This study focuses on the use of the NSW DET information literacy model in a primary school as the basis for the possible establishment of a culture of transfer of information literacy skills. The study used constructivist grounded analysis to interpret data gathered from teachers and principals. Data was collected from teacher diaries and interviews with teachers and the incoming and outgoing school principals. Results showed that the NSW model was successfully implemented by teachers and that most students used part of the model well, with less able students needing extensive scaffolding. Teachers found some evidence of transfer of information literacy skills, particularly amongst more able students. Teachers and principals identified factors which might lead to a culture of transfer. The factors included using a common terminology across the school, formal discussion of transfer, and leadership by the principal and teacher librarian.
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Title: Information Literacy and Transfer in Schools: Implications for Teacher Librarians
Abstract

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Introduction

This study took place in an independent primary school in Sydney. The school has 320 female students, 14 classes and a significant cohort of specialist lessons in art, French, library, sport, music and drama. The school library staffing consists of one teacher librarian and one part time clerical assistant. The curriculum adheres to the New South Wales, Australia Board of Studies outcomes and indicators (NSW DET 2010). These align to school years and divide into Key Learning Areas that broadly determine content.

The key research questions put forward by the authors in this paper were:
• How did teachers define information literacy and transfer?

• What was the teachers’ experience of using the NSW information literacy skills model with their students?

• What evidence did teachers find of the transfer of information literacy skills amongst their students?

• What factors may be identified that contribute to establishing a school wide culture of transfer of information literacy skills across time and subjects?

• What impact might the school executive have on establishing a culture of transfer of information literacy skills?

**Literature Review**

**Information literacy in schools**

There is now an extensive literature on information literacy in schools, although there is no agreed definition of the Term. Doyle (1994), Langford (1998), Abilock (2004) and Herring and Tarter (2007) provide a range of definitions which explore information literacy in terms of skills, processes and as an approach to learning. Reference to the transfer of information literacy skills is only provided in the definition by Herring and Tarter (2007).

The use of information literacy models in schools is common in schools across the world (Herring and Tarter 2007, Kuhlthau, Maniotes and Caspari 2007). The model adopted by the school in this study (and by many primary and secondary schools across Australia) is the New South Wales, Department of Education model (NSW DET 2007) which is referred to as ‘the information process’. This model has interlinked stages entitled *Defining, Locating, Selecting, Organising, Presenting and*
Assessing, with each stage representing a number of skills. Other information literacy models adopted in schools include *The Big 6* (Eisenberg and Berkovitz 1990), which is the most common model used in North America (Eisenberg 2008), and the *PLUS* model (Herring 1996 and Herring 2004) which is used in the UK and other countries. The use of models has been criticised by Green (2004) as lacking individuality, in that one model cannot meet the learning styles of all students. The models’ authors accept Green’s criticism but argue that models should be adapted in schools for student use, as this could lead to students developing their own models of information literacy.

Research on information literacy in schools, particularly by Kuhlthau (2004) and Kuhlthau, Maniotes and Caspari (2007), as well as by Herring (2006), Farmer (2005), and Limberg (2005) has shown that students in both primary and secondary schools can benefit as learners from information literacy teaching in schools. These researchers have identified improvements in students’ identification of purpose, question formulation, concept mapping, information seeking, information evaluation, and the use of information and ideas in assignment presentation. Little research has focused on the transfer of information literacy skills, an exception being Herring and Hurst (2006). Only Herring and Bush (2009) have explored the issue of a culture of transfer in the school context.

**Transfer**

In the field of education, there is a long history of debate and research on the transfer of knowledge and skills, but similar to information literacy, there is no agreed definition of transfer. In the school context, Royer, Mestre and Dufresne (2005) state that while transfer is seen a key goal in education, there remains discussion amongst
researchers about the types of transfer (e.g. near and far) which exist, how to develop transfer in schools, and how to measure evidence of transfer. Approaches to the study of transfer include the constructivist view of Lobato (2003), and Volet’s (1999) sociocultural perspective. On the other hand, authors such as the widely cited Detterman (1993), have little faith in students’ ability to transfer knowledge and/or skills. The present authors adopt a sociocultural viewpoint and argue that evidence of transfer can be found amongst students, if a range of factors is taken into account.

The issue of a culture of transfer is highlighted in particular by Haskell (2001), who argues that transfer in schools is likely to be limited unless there are both formal and informal discussions on transfer by school staff, as well as a widespread belief in the practice of encouraging students to transfer. Royer et al (2005) concur with this view and state that the learning and teaching environment in the school will also be a factor.

