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Accepting the challenge: evidence based practice at Broughton Anglican College

Scan's Research columns values research as a process which:

- strengthens the theoretical basis for the practice of teacher librarianship

- informs practice, through the application of findings, questioning of assumptions, and identification and analysis of practical problems

- is informed by practice as part of an essential professional practice cycle.

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In this issue, **Alinda Sheerman** presents the planning, implementation and results of collaborative action research projects, which used guided inquiry as a framework. The evidence provides an exciting example of the explicit learning gains and student engagement achieved through this approach.

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Introduction

Teacher librarians are being challenged to produce evidence showing the benefits and results of their partnerships and leadership role in teaching and learning through the school library. Todd (2008, pp. 23–24) says that the traditional role of teacher librarians must change to take on the instructional dimensions, ensuring that student learning is based on *discovery, curiosity, inquiry, critical and reflective thinking* so that students can construct deep knowledge. The teacher librarian should advocate for change at a whole school level, even to the level of the school mission and goals, demonstrating that their practice in teaming to deliver authentic learning is backed by evidence.

Teacher librarians, teachers and students, in learning teams, can realise authentic learning experiences. Gordon (2009, p. 34) says that *the school library gives information users permission to make mistakes and revise their work through formative, rather than summative, assessments using digital technology on all stages of the Inquiry.* A teams approach allows for supportive interaction and sharing.

Foley (2010, p. 3) suggests that evidence of specific outcomes achievement should be shared in the form of explicit feedback. Action research conducted in the school by the teacher and teacher librarian team provides this evidence. Canniff (2010) describes how teachers can now learn how to conduct action research through an online action research support website to train teachers to examine their own practice.

...improve educational practices through a systematic and collaborative investigation...

The purpose of conducting action research is to improve educational practices through a systematic and collaborative investigation that is cyclical in nature. It should be a *developmental process that systematically increases the scope of the investigation* (Stringer, 2008, p. 13).

In 2008 and 2009, action research projects on *Incorporating Guided Inquiry into the teaching and learning process* were undertaken at Broughton Anglican College by the teacher librarian in collaboration with teachers. The projects were funded by Australian Government Quality Teaching Programme (AGQTP) grants and supported by the NSW Association of Independent Schools (AIS).

These grants and the guidance of AIS (NSW) support officer Karen Stapleton were pivotal in introducing Guided Inquiry (GI) as a research framework at Broughton. They enabled time for staff training in GI and for planning and formal evaluation of the process by the whole team.

AIS (NSW) also provided the teacher librarian with training in action research.

The evaluations of the first two projects were shared with the K–12 staff by the whole team.

The evaluations of the first two projects were shared with the K–12 staff by the whole team (teacher librarian, teachers and students involved). Because of the evidence and enthusiasm displayed, many teachers wanted to embark on inquiry projects and guided inquiry when the teacher librarian could join the team. Each year the teacher librarian has conducted action research on one of the team projects.

In 2010, action research was again undertaken independently in a different subject area and with a different group of students.

The results of these three studies combined to demonstrate valuable evidence of the success of the GI process to engage students in their learning and to enable them to reach a level of deep personal knowledge in their chosen topic areas. The vital role of the teacher librarian as an active member in the teaching and learning team was also apparent.

The cycle of action research described in this article is in its third revolution. More and more members of the school community have been influenced by the findings of each cycle and, in turn, the findings of this project will be shared with the wider school community and other teacher librarians.

This action research project looks at a team approach to the use of GI and the *Information search process* (ISP), and the use of a wiki to support shared learning and knowledge construction. In this action research project, the class teacher and the teacher librarian worked together

diagnostically to identify learning dilemmas and plan for instructional interventions at the point-of-need (Hay & Todd, 2010, p. 35). This produced a learning environment where authentic learning took place.

Action research project: pedagogy 2010

How does the use of guided inquiry using wiki technology affect the teaching and learning of the Year 10 Commerce topic: Current issues in Australia?

Figure 1 The action research cycle

Plan – determine the position and need for change

Through observation in the school library of students' and teachers' activities, assessments and attitudes to work, it was apparent that many students across all grades and subjects were not engaged in their learning. The reasons for this lack of engagement included:

- learning styles – students of this generation look for opportunities to share and communicate as they learn
- obvious lack of interest with the learning task at hand
- transportation of information rather than transformation of information to solve issues or problems
- acceptance of plagiarised work by teachers, mainly due to a lack of skills and time to check assignments digitally – plagiarised *PowerPoints* were observed being produced as products of learning.

