Building Information Literacy: An Action Research Approach

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The paper argues that action research at a micro level is a valuable tool that can be used by the teacher-librarian to improve student learning outcomes in information literacy. It investigates ways to assess both students' current level of achievement in information skills and also the effectiveness of teaching strategies used by the teacher-librarian.

It will outline the work of three experienced teacher-librarians from Sydney schools. The issue of the value of action research will be discussed. Observations will be offered in terms of the possibilities of action research as a catalyst for professional learning and enhancing student learning outcomes.

Introduction

The work that this paper reports on emerges from three independent girls schools. Two of the schools are relatively affluent, drawing predominantly middle-class students and the third is a well-established girls school in the inner west of Sydney. While the schools are similar in many respects, Independent Girls School Northern is a 7-12 Catholic day and boarding school, Independent Girls School Central is a K-12 non-denominational day and boarding school and Independent Girls School Western is a K-12 Catholic day school with a high proportion of students from a non English speaking background. The action research discussed in this paper developed partially as a response to the Lonsdale report (2003) in which teacher librarians were challenged to address a gap in the research and also as a response to a perceived need to provide a context where teachers could model authentic learning and develop a "collegial and individual responsibility for student learning outcomes" (Mockler, Schutz & Vecchiet 2005).

It is our belief that the process of learning needs to be made explicit and to be assessed authentically. In order for this to occur contextualised information literacy skills and the active involvement of the teacher librarian in this process is essential.

Case 1: Independent Girls School Northern (IGSN)

Upon appointment to the position of Head of Information Services at IGSN, the first author of this paper was charged with fostering a climate of student engagement in the learning process through a staged program of information literacy outcomes and associated

professional learning programs for teaching staff. As there had been no precedent within the school of a teacher librarian in a role centring on pedagogical intervention, a climate of collegiality and of trust had to first be established alongside a professional development program focused on collaborative planning and team teaching. Practitioner inquiry was seen as an ideal vehicle for achieving both of these goals.

It appeared that the most appropriate and immediately beneficial method of transforming practices was through projects with a faculty focus that served to raise awareness in those faculties of the importance of specific information literacy skill development. Projects were developed in response to identified learning dilemmas inherent in current practices. While this provided many opportunities for teacher professional development, and an increasing role for the teacher librarian in engaging in reflective practice, there still lacked an overall understanding of information literacy and the importance of a cohesive curriculum-wide approach to its implementation. At this time it was still seen by many teachers as additional to, rather than part of, the learning process. The inclusion of information literacy as one of the three cornerstones of an integrated model of learning, introduced in 2004 at this school made it imperative that these misunderstandings be addressed.

The "Information Expert" project

Drawing on definitions of information literacy as the ability to access, evaluate, and use information from a variety of sources (Doyle 1994), teachers within IGSN recognised the importance of students being able to make concrete links between information access, information provision and the growth of knowledge. Research evidence suggests that "planned pedagogical intervention impacts positively on mastery of information scaffolds, mastery of content and attitudes to self, to learning and to schooling in general" (Todd 2003), and work which had previously been carried out within the school had highlighted that the development of higher order thinking and new learning in complex information environments could be greatly aided by a comprehensive, explicit, and systematically planned instructional intervention process (Schutz 2000). It was therefore recognised that student learning could be further supported on a whole-school basis through learning scaffolds being embedded into the teaching and learning process across the curriculum and staged across year groups. Experience had shown that students as "information experts" do not happen by accident.

During 2004 a small grant was given through the Australian Government Quality Teacher Program to a collaborative group of teacher librarians across a number of schools to develop a diagnostic tool, generic in nature, that could be administered as a whole or in modules. The context for the test was Ancient Egypt as it is a topic not entirely foreign to students entering secondary school in NSW. The results of this test could be used to assist teachers in developing an understanding of their students' information literacy skills and in turn provide a point of departure for the development of a contextualised and integrated information literacy program. This program called *Kids as Information Experts*, would be much more than the ad hoc approach to skill development which in reality still existed in our schools.