Methodology
This study used a constructivist grounded analysis approach. This method is based on the supposition that the researchers acknowledge data collection and analysis as a construct by individuals (Phillips 1995). Further, the method assumes that the research participants’ own constructions of reality provide the data which is then interpreted by the researchers. Grounded theory, which incorporates grounded analysis, owes its origins to Glaser and Strauss (1967) but has been subsequently developed by others (Strauss and Corbin, 1998 and Charmaz, 2006). The present researchers employed Charmaz’s approach to data collection and analysis. Charmaz (2006) argued that researchers formed grounded theories by interpreting their interactions with research participants.
The key elements of constructivist grounded analysis include:

- The researcher does not set out to prove preconceived hypotheses
- The researcher uses coding (initial and focused) to identify what is happening in the data, as opposed to identifying repeated themes in the data
- The researcher interprets the data (e.g. examining what teachers said in interviews), as opposed to merely reporting the data content. This allows categories to be established
- Categories are then tested by the researcher re-examining coded data from different sources (e.g. diaries and interviews)
- In larger grounded theory studies, categories can lead to the development of theory

Data Collection
Six teachers participated in the study - two year 3 teachers, one year 4 teacher, one year 5 teacher and two year 6 teachers. The teachers agreed upon specific information literacy Terminology and sequencing, to be incorporated into their Science and Human Society and its Environment (HSIE) lessons. The Terminology was developed during two staff meetings early in Term 1 of the academic year. At those meetings, kindergarten to year 6 class teachers discussed definitions of information literacy and transfer. The majority of teachers supported use of the 6 step New South Wales Information Process: Defining, Locating, Selecting, Organising, Presenting and Assessing (NSW DET 2007). This Terminology and approach to research tasks was to be used by the participating year 3 to year 6 teachers in their Science and HSIE lessons during Term 2.
Participating teachers were issued with a diary separated into the 6 individual information literacy steps at the end of Term 1. From the beginning of Term 2, they recorded their own observations in their diaries of what they perceived their students’ understanding and degree of completion of individual information literacy steps to be. For example, teachers noted how successful different students were in defining their purpose. This was done both during and immediately after Science and HSIE lessons. Scott and Morrison (2006) stated that diaries by research participants are useful tools in educational research. Posters displaying the 6 steps were provided to each classroom as points of reference during the lessons. The diaries were collected at the end of Term 2. Participating teachers were also interviewed at the end of Term 2 to expand upon their written observations and collect any further comments at that stage. Cohen, Manion and Morrison (2007) recommended the use of interviews as a research technique as interviews may provide greater insights into participants’ views than other techniques.

Participating teachers were individually briefed at the beginning of Term 3. They were asked to withdraw scaffolding of the information literacy sequence during their Science and HSIE lessons for the entire term. They were issued comment sheets in lieu of the diaries used in Term 2, and asked to record observation during Science and HSIE lessons at three weekly intervals during the Term, i.e., week 3, week 6 and week 9. The teachers were asked to record their observations of whether some students appeared to transfer some of the information literacy skills from Term 2. The comment sheets were collected and interviews with individual participating teachers were completed at the end of Term 3.
Two principals were involved in the study. This occurred as a new principal came into the school as an observer of the current principal during Term 4, and then took over full responsibility of the school Term 1 of the following academic year. Each principal was interviewed during Term 4, to obtain definitions, beliefs and significance of transfer, information literacy and student learning.

**Data Analysis**
Constructivist grounded analysis was employed to analyse the data. Accordingly, the collected data was interpreted with minimal preconceptions. All data was coded and possible categories for analysis were identified. In the case of Term 2 and Term 3 teacher interviews, the final categories were established once both sets of interviews were coded and categorised. According to grounded theory (Charmaz 2006), categorisation is a precursor to developing theory. The restricted size of this study did not allow theory to be developed. Conclusions were based on coded and categorised data.

**Results**
The results of the study are outlined under the following headings:

- Teachers’ diary observations of students’ use of information literacy skills in the classroom during Term 2
- Teacher interviews at the end of Term 2
- Teacher comments at weeks 3, 6 and 9 of Term 3
- Teacher interviews at the end of Term 3
- Interviews with two school principals
Teacher’s Diary observations
Teachers recorded their observations in diaries throughout Term 2. The diaries were subdivided into the 6 steps of the information literacy skills sequence, as mutually agreed to by the teachers at the onset of the study.