It was time for pedagogical change. The goal of this change was to enable teachers to implement a *thinking curriculum*, one that would transform learning to become an individual's personal quest for gathering, transforming and sharing knowledge. This would need to include an integration of technology tools to make the sharing of learning and knowledge seamless.

Act – specify the goal and act upon this

The teacher librarian goals were to:
- investigate the depth of knowledge and understanding students are able to achieve through using guided inquiry and a wiki while investigating an issue in Australian society
- determine the effectiveness of the team's use of Web2.0 technology in sharing the experience of the path of learning to new knowledge.

The class teacher's goals were similar and also included the desire to:
- monitor the level of student engagement in their learning
- assess the effectiveness of guided inquiry and individually selected research areas to achieve the curriculum outcomes for this topic area.

The final stated team goals were to:
- collaboratively plan and teach a guided inquiry unit of work with a Year 10 Commerce class using the *Information search process* and Web2.0 tools, and to evaluate its effectiveness as a teaching and learning tool
- use this product and the evaluation of this project to demonstrate its effectiveness to other teachers and teacher librarians, and to encourage pedagogical change through the school library.

Planning and execution
Step 1: staff training and research

Before planning began, the class teacher, Brad Gillion, grounded

himself in knowledge of guided inquiry and the ISP by reading *Guided Inquiry: learning in the 21st Century* (Kuhlthau, Maniotes & Caspari, 2007) and *Ban those bird units: 15 models for teaching and learning in information-rich and technology-rich environments* (Loertscher, Koechlin & Zwaan, 2005). He also accompanied the teacher librarian to a Guided Inquiry Seminar early in 2010 in which Dr Ross Todd and teacher librarians from a number of schools shared their jointly funded 2008 action research projects.

Brad decided that he would like to work on this project with his Year 10 Commerce elective class. He had already used a wiki for the first time with them in first term so at least that would not be a new experience for them. These students had elected to take Commerce and most were from the class of higher achieving students in Year 10.

He had also managed, through careful planning at the beginning of the year, to gather extra time for this unit so that we had the whole of third term to conduct the research process. (This came out of the results of past action research when it was found that Guided Inquiry takes longer than past research tasks.)

Step 2: planning the unit of work

Specific planning was carried out using the guided inquiry planning sheet and curriculum documents. Outcomes, objectives and assessment were discussed, and it was decided to integrate ICT outcomes by using a wiki for students to construct and share their knowledge. We also wanted to check the students were gaining information literacy skills so these were to be assessed within and throughout the ISP using the SLIM toolkit (Todd, 2005).

Thus, through the wiki and the SLIM toolkit questionnaires, formative assessment and added teacher and teacher librarian support could be afforded to each student.

The general plan and a more detailed plan for each step were uploaded onto the class wiki. Scaffolds to be delivered through the wiki were also uploaded to the students' page when they were completed.

The staff was informed of the action research project and then the Broughton community was informed through the school newsletter.

The students to be involved were then briefed about the project. Letters of specific information and to gain permissions for later publication of student work, products and media data collected throughout were sent home to parents.

All lessons were booked into computer labs in advance so that access to the wiki and internet was available. Students had two teachers supporting them, the class teacher and the teacher librarian, for every lesson.

Step 3: implementation

Students followed the steps of the ISP to investigate an *Issue in Australian Society* of their choice. Scaffolds had to be completed during specific steps of the process according to the project plan.

Students also completed three *Student learning through inquiry measure* (SLIM) questionnaires at specific stages of the process. The teacher librarian used these to monitor information literacy needs and address them at the point of need (Figure 2).

Scaffolds – aids to information literacy

To guide students, a number of scaffolds were uploaded to the wiki. Although the scaffolds were used to assist the students' information organisation and were handed in, they were not allocated marks so they did not pressure the students. Most said this helped to keep them on track.

