

Refocusing the architecture of assessment, learning and teaching

Refocusing marking practices to enculturate learning: developing a practice architecture

AJ. Hunter*, C. Kestell, D. Missingham and L. Westphalen.

*The University of Adelaide *Corresponding Author Email: alison-jane.hunter@adelaide.edu.au*

C1: Integration of theory and practice in the learning and teaching process

CONTEXT

In a design engineering and professional practice core, which is embedded in each of the four levels of undergraduate engineering, the need to develop more sustainable marking practices has become increasingly apparent. This need is particularly evident within professional practice, including engineering communication, as the marking is particularly time-consuming for many aspects of these courses. To address this need, a far more multi-layered, team-orientated approach is required to ensure succession as teaching staff leave, provide consistency of grading for the students and ensure that teaching and learning lie at the heart of the marking process. To achieve this, a team of twelve markers, from 2nd year undergraduate through to postgraduate levels, has been brought together. This range of markers enables the development of a team that can evolve cohesively and be fully trained and moderated. This process seeks to build a bank of expert, inclusive markers who can 'buy in and out' of the marking schedule in accordance with their own learning schedules, enabling us to both mentor and promote marker skills and to support our best markers. Simultaneously a practice architecture for marking is being developed, which continues to support students through the assessment processes of each course, whilst strengthening the connection between the students and their teachers.

PURPOSE

This study is designed to examine the effect of varying practical elements of assessment architecture as a method of integrating continuous teaching and learning into assessment.

APPROACH

To mirror the cohort, we selected a diverse range of successful engineering students from 2nd year undergraduate to 1st year postgraduate levels, to mark into a L1 course on writing in the first instance. Professional Practice reoccurs in L3 and Honours but L1 is our trial ground. We have begun the process of examining the practice architecture of marking, our aims and objectives and devised a new system of approaching marking using questions to challenge those being assessed rather than taking a more traditional deficit approach. The system is designed to be swift and effective for all stakeholders, enabling us to make marking part of the learning process, as well as an efficient approach to returning the marks to the students.

RESULTS

We have evaluated our philosophical approach, levels of inclusion, types of student response, depth and efficiency of marking and the impact of a marking load on the well-being of the markers, using instruments such as short surveys and semi structured discussions.

CONCLUSIONS

We feel confident that reviewing the architecture of our practice will enable us to build a bank of confident, secure markers who mark to level. We also have confidence that the students receiving the type of feedback we are proposing will gain clear advice and support for their ongoing learning in professional practice.

KEYWORDS

Teaching and Learning, Assessment, Practice Architecture, Well-being

The Introduction

This year, to address the need to develop a successful, engaged marking team, to continue to increase the quality of marking and to encourage the recipients of the marking to engage fully with the advice offered, a new practice architecture of engagement and delivery of assessment within a Level 1 Professional Practice course has been explored. The chosen course for the pilot testing was an introductory course for Mechanical engineers.

The levels and style of marking will then be reviewed and expanded to cover the related Professional Practice courses throughout Levels 1 to 3, in time impacting significantly on the Honours level enactment of Professional Practice. Whilst the course has been revised from a contents perspective, as it is annually, it was important to the team to place assessment practice at the heart of learning and teaching rather than being purely summative, thereby creating an impact that goes beyond the immediate assessment piece.

The vision of assessment sought is that it is dynamic, replicable and, above all, not only summative assessment *of* learning (the university requirement) but formative assessment *for* and *as* learning (the learning and teaching driver for the course), with the facility for improvement put firmly onto the students who carry their individual learning forward into future, aligned courses. The practice architecture of assessment is envisaged as what Kemmis (2008) calls a “mediating precondition”, designed to frame, upscale and shape learning, rather than simply define current learning without any design for progression of learning and practice. Thus, from the outset, the embedded protocols were designed to be inherently developmental and reviewable. Critical also was the desire for the processes and practicalities of assessment to be sustainable and supportive of the well-being of the markers: that is, enabling the development of an ongoing team of markers who could then themselves train new recruits in due course, developing reliability, consistency and engagement with this critical discourse.