In all years, teachers reported extensive scaffolding for students who were using the information literacy model. For example, the year 5 teacher provided a proforma with defining questions on the class topic of Democracy, such as “Who am I looking for? What type of information do I need? Why do I need this information?” Scaffolding was also used to provide students with guidance on selecting information and organising information. The Year 6 teachers provided extensive scaffolding on paragraphing, headings and report layout, and these teachers noted that this was in response to previous years where students’ work had been poor in these areas.

The teachers noted that while most students learned how to use the skills in defining, locating and presenting well or fairly well, many students found the selecting skills more difficult. This was particularly commented on by the year 3 and 4 teachers. A year 3 teacher noted that “This [selecting] was a difficult stage, particularly for those with weak comprehension skills.” The most difficult area for students in years 3 and 4 and for some students in years 5 and 6 was selecting. Teachers noted that many students found it difficult to select appropriate websites or information from books and websites, despite the scaffolding. The year 6 teachers noted that some students appeared to be overwhelmed by the vast amount of information available on the web. The teachers, however, did not comment on students’ searching skills.

The assessing stage of the model was only commented on by year 6 teachers in any depth. Some other teachers noted that students had not been given the opportunity to
reflect on their work. Two of the teachers misinterpreted this stage as being the
teacher’s reflection on student’s work. The year 6 teachers noted that most students
were capable of self-reflection and that many students had commented on the new
knowledge they had gained.

Overall, the teachers noted that they had paid much more attention to students’ use of
information literacy skills than they had done in past years, and it was clear that
involvement in this project provided an impetus for these teachers to focus more on
information literacy.

**Teacher interviews at the end of Term 2**

Individual interviews were conducted with participating teachers. The questions for
the teachers covered areas including their definitions of information literacy, their
views on the use the NSW 6 step model of information literacy as a teaching tool and
their opinions on the likelihood of students transferring skills learned from Term 2
into Term 3.

**Definitions of information literacy**

The teachers’ understanding and definitions of information literacy varied. Most of
the teachers viewed information literacy from the students’ perspective but two
teachers saw information literacy more as how teachers presented information to
students. The teachers’ definitions of information literacy ranged from merely finding
information, to summarising information in the students’ own words, and information
literacy as “the ability to find meaning within information.” There was no agreement
amongst the teachers about what might constitute information literacy in the school
context.
Using the NSW information literacy model
There was general agreement on the part of the teachers that the NSW model was an effective tool to be used in teaching and that it fitted in well with their own teaching styles. A year 3 teacher found the model helpful, “because it breaks down a large picture into a process of steps and skills, and it really helped the students - it made it easier for them to go and locate information.” The teachers were also in agreement that having a common terminology for information literacy skills was important for students across the school. The benefits of using the model identified by the teachers included providing students with a recognisable scaffold to which they could return, giving students “a framework for accessing information” (year 5 teacher) and allowing teachers to use a model which fitted in with their own teaching styles. All the teachers agreed that using the model was easily incorporated into their normal teaching styles and a year 6 teacher noted that, “In fact it [the NSW model] has probably made me focus a bit more on the lack of ability in the class as a whole and motivated me to do something about the gaps in their understanding.”

Problems in using the model were also identified. One of the year 6 teachers found the number of steps problematic for some students, commenting “You can almost combine a couple of the steps as you go at a time to make it not quite so laborious for the students to go through every single step.” In all years, teachers found that less able students needed much more assistance in using the model than more able students. The year 3 teachers stated that poorer readers often found websites difficult to cope with because of the amount of information and the complexity of some information, and that having a model did not necessarily help these students. All teachers agreed that a differentiated approach was needed when encouraging students to use the model, and that all students would not use the model in the same way.
**Views on transfer**

All the teachers agreed that the ability of students to transfer information literacy skills across time and subjects would vary with different skills and would also vary in relation to students’ ability. Most of the teachers stated that the majority of their students would be able to transfer the defining and locating steps of the NSW model, but they doubted if more than a few students would be able to transfer all the stages in the model. A typical comment from the year 3 teacher summed up the teachers’ views, as this teacher stated “It would take them a very long time to be able to do this on their own and I would doubt that they would ever be able to.” Only the year 5 teacher was more optimistic, arguing that “I think they will do it quite well. They are familiar enough with the process and it [the NSW model] is displayed in the room, so they are constantly able to refer to it.”

There was also general agreement that very few students would transfer skills without teacher support. The year 4 teacher stated, “I think it will only work if once again the teacher really supports that and monitors and keeps referring back to the model.” A year 6 teacher added, “I doubt there would be much success or any further improvement on what they have already done without definite teacher input.”