Some scaffolds were obtained from the previously mentioned book by Loertscher, Koechlin & Zwaan (2005). In 2008, Lee FitzGerald constructed the *GIresearchers* wiki for teacher librarians to share their joint action research projects (FitzGerald, 2011). Many scaffolds were shared through this wiki, and a number of these were also used in this project (Figure 3). This year, we added the scaffold, *The learning and teaching wheel* (Pirozzo, 2007), to assist in the construction of deep questions.

Observe

For action research to be effective, it was important to constantly observe and monitor the students' learning, so that students experiencing difficulties could then be supported and issues could be addressed as they arose. These observations were the main sources of data from which action research conclusions could be drawn.

Collection of qualitative and quantitative data was undertaken using a variety of methods throughout the project. For example:
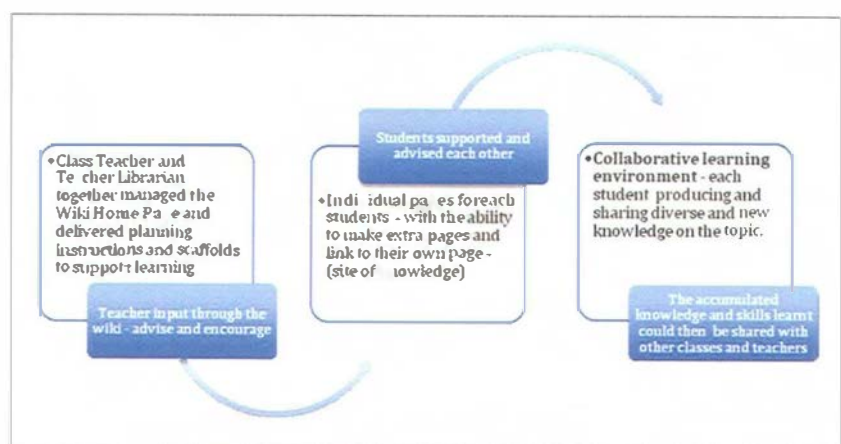

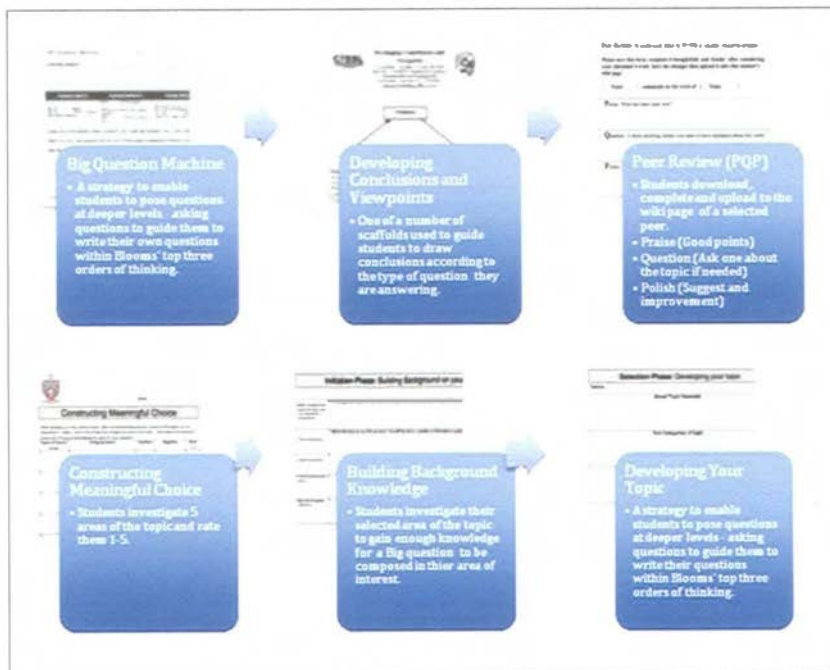Figure 2 Using a wiki for learning and sharing – the team approach

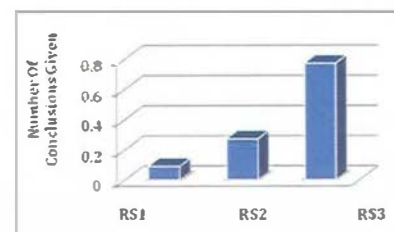*Figure 3 Examples of scaffolds available on the wiki*

Figure 4 Class average of students' responses to three questionnaires given at three stages of the ISP

- The SLIM toolkit questionnaires gave some information about students' feelings towards their learning experience, the development and growth of information literacy standards and also some information about their own perceptions of the depth and growth of their knowledge.
- Teacher observation of students' progress as they worked on their wiki pages. The level and type of information deposited and links made was an indicator of their level of understanding. (Their application of knowledge at the presentation stage showed their level of deep understanding.)
- Comments made on wiki pages by students, teachers and peers
- Student interviews were recorded using photographs and video to capture their feelings and verbalised needs.
- An online survey was conducted to gauge student feelings and impressions on most aspects of the project at the final evaluation stage of the ISP.

