Information Maps: Supporting Students Through Their Research and Writing Processes

Authors

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Imaps provide a visual description of the sources students have engaged with over the research stages of a project. An imap typically includes information about the sources themselves, where they were found, and how they relate to the topic of interest. This publication describes how imaps have been integrated into a first year science class as a way of enhancing information literacy, reducing plagiarism and facilitating feedback on students' research and writing processes. Recommendations for using imaps to promote student research and writing are provided.

Introduction

One of the biggest learning hurdles for students when writing assignments is understanding how to work with other texts. At one level, this is a simple matter of information literacy: students are unsure of what constitutes a quality or appropriate source for a specific context. But at a more complex level, once students have found their sources, they are unsure how to use them. Common questions they ask include:

- Do you want me to just say what everyone else says – or do you want to know what I think?
- What should I do if I disagree with an author?
- How do I balance what I think with what other authors say?
- How much should I quote? What if I can't think of another way of saying something?
- What if I plagiarise by accident?
- What do I do if I just know something and can't reference it?

It may be that the only advice students are given about negotiating the use of secondary sources are dire warning against the perils of plagiarism or instruction on the mechanics of APA conventions – neither of which are effective ways of supporting students as they grapple with these complex questions (Howard, 1999; Lillis, 2001; Gaipa, 2004; Park, 2003).

Our interest in finding ways of helping students develop information literacy and the skills to negotiate relationships between their own ideas and secondary texts emerged out of our work with first year students. Also:

- plagiarism had emerged as a problem in one of our classes, and subsequent investigation showed that most students did not have a full understanding of the complexities of the issue (see Emerson, et al, 2005).
- We had concerns with the quality of our students' research strategies and with their understanding of the writing process for a complex document such as an academic essay or research report.
- We were concerned that standard approaches to teaching the writing process were too wordy for our more visually and kinaesthetically orientated science students.

Background

We first encountered the information mapping concept (the imap) at a conference[1] on plagiarism where Walden and Peacock (2008) introduced it as a tool they had developed to combat plagiarism and develop research skills amongst graphic design students. We saw that the imap could have far more wide-reaching benefits. In particular, we developed the following ideas:

- that the imap could be adapted in a range of ways for teaching students both appropriate methods of interacting with secondary sources and appropriate writing processes;
- that the imap could be an invaluable tool for facilitating teacher feedback on students' research and writing processes; and
- that it would be a particularly effective way of teaching writing processes to visual or kinesthetic learners.

We therefore decided to adapt the imap for three courses we were teaching, and to evaluate (through a range of data collection methods such as reflective journals, questionnaires, student and tutor interviews) the effectiveness of the imap for the purposes outlined above. This paper focuses on the use of the imap in one of these courses - a first year science writing course – and shows how imaps could be used in other courses.

What is an imap and what are its key features/benefits?

An imap, as conceived by Walden and Peacock (2008), is described thus:

> The imap is a way of recording the research stages of a project, focusing on the information-handling process. ...An imap logs such things as finding sources, reading and evaluating them, taking ownership of ideas, formulating a response or argument, evaluating sources where appropriate, and building a bibliography, in a visual account of the process (Walden and Peacock, 2008, p. 142).

It can include any graphical representation of the research process, including annotated bibliographies, journals, interview sources, mindmaps, flow diagrams, images, key words etc. The key issue is to represent the pre-writing and writing process, through a combination of graphical and written material (Walden and Peacock. 2008).

[1] 1 - *Originality, imitation, plagiarism: A cross-disciplinary conference on writing, University of Michigan, Sept 23-25*.

An imap corresponds with other forms of pre-writing (eg research logs) and is expected to have similar benefits for students. However, two things were significantly different about the imap, as we designed it, compared with other kinds of pre-writing activities

a. its substantially graphical nature
b. the integration of writing process activities with source-interaction approaches.

The imap can take a range of forms and be used for either formative or summative assessment. In this class, we used the imap for both formative and summative purposes, and evaluated the process over three semesters.

How the imap was integrated into a first year science class

Communication in the Sciences (119.155) is a compulsory course for most students enrolled in a science degree at Massey University (approximately 700 students annually). The course assessment includes two written assignments: an essay and a group report. The imap was incorporated into both written assignments, and was used both for the formative assessment (during a tutor clinic – a meeting between a student or student group and a tutor), and marked (20% of the assignment grade) as part of the summative assessment.

The imap for this course was presented similarly to the imap developed by Walden and Peacock, but with the addition of incorporating material where students visually represented their interaction with secondary sources. For the individual essay, students were asked to develop an A4-A3 sized visual representation of their research and writing process, and their interaction with their texts; for the group report, the student groups were asked to develop a poster sized imap which represented both their individual and group process.

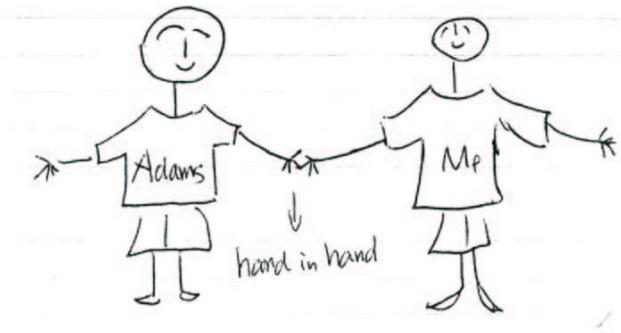
Our aims for the imap for our students were two-fold:

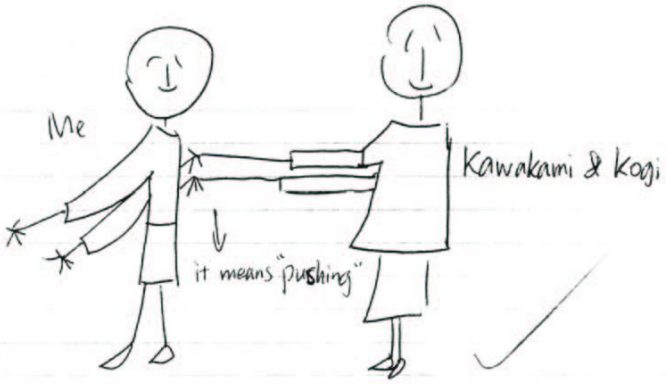
1. We wanted our students to understand the research and writing process
2. We wanted them to engage fully and appropriately with secondary source material (for example, critiquing texts and considering how their own ideas related to those of other sources).