**Teacher comments at weeks 3, 6 and 9 of Term 3**

There was an agreement with the teachers that students would receive much less scaffolding in Term 3 than in Term 2, in order to see whether students might transfer some of the information literacy skills from one term to another. Teachers in all years insisted that scaffolding needed to be available for lower ability students and this was provided to these students.
Evidence of transfer came mainly from teachers in years 4 to 6 as the year 3 teachers reported that, given the work done by students in Term 3, and because of interruptions to the school curriculum, year 3 students had little opportunity to use their information literacy skills. This was a narrow interpretation of these skills by the year 3 teachers, who viewed the skills are being related only to a formal assessment task. The main evidence of transfer from Term 2 was in relation to an improvement by students in years 4 to 6 in the defining and locating stages of the NSW model. The teachers from these years stated that most students showed an improved awareness of identifying a clear purpose for their information gathering, and that most students appeared to have improved their web searching. These teachers also noted that less able students still found some of the concepts in the model difficult to understand, whereas the most able students had incorporated the model as a whole.

There was some evidence of transfer in other stages of the model, particularly in year 6, where the teachers noted improvement in how students selected relevant material and how they organised their information. One teacher noted, “After marking tests there was a noticeable improvement in the quality of the work…less cutting and pasting…paragraphs better sequenced.” The year 5 and year 6 teachers observed an improvement in students’ interpretation of information they found in websites and all noted much less evidence of students cutting and pasting. The year 6 teachers agreed that most students could be seen to be using their knowledge of the model from Term 2, as well as paying attention to the poster of the model in the classroom to facilitate transfer of what they had learned from Term 2.
Teacher interviews at the end of Term 3
Participating teachers were interviewed individually at the end of Term 3. Questions focused on two aspects:

- Information literacy – teachers’ revised views on information literacy, their views on the benefits of using the NSW information literacy model across the school and their views on implementing the model across the school
- Transfer – teachers’ revised views on transfer, evidence of transfer in their classes and their views on a culture of transfer in the school

Information literacy
By the end of Term 3, the teachers appeared to have a greater understanding of information literacy and were able to view it in a wider context. Some of the teachers still viewed information literacy mainly as a process rather than a way of thinking, but other teachers focused on the NSW model and critical thinking by students. The year 6 teachers in particular referred to students taking a more critical approach to defining their purpose and selecting relevant material.

The teachers were asked about their views on the benefits of using the NSW model across the school, and there was unanimity amongst the teachers that having a model for all staff and students to work with would be advantageous. The benefits identified included what one year 3 teacher described as “continuity from class to class.” All the teachers agreed that if students were using one model, then the model could be used across the key learning areas in the school. A second benefit seen by teachers was a shared terminology, and the year 4 teacher summed up the views of all, stating that the terminology of the model should “become the common speak of the whole school.” The teachers also saw that students would benefit, as using information
literacy skills would become “second nature” to the students (year 5 teacher). This view was qualified when teachers noted that the benefits identified for students would apply particularly to the most able students and partly for most other students. All the teachers noted that less able students would still need considerable support whether or not the NSW model was used across the school.

In terms of implementing the model across the school, the teachers were agreed that all staff would have to be familiar with the model and be prepared to use it. A year 3 teacher reflected a common view, stating “You would have to make sure everybody understands it. Make sure it is embedded in the programming and everybody was planning around it.” The year 4 teacher added to this, arguing for “making sure everybody is consistent and regularly using that terminology”, and this view was shared by others who stressed the importance of a shared terminology amongst teachers, to encourage students to view the model as applicable across all key learning areas. The importance of reinforcing the use of the model was highlighted by a year 6 teacher who argued that “regular follow ups across staff...a brief mention in the weekly staff meetings” would encourage consistent use.

**Transfer**

It was clear that the teachers’ understanding of the concept of transfer had increased over the two school terms, and the teachers stated that this was partly from discussions amongst teachers and with the teacher librarian. The teachers argued that they now saw transfer not only as important in principle, but also in practice, and they saw a need for the whole school to focus more on transfer.

The evidence of transfer in the classroom reflected the comments the teachers had previously made, with an emphasis on transfer by more able students in terms of the
NSW model as a whole, some transfer of skills such as defining and locating among most students, and much less transfer among less able students. Comments included, “They are locating really well. The better girls are selecting information and when it comes to organising they are beginning to summarise, so that is transferring” (year 3 teacher), and “They [year 6 students] mentioned that when they followed the define/locate/select they were able to manage the tasks in the time frame much easier than if they were not using that format.”