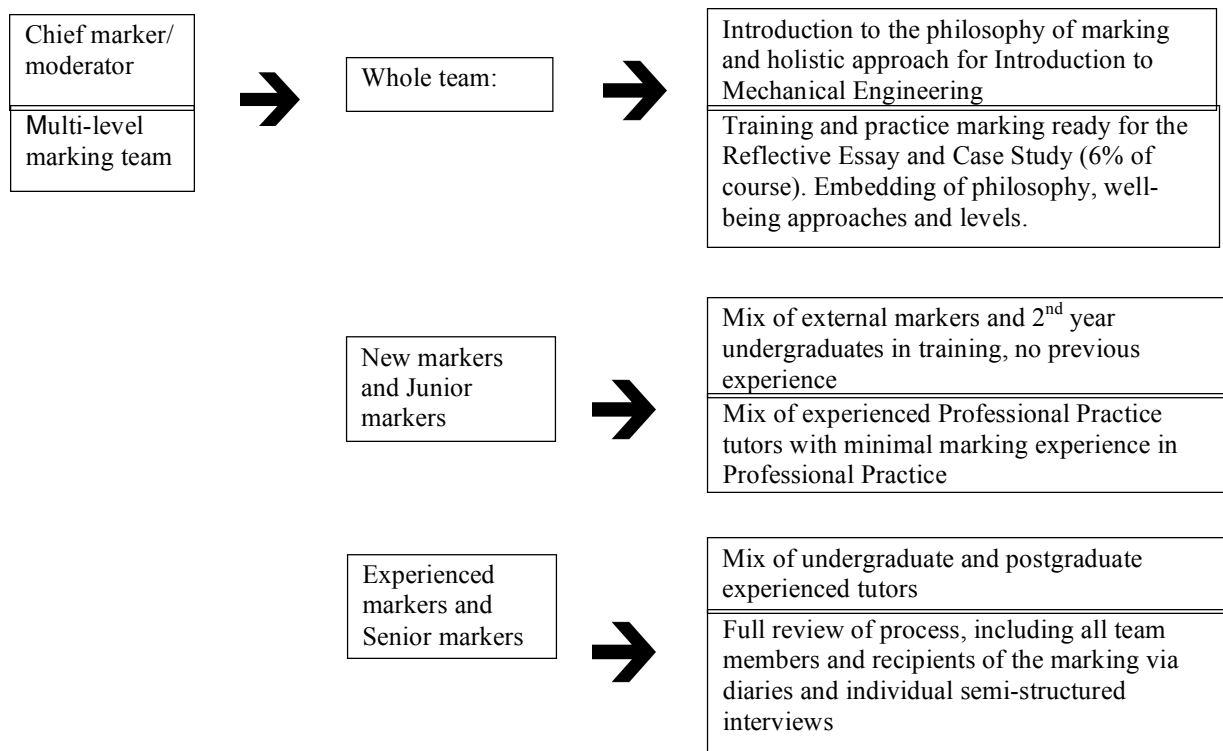


Figure 1: Schematic of Marking Training as an iterative process (paralleling the Engineering Method) (Hunter and Missingham 2017)

Whilst in previous years, teams of (primarily) undergraduate and (occasionally) postgraduate markers have been employed, the teams have been small and can be affected by the timing of assignments of the markers' own. Clearly, a large enough team that some would always be

available and supported by more experienced markers was important to avoid issues of marker overload. However, the more markers there are in the team, the more variations in understanding of rubrics and applications of grade boundaries are possible.

A team that feels confident in its skills and interchangeable is therefore ideal, so that marking can be undertaken with consistency, despite the fluctuating membership of each team for individual marking projects and the varying numbers of markers involved. This breadth of knowledge also protects younger, less experienced, markers from being overwhelmed by the sheer volume of marking to be covered and simultaneously builds confidence and skills. Important also was to ensure that the new practice would be both reviewed and embedded in practice, a feat rarely achieved in a world of innovation overload (Goodyear, Casey and Kirk 2016). An approach that is transformative and sustainable at a deeply individual, as well as an institutional level, was therefore sought (Freire 2005 in Yagalski 2012).

The Approach

The approach incorporated developing a philosophy of marking (marking as assessment using Socratic questioning), a philosophy of marker support (well-being practices), selection of the individual members of the team and mechanisms for reviewing the process (structured tinkering). Selection of the marking team was the first critical task: it was important that this team reflected the cohort of Engineers, was confident in its own professional practice skills and felt empowered to make judgements about the writing of the new cohort.