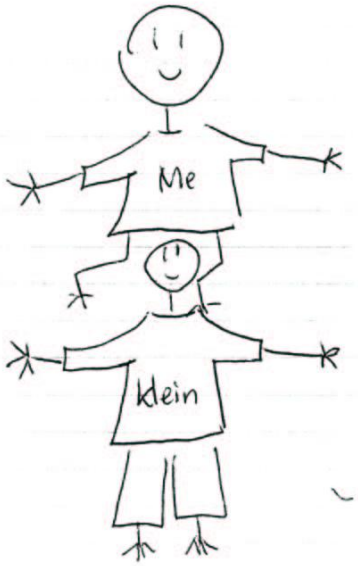
We therefore scaffolded the imap writing process in a number of ways. Firstly, we modelled the writing process in class – and in this way students were helped to build up the imap over time. For example, in week 2 of the course, students completed a brainstorm on their topic and listed potential key words. In week 3, they wrote out a detailed account of their research strategy and outcomes. In week 4, they wrote annotated bibliographies and new ideas from their reading. All this material was then transferred to their imap in visual form.

Second, we asked students to engage with texts in active ways. For example, as mentioned above, we asked students to write short annotated bibliographies in class and share their ideas with others. We asked them to write annotations on an article itself to model the idea of interacting with a text. In one of the other classes that used imaps, the course coordinator asked students to draw pictures which indicated their own relationship with a text (eg were they holding hands with the source, at war with them, or leapfrogging over them?), as suggested by Gaipa (2004). In this way, we hoped to help students see how reading was an active process which involved critical and personal engagement.

The following pictures (pages 4-6) are examples of how students have indicated their relationship with their texts –

