

# An experience interacting with students defining their own assessment tasks

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***Abstract:** This paper discusses an example of assessment in which students are encouraged to define their own tasks for completion in a course on engineering ethics, sustainability and leadership. If they do not choose to set their own task, they need to write a formal report on a randomly assigned topic of ethical contention. From 2008 to 2010, 29 % (of 522 total students) defined their own tasks. Students submit a proposal detailing (i) what will be done, (ii) which learning outcomes will be demonstrated, and (iii) how success will be assessed. The minimal requirements on tasks are that each student must invest 15-20 hours of effort and they engage with 3 or 4 learning outcomes. The marking criteria must include an allowance for the effectiveness of the communication of ideas. Any team project must argue why each person is necessary. Students are given the list of possible report topics and the marking criteria used for reports. Student proposals are approved on a case by case basis. Negotiations can be protracted, needing 20-25 hours in 2010. These negotiations changed the dynamic of interaction with the class and provided detailed conversations about how the class understands the course outcomes. The relationship between lecturer and class changed for the better. Students who self-define do perform better on the assignment, though no differently in the rest of the course.*

## Introduction – the Challenge

Many of us have read about the idea of students negotiating their own assessment tasks, but there seems to be a dearth of recorded, instructive examples of this being tried. Herein, my purpose is to provide such an example, an example of a something that is not traditional within engineering education and rarely discussed from the existential perspective. I believe it is an encouraging example for the teacher. After all, teaching should be fun. First, though, I shall tell something of how it came about, for this is, perhaps, instructive about why so little student-defined assessment finds its way into engineering education.

In 2008, I was given responsibility for a new, final-year (i.e. fourth-year) course – Leadership & Ethics – discussing matters of ethics, sustainability, leadership, teamwork, etc. The learning outcomes (given in the next section) were not precise. I thought, “How do I assess this?” I was challenged to let the students themselves tell me and that made sense.

To understand why, consider the sort of course with which most of us are more familiar and, dare I say it, more comfortable: a course in which the critical outcome is successful engagement with a body of detailed technical knowledge, e.g. technologies using radio waves or used to fabricate plastics. In these, the following learning outcomes are typical.

- Use method *ABC* to measure property *Z*
- Know how to solve problem of type 27(b).

When it comes to showing mastery of these, very little variation is possible in how it can be done. The outcomes themselves imply what is necessary and sufficient. Method *ABC* is only ever for measuring *Z* (though it may be suggestive of other things). Little diversity exists to show this.

In contrast, a course like Leadership & Ethics, which examines topics such as social justice, community involvement, ethics and sustainability, has learning outcomes that are quite general and explores widely applicable, not narrowly focussed, knowledge and methods. These are useful in many situations, including some well beyond classical engineering considerations. We encourage students to explore them in a diversity of contexts. Why not get students to demonstrate their respective achievements in equally diverse, even self-selected, ways? Why not have them explain what they are attempting to show, and the assessor simply say if that is done well, poorly, etc?

Being an experimentalist, I tried this, first in 2008, not knowing what would happen. The next section describes the administrative arrangements allowing students to define their own task. Then follows a brief survey of what students have done. The final section looks at some of the lessons learnt from this exercise.

Before that, though, I want to address the concerns of those who worry that there is something unfair about allowing different students to do different assessment tasks and also mention something about the pedagogy that underpins such assessment.

## **Background**

There is no intrinsic reason all students should do the same thing. Granted, there is a superficial appeal that inter-student justice is assured by them all doing identical assignments, but the nature of that assignment, in a course such as Leadership & Ethics, would be an entirely random choice, from the students' perspective. The learning outcomes develop in highly individual ways. Some students would be lucky with the task chosen by the lecturer, some unlucky, and that doesn't serve justice. Allowing them to nominate how best they personally show achievement of the learning outcomes (which is what summative marks purport to show) removes this element of chance.

Historically, the standard mode of assessment involves teachers prescribing a task and the students completing it. Of course, when there is a tight bound on the context of questions, as with most technologies, then the question posed is generally not seen as arbitrary. Students, though, can be confused by even a single element of unexpected context. Furthermore, in a course with many vehicles to communicate ideas, that chosen by staff is not necessarily the fairest for all students.

An alternative mode of assessment is to have a student set her/his own questions. In this case, they first specify the learning outcomes to be met, and then both how they will demonstrate them and the criteria to be used to gauge their success. Such a form of assessment requires students to ask questions, and asking meaningful questions demonstrates higher cognitive skills.

Notice that this is not a complete negotiated learning contract (Anderson et al, 1996). While students get control of the form of the evidence of accomplishment and the criteria for evaluating it, they simply select learning outcomes from a predefined list and have no input in the learning strategies of the course.

Ethics theorists argue that engineers should pose questions in the pre-technical phase of a design project, before the unavoidable value judgments have been built into the models (e.g. Evan & Manion, 2002, and references therein) and, consequently, students should learn to engage in formulating problems, too. Furthermore, some engineering educators (e.g. Downey, 2005) argue that there should be more emphasis on problem definition within the curriculum, and not so much on problem solution. This, too, challenges the standard assessment paradigm, outlined above.