The online tool, based on the six step information process of define, locate, select, organise, present and evaluate/assess (which is embedded in all syllabus documents K-12 in the state of New South Wales) was designed collaboratively by the teacher librarians and trialled in its draft form at IGSN. It was administered to 150 Year 7 students early in their

first term of secondary school. The students' results were then tabulated and used by a team of teacher researchers consisting of the school's two teacher librarians and the Year 7 teacher/advisors as the basis for the development of a range of learning tools that could then be incorporated into student learning tasks. Data gathered via the tool highlighted gaps in the ability of students to define a task, to select and organise information into a new way of thinking, and as such provided an essential insight into ways of better supporting student learning.

In the next phase of the project, teachers worked with the teacher librarian to design a curriculum based task for Year 7 students which aimed to combine high quality authentic instruction with scaffolds embedded for each stage of the information process. The skills were to be explicitly taught, practised by the students with guidance through the provision of task definition, transformation and production scaffolds and assessed according to a comprehensive rubric. A teacher librarian worked with students and teachers for the duration of the task and collected data through observation in relation to students' abilities to identify key words, develop a range of questions according to a criteria, link prior knowledge to the new information need, select and define appropriate information, organise information, critically evaluate information and effectively communicate their learning. Through ongoing discussion and collaboration, teachers gained particular insights into the difficulties students experienced in defining the task, and accessing and using information, and a decision was made at this point to reduce the number of skills in future tasks and focus for the year on task definition in order to ensure mastery for all students.

In this and subsequent tasks students were given the choice of working through the task definition scaffolds online or on paper with specific support from the teacher librarian. Learning scaffolds included identification of key words and phrases, mind maps, and questioning techniques. The same scaffolds with some modification were used in several tasks in order to reinforce transference of skills across disciplines, using a range of learning technologies to provide variety and encourage student engagement. The use of *Inspiration* software and the interactive white board were assessed by teachers as most successful not only because of the enthusiasm for involvement exhibited by students but also because of the ease of assessing student learning by observation.

Outcomes and Evaluation

Evidence gathered through interview with a sample group of students during class time and in conversation with their teachers as well as the assessment of the learning product demonstrated that the systematic integration of the "learning toolkit" into research tasks across four different subject areas lead to an increase in higher order thinking and development of new knowledge for students. In addition, the growth in students towards information expertise was apparent. Students responded well to the provision of scaffolds that they agreed provided support for learning and lessened anxiety in the most difficult stages of the process. Students quickly developed a familiarity with the process approach to learning and a capacity for skill transference across the curriculum became apparent. Students now report that their confidence in research and their own abilities to problem-solve in relation to their own learning has increased, as has their ability to plan their work and work toward meeting learning goals.

The 'Information Experts' project served as a catalyst for a number of emerging understandings and key changes in pedagogy and practice for the teachers involved. A

common understanding of the importance and workings of information literacy outcomes was developed by teachers, as was an understanding that a willingness to spend more time on the process of learning changed the quality of the learning environment which paid dividends in the final product of student learning. These dual understandings have contributed to a number of key changes in pedagogy and practice. A most exciting outcome was an appreciation by teachers of the value of embedding questioning techniques into task definition scaffolds. Students are now using a taxonomy of "fat and skinny" questions, (Johnson 1992) as an integral part of all research tasks. Mind mapping is also now an integral part of all tasks and transforming scaffolds, such as note-making tables, bibliographic and presentation scaffolds have become the normal expectation of both teachers and students, as has the embedding of information literacy outcomes into student assessment rubrics. As a result teachers continue to see an increase in the intellectual quality of student work within the school, and evidence of an increase in the depth of understanding of ideas and concepts is also slowly emerging.

At the beginning of 2006 a random sample from the original group of students was re-tested to determine whether the observed improvement in student learning was indeed indicative of real transference of skills and development along an information literacy continuum. The improvement demonstrated in the targeted skill can be attributed directly to the intervention techniques and the co-operative planning and team teaching initiative. An additional effect was an observed decrease in the anxiety levels at the beginning a task and the associated increase in self esteem and confidence gained through the use of task definition scaffolds.

Case 2: Independent Girls School Central (IGSC)

Independent Girls School Central is fortunate to be a "technology" school where all students and staff have access to the latest educational software and hardware. All students from Year 6 onwards have a personal laptop computer for daily use in class and at home. The whole campus is networked; there is wireless and/or cable internet access in all classrooms; and students and staff access to the school network from home. Both students and staff are competent, confident users of educational technology, and in fact, the school is a leader in the innovative use of educational technology.