Once the team was selected, balanced to reflect the gender, language and cultural elements of the cohort, training was begun. The training involved a strong time and task framework designed to protect the markers from stress and overwork. Whilst being rigorous in the clarity of its demands and having a didactic purpose for the recipients, the framework also involved discussion, seeking both understanding, personal involvement and ownership from each stakeholder (student markers, student learners and lecturers). Views were sought, shared and brought into the framework through a series of training meetings which were as egalitarian in nature as possible. The details of the training sessions were vital to this process and included running the training in the student learning Hub, to ensure the markers were comfortable and felt ownership of the training space, thereby encouraging them to take an active role in the process of marking, even before pencil was put to paper (Salomon and Perkins 1988).

The first element established was the academic purpose of the assignment. The training document explains that “the students have been given this assignment to test their understanding and knowledge of the Engineering Method, report writing skills, ability to write in the expository style, ability to find appropriate case studies and their ability to write citations correctly. This is a complex task and the variant drivers are all written into the rubric to support both the writers and the markers” (Hunter 2017). This form of testing drives the need for an holistic assessment that produces a final grade, an assessment of learning, that will stand as part of each student’s degree and it provides rigour, purpose and authenticity to the marking. It also supports understanding an application, at a first-year level, of developmental forms of reflective practice (as *per* Dowling, Carew and Hadgraft 2013).

The framework for the responses, however, is also socio-affective, as is reflected in the reminder that “the work has been completed and handed in, on time, in almost all cases. The students are now looking for a response”. It was felt important to remember not only abstract standards, which need to be upheld to ensure the degree ultimately has value in the marketplace, but that real people are at the beating heart of the process. Some 260 of the nearly 300 students in the cohort handed this assessment piece in. Each of those 260 people, therefore, valued their learning and degree sufficiently to complete a challenging task and develop their professional practice skills. The markers agreed that the responses given should give respect to that achievement through the wording of the individual responses, which need to indicate that each individual assignment has been taken seriously and considered for its merits, as well as including suggestions about how to improve the skills set of the individual recipient further. This philosophy drove the need to include assessment for learning, as well as assessment of

learning: it is a way of honouring that effort and dedication on the part of the student and recognising the diligence they have shown. It was also felt important to encourage the 40 students who chose not to complete the task to reconsider this position and the role of professional practice within their Engineering degree.

Thus, as part of this transformative praxis, the team has sought to include a tri-partite approach to assessment, covering all the elements of teaching and learning available through this course, generating, explicitly: “a) A mark which will go on the students’ transcripts, providing them with summative evidence of their achievement in this course. This is called *Assessment of Learning*; b) Feedback which will enable the students to improve on later, similar tasks and provide a form of dialogue for them so that they understand their own strengths and weaknesses and know what to do to improve their work. This is called *Assessment for Learning*. It is formative in nature and should support learning; and c) Formative feedback that enables the students to feel good about their achievements and engaged with the learning process. This is crucial for well-being, positivity and engagement. This is also *Assessment for Learning* and is delivered through the wording of each marker’s responses, which are designed to be helpful, affirmative and emotionally supportive”.

Through this process, the markers should also gain deeper understanding of the issues raised by the task and this knowledge will then be fed back to the task setters, rubric creators and future markers to complete the assessment loop and enhance the experience of teaching and learning for all the participants in the course: learners, teachers and markers. It is this feedback loop that should enable the process to become both transformative and embedded in the praxis of professional practice, and reflective of the approaches and skills which we seek to inculcate in our students and student markers. Meanwhile the recipients of the marking should feel empowered to make positive adjustments to their learning, grow as learners, and develop further their independent learning skills, through ownership and management of their tasks and assignments.

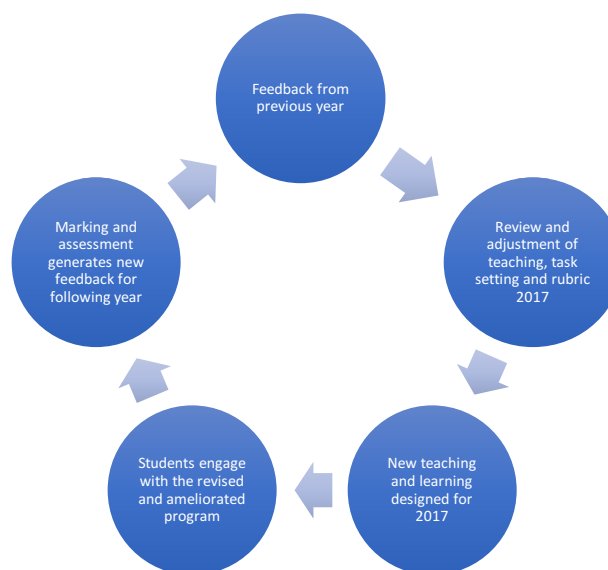


Figure 2. Image of the feedback loop of assessment for learning and teaching (Hunter, 2017).

