witnessed, whereby the children were able to help each other, or a more able pupil was able to support a less able pupil.

However, it was not just Vygotsky's theory that resonated with the findings from this study. The children initially reacted with uncertainty to new information and then, as time went on, they moved towards a cognitive understanding of the information. Kolb's (1984) experiential cycle theory seemed to support the findings of this study.

By combining Vygotsky's (1978) theory of the Zone of Proximal Development alongside Kolb's (1984) experiential cycle theory it was possible to demonstrate that a theory existed of a zone of optimal learning. The theory of the zone of optimal learning posits that between the places of non-understanding and full understanding of information, a zone of optimal learning exists in which children move from an uncertain response to new information to cognitive understanding of the information. As the child moves from one extreme to the other, they enter a place that is the optimal place to learn.

The research study was able to highlight strengths and weaknesses in the way in which Key Stage 2 children were taught information seeking strategies. As a way of promoting information seeking strategies to Key Stage 2 children, four suggestions were offered that aimed to support the way in which information seeking strategies are delivered to Key Stage 2 children based on the children that participated in this study.

The four suggestions offered are:-

1. That as far as possible, children should be encouraged to define their own information need. Being given a choice on areas of the topic that interest them may help with this.
2. Information seeking skills and strategies should be embedded within topics, so that as children are learning "stuff about geography" they are actually also learning how to use information seeking resources.
3. Children need to be taught critical thinking skills. Being taught to regurgitate information does not necessarily demonstrate understanding, children need to be able to question and critically analyse information.
4. Understanding should be demonstrated contextually, this could involve the children being able to demonstrate a link between the topic being studied and their own lives.

It may seem like a huge mountain to climb in getting children to become information literate, but if the educational system is to produce critical lifelong literate users of information, then it is something that needs to be achieved.

9.6 The Future and the Past

At the outset of this research study, areas of interest were identified, however as the study progressed it became apparent that it would not be feasible to cover all of the areas of interest. The focus of the study remained the same, to investigate the cognitive and affective characteristics of a group of Key Stage 2 primary school children; however it was not possible to examine the extent of parental input into the children's information seeking behaviour. Without doubt, the research findings demonstrated that some parents played a part in their children's information seeking behaviour, unfortunately it was an area that was too big for this study and so regretfully it was an area that was not investigated. It is however, an area of investigation that warrants closer scrutiny and is possibly a research study for another researcher or another time.

Being a reflexive ethnographer means that it is always necessary to be aware of "*one's own ethnocentric biases*" Pickard (2007, p.116). It is not possible to engage and participate in the lives of people within a community and remain either "*an automaton or... a neutral vessel of cultural experience*" (Hammersley and Atkinson, 1995, p.16). Ethnography demands that researcher's acknowledge their presence in the setting when writing up their ethnographic account, but Rossman and Rallis (1998, p.26) warn that researchers need to "*be aware of and vigilant about the baggage we carry into the inquiry*".

Whilst it is important to be reflexive in the field, as a doctoral student it is necessary to reflect on the processes of conducting a doctoral study. It was necessary to reflect on whether the aims and objectives of the study had been met. It was reflecting on the aims and objectives that highlighted the need to concentrate the study on the area of the school teaching the children information seeking skills and strategies, rather than pursuing the area of parental input. It was necessary to consider and reflect on the methodological approaches that were adopted for this study as well as the ethical stance that was taken.

It has been possible to reflect on the personal journey too, allowing the reflection to highlight areas of personal growth as well as growing as a researcher and an academic.

9.7 Summary

The findings from this study offered a snapshot in time of the information seeking behaviour of a small group of Key Stage 2 primary school children. Due to multiple, constructed and holistic realities, it is not advisable to apply the findings of this research study to another setting or group of children, however, it may be possible to tentatively apply the findings from this study, should the context of this study be close enough to the context of another setting.

Examining the English/Welsh educational system served to inform this study, this, combined with an examination of theoretical frameworks, teamed with observations of the children in the natural setting of their classrooms, provided an isomorphic relationship between conceptualisation and reality.

Due to the wealth of information available in society today, it has never been more important for children to be taught how to develop sound information seeking skills. In order for children to achieve their potential they must be taught the skills and strategies necessary to allow them to become critically literate users of information.

By investigating the cognitive and affective characteristics of this group of Key Stage 2, primary school children, it has been possible to develop a model of children's information seeking behaviour that was grounded in the data, that may offer an insight into how these important information seeking skills and strategies are taught to children.

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Appendices

Appendix 1 School permission letter



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8 June 2007

To whom it may concern

This is to confirm that Mrs Wendy Beautyman has been granted permission to conduct research in our school and to publish her findings on the understanding that no individual children can be recognised either by name or in a photograph.

Yours sincerely

A handwritten signature in blue ink that reads "Hilary Hardy".

Hilary Hardy
Deputy Headteacher



Appendix 2 CRB Enhanced Disclosure Form

Enhanced Disclosure
Page 1 of 2

disclosure

Disclosure Number 001149692470
Date of Issue: 21 DECEMBER 2006

| Applicant Personal Details | Employment Details |
|---|--|
| Surname: BEAUTYMAN | Position applied for: PARENT GOVERNOR |
| Forename(s): WENDY JANE | Name of Employer: GREENFIELD GPS |
| Other Names: DRAYTON, WENDY JANE | |
| Date of Birth: 18 MARCH 1965 | Countersignatory Details |
| Place of Birth: BIRMINGHAM MOSELEY | Registered Person/Body: NORTH TYNESIDE COUNCIL |
| Gender: FEMALE | Countersignatory: KAY RAYWORTH |

Police Records of Convictions, Cautions, Reprimands and Final Warnings
NONE RECORDED

Information from the list held under Section 142 of the Education Act 2002
NOT REQUESTED

Protection of Children Act List information
NOT REQUESTED

Protection of Vulnerable Adults List information
NOT REQUESTED

Other relevant information disclosed at the Chief Police Officer(s) discretion
NONE RECORDED

Enhanced Disclosure
This document is an Enhanced Criminal Record Certificate within the meaning of sections 115 and 116 of the Police Act 1997.

Use of Disclosure information

Continued on page 2

THIS DISCLOSURE IS NOT EVIDENCE OF IDENTITY
CRB Criminal Records Bureau, PO Box 165, Liverpool, L69 3JD Helpline: 0870 90 90 844
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Appendix 3
Short hand field notes

11/10/07 DC 91

K so the man JS and SV had a D.
 L. Yd he only went by? U?
 DC cos H went his D no b. ~~the~~
 he — he don't want the country
 to be rld by G. Do NYI make
 but had 2 fgs?
 R - she — → ex was her
 DE y. she did - now her ~~it~~ do v
 rubs it H not w/ us?
 M. was she w/ly I. U?
 DE y do v work for her?
 M. was it call of? U?
 DE no ut call, ds NYI make her now?
 SV/1 call → Ann Arng - call clear.
 R. was it Arng De? U?
 DE yrs v. q. In # they did ut
 her mark for or curars to the SI
 pete so the kd to get a ptr to go
 or put a pic of the Psn. Was
 good id R upset ppl by put them
 usly so ptrs wd not the last mark

both the the rly wees. Will v
 can imagine H was v easy when he
 met Arng cos he met a
 prett hide so he DVE her,
 Meg - he wd call - was it how
 or P?
 U?

Ben. CL shut out.
 DE we do NT slt out if vrn
 the Arng pt up v hand.
 Jans → it was call theau.
 DE yrs. bt H teter sl was seeing
 SI else so L hold her
 Gen - he wd call Par and
 she wd ing the H.
 DE yrs she did 1 st thea us
 a rlf fr w. Rt v r going to do
 som work now. This is fairly free
 Can NYI thine into H. not us?
 she can fir a fous city in Eng?
 Ch - was it EI?
 DE yrs w/d, who was sl know?

Appendix 4 Colour coded researcher notes

Date 11/10/07/ JC/G1

TEACHER: *ok so Henry married Jane Seymour and she gave Henry the son he wanted*

Child: *why did he only want a boy?* **TEACHER:** *because Henry wanted his son to be king*

after he died, he did not want the country to be ruled by a queen. Does anyone remember

what happened to Jane Seymour? **Child:** *she died after the baby was born* **TEACHER:** *Yes*

she did, now Child who was Henry's next wife? **Child:** *Is this the ugly one?* **TEACHER:**

yes do you remember her name? **Child:** *was it Catherine of...?* **TEACHER:** *not Catherine,*

does anyone remember her name? There were several mutterings of Anne of Aragon and

Catherine of Cleves until finally **Child:** *Anne of Cleves?* **TEACHER:** *yes very good, it was*

Anne of Cleves. In Henry's time they did not have mobile phones or even cameras to take

somebody's picture so they would get painters to go and paint a picture of the person. Henry

sent his painter to paint a picture of Anne of Cleves but in those days it was not a good idea

for the painter to upset the people he was painting and so he would make them look more

beautiful than they really were. Well you can imagine that Henry was very cross when he

met Anne of Cleves because he only wanted a pretty bride, so Henry divorced Anne and then

he married who? **Child:** *he married Catherine was it Parr or Howard?* There is a chorus of

voices shouting out "Howard" **TEACHER:** *excuse me, we do NOT shout out, put your hand*

up if you know the answer, yes Child **Child:** *it was Catherine Howard* **TEACHER:** *yes it*

was but Henry thought that she was seeing somebody else behind his back so he beheaded

her too. So who was Henry's last wife? **Child:** *it was Catherine Parr and she lived longer*

than Henry **TEACHER:** *that's right she did, I bet that was a relief for her. At this point the*

6 children that had left for their violin lesson returned saying that they had to go back in half

an hour as the group before them had not had their lesson yet [TEACHER to me, *this is*

absolutely ridiculous, it is so disruptive] **Right ok class now listen carefully because I am**

going to explain to you what you are going to do next. [TEACHER picks up an A4 sheet of

paper with the outline of a family tree on it] *This is a family tree and at the top it says Henry*

VII, do you remember he was Henry VIII's father? *Can anyone tell me who Henry's mother*

was, we did this a while ago but I did tell you, [prompts the children] she came from a

famous city in England? **Child:** *was it Elizabeth?* **TEACHER:** *yes well done, where was*

she from?... when Henry and Elizabeth married they joined together two large families that

had been fighting for years, Elizabeth was from the house of?... [nobody offers to

answer]she was from the house of York **Child:** *they joined the two flowers together the red*

and the white and that was the Tudor rose **TEACHER:** *very good and which rose was the*

one for the house of York? You have a fifty fifty chance of getting it right **Child:** um was it the red rose? **TEACHER:** oh no, oh dear you picked the wrong one, it was the white rose of York, never mind. **Right so look at the paper, do you see here it says Henry VII married and that bit is left out, you have to go and write down the name of the person who was married to Henry VII, then underneath you have to write down the name of their child who was?**

Several Children: Henry VIII **TEACHER:** then underneath you have to write down who Henry was married

to and the names of their children if they had any. **Child: do they have to be in order?**

TEACHER: oh yes that's very important because otherwise you will get the children in the wrong order too. Now Catherine of Aragon had a baby girl called? [lots of excited chatter and discussion of Catherine's baby's name]

TEACHER: quiet please, her baby was called Mary, Anne Boleyn's baby was called? **Child: Elizabeth** **TEACHER:** yes and Jane

Seymour's baby was called Edward. Edward was a poorly little boy and he was only King for a little while after Henry died, Edward died when he was 16, that was very young to die and very young to be a king. When Edward died Mary became Queen, I always thought that Mary was a very sad queen **Child: why was she sad** **TEACHER:** because Henry treated her and her mother very badly and she was sad about that. Mary married a Spanish King called Philip but I don't think they even lived together in the same house. After Mary then Elizabeth became Queen. **Right now look carefully on the sheet, there is a list of all the people's names at the bottom so you can see who needs to go onto your tree. [hands out the sheets] take one and pass it on and then go quietly to your seat.**

There is a lot of noise and enthusiastic chatter as the children go to their tables. **TEACHER** came over to me and said, you will notice a big difference between this class and other teachersclass, my lot are enthusiastic but up a height most of the time, its just the different personalities, Other Teachers lot are so laid back and placid compared to this lot. **TEACHER** and I circulate amongst the children offering help if it is needed. Child puts his hand up and I go over to see how I can help him. **Child: you know how Anne Boleyn chose to have her head chopped off with a sword? Me: yes** **Child: well if you had to choose what would you choose to have your head chopped off with? I think about my answer for a few seconds and then** **Me: I think if I had to have my head chopped off I would choose to have it chopped off with a feather. Child: [laughs] you can't chop someone's head off with a feather** **Me: no exactly, so I would probably die of boredom while somebody tried chopping my head off with a feather [laughs] Child: you would be there for ages and I bet it would tickle too** **Me: maybe they would tickle me to death with a feather then, that would be a better way to go [Child and Child both nod in agreement]**

