COMMUNICATING PROJECT MANAGEMENT PRINCIPLES THROUGH OPEN ACCESS LEARNING

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SUMMARY

This paper outlines the philosophy behind the authoring of an open access learning course in the area of project management. The way in which a case study of the Coode Island chemical storage facility fire was introduced and developed throughout the course is discussed. Video material, audio conferences along with an open access learning guide were integrated and used such that an enhanced level of communication between students and facilitators was fostered and maintained throughout the course. Quality communication is considered vital in the success or otherwise of such a course.

The authors aim of instilling the principles of project management to students, in an acceptable and balanced learning environment for distance education is evaluated on the basis of client and student feedback.

ENGINEERING PROJECT MANAGEMENT AND OPEN ACCESS LEARNING

No question about it, engineering management education is required and required quickly and efficiently if Australian engineers are going to maintain or improve their market share in the ever increasing global economy.

The Australian Industry Commission Report No. 811, 11 March 1991 entitled “Construction Costs of Major Projects” makes the following observations:

- “If there is any significant general problem (in the construction industry), it is in the managing of major projects”.
- “Given that most clients would only rarely engage in a major construction, it is not surprising if they do not have highly-developed skills in management of such projects”.

As engineering management educators we need to actively address these actual or perceived shortfalls.

To address this question consider who successful engineering managers are. McCaffer and Adams (1992)2 have just completed an extensive survey into the key skills possessed by and the profile of successful engineering project managers. Not surprisingly the results show such managers have an age profile starting from about 30 years of age, refer Fig 1.

![Fig 1: Age profile of successful engineering project managers](image)

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People in this age bracket are generally mobile and busy with career development, family and community interests. They are unlikely to be able to commit themselves to traditional education, needing to be at a certain lecture or exam at a particular time. Open access learning, such as that offered by Engineering Education Australia (EEA) overcomes this problem of access (in terms of space and time). There is great potential to meet the continuing education needs of engineering project managers through the delivery of high quality material in the open learning format.

OPEN ACCESS COURSE EXPERIENCE

To date two engineering project management graduate diploma units have been written for EEA. Both units are philosophically based on our definition of Engineering Project Management which is:

"The application of the functions and activities of management by professional engineers to an engineering project throughout its life cycle, from the conception stage through development, design, construction, operation, maintenance and recycling, in order to meet an established set of objectives".

The life cycle of a project corresponding with this definition is presented diagrammatically in Fig 2. Engineers need to be involved beyond the technical aspects of design and construction. We should contribute to both the initial development and operation phases of a project if we are to fully service the needs of our clients. Both of the open access units considered in this paper take this broader outlook as the charter for engineering projected managers.

![Phases of Project Management Involvement](image)

Fig 2: Project Management involvement in life cycle of project (after Lock 1989)

The first unit, 'Project Management: Conception to Completion' deals briefly with all aspects of project management over the life cycle of a project. The unit seeks to relate engineering with project management in an effort to broaden the expectation of engineers in respect to what can be contributed to society and its needs. This course covers material such as:

- The principles of project management
- Project selection techniques
- Risk management
- Contract relationships
- Personnel management
- Planning and scheduling
- Budget control
- Contract administration
- Total quality management
- Commissioning
- Asset management

The course targets engineers who have at least two years experience and some understanding of either the design or construction phases of a project. The course was run for the first time during second semester 1992 and attracted the modest enrolment of ten students. Enrolments reduced to seven with early withdrawal by 2 candidates and deferral by a third. Of the remaining seven students, six satisfactorily completed the course and the seventh withdrew because of a change in employment. This unit has been offered for the second time in the first semester of this year and has attracted some thirty two candidates. Interestingly, geographically these students represent seven states and territories in Australia and five international countries in the Asia Pacific region.

The second unit in the series, 'Project Management Practices 1', has been designed as one of a series of sequels to Project Management : Conception to Completion. It assumes the engineers undertaking the unit have several years project experience and aims to advance the engineers skills in the management of the early stages of an engineering project. Engineers are encouraged to take an active leadership role in the decision making process when the project is being conceptualised.

This unit comprehensively deals with:

- Project management plans,
- Marketing and business development,
- Cost estimating and tendering,
- Partnering and other strategic planning issues,

This unit was released for the first semester 1993 and has attracted some eighteen candidates.

TECHNIQUE ADOPTED

I plan to consider the first unit, Project Management : Conception to Completion in some detail to describe how we have attempted to overcome the difficulties associated with remote management training.