The information collected at these points was analysed and considered in reaching the conclusion as to whether our goals had been achieved.

SLIM toolkit data

Three reflection sheets (RS1, RS2, RS3) were completed at different stages of the ISP. The first was completed at the beginning (Initiation phase) of the inquiry, when the students only knew the topic area and had not yet investigated it. The second was completed at the *dip*, when students were finding all their information but had not yet focused on a personal question (Selection phase). The third reflection sheet was completed at the end of the ISP following the presentation when the question had been answered (Evaluation phase).

SLIM Question 1: *Write down what you know about your topic?*

These graphs (Figure 4) show the class average of students' responses to three questionnaires given at three stages of the ISP. By analysing whether their sentences were statements, explanations or conclusions, it was possible to determine whether a growth in knowledge had taken place. Notice that, as the project progressed, more explanations and conclusions and fewer statements were given. Knowledge was being formed.
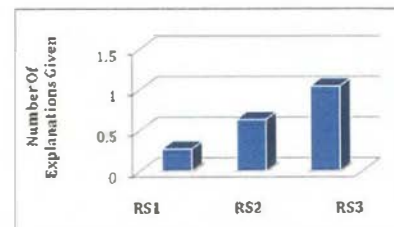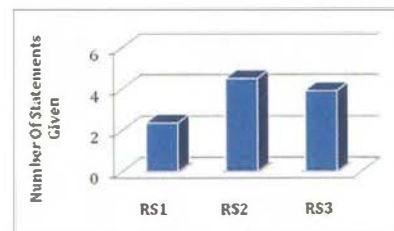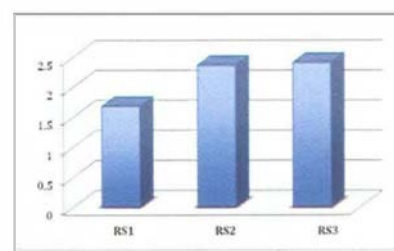
SLIM Question 2: *How interested are you in this topic?*

Student responses to this question demonstrated that, during the process of guided inquiry, interest in the topic actually increased throughout (Figure 5). The students, in their comments at the conclusion, said they still had great interest in the topic because they had taken ownership of their work. It is interesting to note that this has been the case in all three action research studies undertaken on guided inquiry at Broughton.
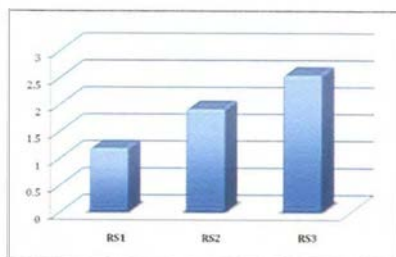

0=not at all; 1=not much; 2=quite a bit; 3=a great deal

Figure 5 Student responses to How interested are you in this topic?

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SLIM Question 3: *How much do you know about this topic?*

Student responses showed that they were aware of their knowledge development, and most said in the final sheet that they knew *a great deal*.

0=not at all; 1=not much; 2=quite a bit; 3=a great deal

Figure 6 Student responses to How much do you know about this topic?

SLIM Question 4: *What do you find easy to do?*

Each student's responses to this question was analysed against the SLIM toolkit *Information literacy*

Figure 8 Student responses to What do you find easy to do?

standards (Figure 7). These Standards were used to analyse SLIM Questions 4 to 6 (Figure 8).

Analysis of these reflection sheets proved interesting and helpful. As the results were built from answers given to this question at three different stages of the ISP, one can determine the main focus of students at these differing stages. The peaks give insight to the major issues at that time. Note that during the red RS2 stage (when they were overloaded with information – commonly called the

dip), 15 students stated that they could ask questions to get information. By the third reflection sheet this was not uppermost in their minds.