On another table Child raises his hand and I go over to speak to him **Me: how can I help Child? Child: are you coming here every week? Me: yes nearly every week, I won't be here next week because I have somewhere else to be but I hope I will be here every**

week after that **Child:** *do you still go to karate?* [Child and I know each other from a karate class that we both used to attend outside of school] **Me:** *yes but I hurt my foot so I haven't been for ages, are you stuck on the next name?* **Child:** *yeah who came after Anne of Cleves?* **Me:** *who got her head chopped off?* **Child:** *[panics] I already got Anne Boleyn, is that wrong?* **Me:** *no that's right but who else got her head chopped off?* **Child:** *I can't remember which one she is, is it Howard or Parr?* **Me:** *it was Catherine Howard* **Child:** *ok, hmmm* **I've nearly finished** **Me:** *well done.*

Just then TEACHER asks the children to please stop what they are doing and put their pencils away and put their papers in the middle of the table even if they have not finished yet. **TEACHER:** *we have such a lot to get through today so we need to get on, please come and **quietly** sit down on the carpet.* Within a few minutes the children are once again sitting on the carpet. **TEACHER:** *now you will remember that I told you about Henry and Anne Boleyn's daughter her name was Elizabeth and she was Queen for a very long time. Elizabeth liked very fine gowns with jewels sewn into them as you can see here [indicates four pictures of Elizabeth which are fixed to the white board] but Elizabeth didn't have very much money and there were lots of courtiers that went wherever she went so what Elizabeth would do was to send out a messenger to a Lord's house and say "prepare the Queen is coming to stay" and then she and her courtiers would **go to the Lord's house and he would feed them all and make up bedrooms for them to stay. That would be like Child going round to Child's house every night for her tea and taking all her friends with her [children all laugh] how would you like that Child? Child:** I would pretend that I wasn't home and not answer the door. **TEACHER:** you would have to be careful because if you upset the queen then she might have your head chopped off.* So the queen would invite herself to peoples houses and then when she had stayed there for a little while she would send out her messengers to the next Lord and tell him that she was coming to stay for a while and make ready for her arrival, in this way she never had to feed herself or her courtiers. Because Elizabeth did not have any money she was very careful not to go to war with anyone because it cost lots of money to fight a war, you had to pay soldiers and give them arrows and cannons and ships but there was one war that Elizabeth could not avoid, **Child mentioned it earlier** **Child:** *it was the Spanish Armada* **TEACHER:** *yes Elizabeth had to fight a war against the Spanish it was the only war she had to fight and her ships beat the Spanish ships.* **[TEACHER points to the pictures on the white board again]**

TEACHER: *Looking at these pictures of Elizabeth in which picture do you think she is the youngest?* [children all point to the second picture] **TEACHER:** *yes she looks very young in that picture, can you see how white her skin is?* **That was white make up, today people like David Beckham and his wife set the trends, David Beckham has his hair cut in a certain way and everybody copies him but in those days everybody copied the King or Queen and so lots**

of the fashionable ladies put on very white make up. Can you see that in this picture [indicates the last picture] she looks older. There were no cameras in those days but we can tell that she had red hair and by all accounts a fiery red temper to go with it, and she had blue eyes.

Colour code

Resource, evidence of ISS, uncertainty, comparison and context, child initiated question, task or worksheet. Other categories included field trips and unexpected

The names of the children have been changed to “Child” and the teacher’s name has been changed to teacher in order to maintain the confidentiality of the participants.

Appendix 5 Memo Journal

11/10/07 JC/Ob/1-3.15

Today I was observing class ***. The children were rather excitable in the playground at lunchtime. It took TEACHER quite a while to settle them down at the start of class. From the field notes I have identified several instances which might be uncertainty demonstrated by the children (note read more on uncertainty and see what the literature says about uncertainty in children). If this is uncertainty, are there different kinds of uncertainty? Do all of the children demonstrate it? Does it get better or worse the more they learn? Need to go back and see if it happens again and also see if it happens in the other year groups with the other teacher. Lots of interesting things came out of the obs today, the children were quite reliant on the worksheets that TEACHER gave them and she had different worksheets for the different ability children in the class, is there some significance to this? Need to talk with TEACHER and ask.

I was feeling less nervous today, I think I am beginning to find my feet and not quite so anxious. The shorthand is helping because I don't feel like I am missing out on so much and it makes it easier to record as much of the conversation as possible. It can feel a little overwhelming sometimes when faced with such long transcripts but it's important not to miss anything in case it turns out to be relevant later on.

Appendix 6 Publications

Beautyman, W. & Shenton, A.K. (2009) When does an academic information need stimulate a school-inspired information want? *Journal of Librarianship and Information Science*, 41 (2), pp. 67-80.

Shenton, A.K. & Beautyman, W. (2009) Getting the message across to other disciplines *Library & Information Update*, Jan/Feb, pp. 60-61.

Shenton, A.K. & Beautyman, W.(2009) Information Literacy - What Is It? *Primary Leadership Today*, 15, pp. 32-34.

Shenton, A.K. & Beautyman, W.(2009) Information Literacy Policy *Primary Leadership Today*, 15, pp. 61.

Shenton, A.K. & Beautyman, W.(2009) Inspiring Independent Learning *Literacy Today*, 60, pp. 30.

Shenton, A.K. & Beautyman, W.(2008) Too Much Information? *Managing Schools Today*, Sept/Oct pp. 40-43.

Journal of Librarianship and Information Science

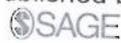
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When does an academic information need stimulate a school-inspired information want?

Wendy Beautyman and Andrew K. Shenton
Journal of Librarianship and Information Science 2009 41: 67
DOI: 10.1177/0961000609102821

The online version of this article can be found at:
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Wendy Beautyman is a PhD student in the School of Computing, Engineering and Information Sciences, Northumbria University. Her doctoral research, supervised by Dr. Alison Jane Pickard, is devoted to the academic information behaviour of primary school children, with fieldwork conducted in the north-east of England. Wendy's interest in user studies is longstanding. In the course of gaining a first-class BSc degree in Information and Communications Management, again from Northumbria University, she undertook a final year Honours project entitled, 'How Do Children Find Information Using the Internet?'

Andrew K. Shenton is a former Lecturer in Northumbria University's School of Computing, Engineering and Information Sciences. He gained a doctorate in 2002 after a wide-ranging investigation of the information-seeking behaviour of children and young people. He has now had over 70 papers published in Italy, the USA and his native Britain. They have been widely cited in books, periodical articles, conference papers, reports, dissertations and student seminar presentations, as well as forming recommended reading for modules of university courses that have included PhD programmes. Andrew currently divides his time between writing, mentoring higher degree students and working with youngsters in the Study Centre of Monkseaton High School in the north-east of England.

When does an academic information need stimulate a school-inspired information want?

WENDY BEAUTYMAN and ANDREW K. SHENTON*

This paper explores the nature of school-inspired information wants. It considers how such wants arise and actions taken by youngsters to meet them. The methodology within the study reported was one of interpretivist ethnography, with data collected from two classes of 7- to 8-year-olds in an English primary school via a form of participant observation that incorporated dialogues with pupils and staff. Children were seen to follow up on topics taught in the classroom with their own questions when one or more of seven situations arose. These included instances in which they developed an empathic interest in the protagonists being studied and when they noted inconsistencies in their own understanding. The findings have a range of implications, notably for practices in both education and LIS.

KEYWORDS: children; information needs; information-seeking; information wants; schools

INTRODUCTION

Few issues in Library and Information Science are so fundamental as the definition of the discipline's terminology. What may appear a straightforward matter of scoping, boundary-marking and explicit statement is complicated, however, when academics and practitioners alike are unable to agree on the ideas that underpin the constructs involved. Authors have long disputed how the concept of even 'information' itself should be understood and there remains little agreement to this day. Writing only recently, Rowley (2007) asserted, 'consensus on the meaning of the word "information" has not been achieved' (p. 165). Another term in common use that has provoked wildly varying ideas among commentators is that of 'information needs', and an analysis of attempts to identify differences between 'information needs' and 'information wants', in particular, reveals a considerable diversity of attitudes.

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NEEDS AND WANTS

A number of significant distinctions between needs and wants have been made by authors. Perhaps the most rudimentary is that offered by Chatman and Pendleton (1995). They associate a need with a 'state of dependency', arguing that an absence of the required information puts 'our current state of affairs in jeopardy', whereas a want simply leads to an 'enhancement', which would provide 'an added benefit if we possessed it' (p. 136). Derr's (1983) principle that information may be needed without being desired may be considered to incorporate several notions, such as the fact that information may be integral for a purpose which is important in the individual's life, yet that person may have no interest in gaining it. If the person is not even aware of the need, the phenomenon of dormant or deliquescent need, which is now well recognized by authors such as Cronin (1981), Nicholas (2000) and Shenton (2007a), arises. Needs of this kind are particularly pertinent in illustrating Case's (2007) argument that, since needs typically lead to less observable behaviour and are not so easily articulated as are wants, it is more difficult to find evidence of them. A further difference is noted by Green (1990). He draws attention to the matter of contestability, arguing that the necessity of what a person states he or she needs may well be debatable, yet there is no scope for disagreement if an individual declares that he or she wants certain material. Gross (2006) explains this discrepancy with reference to goals. Whereas a person who expresses a need, she argues, is motivated by the pursuit of a goal which may be of questionable importance, 'when we say we want something it is a statement of how we feel, and our feelings do not need goals to substantiate them' (p. 24). In contrast to these approaches, which highlight their separateness, Bryant (2000) maintains that an understanding of information wants 'will inform . . . information "need"'. She asserts, however, that it cannot be said to define it fully, since a person's wants are necessarily restricted to what that individual knows is available or at least is able to envisage.

Despite these apparently divergent characteristics of needs and wants, Gross (2006) admits that the terms are often used interchangeably, and other authors write explicitly of the problems of drawing clear lines of demarcation between them. According to Roberts (1975):

A 'need' may or may not be a 'want'; a 'want' may or may not be a 'need'. Both a 'want' and a 'need' may be appropriate, or inappropriate, to an individual's information situation and may or may not be expressed in some consequent form of demand action. (p. 309)

For Line (1974), it is the issue of necessity that is especially vexing. Defining the term 'need' as what 'an individual *ought* to have, for his work, his research, his

edification, his recreation, etc.', Line appreciates that, in strict terms, a need refers to 'something a person cannot do without' but he wonders, 'who is to say what is "necessary", for himself or others?' (p. 87). O'Connor (1968) asks a similar question. Line further challenges the making of any clear-cut division between needs and wants by adding, 'a recreational need may be just as much a need as an educational need' (p. 87). The kind of subjectivity that underpins Line's question about necessity and Green's contestability argument is also raised by Derr (1983). Whilst believing that, for a person to experience an information need, he or she must have a proper purpose and the information sought must contribute to the achievement of that purpose, Derr admits that determination of the former's legitimacy is a matter for value judgement.

Perhaps the key problem in determining what constitutes 'necessity' is that it may be nigh impossible to provide an external adjudication when the commentator cannot be as familiar with the person's situation as the individual in question. Furthermore, moves by researchers to establish themselves as 'need determinists' can appear rather high-handed and prompt parallels with the state paternalism often associated with the Victorian age. For some writers, pronouncements on whether specific information is essential to a particular individual or merely wanted to satisfy his or her desires are inappropriate since they contend that needs should be understood from the person's perspective rather than assessed in absolute terms through detached judgement. Chen and Hernon (1982), for example, indicate that information needs arise when individuals require knowledge in order to resolve a situation 'as they see fit' (p. 5). A similar line is taken by Kari (1998), who believes an information need to embrace 'the individual's conception' of what he or she deems necessary to clarify an aspect of a situation. Nevertheless, the emphasis on resolving or understanding situations at least implies a focus on serious, rather than frivolous, matters. Such a stance is consistent with Eskola's (1998) statement that, in her own research, information was conceptualized as what was needed by students for the construction of meaning during the course of their studies and, similarly, work by the Centre for Applied Cross-cultural Research at the Victoria University of Wellington (2007), which concentrated on immigrants to New Zealand, considered 'information needs' to relate to material required by such incomers 'to acculturate' into the country's society (p. 20).