As educators, the leaders of this team and each member of the marking team believe strongly in exploiting every learning opportunity that is available. Whilst marking drafts and offering individual discussions about the marking decisions would be exemplary, the fact some 300 scripts must be marked within two weeks to comply with university regulations and the moral imperative to return work in a timely fashion, is a huge constraint which makes such an approach impossible to achieve. Thus, this methodology is designed to create not only a form of dialogue but also a way to give responsibility back to the student to manage their learning, is by responding with a form of Socratic thinking: by offering questions instead of comments or closed remarks.

The Experiment

Socratic thinking is based around six types of question forms, all of which are designed to produce problem based thinking, or recipient solutions. The first type of question is questions for clarification, the second is questions that probe assumptions, the third is questions that probe reasons and evidence, the fourth is questions about viewpoints and perspectives, the fifth is questions that probe implications and consequences and the sixth is questions about the question. The types of questions being asked are built into the table of guidance questions below to show that the full Socratic range can be used in response to the assignment, to engage the recipients of the marking as fully as possible (University of Michigan 2017). To achieve this desired outcome, therefore, the markers were asked to respond with questions, rather than other forms of comment. Attention was also drawn to the ways in which the questions change in nature as the marker moves through the elements of the rubric.

Sample Initial Assessment Comment Bank for Markers.

Motivation, context and proposition	Question Types: 1, 4, 6
Could you usefully add more context in terms of the reasons for the case, the situation in which the decisions were made and the reasons why the case is important in your view?	Could you think carefully about how to make your proposition statement clearer? Could you make it shorter/more direct/simplify it to find the essence of the problem?
Have you got a clear thesis statement in this paragraph?	Could you link the case more clearly to the argument?
Could you revise your word choices here so that the writing becomes more technical?	Could you consider the tense here, so that it is logical and sequential?
Background detail and technical information	Question Types: 1, 2, 3, 4, 6
Have you used sufficient Engineering language here to convey the detail of your case?	Have you checked the spelling of unfamiliar words?
Have you linked details/events and specifications for the technical aspects of your case?	Have you made clear in your wording which is primary information and which is secondary to your case?
Discussion and analysis	Question Types: 1, 2, 4, 5
Could you link your argument more closely to the Engineering Method?	Could you move to discussion from recount of events?
Could you move to commentary, where you express your own opinion, as well as a range of others' opinions?	Could you look at your analysis and see if you could analyse in a range of ways, e.g. in terms of the process, the Engineering Method and the outcome(s) of your chosen topic?
Level of Reflection	Question Types: 1, 2, 3, 4, 5
Could you take this from a descriptive view to a personal reflection?	Could you include the traits of Engineers here to deepen your analysis?
Could you provide more justification from the case study for your views (i.e. move from simple review to deeper analysis)?	Could you offer ideas about professional development for those in the situation of the case study or seeking to learn from it?
Knowledge of engineering concepts presented in class and integration with case study	Question Types: 1, 2, 3, 4, 5, 6
Have you included Engineering concepts?	Have you integrated the Engineering concepts you have identified into your discussion?
Have you picked the most appropriate Engineering concepts for the issue you are discussing?	Does your discussion really include the following elements: explaining and interpreting, exemplifying, comparing and inferring information on engineering concepts? Do you select information clearly and present it succinctly? Do you offer good examples from the core text that support your ideas?