The Principal of IGSC recognises the importance of information literacy and its contribution to lifelong learning. She is very supportive of the role of the teacher librarian and sees information skills as integral to the whole curriculum. Therefore the priority upon appointment, as Head of Library and Information Services at IGSC, of the second author of this paper was to develop a spiral curriculum of information skills for Years 7 – 12. The information skills curriculum was based upon the six step NSW Information Skills model mentioned earlier. Specific skills were to be introduced and then reinforced throughout the Year groups with the final aim of students becoming independent users of information.

Making Learning Real

There was a history of pedagogical intervention by the previous T-L but a whole school focus was lacking. In a situation similar to IGSN, teachers lacked an overall understanding of information literacy and the importance of a curriculum-wide approach towards it. Information skills were seen as an addition to, rather than part of, the learning process. Consequently a project team consisting of the head of Library & Information

Services, the Deputy Principal Curriculum and the ICT Curriculum Co-ordinator was established to integrate information literacy (IL) and ICT into the regular curriculum. The project was given the working title of Making *Learning Real.*

The approach of the project team was to develop a matrix showing the inter-relationship between syllabus outcomes and IL and ICT skills. The first step was to analyse the syllabus documents for every subject in Years 7-10 (for instance, English, History, Science, etc.) and identify any opportunities within each syllabus, which could be used as a vehicle to integrate IL and ICT skills into the curriculum. In consultation with the relevant subject Co-ordinator the project team assigned appropriate IL and ICT skills and associated activities to be taught in conjunction with the syllabus topics. Subject teachers were then required to use this approach when teaching this topic. For instance, the Science topic of *Contributions by Australian Scientists* concentrated upon the IL skill of recording/organising information and the ICT skill of digital presentations. The teaching staff was kept informed of the progress of the project through staff development sessions. At the stage of writing this paper the matrix is completed for the largest subjects of Science, English and History.

Concurrently with the development of the ICT/IL matrix, the second author of this paper developed a spiral curriculum, or *Scope and Sequence*, of information skills for Years 7 – 12. It was built around each of the six steps of the information process – *Define, Locate, Select, Record/Organise, Create, Evaluate.* Each step was broken down into its sub skills and given an alpha/numeric code similar to those used in the outcomes statements in the syllabus documents. The *Scope and Sequence* also indicates at which Year level the skill would be introduced, when it would be reinforced and finally when users would be considered independent in this skill.

The diagnosis and identification stage

It was in this climate that the decision was made to trial the test. As the second author of this paper was part of the original group of teacher librarians involved in the development of the online test of information skills, it seemed an obvious opportunity to trial the test. The test was administered to Year 7 students in Term 4 2005. Based upon the original trial at IGSN, the decision was made to concentrate upon testing the skills involved in the first step of the information process – *Defining the task*. When the students' results were tabulated it was obvious that students at IGSC had similar difficulty with the skills associated with this step of the information process too.

The online test was in its beta version and obviously not a perfect diagnostic instrument (and further work is being undertaken to refine the online test). It was however possible to make some observations about the student results. The great majority of students struggled to answer the *Defining* questions accurately. Clearly this was an area in which students were underachieving and intervention was needed to improve student skills. The question was – *Can intervention by the teacher librarian make a difference to students' mastery of information skills?*

The intervention stage

A History research task on the topic of *The Black Death* was selected as a suitable vehicle to use for intervention. The task was issued to two Year 8 History classes in Term 1 2006 – the same students who had participated in the original online test in Term 4 2005. The

class groups had been selected previously according to student ability. The research task was designed by the teacher librarian to focus specifically upon the skills involved the first step of the information process - defining the question. In keeping with the technological focus of IGSC the task was totally online and a website linking students to online scaffolds for the task was set up by the teacher librarian.

Information literacy outcomes from the *Scope and Sequence* document were embedded in the task. A number of strategies to teach defining skills were incorporated into the very first stage of the research task. These strategies included identifying key words; rephrasing the question; developing focus questions, creating a digital mind map; and categorising higher and lower order questions. To cater for the technological expertise of the IGSC students, electronic whiteboards, mind mapping software and Microsoft Publisher were incorporated into the task. Approximately the first two hours of class time during the research task was focussed upon teaching defining skills by the teacher librarian and these skills were reinforced throughout the task.