Children's information needs and wants

The openness with which some commentators accept that what constitutes an information need may be determined by the adult user contrasts with the situation that is often applied to children's information needs. In this context, researchers frequently take a highly prescriptive line. Walter (1994), for example, asserts that children,

with their limited 'experience of the world, lack the frame of reference to articulate many of their most pressing information needs. Adults must articulate those needs for them' (p. 113). Farrell (1974) takes a similar attitude, although Green (1990) questions the ethical soundness of allowing one particular group to express the needs of another. A much more moderate need determinist is Abbas (2005), who believes there are grounds for channelling children's actual information needs towards 'age-appropriate and topic-specific materials' so that youngsters can 'search with less time and less confusion than searching the entire Internet' (p. 1515). The way in which Abbas understands a need within the context of the information resources available bears some comparison with the characteristics of 'compromised need' noted by Taylor (1968), who proposes that here the end-user's question is recast on the basis of what is anticipated can be delivered.

In terms of its own research into young people, the Department of National Heritage (1995) states unequivocally that needs cover what is required to support education and self-development, whilst wants result from self-interest and 'the search for enjoyment' (p. 5). This line broadly reflects dichotomous divisions employed by Gross (2006), who breaks young people's library queries down into two categories – 'imposed' and 'self-generated'. In bringing into sharp relief their separateness, some authors have carefully juxtaposed needs and wants with reference to specific scenarios that may affect young people. Brown (2004), for example, outlines how a child who has been set a school assignment may need information to satisfy his or her obligations yet 'have no interest in the topic at all' and does 'not personally really want the information'.

Nevertheless, in her own study of youngsters in New York, Gratch (1978) draws no distinction between needs and wants, believing the expression, 'information needs', to embrace both information that is essential to the user and that which is simply desired, and several typologies of so-called 'information needs' include groups devoted to what might be construed as information wants. This is true of the 'recreational needs' identified by Minudri (1974), the 'current lifestyles' needs within Latrobe and Havener's (1997) categorizations, the 'interest-driven' information needs noted by Shenton and Dixon (2003) and several areas within Agosto and Hughes-Hassell's (2006a, 2006b) model of the everyday life information needs of urban teenagers, notably those of 'social activities', 'popular culture', 'fashion', 'creative performance', 'creative consumption' and 'current events'.

Blurring of the needs/wants distinction

In contrast to the mass of literature that either deals with information wants simply as a subdivision within

information needs or expresses unequivocal differences between the two categories, little attention has been given in information behaviour research to exploring *associations* between the two categories in terms of their emergence in children's lives. Such coverage, of course, would naturally have to assume that the two areas are indeed different and, as has been discussed, this is by no means universally agreed. Notwithstanding the lack of general acceptance on this matter, the meagre levels of discussion surrounding the relationship between the needs and wants of children are marked.

A recurrent theme in several studies undertaken by Shenton (2002, 2007b, 2008a), however, has been a fuzziness in the boundaries that exist between school situations and young people's personal interests or inclinations. In the most recent (Shenton, 2008a), instances arose in which pupils exploited for their own, private purposes during breaks in the working day software made available on school computers to support teaching and learning activities. More specifically in terms of information needs and wants, data collected at the same school in a previous project (Shenton, 2007b) revealed that, when asked about a recent situation involving the pursuit of information for personal interest, as many as 12 participants indicated particular areas of the school curriculum as the focus of their attention. The data were insufficiently detailed for in-depth scrutiny of these situations but it would appear that some of the youngsters were keen to find out more about topics they had addressed in school, even though there was no academic obligation to do so.

The clearest links between school-generated information needs and interest-related information wants emerged in Shenton's first project (Shenton, 2002), which involved the gathering of data from young people aged from 4 to 18 in six different schools in the north-east of England. As this work would appear to form the most detailed investigation of what may be termed 'school-inspired information wants', it is appropriate to consider its findings at some length. Shenton detects that many youngsters sought material in response to their enthusiasm for particular topics covered in class. Sometimes the area had been broadly addressed and several youngsters wanted to follow up certain aspects in detail. For others, the focus was more general and any information on the topic was welcomed. Most school-inspired wants were reported by first and middle schoolers (i.e. children from 4 to 13 years of age) and, amongst the youngest pupils, they usually pertained to topics that had been studied as class 'themes' over prolonged periods.

Some school-inspired wants among young children started to develop when they had become so interested in a topic that they brought to school items pertinent to it.

Gross (2006) also notes the prevalence of this behaviour. Elsewhere, the fact that a pupil had brought items to school was not because an enthusiasm for the topic had been stimulated but was merely the result of the subject of academic work coinciding with one of the youngster's existing interests. For other informants, interest in a school topic did not *begin* with their bringing materials into class. Indeed, one 10-year-old boy, who was inspired by school work on Muslims, searched for information first and then showed his teacher the materials he had assembled. His presentation of these sources effectively formed the culmination of his efforts. A girl who was a year younger described a similar process. It is not necessarily interest in the subject, however, that motivates pupils to bring in from home materials that relate to it. Gross (2006) suggests that such children may, for example, simply be attempting to please their teacher or be looking to demonstrate their comprehension of a classroom discussion.

In Shenton's (2002) study, the majority of school-inspired wants related to history. Topics included the Nativity, the Romans, 'cave men and cave men times', the Egyptians, the Victorians, the Tudors, the Trojan War, the Spanish Armada and the French Revolution. Whilst historical topics were popular among both girls and boys, many of those favoured by males involved conflict. Indeed, a 7-year-old boy attributed his enthusiasm for history to the fact that 'in old fashioned times there were lots of wars' and, within his overall interest in the Romans, one male a year older was especially fascinated by their slingshot weapon. The elder boy was not alone in expressing a particular passion for a small area of a wider historical topic. A female classmate, who was similarly interested in the Romans, wanted to know 'how people would live in Roman times and how slaves would be treated'.

Aside from areas of history, outer space and the human body were highly popular. In relation to the latter, certain topics were again of special interest, in one boy's case 'cells' and in a girl's 'how we see'. Although the Children's Literature Research Centre (1996) suggests that interest in the human body is heavily linked to the stages of biological development youngsters are experiencing, in this study the fact that all non-homework-related instances in which material on the human body was wanted were nonetheless school-inspired indicates that curiosity stimulated by work at school proved a more significant motivating factor. The remaining reported school-inspired topics that prompted information-seeking action were 'our neighbourhood', 'endangered animals', 'Muslims' and 'Hinduism'.

Where youngsters conveyed to the researcher reasons for their enthusiasm to investigate of their own volition topics that had first been brought to their attention at school, six areas of explanation emerged:

- *Novelty.* Some topics tackled at school were new to youngsters and enthused them. Two boys explained their interest in the Romans and the French Revolution

respectively in this way. The younger child explained, 'Before we started, I knew nothing about the Romans, so I was dead interested to find out more about them'.

This response in itself is somewhat inadequate since many subjects are new to pupils, yet they do not arouse the urge to learn more in each case. The boy was, however, unable to explain the basis of his interest further.

- *Relevance to self and own situation.* One 5-year-old's interest in his neighbourhood developed after a class project on the subject. This had involved the construction of a wall map which 'has got my house in it'. The fact that the topic of the human body also attracted great interest may again be partly attributed to the enthusiasm of some youngsters for subjects relating to themselves, although no informant specifically stated this.
- *Congruence with own inclinations and interests.* A male middle schooler indicated that he found stories of executions 'like where at the guillotine they slice through people's heads' especially appealing, and the fact that history dealt with past wars was considered interesting by a male first schooler.
- *Resolution of gaps.* Occasionally after a subject had been addressed at school a key issue remained unclear to a pupil, who then undertook a process of what Todd (2005) terms 'construction', aimed at 'building up a complete picture' (p. 201). A 10-year-old boy admitted how, during recent work on the Trojan War, he was unsure of the role of the wooden horse and this prompted him to explore further on his own. Whereas this child had simply failed to grasp the importance of an integral element in the conflict, some gaps in understanding arose from deliberate omissions by the teacher, who would address them in a future session. A male 6-year-old, for example, described his interest in 'The Christmas Story', which was being taught in three instalments by his teacher. Unwilling to wait until the second week, the boy wanted to know about the rest of the events after his teacher had covered part one. Elsewhere, school-inspired information wants emerged when a particular issue provoking the curiosity of a youngster had been left unresolved after the teaching programme. Although generally interested in space, one 9-year-old boy was especially keen on knowing 'How many stars are there in the galaxy?'.
- *Stimulation from school trips.* One girl aged 8 explained how she 'really got to like the Romans' when she had visited a Roman fort at Arbeia, in South Shields.
- *Form of presentation by teacher.* Several youngsters pursued topics of their own volition because they found tasks that had been presented by the teacher in class to be especially appealing. This was true of a group of 9-year-olds at one school, where they had been asked to produce work on organs of their own choice within the human body. One child recognized that her interest in the topic had developed after being given the freedom to explore aspects on her own. Her teacher considered

the girl's view to be typical, arguing that many pupils became more involved in a topic when they had been afforded a high degree of ownership in producing their work. Gross (2006) highlights the wider prevalence of teachers' employment of this strategy, considering it one of the key tools they use to involve pupils in the educative process.

The motivation of one 8-year-old boy was unique. Outside school, he sought information on a range of topics dealt with in class, not only because he found them interesting but because he wanted to impress his peers with what he knew. 'I like to know more about what I'm doing so I can . . . go into school and tell things that I've learnt about', he admitted. The boy wanted to be seen to be knowledgeable and to maintain a reputation that he believed he had already acquired: 'Some people say that I'm one of the best people in the class and it's nice when they ask me about things', he confided. Thus, the actual topics were not, in themselves, of sole importance to him. The same was true for a female 10-year-old, although her motivation was different. 'I just like finding things out', she explained. Her enthusiasm related to process, not product. In contrast, a few youngsters, especially in the early years of first school, indicated that, whilst they enjoyed certain topics at school and some even nominated 'favourite projects', they felt no inclination to know more for any reason. Other, older pupils also admitted that they never felt motivated to find out for themselves more about topics unless they were obliged to do so for their work. This discovery is consistent with an observation made by Pickard (2002) in relation to her own research. Writing about some of her teenagers, she notes, 'If the homework requested ten facts, then they identified ten facts and made no effort to investigate this any further' (p. 132).

THE RESEARCH PROJECT

Purposes and aims

This paper addresses situations in which information needs within a primary school classroom led to 7- and 8-year-old children pursuing, for their own interest, material on the topic being studied. Such action might take place either in the classroom environment or elsewhere. This phenomenon was not, however, the main focus of the study from which the data are drawn and the sample in the overall project was considerably wider. Carried out by Beautyman, the work, in its entirety, related to the much broader territory of the teaching of information skills to primary school children operating at Key Stage 2 (i.e. 7- to 11-year-olds) and the ways in which youngsters of this age implement them in their academic lives. Although the paper concentrates on the 7- to 8-year-olds, the project itself sampled youngsters from this age up to 10 years. The decision was taken to investigate children within Key Stage 2 since this phase is crucial in the lives of pupils – it is

the point where they are bridging the gap from structured learning to the more independent and open learning that is required of them when they enter the secondary phase. In this respect, it is during Key Stage 2 that the foundations of lifelong learning are laid.

Two aims for the overarching research study were defined:

- to investigate the cognitive and affective characteristics of Key Stage 2 children in the context of their information-seeking strategies;
- to develop a framework or set of guidelines for developing and promoting information-seeking strategies in Key Stage 2 children.

Wants as understood in the study

For the purposes of this paper, a school-inspired information want is considered to refer to a situation in which a pupil feels an urge to investigate, on his or her own initiative, a topic previously introduced to the youngster through academic work, either in class or as homework. A want, in this context, is believed to differ from a school-inspired need in that here the child has not been asked to pursue information as a result of a requirement from a teacher to complete an assignment. The paper deals only with those school-inspired wants that prompted information-seeking action which was revealed as a result of the researcher's study.

The school and the classes observed

The organization in which the fieldwork took place is a state-funded, community primary school, situated in the north-east of England and serving youngsters between 3 and 11 years of age. Some 430 children are on roll. This figure includes 78 nursery places. The area and indeed the families from which the school's pupil population is drawn are predominantly working class, and there is a mix of single- and two-parent families. Overwhelmingly, the children attending the school are White, Anglo-Saxon Protestant. There is only one black child and he, like his parents, was born and raised locally. English is the first or even only language of all the pupils. The school's results in Standard Assessment Tasks are slightly below the average both for the Local Education Authority and nationally but the Senior Management Team is aware of the problem and has put in place remedial strategies, such as running 'booster' classes for children in Years Five and Six.