Students improve their engagement with learning outcomes when working in a contextualised problem important to themselves. This is consistent with what is observed when engineering students work on industry- or community-based projects. Many within the students' age-group are deeply concerned about questions of social justice (e.g. Macquarie University, 2006), part of the 'idealism of youth.' Students combine this with their interest in engineering. Many have a favourite, existing cause and so, again, it is sensible to use that pre-existing context and knowledge as a basis for their demonstration of achievement of the learning outcomes. This exploits the importance of personal relevance in the learning process (e.g. Toohey, 1999).

Interesting as they are, these ideas are not explored any further in this paper, whose scope is simply to detail how the student choice was structured into the specified course and how it turned out.

## Implementation

The course Leadership & Ethics has the following nine specific learning outcomes, disseminated to the students.

- *Describe important aspects of the social, environmental, regulatory, & organisational context of engineering.*
- *Identify ethical problems, particularly in the context of practising engineering.*
- *Formulate and communicate consistent, coherent responses to such problems, using the formal language of ethics.*
- *Critically examine the ethical arguments proposed by other people.*
- *Explain details of an engineer's rights and responsibilities.*
- *Define technocratic decisions and some processes used to make them.*
- *Use different criteria, including aspects of sustainability, to evaluate technological innovations.*
- *Help lead, i.e. facilitate the effective working of, a team (be it a technical project team or those involved in using an innovation).*
- *Identify ways to assess and reduce risks, especially those associated with human fallibility.*

As part of the assessment schedule, students must complete an assignment worth 15 % of the summative mark for the course. They are encouraged, but not required, to define their own assessment task. The assignment is simply to produce something to demonstrate achievement of some learning outcomes. Of course, there are some rules about what they can choose, introduced below.

First, though, note that students have a default option: to write a formal ethics report on a randomly assigned topic. If no proposal is received by a specified date, this is what is required of them. Why this arrangement? It is a practical administrative arrangement. By having a default, it avoids the troubles associated with the students who won't get around to thinking of something for themselves. Additionally, the report specifications provide an example of what we expect in terms of effort, depth and challenge.

### Task specification – the scope

Students must choose the learning outcomes they will address, pick a topic area, pose questions in that area, and choose a mode of expression through which they will convey their answers. They are advised that a typical task is expected to engage with only three or four of the learning outcomes.

Students get, too, a statement about expected effort.

*We expect you to invest about 25 hr per person on this project. Some of your total effort will involve developing the proposal. The amount expended on that will depend on the nature of your proposal. If you undertake a group project, we will recognise that some of the time allowance will be used managing the internal operation of the group.*

Apart from the task's general specifications, the students are given the detailed requirements of a formal ethics report – the default option. These details include the length and due date, the marking criteria, the list from which random topics are selected, and the following task definition.

*Your report must contain a discussion of the ethical issues associated with the topic and related to engineering. In particular, it must consider both ethical dilemmas and how and by whom appropriate decisions should be made about these same questions. It must consider both sides of any argument; it must clearly identify your conclusions about the issues and why you reached them. (No credit will be given for surveying the technology or laws involved.)*

These together provide enough guidance about what we expect. It lets students decide if they want to depart from the traditional report and design their own task. It indicates the sort of information needed to get started, by providing a sample marking scheme, scope, etc.

## Task specification – the proposal

In defining their own task, students must explain three things. First and obviously, they must tell us what they will actually do, i.e. write a story, interview someone, etc. Second, they must tell us which learning outcomes they will demonstrate in their project. Third, they must define the criteria by which they want us to assess their assignment, i.e. provide a marking scheme.

*Your proposal must include the marking scheme that you want us to use in assessing your final project. This must include an allowance for relevant elements of your communication skills. In a group project, you may wish to allot some marks for the group's operation. The proposal for a group's project must include how to divide the marks between members.*

All this information is provided in the formal proposal that the student must submit. The proposal may be as simple as a particular topic for a report. (Incidentally, this is a good source of new topics for the succeeding year's list.)

Additionally, any proposal for a group project must explain why more than one person is intrinsic to the task. For example, a talk does not need two speakers; a debate does. A completed group project must be accompanied by an individual statement from each member of the group reflecting upon the group's functioning as a team, as well as what was personally gained from the project.

## Approval process

Before a student can start work, the relevant proposal must be approved.

*Approving your proposal involves considering (i) its scope, given the assessment weighting (i.e. 15 %) and the number of people involved, and (ii) how well your proposal matches your stated learning outcomes.*

In many cases, especially nomination of a report topic, that is routine. Only one proposal has ever been rejected outright. All others are approved or a modified counter-offer is suggested to the relevant student(s). It is a practical negotiation process embedded in a course which explores such things as part of teamwork. Approval of projects is not entirely my responsibility. Proposals with unusual topics or formats or those which may have inadequate depth are reviewed by a second member of staff. Unusual formats are those which staff have not seen previously, e.g. an interactive board-game, in 2009, and a suitable adaptation of an entry in the Audi Production Award competition (Audi AG, 2011), in 2011.

