Reflections – managing the process[1]

Since most students have never been exposed to reflecting on their own work, we have covered this in some detail to get you started. These reflections will be interspersed throughout your design file.

Why write reflections?

Reflecting on your project and the learning process **helps you to learn**. The more you think about the concepts and issues in your subject area or projects and connect them to what you know and see around you, the more you remember and learn. It also helps you to think about what next you have to do in your project work.

When you go to work, you'll find your fellow engineers using the same process.

Competency being developed

Engineers Australia describes this as:

PE3.6 Capacity for lifelong learning and professional development
a. Recognise limits to own knowledge and seek advice, or undertake research, to supplement it
b. Take charge of own learning and development; understand the need to **critically review and reflect on capability**, invite peer review, benchmark against appropriate standards, determine areas for development and undertake appropriate learning programs
c. Commit to the importance of being part of a professional and intellectual community: learning from its knowledge and standards, and contributing to their maintenance and advancement
d. Improve non-engineering knowledge and skills to assist in achieving engineering outcomes

Action Learning (Learning in Action)

Action Learning [??] is a specific methodology that acknowledges that learning happens when we are involved in activity. A simple summary of this approach is the following cycle:

Plan ➔ **Act** ➔ **Observe** ➔ **Reflect** ➔ Plan ➔ Act ➔ Observe ➔ Reflect ➔ Plan ...

The first two steps are obvious. As a trainee engineer, you **plan** the design of a bridge or printed circuit board. You **act** by working with other people, to complete the design. You **observe** what is happening in your group and realise that there are real differences of opinion about how to complete the design. (You add these observations to your logbook). You **reflect** on these differences and resolve to try a new approach (your new **plan**). You add these reflections and new plan to your logbook.

At your next meeting, you **act** by presenting to the group your new idea. You **observe** the discussion that follows, and so on. Later you **reflect** on whether your new plan was successful and what now needs to be done.

So, you develop a strategy of **continuous improvement** in your work, through careful observation and reflection, documented in your logbook.

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[1] The RMIT Learning Skills Unit shaped this section (http://aps.eu.rmit.edu.au/lsu/).

What do I observe (and write about)?

This process of plan-act-observe-reflect is useful in everything you do – both technical subjects and projects. Some really useful questions are:
- What's going well at the moment? (it's always good to start with positive things)
- What's not going well?
- What could we be doing to improve things?
- How will we do that? (process)

The following prompting questions give you other ideas for reflection questions:

Course Content

New information gained. Things that struck you as interesting
> *e.g. I really liked Tony's bridge design. I hadn't thought of merging the two designs.*

Questions raised (they may be still unanswered)
> *e.g. Why is this model stronger than the other one? (explains)*

Application to your own situation or something you've noticed outside the course.
> *e.g. There is one of those bridges in my city in Korea. I'd never really thought about the design before but now I see…*

Process

How the information was presented
> *e.g. I was inspired by the guest speaker who talked about water systems. He really…*

How you gained your insights
> *e.g. I seem to learn best when there are plenty of examples.*

What else you could do
> *e.g. I need to work on my report-writing skills, particularly the introduction.*

What works best
> *e.g. The group functions best if we make clear tasks and deadlines. When people are late it…*
> *(explore feelings and dynamics)*

Analysis and insights

How the information fits together
> *e.g. I can now see how that formula can be applied (then give example)*

The inter-relationship between different aspects of the content
> *e.g. That design could also be used in… (describe another situation).*

Application to other situations/cultures
> *e.g. Those environmental concerns also apply to (describe another relevant context)*

Evaluation of the ideas/concepts raised
> *e.g. I agree with the models of energy efficiency, because…(explain why)*

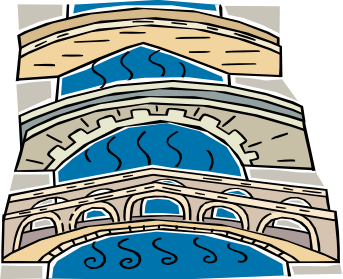## What kind of style can I use?

Logbooks are not formal academic pieces of writing. The style is pretty flexible. You might use:
- informal language including the first person (I) voice and casual expressions
- abbreviations
- bullet points
- some diagrams and charts
- brainstorms or mindmaps
- rough sketches
- as well as more connected writing.

How could I set out the logbook?

Here are some samples adapted from first year civil engineering logbooks.
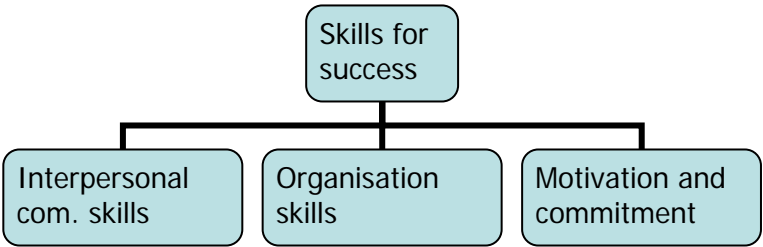
Sample logbook extract 1

Date: X/X/XX	What's happening in the writing
Today I thought was one of the most challenging statics tutorials we've had – not with the difficulty but with collaboration in the group. We had a hot debate about the structure and two members confronted each other in a bid to have their structures acknowledged. The power struggle wasted a good half an hour. I tried to get them to come back to the guidelines and requirements but we had run out of time and no decision was made. I now realise a couple of things:	Tells about group incident Gives insight into group dynamics
managing the dynamics in the group is really important – you can waste a lot of time if you are not focussed on achieving an outcome.	Reflects on group process and possible solutions
We need to set some clearer expectations in the group.	
Since then I've been thinking about a particular bridge – it's a simple design but a bit different and I hope the team will like it and also have some fresh ideas for improving it or other ideas themselves.	Reflects on a number of areas.
	Includes sketch
Maths has been getting pretty difficult lately. I've got more work to do in this area although with a part-time job I'm starting to feel like I'm running out of time in the week to fit things in.	Identifies some weaknesses

Sample Journal extract 2

Things are going pretty well so far. Chemistry and Physics I did last year so I'm going OK there. I didn't do specialist maths though so maths is going to take a bit more work (and time). I can see time-management is going to be a big issue at uni. When I get my lap top I'll be able to use the time on the train a bit more effectively, just going over notes and writing up my log book etc.	What's happening in the writing

Reflects on a number of areas. |
| Our first project in CIVE was to present a poster on Civil engineering. It was good to think a bit more broadly about engineering and to get to meet a few people. I guess I imagined I was going to be a structural engineer but I can see there are a lot of jobs that engineers do. It will be good to go on the fieldtrip and see this a bit more first-hand though it seems a long way to go when there's a lot of things being built in the city. It must be a special project or have particular things they want to show us. | Identifies some weaknesses and a possible solution |
| I have been thinking about the qualities needed for success at uni (and in life probably) that we talked about in class. | Could have given more detail on the other jobs engineers do. |
| Skills for success

Interpersonal com. skills   Organisation skills   Motivation and commitment | Brainstorm in diagrammatic form |