The data used in the writing of this paper pertain to youngsters in two mixed-ability Year Three classes, whose pupils were all aged either 7 or 8 years. The first class consisted of 23 youngsters, six of whom were girls and 17 boys. There were 25 youngsters in the second class. Of these, eight were female and 17 male. For the first term of the year in which the fieldwork took place (i.e. the Autumn term), the children were observed studying the historical topic of the Tudors. In the second term (i.e. the Spring term), the focus of the sessions witnessed was switched to geography and lessons covering St Lucia were taught. In

the third and final term (i.e. the Summer term), the children studied the Aztecs. At this point, however, a student teacher who had temporarily joined the school took responsibility for the first class and the regular teacher taught the same Aztec topic to the second class.

METHODOLOGICAL APPROACH

Ethnography and data collection

The methodological approach adopted was that of interpretivist ethnography. As Pickard (2007) recognizes, interpretivists believe that there are multiple realities and that these 'cannot exist outside of the social contexts that create them. Realities vary in nature and are time and context bound' (p. 7). The decision to adopt an ethnographic method was based on two considerations. Firstly, ethnography was felt to offer the most in-depth and holistic method of meeting the study aims. The second reason was associated with the ages of the children who would be involved with the research. Clearly, the youngsters' behaviour should be observed in the most natural setting possible. Holt (1983) believes that it can be misleading to assume 'that from what we can learn about people in a very, limited unusual and often very anxious situation we can make reliable judgements about what they do in very different and more usual situations' (p. 8). Ethnography was believed to offer the best opportunity for observations on a participant level without drawing attention to there being 'another adult' in the classroom.

Hammersley and Atkinson (1995) assert that ethnography

in its most characteristic form ... involves the ethnographer participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions – in fact, collecting whatever data are available to throw light on the issues that are the focus of the research. (p. 1)

Observations of the classes participating in this research were conducted over virtually a whole academic year (specifically the period from September 2006 to July 2007), with the researcher assuming the role of a full participant in whatever activities took place in the classroom. After a time, the children stopped asking if they were 'in the book' (i.e. the researcher's field notes) and treated her as another adult in the class who could answer their questions and help them solve any problems they encountered as part of their learning experiences. The notes made by the researcher consisted of two parts: an observational record of what was seen and heard, and transcripts of conversations that she had with classroom protagonists, such as the teacher and the pupils.

In total, the researcher spent approximately 88 days observing in the school. The notes related principally to what took place in the classroom. Although, on occasions, groups of youngsters visited other places within the school

building, such as the library, in these instances the researcher remained in the classroom. She did, however, accompany the children on several class trips to local organizations, such as museums. As soon as possible after completing her day's session, she prepared word processed copies of her notes. The researcher did not change in any way the language of the participants or formalize it to render it more grammatically correct. Member checking took place as the data were being gathered. Indeed, an integral element of the fieldwork lay in verifying with the participants – teachers and pupils alike – that the researcher's interpretation of a situation was correct and that, in her portrayal, the classroom community was accurately represented.

Grounded theory and data analysis

A key aspect of interpretivist inquiry isolated by Lincoln and Guba (1985) is that of grounded theory. As Charmaz and Mitchell (2001) concede, one potential problem with an ethnographic study is that, with the researcher being so deeply immersed in the setting, he or she may see 'data everywhere and nowhere, gathering everything and nothing' (p. 161). Grounded theory was used in the study to combat this problem. Charmaz (2006) explains that 'ethnographers can make connections between events by using grounded theory to study processes' (p. 23). This was done through ongoing comparative data analysis, which took place from the very beginning of the fieldwork. Specifically, the researcher developed from her data emerging categories pertaining to identifiable concepts and explored links between the concepts involved. A journal was used to note themes, patterns of interest and issues that caused her to wonder. Where these gave rise to specific questions, she sought answers when she next returned to the field. In addition, the journal provided a repository for the researcher's reflections on how she was collecting and analysing the data, thereby helping her to remain vigilant with regard to the danger of investigator bias, which could result in distortions to the results of the inquiry.

The fact that the design of the study was emergent meant that the researcher was able to follow cues and leads from participants that related to issues which may not have been considered at the outset of the research. In large measure, the researcher's ability to pursue this line derived from the responsiveness she could exhibit through the use of her 'human-as-instrument' approach. Relying on tacit knowledge, previous experience and adaptability, she was capable of conducting ongoing analyses of situations and of grasping nuances within interpersonal exchanges that other data collecting instruments may miss.

Data were also, of course, analysed summatively, through the colour coding of the researcher's notes. Where a particular concept lay at the heart of several of the qualitative episodes, the text relating to them was united with the same colour code. This process was achieved manually; no computer software, apart from that used to prepare the word processed record of what had taken

place in the classroom and the researcher's conversations with others, was employed.

FINDINGS

The account that follows draws heavily on the notes maintained by the researcher. The real names of the participants have been replaced by pseudonyms but their language is reproduced without any grammatical corrections being made.

Evidence of school-inspired information wants

The research revealed a range of instances in which the children sought of their own volition to find out more about a topic introduced in class. In so doing, they went beyond what was expected of them to satisfy their academic obligations. In one particular situation, David talked about his enthusiasm for studying the Spanish Armada. After he had demonstrated in a class discussion a clear understanding of the topic based on books that he had brought to school, the researcher took the opportunity to discuss David's interest with him further as the children were sitting at their tables.

- Researcher: So, David, how do you know so much about the Spanish Armada?
- David: Me and Dad went to the library and . . . we found stuff on it, books and pictures. There was loads of stuff on the Internet too.
- Researcher: When did you first find out about the Spanish Armada?
- David: Well, Mrs J [he indicates the teacher] was talking about how Elizabeth had only had to fight one war and it was with Spain with ships. My Dad knows loads 'bout ships so we looked it up on the Internet.
- Researcher: Why did you look for more stuff about it at home?
- David: (shrugging) I dunno, it's just like, well, it's really cool, I wanted to find out about the ships and the sailors. The Spanish had loads more ships than us you know, but we still beat 'em.

For David, the desire to find out more information seems to have been sparked in part by his fascination for ships and war. Perhaps his interest was further fuelled by the fact that the English, although outnumbered, were ultimately triumphant. What clearly helped to shift mere interest to real information-seeking action was the presence at home of domestic support for which David had a high regard. Later in the term, the researcher was to witness David's enthusiasm for studying the Aztecs. During one lesson, the children were talking about Huitzilopochtli

and David was eager to share what he already knew. He told the other pupils that Huitzilopochtli was the god of Sun and War and that the Aztecs sacrificed more humans to him than to any other god. Although David did not appear intent on establishing himself as the class expert and attracting attention by demonstrating his knowledge to others, the subject had certainly captured his imagination and he was eager to discover more about it. If other pupils also wanted to know more, he was happy to share with them what he now knew. It is illuminating to note, however, that, when the class turned their attention to St Lucia for a geography project, David undertook as much work as was required of him to complete his assignment, but no more. Perhaps for this youngster historical topics held more appeal than geographical.

Whereas David was keen to find out in reasonably general terms about a certain historical event, other children were more specifically concerned with how a particular matter of interest affected real people. Here, the children involved wanted to develop an empathic understanding of those living in the period. Shelley and Lisa, for example, sought to find out more about Elizabethan clothing. During lesson time, they gathered together the reference books on Queen Elizabeth I from the school library, which was situated in the adjoining room, and sat together, discussing the merits of and drawbacks to wearing tight corsets and having jewels sewn into clothing. Unlike David, their want did not extend to their taking information-seeking action outside the school building. When asked why they wanted to find out more about Elizabethan clothing, Shelley confided that 'the clothes were just so pretty back then. I wanted to know more about them'. In another situation in which a problematic historical situation was discussed from a 'people' perspective, although admittedly one rather more serious than the discomfort posed by period costume, Rob and Liam wanted to know 'If you had to choose how to have your head chopped off [like Anne Boleyn] how would you choose to have it done?' Whereas David, Shelley and Lisa exploited relatively formal information providers, such as libraries and the Internet, Rob and Liam were content simply to ask for more information from the nearest adult, whom they felt might know more about the subject than they did. The boys took no further information-seeking action. Such behaviour was typical within the study.

Rob's and Liam's interest in executions may perhaps give the impression that it was mainly boys who were interested in the more savage aspects of historical topics. This was not, however, universally true, as the following exchange involving the teacher and two girls within the context of a class discussion on the Aztecs illustrates.

- Teacher: The Aztecs would capture their enemies and then offer them to their gods as human sacrifices.
- Lisa: How did they kill them?

When does an academic information need stimulate a school-inspired information want?

Betty: Did they chop their heads off?

Teacher: No. The Aztecs believed that the blood and heart were where people got their strength from and so they cut out the hearts of their victims and offered them to their gods to make the gods stronger.

Whilst Lisa and Betty's fascination with Aztec sacrifices came to light in a class discussion pertaining to the topic, one of Lewis's school-inspired information wants emerged as a particular end product was actually being constructed. Specifically, the class was building a three-dimensional model of a Tudor street. Several children had already completed their own designs for a Tudor house and had been chosen by the teacher to make the road.

Teacher: I have mixed together some glue into the paint for our road and then we can sprinkle some sand on top to make it look like a cobbled street.

Lewis: Why do you need to put sand on?

Teacher: We are trying to make it look like a cobbled street.

Lewis: What's cobbles?

Teacher: Cobbles are stones. They are put down to make a bumpy road.

Lewis: Why did they make the road bumpy and not smooth?

Teacher: Hmm... That's a good question. I think it was to help the horses to walk on it more easily. The stones fit inside their hooves and stopped them from slipping.

Lewis: Oh, cool!

This exchange took place as Lewis and the teacher worked side by side creating the Tudor street. The other children in the group listened intently to the conversation but made no effort to contribute. Initially, Lewis had wanted to know more about what he was doing with reference to adding sand to the paint but very quickly his interest widened as he sought to understand more about why the Tudors had built roads with cobbles. At the end of the exchange, he was entirely happy with the information provided to him by the teacher and did not feel motivated to investigate any further.

It was not always, however, the teacher who formed the information resource that was exploited when an information want arose in the classroom. In some situations the youngster approached the researcher. This was the case when the children were making Christmas decorations for a display for the school hall.

John: Mrs Beautyman, why do we have Christmas trees in our houses? [John is working on a Christmas tree-shaped ornament]

Researcher: I believe it was a tradition that was started by the Victorians, although I am not sure. The tree is symbolic of growth.

John: Did the Victorians put twinkly lights on their trees?

Researcher: I think they actually put candles on their trees but that is a bit dangerous nowadays so we use fairy lights.

Josh: Why did they put the candles on if it was dangerous?

Researcher: Well, if I remember correctly the candles were meant to be the stars in the sky when Jesus was born.

Whereas Lewis's information want was stimulated by the fact he had recognized when in conversation with the teacher that there was a shortfall in his knowledge which prevented him from gaining a full appreciation of the activity that he was undertaking, in John's case the practical task occupying him caused him to reflect on the significance of a convention which was familiar to him. The adult's answer then stimulated further information wants.

The information wants of Lewis, John and Josh all came to light during the course of actual activities but the format for structuring lessons employed by the teacher also made provision for wants to be articulated at the end of a session. She began each lesson by drawing the children's attention to WALT and WILF (acronyms for 'What I Am Learning Today' and 'What I am Looking For' respectively), which referred to the intended learning outcomes for that particular session. At the end, the teacher revisited WALT and WILF in order that the children might reflect on what they had just learnt. This space also offered scope for the pupils to inquire about matters that interested them and which might not have been addressed already. They could then be covered in a short whole class discussion.

After one particular lesson on the Aztecs, the children were gathered on the carpet in their customary fashion and the teacher was answering questions on areas that the children wanted to understand better. In this instance, some of the questions dealt with fairly basic motivational issues, like 'Why were the Aztecs so frightened of Hernando Cortez and his men?'. Yet others were rather more philosophical, such as 'Where did the Aztec gods go when the people stopped believing in them?'. Occasionally, questions were asked as pupils became curious as to the reasons for apparent logical flaws in material presented to them or anomalies in their understanding. After a lesson in which the children had watched a recorded programme about Tudor times, one asked, 'Why did the mum in the video say that if the meat went bad they would still have to eat it?'. Comparisons can be drawn between this question and Josh's concern about why candles would be put on Christmas trees if the practice could be considered dangerous and Lewis's

Table 1. Resources used by pupils acting upon school-inspired information wants

| Level | Location | Resources |
|-------|---------------|---|
| 4 | Beyond school | Domestic and community resources, e.g. local public library |
| 3 | Wider school | Extended school resources, e.g. those of school library |
| 2 | In classroom | Immediate resources, e.g. teacher, exploited in separate, purposeful exchange |
| 1 | In classroom | Immediate resources, e.g. teacher, exploited within existing class discussion or activity incorporating interpersonal interaction |

curiosity about why a road should be deliberately made to be bumpy. In all three cases, the child had recognized an anomaly and was prompted to seek information to resolve it.