At the Initiation phase of the ISP, instruction was given on the responsible use of information and referencing by the teacher librarian, and this is reflected in the blue RS1 column at Standard 17. It was very pleasing to note that this was uppermost in their minds at that time.

Students also made a few comments that did not fit within these standards and these were noted and acted upon.

SLIM Question 5: *What do you find difficult to do?*

Responses to this question were analysed against *Information literacy standards* (Figure 9).

Note the very high incidence of Standard 8 —*Selects information appropriate to the problem or question at hand*. This is a very common and recognised *dip* at the Selection phase (Standard 8, Red RS2), which has been documented by Kuhlthau (2007, p. 18) as being a period of frustration and discouragement. The sheer volume of information choices with various ways to turn confused the students and they reflected this by saying they had difficulty in selecting appropriate information to the

1. Able to develop questions that lead to appropriate information
2. Able to access information efficiently and effectively
3. Develops and uses successful strategies for locating information
4. Able to evaluate information critically and competently
5. Can determine the accuracy of information
6. Distinguish among fact, point of view and opinion
7. Identifies inaccurate and misleading information
8. Selects information appropriate to the problem or question at hand
9. Organize all the information
10. Integrate new information into one's own knowledge
11. Applies information in critical thinking and problem solving
12. Able to produce an appropriate product
13. Derives meaning from the information
14. Able to communicate information and ideas in appropriate formats
15. Has strategies for revising and improving
16. Respects intellectual property rights
17. Uses information technology responsibly
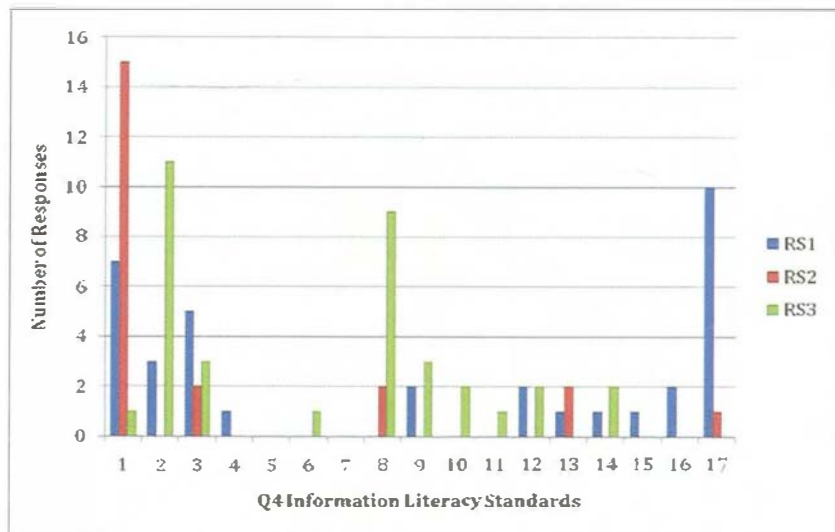18. Other

Figure 7 Information literacy standards

Figure 9 Student responses to What do you find difficult to do?

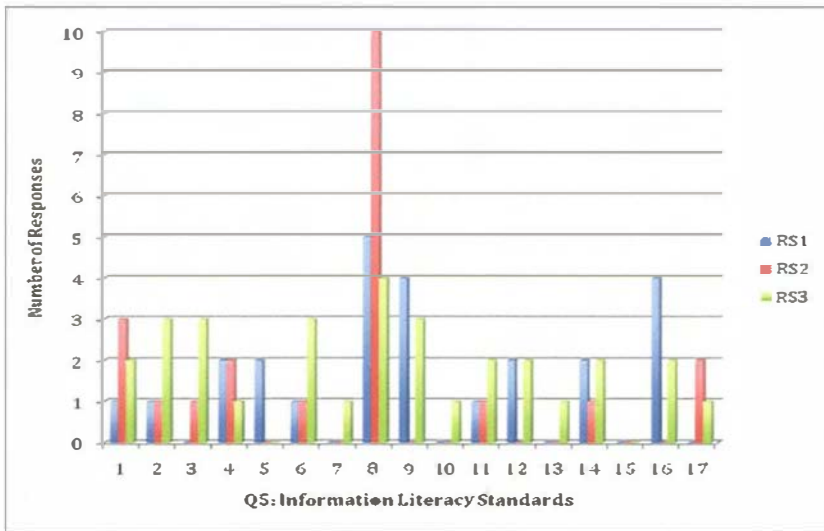Figure 11 Student responses to Question 1