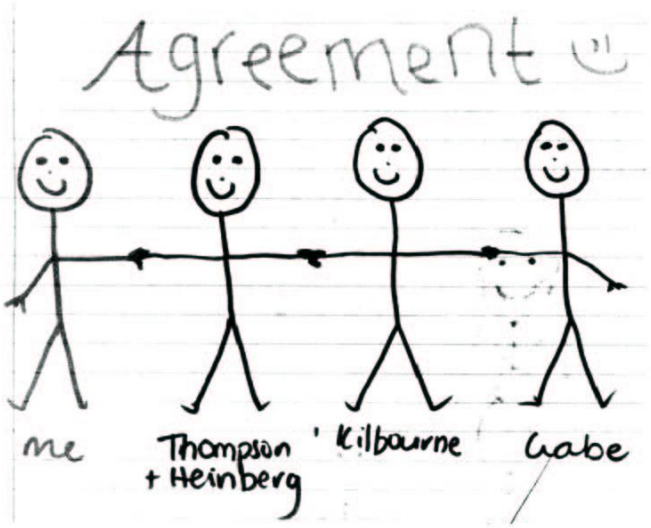




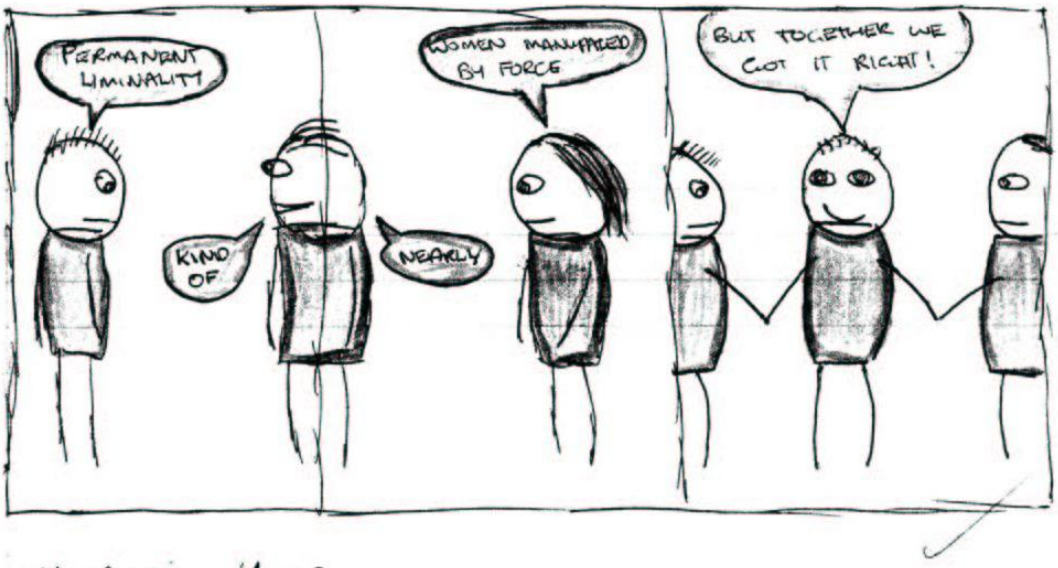


Leap frogging
me
Thompson + Heinberg
Kilbourne

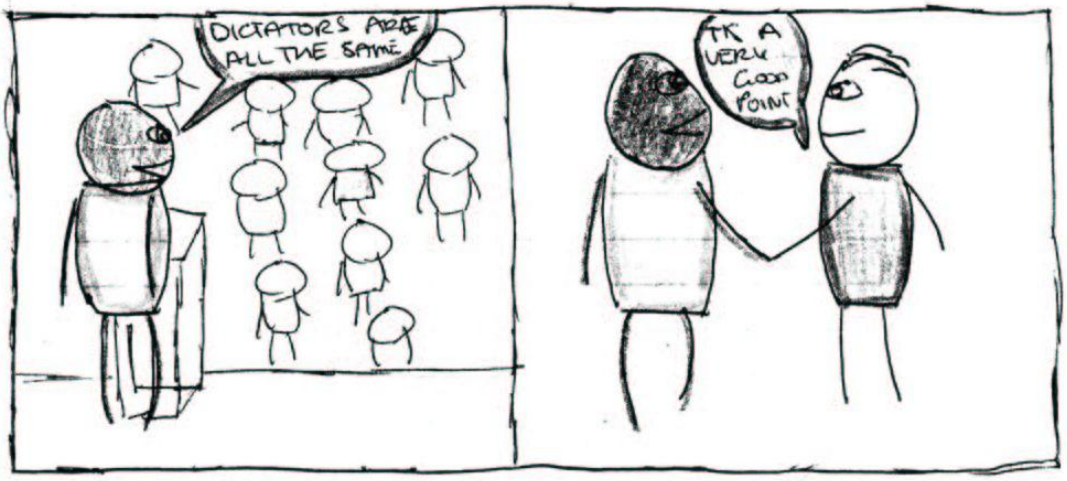
Dropping out
me
Rodman


Agreement
me
Thompson + Heinberg
Kilbourne
Gabe

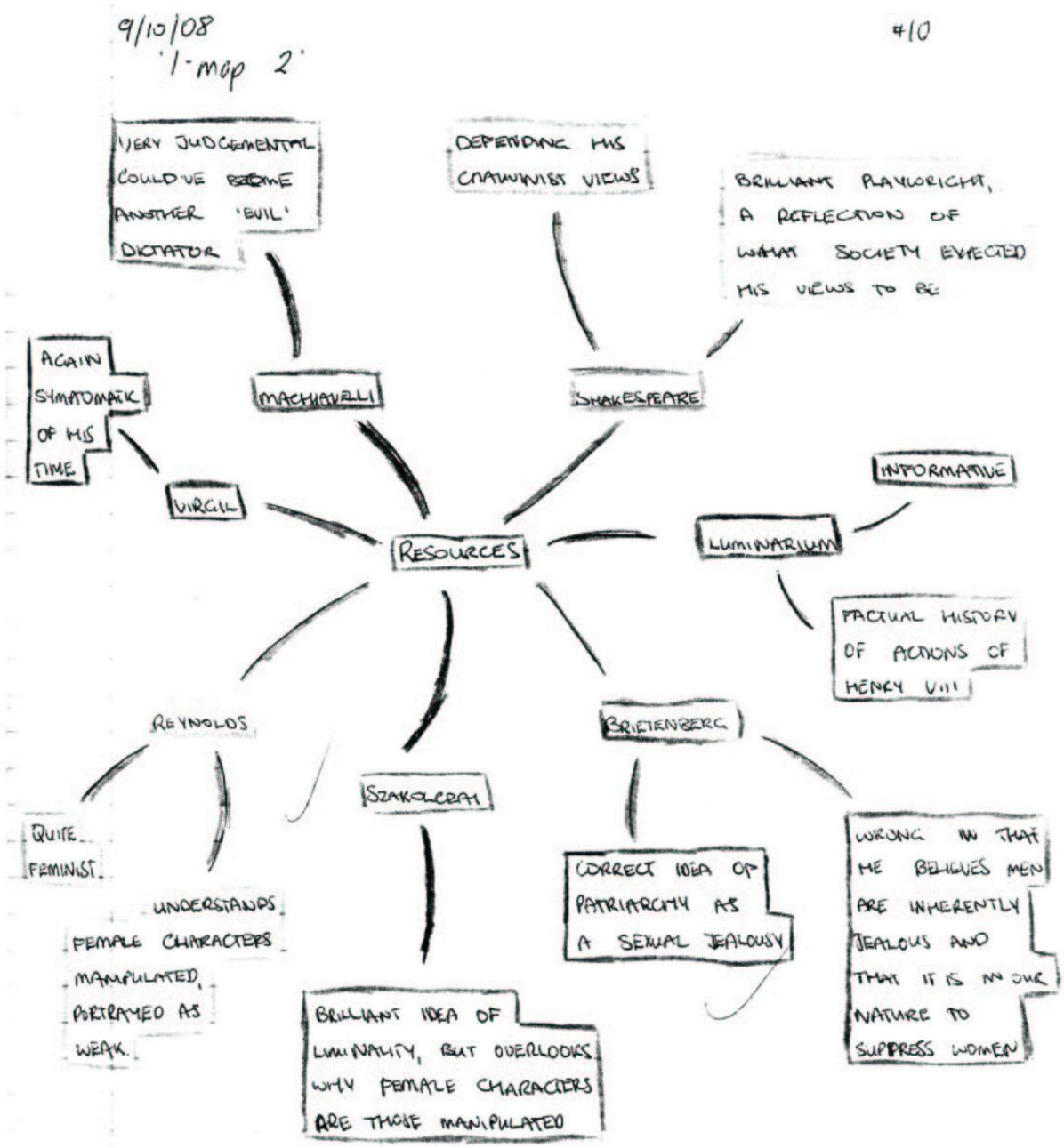
Arpad Szakolczai vs Paige Reynolds

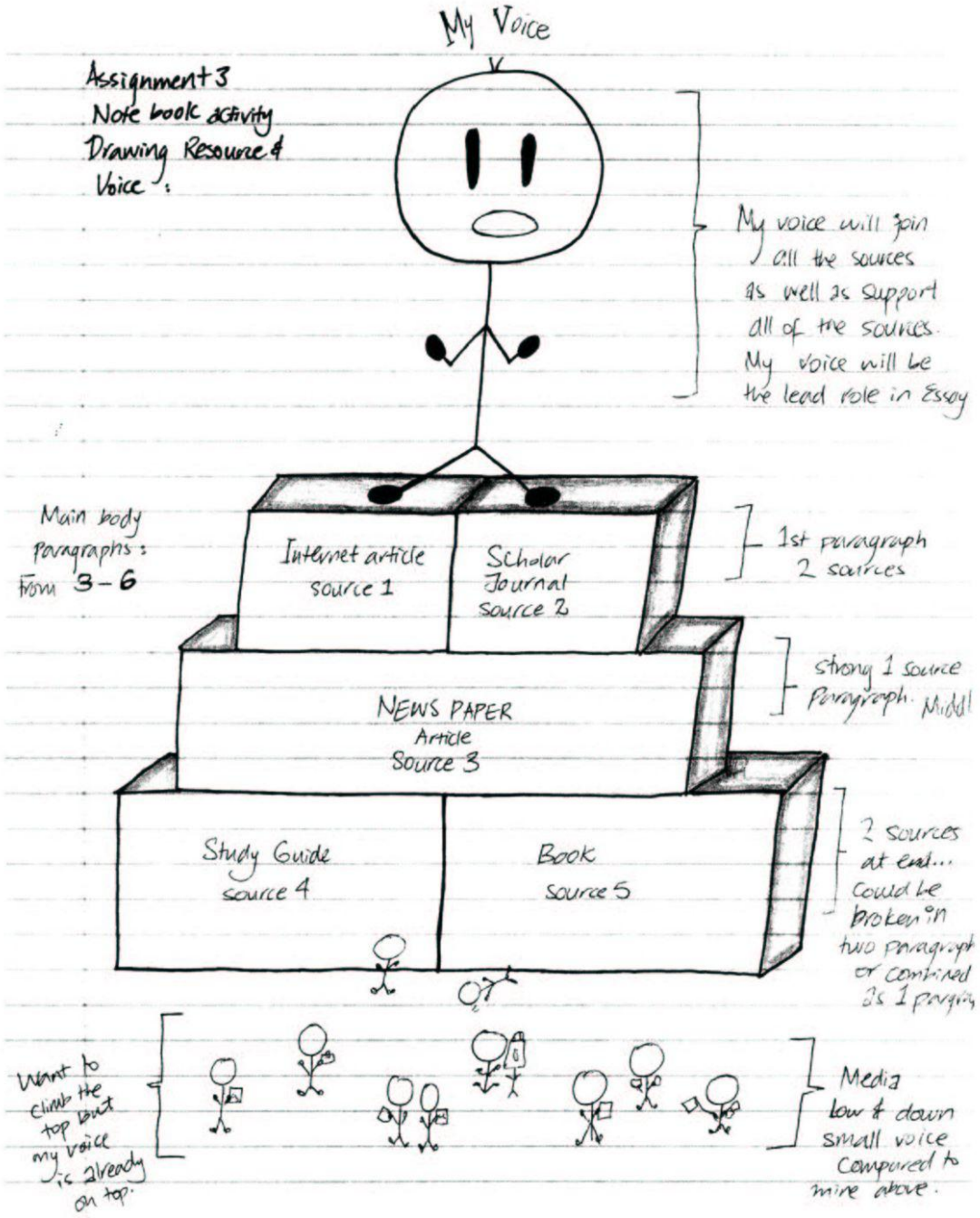


Chenjerai Hove

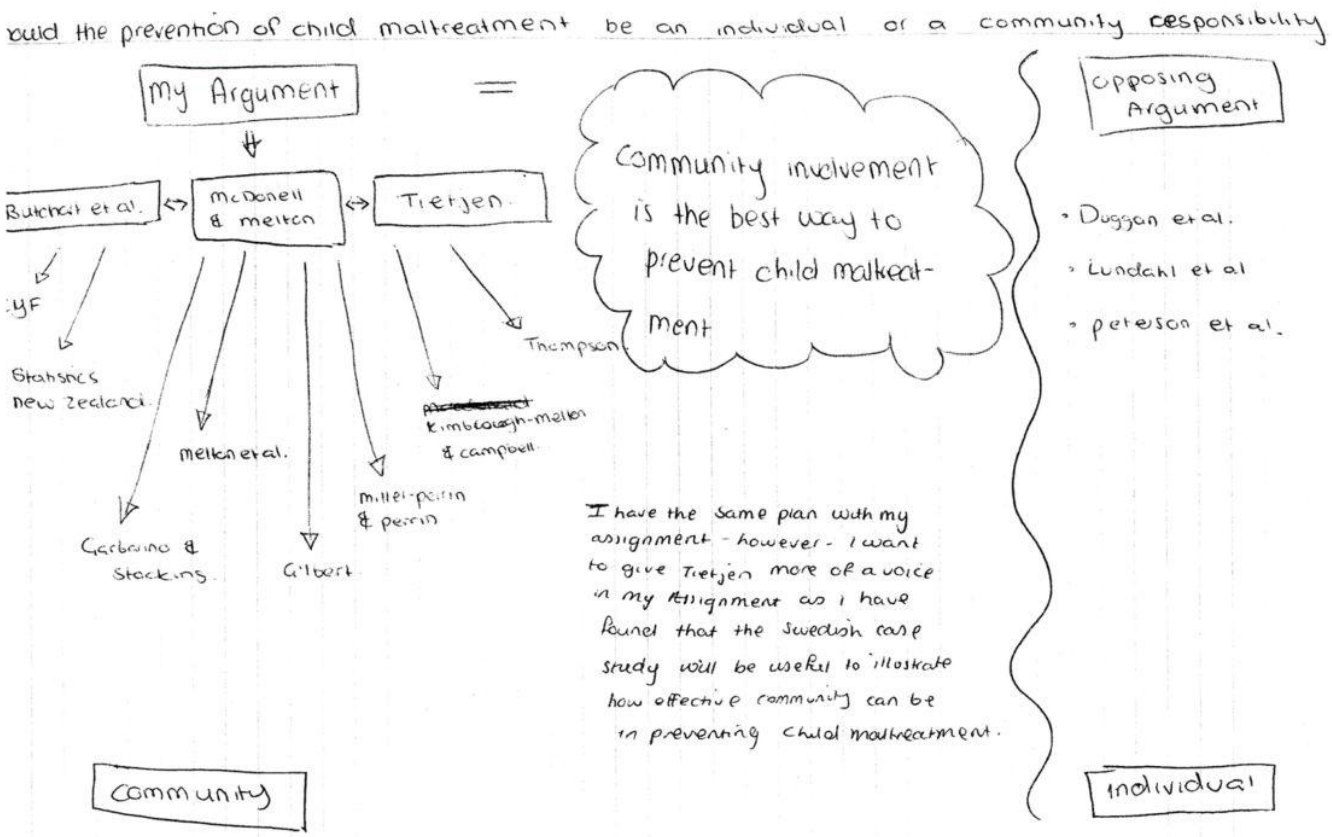


From here, students were asked to draw mindmaps which showed their engagement with sources in relation to the structure and theme of their assignment (pages 7-9).




My Voice
Assignment 3
Note book activity
Drawing Resource 4
Voice :
My voice will join all the sources as well as support all of the sources. My voice will be the lead role in Essay
Main body paragraphs : From 3 - 6
Internet article source 1
Scholar Journal source 2
1st paragraph 2 sources
NEWS PAPER Article Source 3
Strong 1 source Paragraph. Middl
Study Guide source 4
Book source 5
2 sources at end... could be broken in two paragraph or combined as 1 paragra
Want to climb the top but my voice is already on top.