An information-seeking typology

It is possible to arrange the strategies used by the children for seeking information to satisfy their school-inspired wants within a four-part typology, whose categories may be considered to reflect varying intensities of the want. This typology is summarized in Table 1.

A Level 4 approach was taken by David. His want was sufficiently strong for him to pursue information outside the school building and in his own time. Level 3 reflects the action of Shelley and Lisa, who were prompted to exploit facilities available in the organization, although outside the environment of the classroom, despite the fact that they were under no academic obligation to do so. As these materials were located beyond the children's immediate academic territory, they are described in Table 1 as 'extended school resources'. Rob and Liam's response, in which they resorted to the more casual strategy of consulting an adult orally, is represented in Level 2. This differs from the Level 1 approach taken by many of the other children in that Rob and Liam purposely initiated a separate conversation with an adult. Level 1 refers to situations in which the children simply took advantage of the opportunity offered by either an existing class discussion or a dialogue which formed a natural part of an ongoing activity, such as the model-making task or the display work. Despite the fact that

four variations in action can be identified, all the cases are fundamentally similar in that the original academic work gave rise to a situation where the children wanted to know more about something that interested them. In one case, the want proved so pressing that it motivated later action outside school, although, in many instances, it was dealt with in the classroom. The question of whether the youngsters asking questions in exchanges with the teacher or researcher would have taken their own information-seeking action independently, away from school, had no such opportunity been presented is fascinating, although, since the issue is entirely hypothetical, it is impossible to reach a firm conclusion.

SUMMARY: THE EMERGENCE OF SCHOOL-INSPIRED INFORMATION WANTS

School-inspired information wants clearly arise when a particular topic taught in the classroom, or a more specific matter pertaining to it, catches the interest of pupils. It would appear that this situation is most likely to emerge when:

- youngsters recognize that deficiencies in their existing knowledge state limit their enjoyment of the work at hand, although they are nonetheless able to complete satisfactorily what is required of them;
- the subject impinges on children's own personal interests or inclinations;
- pupils are prompted to empathize with people under scrutiny;
- learners feel some sort of personal association with the topic;
- distinctive features of another culture or way of life are considered so different from our own as to stimulate curiosity;
- the work involved causes children to reflect on a familiar convention whose significance is found puzzling;
- youngsters recognize an anomaly between the content of their existing knowledge base and information that is new to them.

Information-seeking action may well be taken to satisfy the want if appropriate information sources are readily available and if any necessary process support for exploiting them is forthcoming.

DISCUSSION

Since it has already been indicated that one particular previous research project (Shenton, 2002) has also considered in detail the phenomenon of young people's school-inspired information wants, it would appear pertinent to compare directly the key results of the two studies.

Dervin (1976) explains how four specific 'life situations' drive people to seek information (p. 332):

decisions – where the individual is to choose from a range of options;

problems – where the person must respond to a barrier;

worries – where a lack of predictability and control is felt;

comprehendings – where the protagonist is seeking to understand.

When the information wants revealed in the two studies are seen in terms of these constructs, all may be recognized to lie within the fourth category, although in some cases the child's immediate priority lay in simply *knowing*, rather than *understanding*. One may well speculate that, generally, school-inspired information wants are likely to be motivated by one of these two aims. In both studies, the wants varied in subject scope enormously. Some related to broad areas, whilst others pertained to highly focused questions. The latter were particularly prevalent in the more recent project, probably because the ethnographic methodology employed recorded the very precise matters emerging in classroom discussions between teachers and pupils.

Shenton and Dixon (2004) have shown how information needs may form a chain, with the information collected in response to an initial problem stimulating further needs, these giving rise to yet more, and so on. The authors found that the pattern was especially apparent among high schoolers tackling essay questions. In this context, several informants sought information in response to increasingly precise aspects as their own understanding of the topic and its issues developed. Chains of information wants were not especially obvious in Shenton's (2002) study. In the work forming the subject of this paper, however, they were much more prevalent. Often the original want was prompted by a curiosity emerging from an activity in which the child was involved and the ensuing response from an adult led to the individual identifying associated matters of interest. Again, where such wants arose from direct teacher/pupil exchanges the methodology employed proved ideally suited to reveal them.

It would seem that, for virtually all the youngsters in both this study and Shenton's (2002) work, the biggest single factor prompting them to take information-seeking action to satisfy a school-inspired want was that of their interest in the particular topic involved. Whilst one might have speculated that past success at school in locating information on the same subject, enjoyment in simply 'finding out' or the attraction of using a favourite book, such as an encyclopedia at home, which was particularly appropriate for the exploration of a certain topic, might all have formed motivators, there was little evidence in any data within either project to indicate that the role of these criteria was really significant.

Two recurrent types of school-inspired information want were especially evident in the new study. The first

embraced those situations in which the children responded with great interest to situations in which they could empathize with people of a particular period experiencing a very different way of life from their own. Such scenarios are not widely addressed in discussions of youngsters' information needs and wants, although comparisons can be drawn with categories in two existing adult-oriented frameworks. Both of these, however, relate more to the use of information than needs for it. Dervin (1983) presents 16 categories of this kind, one of which appositely encompasses the aim of Shelley, Lisa, Rob and Liam in pursuing information in their situation – that of developing a connection with others. Here, of course, the 'connection' lies with people of the past, rather than individuals personally known to the children. In addition, one of the 'information intents' defined by Todd (2005) is that of getting 'a position in a picture' (p. 201). He explains how this can involve deriving a personal conclusion from the facts available. The aim of forming an empathic understanding of what life in historical times was like from the information available may be considered to involve a particular type of 'personal conclusion'.

The second recurrent type of information want resulted from situations in which youngsters detected an inconsistency between new information presented to them and their existing grasp of a broader area. This conflict may be considered a mild form of cognitive dissonance. Richard Gross (2001) explains how, in cognitive dissonance theory, 'whenever we simultaneously hold two cognitions which are psychologically inconsistent, we experience dissonance. This is a . . . state of "psychological discomfort or tension"' (p. 361). Wilson and Walsh (1996) note that one way of reducing such dissonance is to seek information. The authors suggest that the individual will be aiming 'either to support existing knowledge, values or beliefs, or to find sufficient cause to change these factors' (p. 14). The children in the study, however, pursued information in order to understand an apparent discrepancy. Shenton (2008b) has raised a similar issue regarding cognitive dissonance in a previous project conducted with English high schoolers. In that work, a teenager admitted to experiencing unease when discovering that the information presented in two different sources appeared to diverge.

The concept of 'intrinsic' motivation, which has for decades been applied in psychology, offers considerable potential for academics to understand, against an established theoretical framework, one of the most distinctive characteristics of the school-inspired information wants upon which the youngsters in the study acted. Drawing on the work of Young (1961), Calder and Staw (1975) explain,

If a situation contains a specific goal which provides satisfaction independent of the actual activity itself, behavior is said to be extrinsically motivated. On the other hand, if the activity is valued for its own sake and appears to be self-sustained, behavior is said to be intrinsically motivated. (p. 599)

Applying the latter concept to information-seeking, Fourie and Kruger (1995) write, 'Intrinsic motivation could arise from the pleasure derived from finding out more about something that interests the individual personally' (p. 228). The children's attempts to satisfy their school-inspired information wants can be said to be intrinsically motivated in that they simply sought to know more about or better understand topics pursued in the classroom that held particular appeal for them. In contrast, when looking to achieve a school-required need, the child was motivated to meet a purpose independent of the information-finding activity, such as the completion of an academic assignment. Work for the youngsters in the study during the period of data collection took the form of outcomes as diverse as completed sheets, display presentations, pamphlets/booklets and the model of a Tudor street already discussed. No instances were noted in which the children were, in satisfying a school-inspired information want, intent on the construction of a tangible end product.

In a reading and information-seeking context, Fourie and Kruger (1995) equate extrinsic motivation with situations in which 'the individual may have an expectation of a reward to be gained from others for the effort expended in finding out the information' (p. 228). Thus, where, after satisfying a school-inspired information want, children bring to school reference materials that they have exploited for this purpose, if such an action is, as Melissa Gross (2006) suggests, prompted by a desire to gain the approval of others, then the act of showing such resources to a teacher may be considered extrinsically motivated.

IMPLICATIONS FOR PRACTICE/RECOMMENDATIONS

Implications of the study of young people's school-inspired information wants go far beyond the realms of information behaviour. Indeed, the notion of stimulating young people to find out more for themselves about particular topics first investigated in the classroom is central to education itself. The CILIP School Libraries Group (2007) suggests that schools in the 21st century should aim 'to light sparks rather than fill vessels'. Dubber (2008), writing in the same vein, asserts,

Cultivating curiosity in our young children is one of the most important things that we can do for them. Their enthusiasm for learning, for finding out about themselves and the world around them is at the heart of human development, a basic tenet of evolutionary psychology. (p. 3)

It is thus vital that youngsters feel empowered to take action to satisfy the wants that develop in them. Such 'empowerment' requires various fundamental elements to come together. Clearly, the learner must possess certain information skills, notably the ability to formulate an appropriate question to represent the want and it is here that information literacy teaching is of fundamental

importance. Where there is a shortfall in such skills, support from another individual, such as a teacher or parent, may assist the child in overcoming the problem. Information resources that help the youngster to satisfy the want must also, of course, be available.

Information-seeking action taken in response to a school-inspired information want can lead to a range of positive outcomes. In addition to increasing the child's knowledge of the subject in question, the potential exists for the individual to gain new skills associated with 'learning to learn' in settings as diverse as the home and public libraries and for them to appreciate the transferable value of those skills they have already acquired, as well as merely practise them further. Thus the child's investigative desires must be encouraged wherever they manifest themselves – in the classroom, the school library, the home or indeed anywhere else. The question of how to effect a transition from pupils working to satisfy a classroom requirement to the same youngsters feeling, and then acting upon, an urge to explore their own avenues of interest in relation to the topic is, however, a challenging one. In terms of the classroom, there is much to commend the practice of the teacher in the study providing scope both during a lesson and at its conclusion for children to articulate their curiosities about the topic under investigation within a supportive and collaborative environment. The provision of information resources is similarly crucial. Lively classroom and library displays of materials that may help children to satisfy their wants can draw youngsters to them by capturing their initial attention. Guides explaining how information on curriculum topics may be found easily can encourage independent information-seeking action by pupils. They may feature references to websites that have not been used by the teacher for classroom work and so offer an appealing novelty to youngsters. The school library should be branded as a stimulating, fun environment that can meet individual information wants as well as simply support the curriculum.

IMPLICATIONS FOR FUTURE RESEARCH

This paper has highlighted the critical role played by adults in the attempts made by the young people to satisfy their school-related information wants. Although, in many of the incidents reported, this adult took the form of a teacher, a fertile area for future investigation would be that of parental input into the information-seeking process. This was not an area that formed a particular focus for the study reported here but domestic support may well be a very significant factor in the extent to which school-inspired information wants are met and how such satisfaction is achieved. More focused future research could explore specifically how children with home Internet access employ this resource with parental assistance in order to act upon school-inspired information wants. Where such a project aims to collect data from children themselves, however,

it would be difficult to use the heavily observation-based method employed here to explore the relevant domestic situations. Whilst techniques such as interviews, which allow youngsters to recount recent events taking place outside school, might in this sense seem more appropriate, as Mauthner (1997) warns, interviews are unsuitable for very young children. An alternative could involve focus groups. These would afford more scope for peer support, although weaknesses that result from dominating personalities and irrational group conformity pressures are just as likely to emerge in groups involving children as those involving adults.

CONCLUSIONS

Very little has been written about how academic information needs may give rise to school-inspired information wants. It is this gap in the literature that led to the writing of the paper. The approach employed in the study reported – interpretivist ethnography – has proved a useful tool for uncovering evidence of such needs and wants in a primary school classroom in England. It has also revealed a range of ways in which the participating young children sought to satisfy wants of this kind, both within and beyond the classroom. The identification of specific conditions that must be in place for an academic information need to become a school-inspired information want is by no means straightforward but the data collected and analysed have enabled the authors to isolate a series of factors that would appear crucial for this transformation. Not only has the work contributed to the enhancement of a hitherto meagre knowledge base in this area; its findings also have important practical implications for teachers who are keen that their charges pursue their own lines of interest emerging from school projects. Future work exploring the role of influences that have largely gone unaddressed in this paper, such as the contribution of parents to the information-seeking process, may have a significant part to play in extending our understanding of how young people look to deal with information wants inspired by academic work, particularly in terms of their actions outside the school environment.