Figure 12 Student responses to Question 2
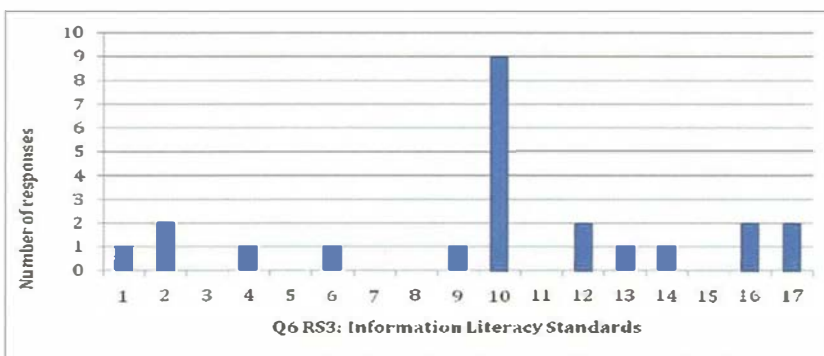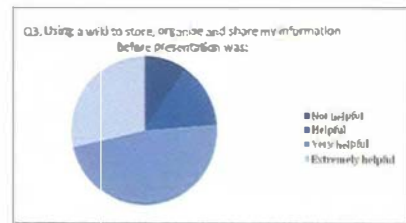

Figure 13 Student responses Question 3

Figure 10 Student responses to What did you learn in doing this project?

question at hand. Once we gave them more scaffolds to guide them, this level fell dramatically, as seen in the yellow column during reflection sheet 3, towards the end of the ISP.

Question 6: *What did you learn in doing this project?*

This question was only asked at the end of the project during the final reflection sheet (Figure 10).

It was very pleasing to note the large number of students who indicated that they had been able to *Integrate information into one's own knowledge* (Standard 10).

Evaluation

The student survey focusing on their use of a wiki was given as an online *SurveyMonkey* questionnaire (Figures 11 to 19) at the Evaluation phase.

Figure 14 Student responses to Question 4

The use of a wiki as a method of access to stored information was acknowledged.

The last five questions required short answers, and a selection of these answers follows:

Q5. How was this Guided Inquiry research process different to any research you have done before?

I was able to choose my own topic, it made me more interested and actually want to do the work. I found it great that I was able to research my own topic, in my own way that interested me as well as let me learn and present the topic in my own individual way.

It was good because at the start every step was laid out for you. It was really good because you got to pick a topic that you were interested in.

It had a long and thorough starting process but was quite helpful as it gave me a great broad idea of what areas I had to focus on.

It was broader so I had a chance to choose something I was really interested in. I think my work improved because I wasn't just finding facts it was making my own summaries/ recommendation.

I know it was very different, but it is hard to determine why. I feel it was mainly due to the fact that we could choose any topic. The 'guided' part of the inquiry was noticeable at the start - the scaffolds, but it became more of a regular assignment (but exciting) as it went on.

In terms of teacher support, there was not as much as I had expected. Comments came, but were not as regular as I had thought. But not a major problem. I knew I could always ask for help. This was a good part of being 'guided' – I was doing major research but in a 'secure' environment.

Asking my own question and using Blooms taxonomy was new to me.

It had to be done much more thoroughly

Figure 15 Student responses to Question 5

Q6. What did you like about it?

The fact that there was not really a right or wrong way and that I learned so much because of both my passion for the topic and the fact I had control over the task.

I liked being able to store my information in the wiki

I liked how much freedom I had to conduct my own research both first hand information and second hand

That it lasted for such a long time and that there were certain sections due at certain times and the teachers could see your work and tell you to get a move on. I didn't do it at the last minute and I had plenty of time to do it so I wasn't stressed at all. The teachers had constant access to the work and how everything was already organised before we started. Good planning!

The wiki pages, freedom of choice, time given, we could express an opinion on an issue we are passionate on through a variety of mediums. The asking a question to research is a good concept - contributes greatly to improved learning.