Media low & down small voice compared to mine above.

2nd drawing.



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Third, at our students' request, we provided a handout on what must be included in the imap; however, we encouraged students to add other items into their imap if they were relevant to their process, and to be visually creative. Students also asked for models of imaps, so they could understand the concept more easily, so we collected copies of great imaps, and displayed these in a meeting space where students could view them freely.

We did initially fear that providing too much direction and models would lead to a standardised, idealised product, but these fears were completely unfounded. On the contrary, the combination of engaging in in-class scaffolding and exercises, and providing models and directions seemed to free up students to engage creatively with the material, both in what they included in the imap and how they portrayed the visual process. No two imaps are ever the same – and we were confirmed in our view that taking a visual approach to teaching process has been enormously helpful in enabling our visual and kinesthetic learners to understand the writing process. Students generally take great pride in the visual representation of the imap. Furthermore, our students' assignments show evidence of students being more confident about engaging with secondary source material, articulating their own position in relation to a research question, and understanding the writing process.

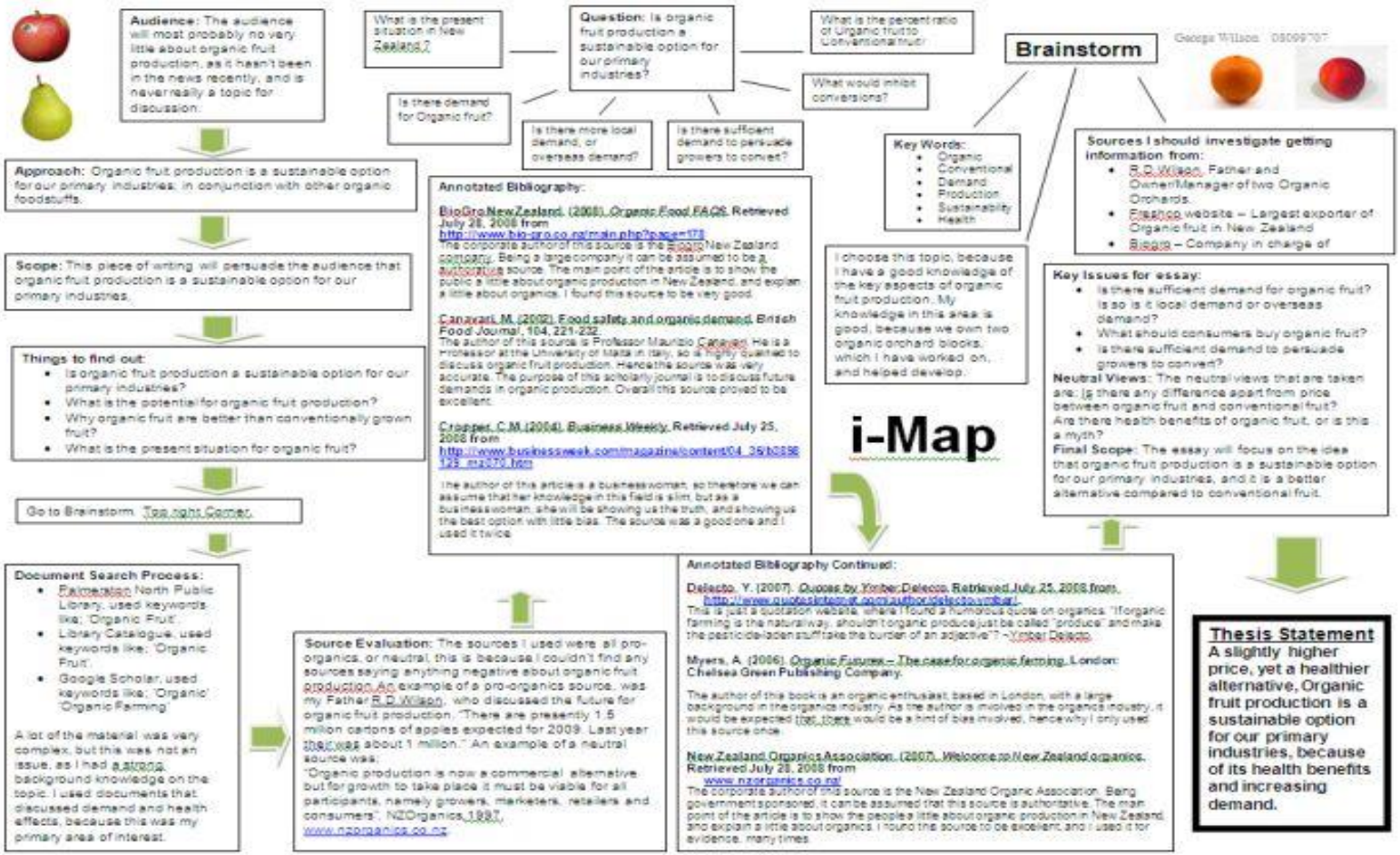
The imap has also been very useful for tutors as part of the formative aspect of the assignment. One of the course tutors commented recently "I used to have to read a whole essay before I could confirm if a student had based their essay on three sources from a google search. Now, I can simply glance at the imap and see in a moment that this is the case, and can address the issue directly. And students know this is the case and so they simply don't try to take the short cuts". Another commented "The imap, more than anything else, has taught students the value of a careful information gathering and writing process. It models the process for them, and so teaches them how to engage and, more importantly, interact with sources"