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Government information: then & now

Interview: CILIP President Peter Griffiths

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Getting our message across to other disciplines

Lessons learnt through some LIS projects could inform practice in other disciplines, but researchers can come across difficulties when trying to reach these practitioners via the appropriate professional magazines. **Andrew Shenton** and **Wendy Beautyman** provide some tips.



JUST AS IT is possible to use literature from other fields to further our understanding of information science, what is learnt through LIS projects can be relevant in related areas. The links between information behaviour, in particular, and disciplines beyond LIS are now well appreciated. In a British Library Research and Innovation Report, Wilson and Walsh draw on concepts from a range of subjects to explore information behaviour,¹ and papers relating in some way to information behaviour or its investigation have appeared in journals whose principal territory is as diverse as anthropology, communication, health, management, politics, psychology and sociology.²

For instance, research into the information-seeking behaviour of children in primary schools may well have implications for the teaching of information literacy and the organisation of primary school libraries. Yet, at primary level, both are rarely the responsibility of a dedicated information professional. Finch, one of the few librarians employed in a school of this type, writes: 'The library is more often than not being run by teachers or teaching assistants aided by keen parents' (p. 38).³ As teachers are unlikely to be found with copies of information science magazines, it is important that researcher/writers target what they do read.

How do you identify a suitable periodical? If it's a practical article, scholarly journals can be ruled out, as they are seldom read by practitioners. When we began writing about the importance of primary schools having policies for teaching information skills, we found that many education magazines, especially those published by one of the market leaders, Scholastic, deal with pupils in very specific age groups and so articles on whole school issues

are frequently unsuitable. It may be difficult to find a natural 'home' in education circles for any piece devoted to information literacy, which neither forms a National Curriculum subject in itself nor fits neatly into another.

Another problem for researchers is that some magazines have regular writers, forming something of a 'closed shop'; the professional press tends not to evaluate submissions through a 'blind' reviewing procedure.

Researchers should use their contacts, such as specialist librarians and practitioners in the relevant field or the appropriate professional association: their advice on which publications to approach will save much time.

A crucial topic to a researcher/writer in LIS can appear much less important to editors of magazines in another field, even if the author sees clear implications for its practitioners. For example, such an editor will know that the management of the library in a primary school is liable to fall within the remit of a teacher who is concerned with an area as wide as 'resources', as well as teaching several subjects to their own class. Similarly, the teaching of information skills might be seen as a minor element within the 'language' or 'literacy' umbrella. In these circumstances, writers may face an uphill task to convince an editor that their work on such a specific topic is worth publishing.

Writing for other magazines: top tips

- Target the magazine with care, considering its major focus, style, treatment and readership.
- If writing about a topical issue, act quickly to ensure that, as far as possible, the matter is still current when the article is published.



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6 See 4.

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Wendy Beautyman is a doctoral student at Northumbria University. She is researching how children of primary school age find information to satisfy their academic obligations.

66

Give particular emphasis to concrete suggestions of how your work can lead to improved practice in the reader's area.



'What some LIS practitioners see as basic terms can cause confusion and alienate readers who do not recognise them...'

- Identify trends and initiatives within the field associated with the magazine and to which practitioners know they are expected to respond. Show that you're aware of at least some of them by highlighting them explicitly and demonstrating your topic's relevance. In the piece mentioned earlier dealing with information literacy policies in primary schools, for example, specific reference was made to the Every Child Matters agenda, concerns expressed by Ofsted, the requirements of the National Curriculum, the movement towards self-evaluation in schools and the Assessment for Learning initiative.
- Get to know the specialist vocabulary used in the field and use it in your article. By doing this, you form an immediate link with the audience. The information literacy piece was liberally sprinkled with references to 'differentiation', 'continuity and progression', 'learning outcomes' and 'Inset'.
- Be wary of using our own professional jargon, however non-specialist it may appear. If you do use it explain it carefully. What some LIS practitioners see as basic terms can cause confusion and alienate readers who do not recognise them. Even 'information literacy' is not used by Ofsted in any of the 44 school inspection reports that one of us analysed,⁴ and the term is not explicitly used in the National Curriculum.⁵ Moreover, when we approached the Department for Children, Schools and Families with a request for information on national policies or frameworks dealing with information literacy, they believed the query referred to 'information about literacy'.
- Give particular emphasis to concrete suggestions of how your work can lead to improved practice in the

reader's area, while still providing enough detail about how the research was carried out, where it took place and whom it involved. This way, it is more likely that the recommendations will be seen in context. After having a detailed and scholarly 9,000-word paper on the subject of Ofsted and libraries in first and primary schools published in the *Journal of Librarianship and Information Science*,⁶ Andrew prepared a reduced version (1,000 words) for *Child Education Plus*, a magazine catering for teachers of four- to seven-year-olds.⁷ The shorter article was based mainly on nine 'library recommendations' that had been evolved from the study. However, writing short pieces intended for unfamiliar readerships is not without dangers. You might simplify your work to such an extent that you misrepresent your findings or fail to place them in a proper context. If the piece is then amended, prior to publication, by the magazine editor who lacks your understanding of the library and information field, the problem is compounded.

- Remember that impact is crucial – the LIS issue that you raise may form only a small part of the wider work of readers, so capturing their attention immediately is important.

By limiting the dissemination of our ideas to academics and professionals in our own discipline, we may often be doing no more than 'preaching to the converted', since one of the foremost messages in our work frequently involves the raising of the profile of LIS, perhaps in terms of promoting a particular aspect. Taking our findings beyond LIS boundaries can bring to the attention of those in other fields new and exciting ideas, significant to their own working practices. [U]

Information literacy - what is it?

“Information Literacy” may not be a phrase that is commonly heard in the primary school staffroom but it is central to education today. Andrew K. Shenton and Wendy Beautyman explain what it is and why we should be building it into our curriculum.

The “Information Age”

The mass of available information is one of the key characteristics of life in the modern Western world. In no previous era has so much information been available in so many different forms and from so many diverse originators. Although some of it is presented to us unsolicited, much of it we actively seek in relation to activities we undertake in our capacities as, for example, learners, hobbyists, consumers, parents, carers, employees, managers and citizens. Whilst many of these roles do not pertain to children, it is, perhaps, young people who feel the greatest impact from the proliferation of information. Much of the information with which children came into contact at school in the past was either provided by the teacher personally or accessed via the school library. In both cases, the quality and quantity of the information was controlled. Since a lot more material is now available, much of it from the World Wide Web and of dubious accuracy and trustworthiness, skills that help learners deal with information have never been so fundamental.

Teaching Information Literacy

No single, universally-accepted definition of information literacy exists. Nevertheless, the term is widely applied by information specialists, such as librarians and informatics academics, to that body of knowledge, skills and understanding required by an individual to find information effectively and use it appropriately. It must be stressed that “information literacy” is not the same as “computer literacy”. Rather, it provides a set of strategies for coping with the complexities of modern life by employing information to solve problems and address emerging issues.



The phrase, "information literacy", is not the product of the current Internet age. In fact, it substantially predates the widespread use of the World Wide Web. However, modern developments involving telecommunications and computers, with their attendant effect on the volume of information, have added to the need for it. It is generally believed that the expression dates back to the mid 1970s, when Zurkowski (1974) highlighted the importance of information-related skills that would enable people to meet the demands of a society and its developing technologies.

In the 1970s, many of the skills that teachers and librarians aimed to foster in children were developed with the use of individual information sources, or with elements of what we would now regard as traditional library "user education", such as familiarisation with the classification scheme and how the catalogue should be exploited. Over time, however, attitudes have changed markedly and, today, the teaching of information literacy typically focuses on promoting a more transferable, problem-solving mindset that goes far beyond the exploitation of sources and organisations such as libraries.

A turning point came with the work of Marland (1981), who, in his seminal *Information Skills Curriculum*, proposed that youngsters should consider a series of nested questions when undertaking tasks associated with finding and using information. Marland's work may be considered an early model for the teaching and learning of information skills and, in more recent years, many other approaches have appeared. Whilst the emphases of the individual models vary, typically they stress the need for learners to receive training in

- recognising a need for information, based on a situation that has arisen in the person's life;
- forming a question to represent the need;
- determining a course of action involving the pursuit of information in order to answer the question;
- collecting the material required;
- assessing it with a view to determining its trustworthiness and relevance;
- putting the information to use in such a way as to meet the need effectively and ethically.

The Importance of Information Literacy

It is a measure of how crucial the effective location and use of information have become that specialists in the field now unhesitatingly refer to this area as a "literacy". Yet, the words, "information literacy", are not widely used in many circles beyond information science. In the field of education, they are not to be found in the National Curriculum (Smith & Hepworth, 2005), and one of this article's authors discovered that the phrase was not employed in any of the forty-four OFSTED reports relating to first and primary schools that he scrutinised when undertaking research to investigate inspectors' attitudes to school libraries (Shenton, 2007).

The unfamiliarity of the phrase outside the domain of information science should not, however, be considered to reflect a lack of importance in terms of the area to which it relates. *Harrod's Librarians' Glossary and Reference Book* (2005) goes as far as to argue that information literacy can be seen as "a basic human right; an essential component in the acquisition of life-long learning" (p. 351). Although many of their needs for information are met by adults such as parents and teachers, even young children must possess a measure of information literacy. They will need it to be able to take any form of independent action to satisfy their personal interests and curiosities concerning the world, address problems and situations that arise in their lives and take the first steps in their careers.

Encouraging the acquisition of skills that prevent the emergence of a "copy and paste" mentality can help youngsters avoid falling into habits associated with plagiarism which, in recent times, have led to the downfall of distinguished scholars, as well as school pupils and university students. On occasions plagiarism may be symptomatic of a desire to find a "quick fix" but it may be an indication, too, of an inability to draw on the work of others in accordance with academic convention, thus reflecting poorly developed information skills (Shenton & Jackson, in press).

The teaching of information literacy also affords a practical context for the learning of advanced generic skills, such as the ability to:

- compare critically, here in terms of two or more information sources;
- evaluate, in this case information materials for their soundness and appropriateness to the need;
- solve problems, such as those encountered when looking for information, by formulating flexible plans that enable alternatives to be explored or creative courses of action devised at the point of need;
- summarise accurately, in this sense with respect to information found in sources;
- synthesise material, here from the information collected.

Several of these skills lie within the higher classes of Bloom's Taxonomy of Educational Objectives (Bloom et al, 1956).

Information literacy is often quite rightly believed to be a prerequisite for academic achievement but it is by no means confined to scholarly activity. Its role in enabling individuals to pursue their leisure interests has already been noted, and, in addition, information literacy has long been recognised as critical to such diverse aims as

- self-development among employees in the workplace;
- gaining the level of knowledge necessary to make an informed contribution to participative democracy;
- making wise decisions as a consumer;
- understanding current issues, such as global warming, the terrorist threat and innovations in science/technology, and how they may affect the individual.

Fostering Information Literacy in the Young Child

The teaching of information literacy may begin with children as young as six and seven, at the point when they are starting to use limited ranges of information materials made available by the teacher. Initially, these may take the form of information sheets, small groups of basic non-fiction books or a few electronic sources accessed through an intranet. From here the emphasis gradually shifts to situations in which pupils must make their own decisions involving the exploitation of materials drawn from a wider collection of resources. At this point the information may be less relevant, useful or trustworthy, the need for learners to exercise increasingly sophisticated information skills becomes correspondingly greater.

Sadly, information literacy struggles to achieve the prominence it deserves in the primary school. One of the principal barriers is the fact that it is seldom promoted by an in-house "champion". Few schools in this phase employ specialist librarians and skills associated with the location and use of information are often considered to fall within the curriculum area, "language" - a subject in which priorities frequently lie in the fundamentals of speaking and listening, reading, writing, spelling and grammar, rather than information skills. Whilst the importance of emphasising information literacy, from a policy dimension to practice in the classroom, cannot be exaggerated, in many schools the tone is set by the fact that paperwork for information literacy is absent or inadequate. Guidance on producing an information literacy policy is included in the manager's briefcase.

In a nutshell

Information literacy is a very important skill. It is the means by which we access, sort and process the mass of information around us. With the increasing availability of solicited and unsolicited information it is particularly important that we equip our children with the skills to be able to evaluate, summarise and synthesise information whilst discerning the validity of their sources. Without these skills, they are more likely to find themselves cutting and pasting their research - a habit which can lead to plagiarism in later life.

