Title: Re-imagining engineering internships: embedding digital affordance and reflection frameworks

Introduction

Margaret Jollands talks about a subject she recently designed to enhance learning of engineering interns by embedding curriculum in the internship. She blended a reflection framework with a digital affordance model to construct curriculum for a subject called “Professional Engineering Experience”. For Margaret, scaffolded reflection is a key skill to promote employability because graduates will need to critique their own capabilities to succeed in their future roles.

Keywords:
Judgement, communication, critical reflection.

Why do you do it?

Everyone agrees that internships or work placements are the best way to develop employability, but how much a student learns from an internship is highly variable. I was struck when I read the OLT final report of Smith et al. (2016) WIL project that students on the lower quartile of placement quality had similar learning outcomes to no placement – they might be better off not doing the placement!

What could I do to enhance student learning outcomes, even if the placement was not of a particularly high quality? When I got the opportunity to design a new elective course for engineering students on placement I decided to help students by giving them communication and reflective tasks to do during their placement.

I liked Eyler’s reflection map (2001): reflection should be systematically planned, in the context of self, peer and work partner. Students start internships have a vast range of capabilities, so learning on placement should be scaffolded. Assignments were developed using Best’s digital affordance model (2009) so that no matter what their starting point, students could make progress towards achieving the learning goals. A great example of curriculum embedded in placement is described by Zhu and Bargiela-Chiappini (2013), where students reflect on their own values, through observing and analysing participant behaviour in a company meeting.

It is really important for students to understand how their own behaviour helps them to fit into a workgroup, contributes to developing networks with others, and how making mistakes can be a learning opportunity. The choices they make impacts their futures.

Communication, networking and reflection skills were the three curriculum topics. These are identified by employers as critical or gaps in current graduates. Each topic was designed using a reflection framework - engineering is all about critical judgement!

The best way to develop these skills is to put the student into a situation where they really matter, like a meeting, a networking event, and

Internship case study

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something that didn't go well at work. Then you support them to learn from that through structured assignments and great on-line resources.

What do you do?

The course is on line so the learning is fully directed by the assessment. I developed three assignments worth 20% each. Each assignment had learning resources, a template and a marking rubric with four criteria. The assignments were marked pass/fail. To pass the assignment, each criteria had to be passed. The assignments could be done at any time during the internship.

The subject is timetabled flexibly so students do the subject while on placement. A new class starts each month. About 500 students enrolled in the first year.

The first assignment is "observe a meeting"; write about it using a rich thick description; analyse it using a framework such as Hofstede's cultural framework; reflect on own values; identify a strategy to have more impact in a future meeting. The second assignment is "attend a networking event"; write about it using a rich thick description; prepare an elevator pitch; analyse own approach; identify a strategy to have more success in a future event. The third assignment is "reflect on something you're not happy about"; describe it using a rich thick description; analyse it in terms of work place practice and organisational structure; talk with a mentor about a strategy to have a better outcome in future.

Each assignment is scaffolded through the affordance framework:

- describe what happened (functional)
- why did you or others behave the way you did (perceptional)
- what could you do differently next time (adaptive)

Each assignment is supported with extensive online resources. For the meeting assignment, students are provided with links to four different frameworks for looking at group dynamics, or can use their own; a sample report is provided based on a meeting I attended as a new grad (I still remember it with horror!)

I give each assignment feedback on what was done well, and if criteria in the rubric are not met, why not. Students have an opportunity to resubmit for a second chance to pass the assignment.

Who is involved?

I've just started this subject last year, and so far about 400 students have enrolled, and 200 have completed. I used two tutors with about 150 students, but I didn't invest enough time in training them, so I needed to mark or remark many of their students.

I have colleagues in Psychology and computer science interested to introduce something similar in their placement subjects. We have written a paper (Jollands et al. in press).

How do you do it?

It's been easy to set up using our learning management system, Canvas, which is a good platform for an online subject. There were teething

Promoting:

- **Judgement**
- **Professional Integrity**
- **Critical reflection**

problems of course but its been plain sailing most of the way. No one was used to running flexi-subjects in Canvas.

The quality of online resources is very important with this course. Fortunately some really good resources are available on line for meeting dynamics and a few for networking. Hardly anything is available for reflection which was interesting!

Students are enrolled in this subject from many different engineering disciplines, with different approaches to teaching and learning. Some had never used rubrics. I was glad I had planned to allow resubmission! You have to encourage them to learn by believing they can do it, but help them if they struggle. My aim is a 100% pass rate (hence the course does not count to GPA). Some students just don't submit any assignments, so pass rate is around 95%.

Does it work?

I don't know yet but I'm optimistic. Student engagement has been good. Most students submit all the assignments and many submitted highly descriptive nuanced descriptions exceeding the word limits. Student survey results for the subject will be available in 3 months. In the long term I hope that this cohort achieves better employment outcomes. These will be available in around 2 years' time.

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