I liked that we had to develop a question. It provided a way of researching specifically for something, allowing minimal chance to drift off topic.

Being able to choose our own topic. Being able to use the wiki

Figure 16 Student responses to Question 6

Q7. What could be improved and how?

I think the teachers could of explained to us better how to use the wiki page. Like how to create to pages and stuff like that.

More openness, if you know what I mean. Like having a part where you could do what you wanted to do and how you wanted to do it

Less scaffolding.

Everything was good

I felt maybe some steps like the big question machine one was one that could be changed a bit as I didn't really find it helpful

Getting more experience with the wiki because if you don't know your way around it is hard to find certain files.

The process could be minimised a little because not all assignments and research task do you get 10 weeks to do.

I don't know… it was a very good assignment. :)

Figure 17 Student responses to Question 7

Q8. The best part of the project was:

Using the scaffolds (very helpful)

Sharing my findings.

Watching the presentations

Being able to choose our own topic that felt relevant to us.

Coming up with a conclusion to your research.

The simplicity of the format and presentation.

Conducting a survey

I can use the process of guided inquiry to make future questions/ assignments better.

Just answering the question and creating my question... and how we got do what we wanted to which helped me and other students to do the best they could.

I learned much in regards to my topic and I feel like I can more easily relate to the topic now that I understand it. I will enjoy learning more about my topic in the future.

Gaining new knowledge

Being able to see my final product.

Figure 18 Student responses to Question 8

Q9. After investigating the Issue did you go on to take any action to address the problem yourself – or do you plan to take some action? (This includes sharing your results outside of the classroom situation.) If so please write about this here.

I plan to take action.

I want to present my findings in different situations and get my message out there!

No I do not plan to take any action because the action that needs to be taken I cannot do because I'm not able to because I am young, also it is government related so I cannot.

My topic is hard to change. Like with others, giving a simple solution, like turning off a light bulb to save electricity. Speeding involves the person's state of mind, which is hard to change. Speeding includes condition and person. You can't really do anything other than inform others about the stats

I might share it out. Hopefully when you present it to other schools they look at the serious side of it not just the construction process.

After the investigation on obesity it gave me a very clear idea about the situation on obesity, as prior to the investigation I thought It was not a global epidemic. As a result, it made me take a serious approach to my personal health and well-being.

I am now more aware of the need for eco-friendly sustainability. After doing my assignment, while shopping, I have definitely made more eco-friendly wise choices. I also now think it is very important for all people to realise the dangers of continuing the way we are at the present. Everyone should know that by making these different choices while shopping can make a huge difference in the long run.

I was thinking about opening my survey monkey results to the public. That way if anyone ever wants to do a similar survey it will already have been done for them. Thinking about it now, I could also send the end product of my assignment to the local government because it wouldn't hurt and they might find something useful in it. (Research into the Infrastructure of State Rail)

Yes, I've started being more electricity conscientious and started telling others about the consequences of using too much electricity and how the rises will affect us in the future

Now that I have completed this assignment I feel that I can take a small part in improving the issue. I can't do too much to change the whole of NSW or Australia as a whole, but specifically I can try to focus on not going over the speed limit while driving in the future.

Figure 19 Student responses to Question 9

Comments from parents

Comments from parents were collated through a very short survey at the end of a final information letter (Figure 20).

All parents who returned the questionnaire ticked the first box saying their student had an increased interest in their work compared to other research assignments. Very few comments were added. No negative comments were added.

1. While your Year 10 student was doing this Research Task did you notice:
   ☐ An increase in interest/engagement in this project work compared to normal project work
   ☐ A higher level of stress about this task compared to other school assessment/research tasks
   ☐ A lower level of stress about this task compared to other school assessment/research tasks

2. Comment:

This research task brought out an interest in my son to a level I have not seen before. He took on his project with an "ownership" and pride and above all enjoyed researching and presenting his findings.

Sarah had an increased interest in the family's use of electricity and often commented on ways we could save on power.

Her stress level increased when she realised the depth of the project but settled with increased research. She felt very pleased when she had completed this extensive work and her ability to complete it well.