Results

The teacher librarian and the class teachers observed that there was a very high level of on-task behaviour by the students during the research task. The comments from the teachers were very positive. In fact, the teacher of the lower ability class commented that he had "never seen them so engaged in a task before". Students had a sense of purpose and were motivated and engaged throughout. Teachers from both classes believed that they had previously underestimated their students' ability to define the task and the amount of class time needed to teach this skill.

Students from both classes were formally interviewed by the teacher librarian at the conclusion of the research task. The students were unanimous in their verdict that it had been a successful task. All students attributed this success to the time spent "explaining" (i.e. defining) the task by the teacher librarian in the first two lessons. A universal comment from students was that they "knew what to do" this time. The mind mapping strategy in particular was seen by students as very helpful in defining the task. No student or teacher saw the considerable amount of class time that was focussed upon teaching defining skills as wasted time - overall students and teachers were enthusiastic about the research task.

Case 3: Independent Girls School Western (IGSW)

The diagnostic tool was administered at the beginning of Term 1 2006 to students entering Middle School under similar conditions as the initial trial school. The results showed marked similarities to those of the other two schools. The higher proportion of students at this school requiring learning support is reflected in the results. The teacher response was very encouraging as they immediately realised the need to provide time for planning tasks with embedded information literacy skills and were very willing to allow class time for the mastery of these skills.

Intervention techniques began in the second half of Term 1 and will continue throughout the year using a similar method to that used in the other case Studies. At the time of writing this paper no definitive observations can be made yet but these will be reported on in the presentation.

Conclusion

The implementation of the diagnostic tool, albeit in a beta format, produced some unintended consequences. It became apparent early the administration of the test that some students did not have the technical skills that classroom teachers assumed they had. This caused some students to seek help and therefore lose time. The test itself in its current format is too long to complete in the timeframe due to the software used. Despite an initial trial of each of the parts of the test there remains some confusion in the minds of the students about the requirements of some of the activities. The structure of the diagnostic tool is now under review to make it more user friendly for students and to simplify the data gathering process.

There is still much work to be done as we move forward from a focus on task definition to a focus on developing synthesising skills in the following years. The diagnostic tool will be used again in a new format to highlight students' strengths and weaknesses in the next phase, and programs will be re-assessed. Lonsdale (2003 p. iv) suggested that "integrating information literacy into the curriculum can improve students' mastery of both content and information seeking skills" Her review of the research showed that while there is a significant body of evidence to suggest that school libraries have a positive impact upon student achievement and she calls for more investigation into what it is that helps student learn more effectively. By identifying areas of weakness and specifically targeting them over an extended period of time the process of learning is more explicit and the development of critical thinking is increasing.

As the research from our three schools shows the teacher librarian has a role to play in student learning. In 2001 Ross Todd challenged teacher librarians to provide evidence of a direct and tangible contribution to improving student learning. This he stated, "should be the substance of your message, the substance of your public concern, the substance of your negotiations. "(Todd, 2001). Through our involvement in the four phases of this project (diagnosis; identification; intervention and analysis) we believe that we have demonstrated that the teacher librarian **can** make a difference to student learning outcomes.

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Helen Schutz was previously Head of Information Services at Loreto Normanhurst and is currently Co-ordinator of Library Services at Santa Sabina College. She is committed to developing an information literate school community of engaged and self directed learners and enjoys working co-operatively with teachers in planning and teaching. In 2003 Helen received the ASLA-Pledger Consulting NSW Teacher Librarian of the Year Award for her contribution to the profession.

Alison Pick has been a teacher librarian for over 17 years and is currently Head of Library and Information Services at Wenona School, North Sydney. Alison is particularly interested in the co-operative planning and teaching of information skills along with the integration of new technologies into the teaching of information literacy.

Gina Knox was previously teacher librarian at Loreto Normanhurst and is currently teacher librarian at Pymble Ladies College. Gina uses her enthusiasm for learning and her creativity in teaching to develop her students as life long learners. She thrives on team teaching with subject specialists and has an innovative approach to the development of information literacy.