This approval of proposals is not without effort for the lecturer. For example, in 2010, with 199 enrolments, I spent 20 to 25 hours negotiating proposals. This is time that I would not otherwise have needed to invest in the class, had I had a uniform task. Below I will explain why I believe this is time well spent. Also, a large part of this time is actually spent clarifying the outcomes of the course, which is the sort of consultation that normally take place, though not usually as early in the semester as this task requires.

An incidental benefit of this process is that there are no longer any 'late' reports with accompanying 'excuses.' If a student will be late, a 'variation to the proposal' (contracted task) is submitted with a new nominated date. It seems a student feels a much stronger duty to meet a self-nominated deadline than a seemingly arbitrary one set by a course authority. I explain that we need to know when to expect something, so that we can manage the marking schedule.

## What Happened

Since first trying this assessment process, out of 522 students in total, 29 % have chosen to define a task other than a formal report. Anecdotal evidence (cited with student's permission) hints at why such a choice may or may not be made.

[why yes] *"I wanted to try something different. I'm sick of writing reports."*

[why yes] *"I've never made a board-game before."*

[why yes] *"I am much better at talking than writing."* [did an oral presentation]

[why no] *"I knew I could easily do an OK enough report."* [and did one]

Such comments are not collected formally from the students, but recorded systematically in my teaching journal when they arise in other conversations. In addition, about half the remaining students negotiate a personal topic for a formal report, i.e. do not get one randomly assigned but one in which they have a personal interest. This topic need not be about ethics.

Over successive course offerings students have used many different avenues to demonstrate their achievement of the learning outcomes:

- short stories (individual works)
- board-games (both individual & group works)
- recorded dramas, docu-dramas and skits (group works)
- live dramas, i.e. performed in class (group)
- book or movie reviews (individual work)
- oral presentations (individual and group work)
- songs, written and recorded (individual work)
- three-on-three debates
- a lecture given in another course (group work)
- on-line learning resources, discussion boards & blogs (group work)

The final production quality of some of these has been extraordinary for the care taken over incidental details. (I wish you could experience some if it.) Students have creative talents we know little of and take very visible pride in what they submit.

Students who chose their own assessment task, on average, scored better on the major assignment than did students working with a randomly assigned report. Even identifying one's own report topic is enough to make a slight statistical difference to performance. However, again on average, students achieved no differently in the rest of the course. It is NOT a case of better students choosing this alternative. Very weak students, though, always opt for a random topic, as you might expect. When you think about it, this is not surprising they do better with this task. A student invests time and thought in developing a proposal and so better understands what is required of them as well as better understands the outcomes of the course.

## Some Reflections

What have I learnt from these experiments in learning? Nothing particularly startling as far as pedagogy. It supports the teaching principle (e.g., Boud, 2010) that students learn at a deeper level when actively engaging with the learning outcomes, as when defining an assessment task. It supports the teaching principle (e.g., Boud, 2010) that students are more engaged with a course when they have some control over the assessment tasks. That there is some negotiation and potential control seems to be more important than the exact proportion of marks concerned. The task described herein only involves 15 % of the summative mark. Quite clearly, too, students do better work when they enjoy it. (Ramsden, 2003).

Comparison with theses deserves attention. In hindsight it is obvious, but the thesis is a case when students exercise some choice about their assessment task. The learning outcomes and assessment methods are common to all students, but each gets some choice about the project through which to demonstrate their respective achievement of the goals. Most of us know how much more engaged students get with their projects than with lecture courses. It was, however, only after I implemented such flexibility in Leadership & Ethics that the analogy became apparent. This is a case of a practice, namely student choice, that is well founded but whose rationale is never revealed to the new academic.

It is as the course co-ordinator that I made some interesting discoveries. The whole process has changed the dynamic of how I interact with the class. It has shifted teaching to a mode involving more dialogue between teacher and learner. During negotiations, I now have detailed conversations with what seems a representative sample about the outcomes, thereby learning what the cohort understands of these outcomes. Such conversations also reveal the student generation's different interpretations of ethics, sustainable, diversity, etc. My relationship with the class cohort is changed dramatically. The

students see me more as a mentor to help them through the assessment than as an adversary watching to trick them with the assessment. This supports the teaching principle that students learn better when there is dialogue with the teacher (Gibbs, 1995) and they fully understand what the course is about (Ramsden, 2003).

Student feedback about this task also reveals some interesting and otherwise obscured features of their whole experience of studying engineering. For example, consider the following

*“This was my first opportunity [at university] to be creative.”*

*“Thank you for allowing me to do something different.”*

*“I’ve written heaps of reports. I wanted to do something different.”*

*“This project helped me make some new friends.”*

These are an implicit criticism of the existing programs delivering an engineering education at universities. Probably there is nothing conceptually unique about this particular Go8 university’s programmes to make these sorts of comments only locally applicable. Remember that the context of Leadership & Ethics means these are comments of university students at the end of four years of study. We may produce technically fine engineers, but has their tertiary education been all it could and should be?

Let me encourage more of you to experiment with allowing students define their own assessment tasks, especially in courses that address the diversity of contexts associated with social justice, community involvement, ethics and sustainability.

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