Figure 20 Examples of comments from parents

Comments made on wiki pages by students, teachers and peers

There were not a lot of comments made on wiki pages. The class teacher and teacher librarian occasionally wrote an encouraging comment on every page. One student summed it up by saying, *It was supportive knowing that someone actually cares about this major research project that you are doing.* As well as giving encouragement, it is also a useful tool for keeping up the pace when a student is lagging behind. A wiki is very transparent and peer pressure can be a useful tool.

Reflect: student achievements

After looking at all the evidence, it is clear that the students found this method of research engaging and fulfilling. Most of the above evaluations by the students and parents pointed to the positive experience they had during the research process.

The class teacher and teacher librarian, however, could see the very real and engaging and supportive situation afforded by using guided inquiry and the ISP for guided research, and the use of wiki as a tool for sharing and supporting the students in this.

The presentation of their work was a real celebration, and all students actively encouraged and praised the efforts of their peers. Having watched

the growth of each topic, they were genuinely interested to watch the presentations and hear the solutions offered for each issue. Many had surveyed the class or the wider community to gauge opinions and had incorporated these into their conclusions.

The whole class produced work of a very high standard. All, without exception, had worked well above what they normally do in terms of creative product. Real knowledge had been created and applied to their issue.

All curriculum outcomes had been achieved by all students and by most to a very high level of achievement.

The peer reviews carried out by the students on each other's work also indicated that they were all travelling happily together on the same journey. The praise and advice they gave each other was genuine and practical (Figure 21). This was a new experience for them. Some said it was a bit confronting to be receiving advice from peers but that they did find it beneficial.

Implications for practice

The evidence was overwhelming. It showed that guided inquiry, using the *Information search process* and a wiki to share learning, encouraged the production of new knowledge.

Peer Review: to assist each other to develop a 'quality' research project

Please save this form, complete it thoughtfully and 'kindly' after considering your classmate's work. Save the changes then upload it onto that student's wiki page.

| Lindsay N | comments on the work of | Courtney W |

1. Praise: What has been done well?

I like how you have looked at every aspect of the issue on Asylum Seekers and how you have used different sources to help explain. Good explanation of your opinions. Comparing old schemes (snowy mountains scheme) to the issue.

2. Question: Is there anything further you want to have explained about this work?

Where do you think the government should get the funding from in order to allow asylum seekers a safe refuge within Australia? (e.g. taxes? charity?)

3. Polish: What in your opinion could be done to 'polish' this work?

Grammar and spelling ('their' not 'there'). Maybe add more images or statistics.

Figure 21 An example of peer review saved to the student's wiki page

The environment of mutual peer and teacher support and the enjoyment of learning had not been experienced before by the students. Their enthusiasm was obvious. Here are some examples:

- Two of the students presented their experience at the *21C school libraries – Getting into the action* seminar in Sydney (2010) and also at our full staff meeting K–12. Their enthusiasm and documented evidence of their journey was inspirational. Consequently, many more teachers at the school and many teacher librarians at the conference have vocalised their intention to embark on the guided inquiry experience.

- A number of students have begged their new Year 11 teachers to ask the teacher librarian to set up guided inquiry for their research tasks in 2011.

- After the end of the process, the class teacher stated that they all went through a withdrawal period where class work seemed so *boring*.

- A number of students came into the library asking when the teacher librarian was going to come back and help them again, as they enjoyed learning that way.

As this was the third action research cycle for the teacher librarian, changes have been made and built upon after each cycle. Some members of this recent group stated that they would have liked more lessons specifically on using a wiki. This will be incorporated into projects in the fourth cycle in 2011. More scaffolds were used this time and most found them very beneficial. However, a few students found some of them intrusive and unnecessary. Consideration will be given to making a few of them optional.

The class teacher, speaking at the *21C school libraries – Getting into the action* seminar in Sydney (2010) of his experience said:

> What inspired me about the whole process was that it answered the question, How can I make a

difference to these students and help them to take something away from the school?

The skills learnt can be applied throughout their lives. The students learnt to create their own research results and then proved that their findings mirrored that of wider research and this was then applied to their inquiry question. They found this authentic learning very exciting and valuable.

The students have agreed to share their work in the interest of students and teachers everywhere, so others have a model for using this method in their learning and teaching.

Examples of their work and video footage of their presentations can be seen from the *Broughton Information Resource Centre blog: BACIRC* at <bacirc.edublogs.org/guided-inquiry/>. ∎

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