This unit revolves around a case study of the relocation of a chemical storage facility from within 5km of the central business district of Melbourne to a 'safer' more 'environmentally acceptable' site. The need for some form of project is graphically displayed in the opening scenes of a videotape that forms part of the study materials.

It is 21 August 1991, black plumes of smoke billow from a large industrial fire at the Coode Island chemical storage facility. The fire threatens the safety of some two million people with the prospect of chemical poisoning. Thankfully, in this instance the cocktail of chemicals is not lethal and the fire is successfully extinguished on 22 August. Once the immediate danger of the fire had passed society demanded the issues of ongoing safety be considered and addressed. This is the start of two and possibly three new and ongoing projects which the student of the unit begins to experience, learn from and work through. The projects are:

Project 1:
The first project involves the so called 'Coode Island Review Panel' who had the charter to:

- Recommend an immediate action plan to minimise the risks associated with the existing Coode Island facility, and
- Recommend on the long term storage of hazardous chemicals at port facilities.

Project 2
The criteria for, design of, construction and operation of a new chemical storage facility.

Project 3
The refurbishment and clean up of the existing Coode Island facility.

The findings of the Coode Island Review Panel are relayed to the students by way of the Coode Island Review Panel, final report, March 1992\(^4\), (which form part of the learning guide), a videotape and by ongoing update press releases which are forwarded periodically.
The Coode Island case study is a marvellous example of community involvement in the decision making process of a major project. The leadership shown by John Landy (chairperson of the Coode Island Review Panel) is brilliant in meeting the charter of the review panel by addressing:

- community needs,
- lobby group concerns,
- the functional and financial restraints of the government and chemical companies.

STUDENT PARTICIPATION

Management education should be an interactive process between student and presenter. From a presenter's point of view the right environment for this exchange has been fostered throughout the use of a vibrant case study supported by an easy to read learning guide. The learning guide is interleaved with readings and exercises to reinforce the concepts being presented.

Students are encouraged, (no expected) to respond to these materials and activities by:

- Facsimiles to tutors
- Telephone discussions for clarification and advice
- Informal visits whenever possible
- Structured audio conferences at strategic points throughout the unit
- Written feedback from tutors

It was gratifying to participate in a unit where most of the students became quite engrossed in the materials, submitting the majority of activity exercises for feedback and certainly assignments for assessment. A level of camaraderie amongst the students was developed through the audio conferences. These proved most useful in allowing the students to learn from each other and hear about a broad range of past projects. Four such conferences were conducted throughout the course. The audio conferences were not without some glitches, on each occasion telephone communication was lost with individual students at various stages. This was certainly frustrating as you were never sure if everyone was still connected to the conference call. This necessitated a process of checking to see who was on line and having backup staff ready to try to facilitated reconnection of communication if something went astray. To ensure no one missed out on aspects of the conference all audio conferences were taped and these tapes were distributed at a later date.

Even with these technical difficulties the students made the following remarks in respect to the audio conference and their discussions with colleagues on the telephone; good, exciting, went well, exhilarating, very good.

Some students found it difficult to meet the required time deadlines of the course. This posed an interesting situation. Did we want to offer the greatest degree of flexibility in the course or did we want to reinforce the project management concept of completion within time to the required quality. A compromise was struck that seemed to fulfil both purposes.

FEEDBACK

On completion of the course the students were invited to comment on how they found the course. Only four students responded leaving a very small sample. The results from these students have been collated into Table 1. The sample size is not large enough to draw firm conclusions but if you assumed these feedback results were representative the course appears to be satisfactorily meeting its objective of delivering quality management education to the people in their geographic and personal situation.

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<td>Study Materials</td>
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<td>Overall</td>
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Table 1: Student Feedback at End of Course
FUTURE POSSIBILITIES

Open access coursework on Engineering Project Management appears to service a need in the market place. This is partially borne out by the increased demand from seven students in 1992 to a total of fifty students undertaking the two units: Project Management : Conception to Completion and Project Management Practices 1 in the first semester of 1993.

It is planned that a suite of five or six project management units will be developed on behalf of EEA by a selection of training institutions. This will facilitate a specialist project management stream within the Institution of Engineers Graduate Diploma. It is hoped the experience gained from the development and running of these two project management learning units will provide valuable assistance and feedback for overall project management training by this technique.

REFERENCES


4 Coode Island Review Panel, Final Report, March 1992

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