Expositional Structure	Question Types: 1, 3, 4, 5
Do you have a clear introduction with a clear set of thesis statements and an outline of the key issues for your discussion?	Do your body paragraphs really take one concept at a time, following a clear pattern, logically and persuasively?
Do you link everything together neatly at the end in a succinct summative conclusion?	Do you have clear topic sentences in each paragraph that act as a road map to the case study?
Have you used analysis in each body paragraph? Is it layered? Is it locked onto the Engineering Method?	Could you improve the cohesion in your writing either across the assignment as a whole, or within its sections?
Formal language/ grammar/spelling; concise, succinct expression (including depth of meaning)	Question Types: 1
Have you avoided all contractions and all colloquialisms?	Is your grammar accurate, particularly the use of tense and voice?
Is your work sharp, technical and to the point, cutting out all irrelevance?	Is your spelling accurate, especially for all technical terms?
Referencing and Evidence	Question Types: 1, 6
Have you included at least three pieces of textual evidence to support your argument?	Have you included in-text references?
Have you included at least three elements of accurate Harvard referencing at the conclusion of your writing?	Have you used referencing and evidence skilfully to advance and support your argument?
Formatting and Presentation	Question Types: 1
Are all the parts of your assignment present, including the cover and mark sheets? Have you signed to say you have avoided plagiarism?	Have you made clear in your wording which is primary information and which is secondary to your case?
General Comments	Question Types: 1, 2, 3, 4, 5, 6
Review for word choice.	Review for word form.
Have you made clear in your wording which is primary information and which is secondary to your case?	Is this logical? How might it be improved? Go back to the order you created in your introduction and check everything matches up.
Is this the most important idea? If not, could you include it somewhere else or leave it out so you have more room for reflection/analysis?	Do you have a verb in this sentence? Is the verb in this sentence in the right tense?
Might you have included personal/professional reflection here?	Is this an Engineering term?
Check your word order here so as to maximize the impact of your writing.	Does the reader know the case as well as you do at the end of this report?
Have you used punctuation for effect? Have you avoided comma splicing?	Have you avoided journalese? Do the verb and its subject agree in number and form?

Each of these suggestions is derived from prior experience of marking this course and is designed to support the development of appropriate Socratic choices, to stimulate thought and action on the part of the recipient, the student whose work is being marked. Ferreira and Ferreira (2015) reinforce this approach, demonstrating that Socratic questioning can be used for “professional socialisation ... teaching professional values ... may enable students to eventually develop into reflective practitioners”. The process of change is designed to be incremental and highly focused, using the theory of Structured Tinkering, which allows step-by-step change to become a powerful tool for creating and embedding authentic change (Vossoughi and Bevan, (2014).

The Results

The student markers responded strongly and positively both to the training and the format of the responses suggested for assessing this assignment. That said, some issues were raised by the markers and recipients of the marking. The markers kept marking diaries throughout the process to create a dialogue with the lead marker and feed into development and training

for the next round of structured tinkering. These diaries revealed that, despite the clarity of the rubric, there were content issues with the work, focused around actually including elements such as the Engineering Method or formatting references correctly. In terms of assessment, these were easy to point out and remind students of the constraints of the piece.

More challenging in terms of the marking were issues surrounding accuracy and style and the point at which a script becomes so poor in terms of both expression and genre that it should fail. For many undergraduate markers, it felt “unfair” (Marker 3) to fail someone whose English is poor because they are an international student. Ultimately the decision is subjective: the rule that was agreed was that if the reader could not understand the work, it would fail. It had already been established that failing to attain control of the genre was an automatic fail, so this aligned with an established marking constraint.

This question had a corollary, however: to what extent should errors of expression be pointed out in the marking? The spread of responses will need to be addressed in the next training sessions for consistency. There was also some feeling that the Socratic questioning ultimately became limiting rather than enabling. As Marker 5 put it, “saying ‘have you provided an introduction?’ sounded sassy”. It was felt necessary, having established Socratic questioning as the core response, to have the freedom to make statements where clarity would be enhanced, as it would in this case, without sounding aggressive. Thus, in this round of marking, it has been a conscious decision to explore the limits of Socratic questioning as well as the benefits in the marking and consider how to use it to the greatest effect, without it becoming limiting in and of itself.

In terms of how the team were supported (a core focus was on the well-being of the markers), this system indubitably worked effectively. Many of the markers commented explicitly in their diary feedback that they felt supported by having a team leader who kept in clear, regular contact with them. They formed sub-groups and moderated within those sub-groups, which was very positive, and made the final sample moderation significantly easier and faster. The undergraduates liked being invited to shared marking sessions with the postgraduate students and felt valued as a result (they were invited to join the Postgraduate *Shut Up and Write* group). They commented consistently that they liked the training process, which included looking at sample marked papers to start to develop levelling. They found the comment banks and marking codes very affirming and genuinely time saving. They also genuinely felt included in the process and that it was, indeed, a co-operative learning environment. The level of positivity about the process and the deep understanding that this was an on-going, embedding process was most pleasing. The students felt that the connections between the rubric and the assessment outcomes and details were clear and gave clarity to the final grade given; they loved marking in pencil so they could make changes easily. They also affirmed and celebrated the written and spoken reminder to give both constructive and supportive comments.