The teachers all viewed the existence of a culture of transfer in the school as being highly desirable, but differed in their views as to whether the school could be seen to actually have culture of transfer. The year 6 teachers argued that there was a culture of transfer amongst the project teachers and that this could be extended across the school. The year 4 teacher was less convinced and argued that “I am actually not sure because I haven’t really seen the results of this project and what other people are doing.”

**Interviews with two school principals**

A change of school leadership overlapping the study time frame necessitated interviewing both the outgoing principal (principal 1) and incoming principal (principal 2). The principals were asked for their views on the development of information literacy in the school, and on the development of a culture of transfer in the school.

Both principals agreed that developing information literacy was a high priority for the school. Principal 1 stated that there had been considerable development in information literacy in the school, mainly because of the teacher librarian’s work with some teachers, and added that all teachers in the school needed to be involved across
all curricular areas. Principal 2 argued that, while considerable work had been done in the school, there was a need to embed information literacy in assessment, as this would be a driving force for teachers.

In terms of transfer, both principals saw the development of a culture of transfer as a very desirable aim, but they also saw difficulties in achieving such a culture. Principal 1 argued that, while a whole school approach was needed, there had to be leadership from the principal and the teacher librarian. Principal 2 stated that all staff needed to be involved and all staff needed to be convinced of clear benefits to students’ learning. Both principals agreed that a culture of transfer would only develop with a combination of top down and bottom up approaches, implying that all staff needed to feel that they were involved in developing transfer in the school. Both principals also agreed that developing a culture of transfer would be a gradual process, and not something which could be imposed on a school.

**Discussion**

Three categories were identified by the researchers following the analysis and interpretation of the data: teachers’ adoption of the NSW model; teachers’ critical views on transfer; and teachers’ and principals’ critical views on establishing a culture of transfer in the school. Collaboration between the teachers and the teacher librarian is an underlying theme in all three categories.

It was clear from the data that all the teachers in the study adopted the NSW model and saw value in doing so. The value that teachers identified was the improvement in the performance of their students, particularly in relation to planning for learning tasks and to information seeking and use. It was evident that the teachers had
generally paid little attention to the development of information literacy skills in the past, and that using the model highlighted the importance of information literacy skills in the school curriculum. These findings reflect research on information literacy skills models by Herring and Hurst (2006), Herring (2006), Kuhlthau et al (2007), and Wolf, Brush and Saye (2003) but add new evidence of how teachers valued the model.

At the beginning of this study, teachers’ knowledge of transfer was limited, and while the teachers saw transfer as of great value in principle, they admitted that little attention was paid to transfer in the school. Teachers developed this over the two terms of the study and could be seen to take a more critical view of transfer. This was demonstrated by the teachers’ differentiation between groups of students, e.g., identifying the most able students as more likely transferors, and the less able students as being unlikely to transfer without considerable scaffolding. Royer et al (2005) emphasise that a clear understanding of transfer is necessary amongst teachers if transfer is to be developed.

The establishment of a culture of transfer in relation to information literacy in this school was seen by both teachers and principals to be of value to the school, but it was also viewed as something which might be difficult to achieve. Haskell (2001) stresses the need for schools to develop a culture of transfer and notes a range of factors, including the school’s overall culture, which will influence this development. This study provides new evidence of factors which might influence the development of a culture of transfer and these include a common terminology, both formal and informal discussion of transfer within the school, and leadership on the part of the principal.
Underpinning the above categories is the need for collaboration between the school staff and the school librarian. Gibson-Langford (2008) explored the issues relating to collaboration, and Kuhlthau et al (2007) and Herring and Tarter (2007) emphasise the need for collaboration in the development of information literacy in schools. The findings of this study add support to the need for collaboration.

Conclusion

While it is not possible to generalise about transfer of information literacy skills and the roles of the teacher librarian and other key school personnel from this study, clear pathways did emerge from the teachers’ diaries and principals’ interviews. To be influential in establishing a culture of transfer in the school, teacher librarians should consider playing an active role in:

- In-service training for all staff to establish clear understanding of meaning of transfer and information literacy
- Gaining support from the school principal and executive
- Close liaison between teachers and the teacher librarian, and between the teacher librarian and the principal
- Embedding information literacy skills, including higher order thinking skills, in the school curriculum
- Ensuring a consistent approach to information literacy skills in the school, via use of shared terminology across the school
• Providing visual reminders of information literacy in every classroom, in the form of posters

• Developing strategies for improving students’ use of information literacy skills and practices in a virtual environment
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