Benefits of imaps

Our research showed that students benefited from the use of the imap in a number of way. These are the key benefits of imaps:

- They help students articulate the value of a research source
- They help students to establish their relationship with a research source
- They help students to follow an appropriate search strategy
- They support students through the writing process, and enable them to articulate an effective writing process.
- They provide invaluable information to tutors at a formative stage, allowing them to instantly assess a student's research strategy and provide formative feedback to students.
- They are useful in group projects at the formative stage as discussion points for groups in relation to process and secondary source material
- They are useful to markers of group projects, to show how different group members engaged with secondary source material.
- The visual aspect of the imap was perhaps one of the greatest benefits to students. A majority engaged creatively with the visual aspect and showed pride in the quality of their work.

Examples of imaps from Assignment 1- individual essay



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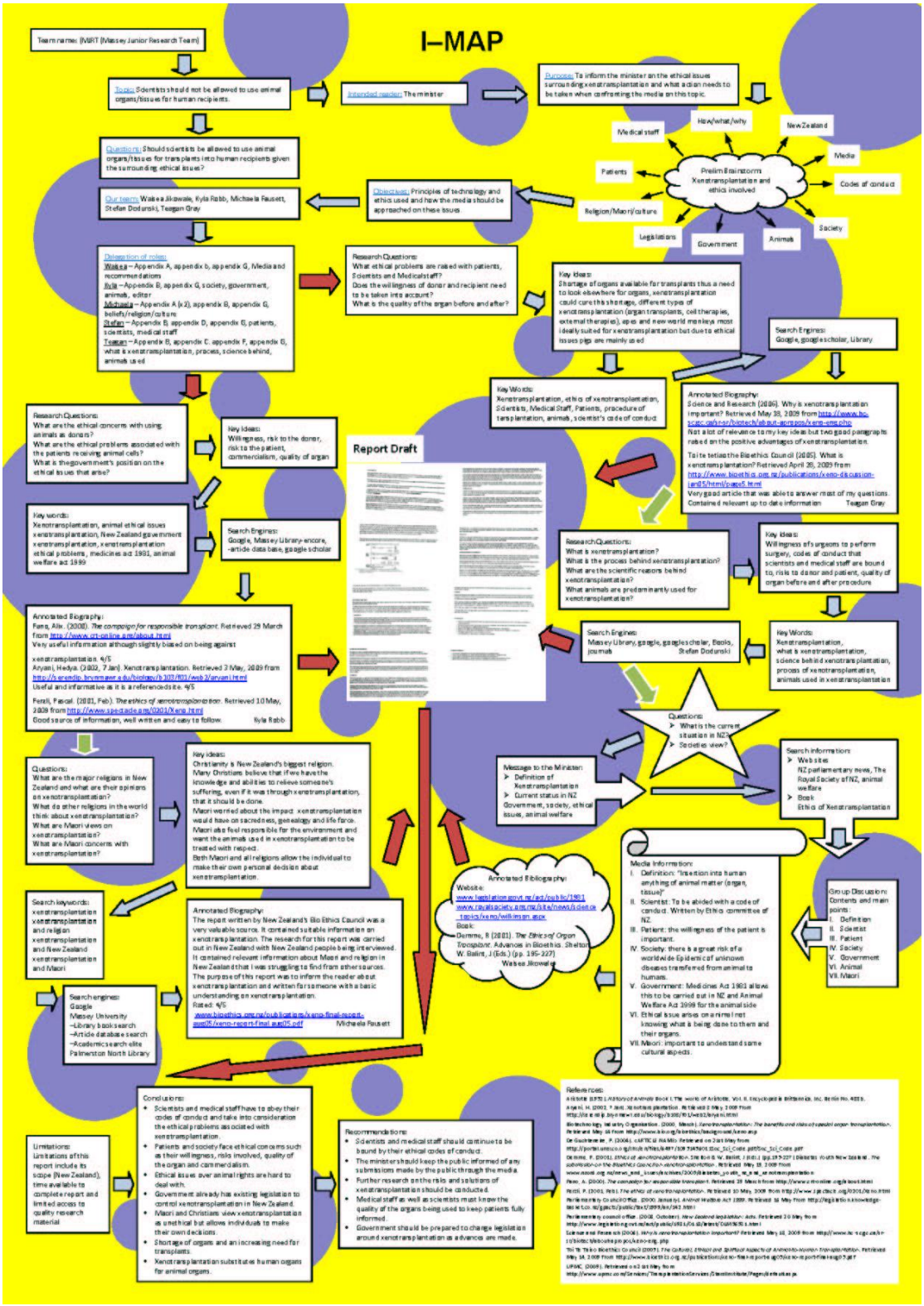
Examples of imaps from Assignment 3, displayed across pages 13-15 (group report) –