For all the markers, marking in a team meant the new markers were never alone, “the act of writing questions on their reports rather than direct corrections feels risky, because I know most students will not understand exactly what I want them to do, but I also realise the ones that do will get much more out of it”, was one affirmatory comment (Marker 8). Another was, “understanding how important communication is, having read a load of papers I could barely understand, made me see how vital these communication courses are for professional practice and helped motivate my marking” (Marker 4). The markers saw this process as invaluable for their own learning, as much as for those whom they were trying to help through their marking protocols and so, for the entire team, this experience was affirmation that the protocols were indeed worthwhile.

All the marks were moderated by taking a sample to check. The sample consisted of the two top and two bottom grades and two papers either side of each grade boundary. The consistency of the marking was evident. Not unexpectedly, the next round of training needs to focus on the credit band which contained the greatest numbers of discrepancies, though even here the margins of error are pleasingly narrow. The fails and scrape passes are perhaps

the easiest to locate, as are the very good and excellent papers falling into the D and HD bands. As always, the middle band contains the greatest number of variations. This, then, is the key training focus for the new round of marking.

The other element of this process and to close the loop, is a consideration of the perspective(s) of those being marked. There were no complaints about the marking and no grade challenges from any of the cohort being marked. Whilst high levels of challenge are not routinely experienced at the University of Adelaide, some challenges do eventuate. This silence suggests that the students were at least accepting of the marks and could see from whence they derived. A small sample of students were interviewed via semi-structured informal interviews about how they felt about the marking and the comments were strongly indicative that they were keen to learn from the marking and that whatever their grade (Recipient 1 had obtained an HD, for example), they actively sought to learn how to improve. This suggests that this level of detailed marking is valued by all stakeholders (markers, educators and recipients) and so should be embedded and not remain experimental for Professional Practice courses.

The Conclusion

Overall, the structured tinkering approach would appear to have added value to the marking process and ensured that assessment falls within the teaching and learning category, in and of itself. All stakeholders see value in the new approach and so would like it to be embedded in practice throughout professional practice, if not beyond. For us, this is an ongoing, exciting task of structured tinkering which will enable us to design follow-on courses which have embedded value in all elements, and allow us to build a sustainable team of markers to support learning through assessment practices, alongside the direct teaching of the course.

References

- Dowling, D.G., Carew, A., and Hadgraft, R., (2013) *Engineering Your Future* 2nd Edition, Milton, Queensland, Wiley
- Ferreira S, Ferreira R, (2015) Teaching Social Work Values by means of Socratic Questioning *Social Work* Vol 51, N4, Stellenbosch
- Freire, 2005 cited in Extending the Conversation Writing as Praxis, Yagelski, R.P., (2012) 188 *English Education*, National Council of Teachers of English
- Goodyear, V.A., Casey, A., and Kirk, D., (2016): *Practice architectures and sustainable curriculum renewal*, *Journal of Curriculum Studies*
- Hunter, A.J., (2017) Training Documents, University of Adelaide
- Kemmis, S., and Grootenboer, P., (2008). Situating praxis in practice: Practice architectures and the cultural, social and material conditions for practice. In S. Kemmis & T. J. Smith (Eds.), *Enabling praxis: Challenges for education* (pp. 37–62). The Netherlands: Sense, in Goodyear, V.A., Casey, A., and Kirk, D., 2016, Practice architectures and sustainable curriculum renewal, *Journal of Curriculum Studies*
- Salomon and Perkins (1988), Individual and Social Aspects of Learning, Vol 23.1, Pp 1-24, *American Educational Research Association*
- University of Michigan (2017).
<http://www.umich.edu/~elements/fogler&gurmen/html/probsolv/strategy/cthinking.htm>
- Vossoughi, S., and Bevan, B., (2014). Making and Tinkering: A review of the Literature. *National Research Council Committee on Out of School Time STEM*: 1-55.
http://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_089888.pdf

Acknowledgement

Gratitude is offered to Dr John Codrington and all the tutors and markers in Professional Practice at the University of Adelaide, who supported, developed and worked within this project and continue to do so as it unfolds across the Professional Practice courses.