There remains a lack of recognition within education of the importance of information literacy and as such schools need to take the responsibility of ensuring that its profile is raised through discussing how it is taught and what school policy is.

Editors Comment

As pointed out in this article, the need for information literacy is not new. We talk about it more because of the concerns around accessing information via the internet. However, the importance of children and adults being able to sort through the garbage that so many newspapers produce should be a fundamental core principle of our curriculum! Children and many adults have a tendency to believe what is in print but sources of information can be dubious whichever media form they may be communicated through.

Profile

Andrew K. Shenton is an ex-primary practitioner and former lecturer in Northumbria University's School of Computing, Engineering and Information Sciences. He gained a doctorate in 2002 after a wide-ranging investigation into how young people find information. He has now had over sixty papers published in Italy, the USA and his native Britain. They have been widely cited in books, periodical articles, conference papers, reports, dissertations and student seminar presentations, as well as forming recommended reading for modules of university courses that have included PhD programmes. Andrew currently divides his time between writing, mentoring higher degree students and working with youngsters in the resources centre of a high school in northern England.

Wendy Beautyman is a PhD student in the School of Computing, Engineering and Information Sciences, Northumbria University. With fieldwork conducted in the north-east of England, her doctoral research is devoted to how primary school children find and use information. Wendy's interest in young people and information is longstanding. In the course of gaining a first-class BSc degree in Information and Communications Management, again from Northumbria University, she undertook a final year Honours project entitled, *How Do Children Find Information Using the Internet?*

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Manager's Briefcase 4

Information Literacy Policy

In this issue of Primary Leadership Today we have heard about 'Information Literacy' and how important it is in helping to develop the critical readers and articulate learners of the 21st century. In this briefcase a sample policy is provided using a fictional context. It has been devised using the guidance provided by Dr. Andrew K. Shenton and Wendy Beautyman in the article 'Too Much Information' (Managing Schools Today Issue 17.6.)

See website for remaining parts of this article: www.teachingtimes.co.uk

Information Literacy Policy

Rationale

This school believes that information literacy is the ability of our pupils to be able to determine the questions, identify the sources, extract the information, evaluate and appropriately apply what they find. We believe these to be essential skills for 21st century living, recognising the amount of information that is available to young people and the challenge that this can provide.

It is essential that our pupils are encouraged to be independent learners if they are to achieve the Every Child Matters outcomes. Being information literate can help children be healthy, stay safe, enjoy and achieve, make a positive contribution and achieve economic well-being.

Our aims

We aim to enable our pupils to become life long learners:

- who know how to access the information they need when they need it
- who enjoy learning and who can use these skills for pleasure and problem-solving throughout their lives

We intend to do this through helping our pupils:

- discern what it is they need to know - formulating relevant questions
- identify the source from which they might extract the information
- check the reliability and validity of the source
- extract the information necessary to answer their questions
- consider the need to consult other sources
- apply the information found in order to be able to use it for their own purposes

This includes using the internet, fiction and non-fiction library, and other sources available including oral accounts, leaflets and programmes, brochures, flyers and archived material.

Teaching and learning

The units of work we cover during our afternoon sessions are structured in such a way that each one includes opportunity for research. The research activities provide the framework within which information literacy should be delivered. Each unit of work identifies a particular skill focus for teaching. This should then be applied and assessed during the research activity itself.

The skills to be taught are identified by year in the 'information literacy' long-term programme. Year groups should ensure that over the period of the year all the assigned skills are taught discretely and that children are then encouraged to apply them in their research activities.

Inspiring independent learning

Dr Andrew K. Shenton, a former primary schoolteacher, and Wendy Beautyman, of Northumbria University, report on research into what it is that sparks children's curiosity and how that curiosity can be nurtured to improve children's information literacy.

The recent DVD, *Designed for Learning: School Libraries*, produced by the Chartered Institute of Library and Information Professionals, highlights a key role of schools today, namely that they should aim "to light sparks rather than fill vessels". Developing curiosity in our young children is one of the most important things that we can do for them. But how best can such sparks be lit? How is pupil curiosity fostered?

These issues have formed important foci in two major research projects. The overall scope of each was the ways in which young people find information in response to particular situations that arise in their lives. Andrew's study involved the collection of data via focus groups and individual interviews from some 188 pupils, drawn from six different schools, whilst Wendy immersed herself in life within a primary school classroom for virtually the whole of the 2006/07 academic year, investigating, through observation and conversations with teachers and pupils, what was taking place within this environment. All the schools in which fieldwork was staged were located in the north-east of England and both research projects were conducted under the auspices of Northumbria University in Newcastle upon Tyne. This article concentrates on findings that emerged in relation to the youngest children, i.e. up to and including eight years of age.

The two studies were conceived entirely independently, yet both researchers were intrigued by the same issue – at what point does work in the classroom stimulate young children to form their own questions arising from personal interest and take action in pursuit of appropriate information? Research showed that such a transformation was most likely to take place when:

- youngsters recognise that gaps in their knowledge limit their enjoyment of or satisfaction with the work at hand, even though they are able to complete the required activity. It may be, for example, that pupils are involved in a

practical task and cannot fully appreciate the reasons for particular elements of it without learning more about the topic that forms the context;

- the subject impinges on children's own personal interests or inclinations. Several boys, for example, proved most enthusiastic when learning about topics of a military nature, and instances came to light in which girls were keen to know more about Elizabethan clothing;
- pupils are prompted to empathise with people under scrutiny. This was often the case when the topics were historical and the youngsters gained insights into how people of the time lived;
- learners feel some sort of personal association with the topic, perhaps in terms of sharing a nationality with the protagonists or being familiar with a particular place. Sometimes links were fostered by visits to nearby sites or organisations relating to the topic being studied. Biological matters that the children could relate to their own bodies also aroused substantial interest;
- distinctive features of another culture or way of life are considered so different from our own as to stimulate curiosity. These included Tudor executions and Aztec sacrifices;
- the work involved causes children to reflect on a familiar convention whose significance is found puzzling, such as the use of Christmas trees in houses during Advent and their decoration with lights;
- youngsters detect an anomaly between the content of their existing knowledge base and information that is new to them. Questions of this type included why the Tudors made their roads uneven by using cobbles when roads are usually intended to be smooth, and why in Elizabethan times food was often eaten even though it might be starting to decompose.

Two distinct implications emerge for the teacher. Firstly, it is important to stimulate the development of "urges to know" by

using strategies that lead to the conditions established above. Secondly, the teacher should seek to capitalise on the child's interest in class work and aim to convert it into actual information-finding action. This may be achieved through the following measures.

Look to develop in children the vital, and often underrated, skill of formulating questions that accurately reflect what they want to know.

Provide scope both during a lesson and at its conclusion for learners to articulate their curiosities about the topic under investigation within a supportive and collaborative environment.

Begin to develop in pupils from around seven years of age upwards the kinds of information skills needed for the exploitation of elementary non-fiction books and electronic resources.

Create lively classroom and library displays of materials that may help children to satisfy their school-inspired interests.

Construct pictorial guides demonstrating how information on curriculum topics may be found easily so as to encourage independent information-finding action by pupils.

Promote the school library as a stimulating, fun environment that can offer the kinds of information necessary to satisfy the youngsters' curiosities.

Ensure that parents are made aware of the topics being addressed in the classroom and, where they are keen to support their children's education, freely offer advice on how they can work in concert with the school to satisfy related interests that emerge.

The questions of why certain topics studied in the classroom fire youngsters with sufficient enthusiasm to motivate them to look for further information themselves and how such action can best be encouraged are challenging ones. Nevertheless, the authors' research would suggest that when the circumstances discussed in this article pertain, such proactive behaviour on the children's part is very often forthcoming.

Too much information?

Primary schools with policies on information literacy can give their pupils a head start in filtering and using data to their advantage – and impress Ofsted too.

Andrew K Shenton and Wendy Beautyman explain

'Information literacy' is not an expression that is likely to be familiar to all primary school teachers. Nevertheless, while precise definitions vary, it is widely employed in the field of information science to refer to that body of knowledge, skills and understanding essential for the effective location, assessment and use of information, in all its forms, necessary to meet the wide range of needs that arise in people's lives.

A 2006 Ofsted report highlighted a range of weaknesses that inspectors had identified when observing the teaching of information literacy in schools.¹ A major concern was the frequent lack of whole-school policies on this matter. The inspectors also noted a recurrent absence of coherent information literacy programmes, no overall rationale behind individual information skills lessons, and repetition in the content of the activities – all of which can be attributed to either the lack of such a policy or its inadequate implementation.

Ofsted's findings are especially disappointing in view of the fact that, for many years, curriculum co-ordinators in primary schools have developed policies for the individual subjects of the National Curriculum, as well as for high-profile 'issues' such as bullying, equal opportunities and health & safety. Despite the importance of information skills in terms of both lifelong learning generally and, more immediately, helping to ensure academic success at secondary level in an era when assessed coursework is given great emphasis, it would certainly seem that, from a paperwork perspective, information literacy has suffered relative neglect in primary schools.

A significant problem is that, in many primary schools, information skills are the responsibility of a teacher more broadly concerned with 'language' or 'literacy'. Elsewhere, they may be considered to fall within the remit of someone who is in charge of not only the school library but territory as wide as 'resources'. In such a situation, information literacy may hardly seem significant enough to be allocated a whole policy to itself.

There are, nonetheless, several sound reasons why schools should put in place a policy devoted to information literacy.

- The existence of such a document is in itself a recognition of the critical importance that information skills play in the life of the 21st-century pupil – and tacitly indicates that they enjoy a high profile in the school.
- Where the school's work in this area is covered by a policy and its content is supported by what is observed in actual lessons, the school is more likely to receive proper credit from Ofsted inspectors for its good practice.

Having a policy on information literacy recognises the critical importance of information skills in the life of the 21st-century pupil

- Such a statement of the school's stance can provide ideal orientating material for new staff and student teachers.
- A whole-school policy aids planning, guides teaching and makes it easier for individual members of staff to understand the overall context of their work in this area, helping to ensure continuity and progression in the children's learning experiences.
- The processes of gathering together material for the policy and reflecting on what is done by the school can highlight gaps and deficiencies in the organisation's work

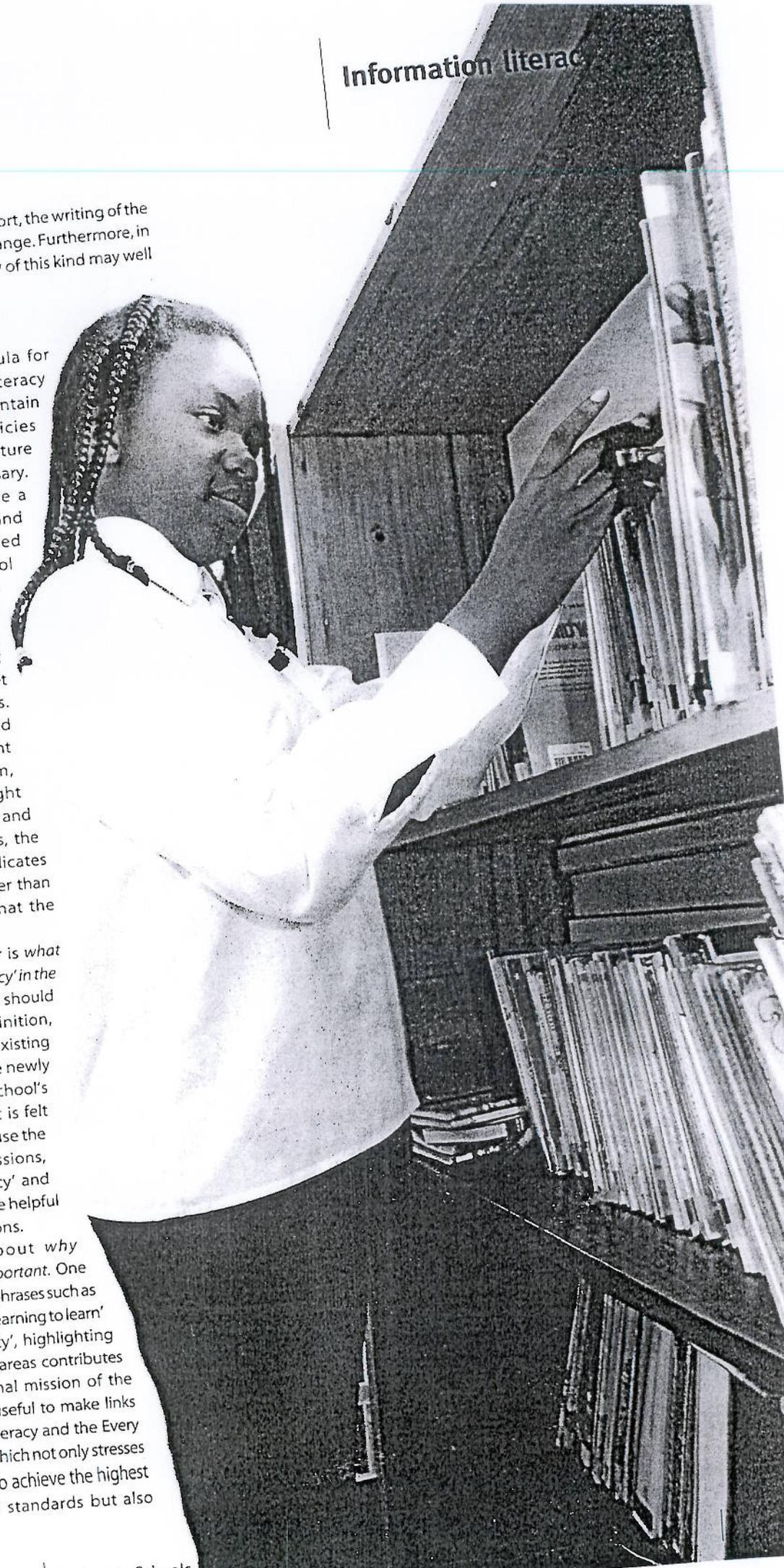
which can then be addressed. In short, the writing of the policy can provide a catalyst for change. Furthermore, in the age of self-evaluation, a review of this kind may well impress inspectors.