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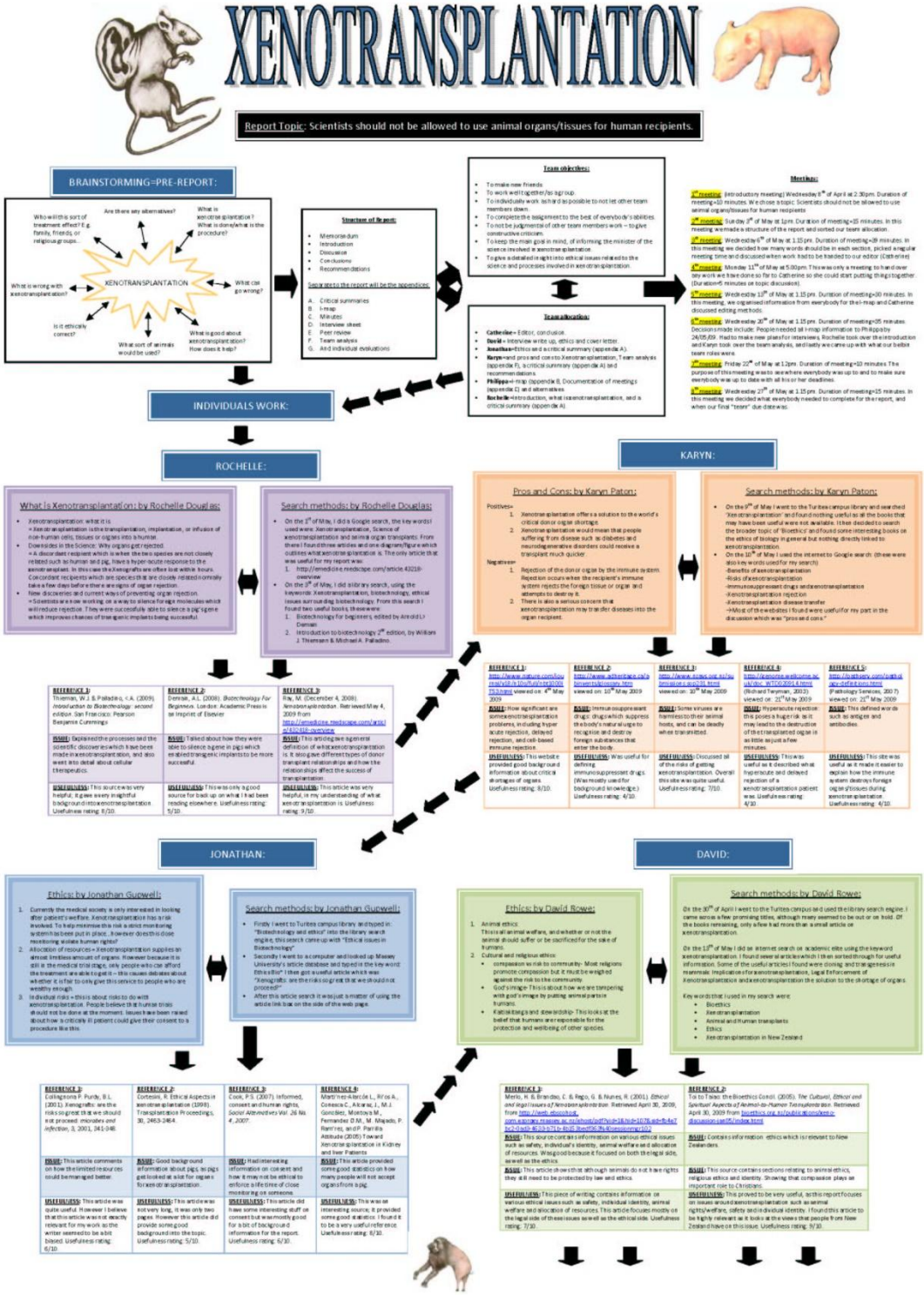

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BRINGING IT TOGETHER:

CATHERINE:

Editors Piece: by Catherine Carter:

- First Draft: Overall good grammar usage and layout techniques. Most of the ideas being put forward are concise and clear to understand. They are relevant and easy to follow.
  The only things that need to be worked on are more detail is required and more explanation of points being out across. Referencing needs to be looked at as well. We need to make sure we do not go off track either. More about how the minister can handle the meadia. I think we need to work out how reports are actually formatted as well. Overall, awesome first drafts.
- Second Draft: Overall the report is coming together well, everyone has completed and corrected what I have requested. There still needs to be changes made to the formatting and the conclusions and recommendations but these can be brought up in meetings. There are still parts of the report to come but I am confident they will. Everything for the report should be done now and there should be no new information. Hopefully this is the last draft.
  → From the 2nd draft there were only minor changes that needed to be done to complete the whole report.

PHILIPPA:

Alternatives: by Philippa Vruink:

The Alternatives discussed throughout the report are:

1. Stem cell transplantation: This involves producing one or more organisms genetically identical to the parent that donated the single cell.
2. Artificial or mechanical organs: This is a good alternative for people who are on waiting lists; however this still has issues with the effectiveness.
3. Aborted fetuses: This transplantation method involves organs from infants that have been aborted to be transferred into live infants (very controversial).
4. Efforts to increase human organ donation: Making the public aware is a start, also putting emphasis on the facts e.g. brain dead people cannot return to life, also there needs to be ways to have at hand people's willingness to donate organs.