Designing the policy

There is no hard and fast formula for the design of an information literacy policy. Some schools like to maintain a consistency across their policies by adhering to a common structure and deviating only where necessary. Any teachers looking to create a policy from scratch, however, and who are not hindered by a need for uniformity with other school documents, should consider addressing the issues raised below. It is impossible here to provide a model policy that schools can simply edit to meet their particular circumstances. Any attempt to do so would result in a very bland document which, even in outline form, would give insufficient weight to the specific characteristics and priorities of the school. Thus, the breakdown that follows indicates issues to be considered rather than directly providing words that the policy writer should copy.

The first issue to consider is *what constitutes 'information literacy' in the school's eyes*. The document should begin with a working definition, which may be taken from existing source material or could be newly formulated to reflect the school's stance more precisely. If it is felt that staff are likely to confuse the term with related expressions, such as 'computer literacy' and 'study skills', then it may be helpful to draw explicit distinctions.

Secondly, think about *why information literacy is important*. One way to begin is with buzz phrases such as 'independent research', 'learning to learn' and 'the learning society', highlighting how attention to these areas contributes to the wider educational mission of the school. It may also be useful to make links between information literacy and the Every Child Matters agenda, which not only stresses the need for all pupils to achieve the highest possible educational standards but also



Information literacy

emphasises the importance of primary schools offering study support within a programme of 'extended services'.²

A further area to look at is the *aims and objectives of information literacy teaching in the school*. These will naturally reflect the priorities of the school and the situation within it, especially with regard to resources. The aims may concentrate on laying the foundations of lifelong learning by inculcating the skills necessary to find information for school work, leisure and other situations arising in the child's life. Objectives may be more specific, such as identifying information needs, using information sources, evaluating the material found within them, and effectively and ethically using that information identified as valuable and pertinent to the need.

Fourthly, consider the *means of teaching information literacy*. Even if the preferred teaching method involves introducing the skills in standalone lessons, pupils should be given practice in employing them in different contexts, particularly in 'theme' sessions. So it is essential that the policy indicates how deeply information skills are embedded in the schemes of work featuring the different National Curriculum subjects. If the school favours the use of a certain model for information skills instruction, this must also be stated. It needs to be made evident, too, that plans for lessons involving information skills are expected to have well-defined aims, objectives and learning outcomes. In addition, the policy should outline the school's provision for differentiated work. Ideally, there will be a range of differentiation strategies, such as differentiation by task, by outcome and by the level of support from teachers.

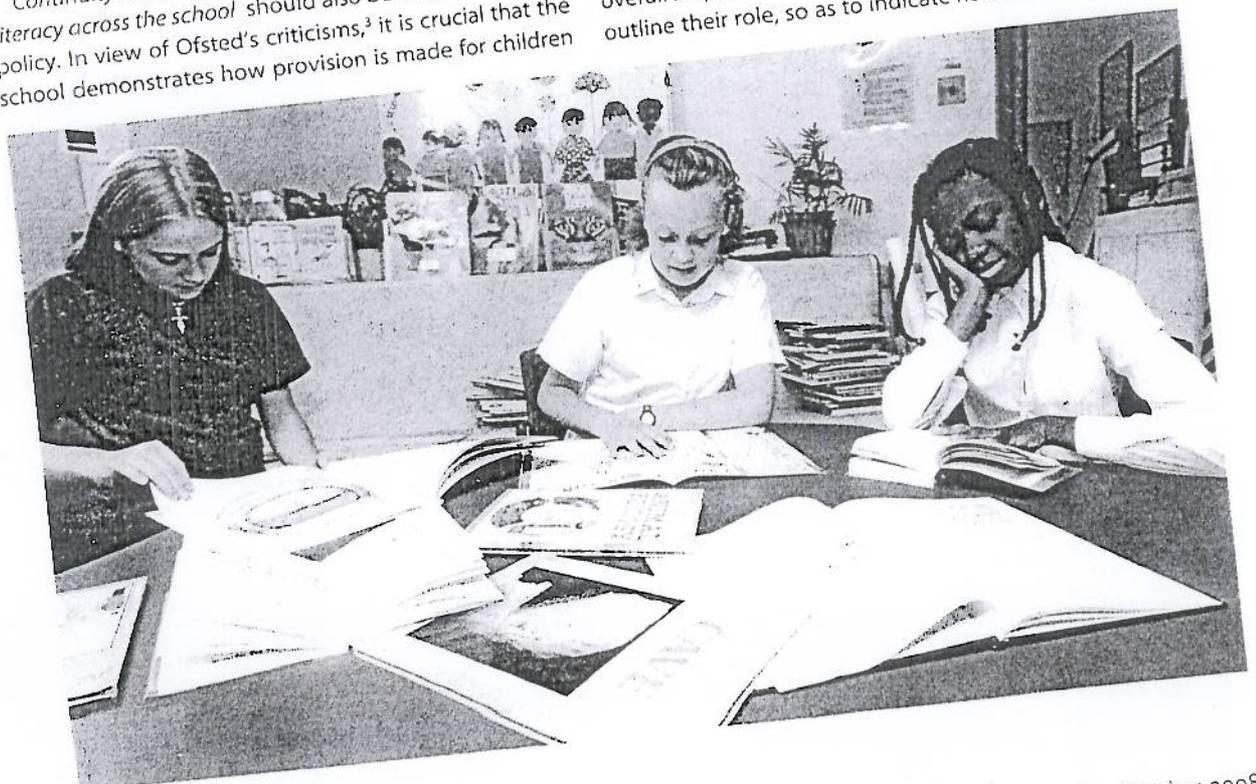
Continuity and progression in the teaching of information literacy across the school should also be addressed by the policy. In view of Ofsted's criticisms,³ it is crucial that the school demonstrates how provision is made for children

to develop their information skills systematically, without needless repetition or major jumps in level from task to task. One planning response is to include in the policy a series of charts showing the skills divided into categories. The way in which difficulty builds may be shown in a left-to-right sequence that runs from Reception to Year 6. Continuity and progression are often achieved most effectively, at least at a planning level, if this integrated programme is created using a whole-school approach.

Next, take into account *assessment of information literacy*. The fundamental question here is how such assessment is carried out and recorded. Where a diversity of formative and summative strategies is employed, this should be made explicit. The policy should also cover whether the sheets for recording assessments are devoted exclusively to information skills or whether this is merely one area within a proforma devoted to a wider discipline, such as language. A longitudinal picture of each child's progress may be best gained by using sheets that allow comments to be added as the youngster moves through the school, from year to year. Clearly, any statement with regard to assessment that is made in the policy should also reflect more generic good practice in assessment, such as that presented by the ten principles associated with the assessment for learning initiative.⁴

The policy should emphasise *the role of the library and other major resources in the school*, such as computer laboratories, in developing information literacy. The policy needs to show that the library is truly embedded in the information skills teaching programme and convey how instructional sessions that take place there go well beyond mere library induction and 'user education'.

Finally, the policy needs to cover *key staff and supporting organisations*. It should identify a member of staff with overall responsibility for information literacy and carefully outline their role, so as to indicate how the whole school



benefits from their expertise. Is that person involved in the teaching of information skills to other year groups, for example, in addition to their own? The line of demarcation between the work of the co-ordinator and individual class teachers must also be defined. It may be that the co-ordinator stipulates the skills to be fostered and suggests exemplar activities for particular year groups and class teachers determine the context. When the co-ordinator attends courses, runs Inset events for other school staff, or exchanges ideas for good practice with neighbouring schools, this, too, should be emphasised. If use is made of visiting information specialists, such as staff from the local public library or the schools' library service, their contribution needs to be noted. Similarly, does the teaching of information literacy incorporate class visits to other organisations, such as public libraries?

It is worth pointing out, as a footnote, that the policy must, of course, be kept up to date, recording key changes in the school's circumstances, such as the departure of a teacher with a pivotal role in teaching information literacy, modifications in the way academic work is planned or major alterations to the library.

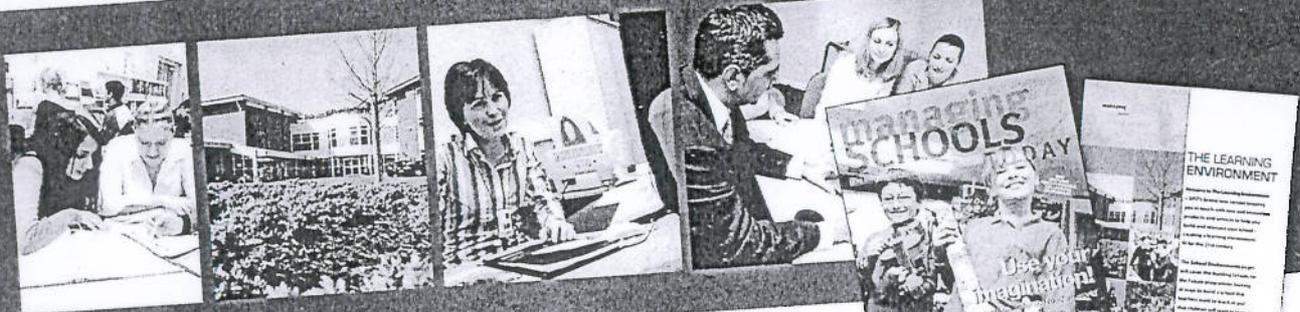
Although the writing of a school policy on information literacy may seem like yet more burdensome bureaucracy involving unnecessary effort for something that does not even command the status of a full National Curriculum subject, it is nonetheless worthwhile. The act of writing the

policy can itself be invaluable in revealing weaknesses in the school's practices, alerting management to the need for corrective measures. And by formally recording details of the organisation's work, it is more likely that the school will receive due recognition of its good practice – as long as the policy is fulfilled in the classroom. Most importantly, the document acknowledges the crucial role that information skills play in the lives of people today.

Dr Andrew K Shenton is a former primary school teacher who holds a PhD in how children and young people find information. He has had 60 articles and research papers published on the subject. Wendy Beautyman is a doctoral student at Northumbria University. She is researching how children of primary school age find information to satisfy their academic obligations.

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2. Department for Education and Skills (2004), *Every Child Matters: Change for Children in Schools*
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4. Qualifications and Curriculum Authority (undated), *The 10 Principles: Assessment for Learning*



In the next issue of Managing Schools Today...

Finance & fundraising: In his second article this academic year, Malcolm Trobe examines how financial planning can be linked with strategic and longer term planning.

School environments: Biometrics in schools – We look at the many ways in which biometrics is now being used in schools, from cashless catering and vending, to school libraries and access control.

Parental engagement: Reaching the Hard to Reach Parent - In his second article David Joslin looks at how to reach the hard to reach parent.

Enterprise education: *Managing Schools Today* focuses in on the 2008 Young Enterprise UK Innovation Awards and the winning student companies as well as the findings of the Young Enterprise Alumni research.