Search methods: by Philippa Vruink:

- On the 3rd of May I went to Turitea campus library and did a search using the library search engine, the key words I used were: Xenotransplantation, Bioethics alternatives, Organ transplantation. There were a couple of books that look like they may have been useful but they were taken. However I got out:

Thieman, W.J. & Palladino, M.A. (2004). *Introduction to Biotechnology*. San Francisco: Pearson Education.
-> This book was good for background reading but was not used in my part of the report.

- On the 10th of May I did a Google search using the key words:
  1. Xenotransplantation
  2. alternatives to xenotransplantation
  3. Organ donation
  4. Bioethics

This search came up with some relevant articles that were useful for my part in the report which was alternatives to xenotransplantation.

Overview of Team analysis: (Appendix F)

This was an interesting group which had to stay focused, especially in the last couple weeks of the assignment; we did have our ups and downs but got through it all in the end. We made decisions by discussing the positives and negatives as a group and then voting. The leadership style of our group is non-directive or laissez faire.

Our Belbin team roles were:

- Catherine=Monitor evaluator, Team worker and completer finisher
- David=Resource investigator
- Jonathan=The Plant
- Karyn=Team worker
- Philippa=Leader (non directive or laissez faire), Coordinator and the Implementer
- Rochelle=Implementer.

Conclusions:

- Has potential to solve or reduce organ shortages, this means less people will be on waiting lists.
- There is a high risk of organ rejection.
- Highly controversial.
- It is hard to decide whose rights take priority because the topic is so controversial.
- Wide range of public opinions.
- Human transplants still remain the safer more preferred option.

Report Limitations:

1. Time constraints.
2. Word limit of 2500 words.
3. Lack of local experts on the topic.
4. We could not look into all alternatives, or the ethics behind the alternatives we did look into.
5. We did not cover all the problems/ethics behind Xenotransplantation.
6. Lack of resources, when going to the library a lot of books were on hold or were already taken.

Recommendations:

- Research needs to be done, public need to be better informed.
- Research into immunosuppressant drugs needs to be done.
- Who gets the right to say whether animals should be sacrificed?
- There needs to be a hierarchy of whose rights have priority.
- Amend the law allowing families the right to overrule organ donation.

REFERENCE 1:	REFERENCE 2:	REFERENCE 3:	REFERENCE 4:
Center of bioethics. (2004) *Ethics of Organ Transplantation.* Retrieved May 10, 2009, from http://www.ahc.umn.edu/img/assets/26104/Organ_Transplantation.pdf	Corr, C.A. & Corr, D.M. (2007). Retrieved May 10, 2009, from Organ Donation and Transplantation: http://www.deathreference.com/Nu-Pu/Organ-Donation-and-Transplantation.html	Mayo Clinic Staff. (2008, April 11). *Stem cell transplant.* Retrieved May 10, 2009, from MayoClinic: http://www.mayoclinic.com/health/stem-cell-transplant/MY00089/DSECTION=results	White, J. (2005). *The Cultural, Spiritual and Ethical aspects of Xenotransplantation.* Retrieved May 6, 2009, from ta te taiao the Biotechs Council: http://www.bioethics.org.nz/publications/xeno-discussion-jan05/html/page2.html
ISSUE: An interesting transplantation method was in this article, this was aborted fetuses. However there are debates about this being morally wrong.	**ISSUE:** This article had a lot of information about 'organ donating' and what can be done to increase the amount of organ donors.	**ISSUE:** Mentioned a problem where the donor cell will attack the host cell this is called "Graft-versus-host disease".	**ISSUE:** States that in New Zealand, families have to give consent if they want their loved ones organs donated to another person.
USEFULNESS: This was an extremely useful article; it stated a few different alternatives. This was the most popular source I used. Usefulness rating: 8/10.	**USEFULNESS:** This site was also quite useful; it had some interesting methods to help with getting more humans to donate organs. Usefulness rating: 7/10.	**USEFULNESS:** This was not as useful as some of the other references; it did have some good background information on stem cells though. Usefulness rating: 4/10.	**USEFULNESS:** This was not as useful as the other resources; it was good for a bit of background reading and started me off quite well to know what I needed to look for. Usefulness rating: 3/10.

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Recommendations for using imaps to promote your students' research and writing process

Imaps could be included in any course that is concerned about the quality of students' research strategies, and where students need to learn how to interact with other sources. If you would like to use imaps as part of your assessment strategy, we recommend the following:

- You need to take a broad, creative approach to what an imap might look like, so that students are allowed maximum creativity in the process. It is beneficial to provide a wide range of models to students, to assure them that a wide range of approaches are appropriate.
- You need to provide a list of items that should be included in the imap, with emphasis on the idea that other items may be included.
- It is important to emphasise to students that you would like them to present a real (as opposed to idealised) representation of their process.
- Ideally imaps should be used initially as part of the formative assessment process. This allows students to then correct any errors in their information search strategy.
- They can also be used successfully as part of summative assessment, if you wish to reward effective process as well as effective product.

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Howard, R. M. (1999). *Standing in the shadow of giants: Plagiarists, authors and collaborators*. Stamford, CT: Ablex Publishing.

Lillis, T. (2001). *Student writing: access, regulation, desire*. London: Routledge.

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Walden, K., & Peacock, A. (2008) Economies of plagiarism: The imap and issues of ownership in information gathering. In Vicinus, M., & Eisner, C. *Originality, Imitation, and Plagiarism: An anthology.* Ann Arbor, MI: University of Michigan Press.

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