Bluewaters Project: Engineering for Sustainable Development

ABSTRACT

A blended simulated negotiation of major engineering project: establishing political, social, economic and environmental constraints to assure sustainable outcomes.

KEYWORDS

Sustainable development; Engineering; Blended learning; Negotiation.

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DESCRIPTION

Final year engineering students research a major contemporary engineering project (e.g. solar power plant, new offshore gas production facility) and then, in small teams, role play different stakeholders. Acting in role, participants negotiate the government conditions under which the project can proceed. Prior instruction in negotiation techniques and procedures underpins these interactions.

Teams negotiate with each other using both face-to-face and online communication. There are 3 face-to-face sessions of up to 2 hours each over a 3 week period as well as communication through electronic discussion forums.

AUDIENCE/GROUP SIZE

- Bluewaters Project b-Sim has been run with up to 150 students, organized into 5 simultaneous parallel negotiation "streams", each consisting of 6 or 7 stakeholder teams of about 5 students
- Final year engineering students (4th – 6th year at university)
- The b-Sim is embedded in a core unit of study at the University of Western Australia: Engineering for Sustainable Development (MECH4400)

LEARNING OPPORTUNITIES

Participants increase their awareness of:

- Some of the stakeholders involved in project development and appreciate the conflicting pressure generated as they pursue their interests,
- Some of the principles used in negotiation and influencing,
- Contemporary debates on environmental and social issues,
- Ethical responsibilities of engineers, particularly on environmental and social issues,
- Team negotiation skills,
- Basics of project management, and
- Who to approach for help.

TIME AND SETTING

- Bluewaters Project explores development issues in a present-day setting using real-life media and documents to stimulate interactions.
- Run during semester 1 of final year of study
- The b-Sim runs over 6 weeks

RESOURCES

The Bluewaters Project b-Sim was built in the Simulations Builder System developed by the Multimedia Centre of the Faculty of Arts, Humanities and Social Sciences UWA. Participants access the b-Sim via UWA's WebCT LMS.

- F2F sessions are assisted if teaching spaces are flexible and accommodate team work (movable desks)
- Students are expected to seek advice from the real groups involved in the actual project: engineers, state government departments, contractors, unions, community action groups, green lobby groups etc. Visiting speakers from these organizations provide lectures and discussions for the students.

Online functionalities include:

- Communication tools - discussion forums and chat
- Documents (e.g. full environmental submission for the real-life project)
- RSS feeds from news media (Dow Jones Factiva search etc.)
- Text – general sustainability principles

ASSESSMENT

The role play exercise contributes 20% to the unit marks. Students are assessed through:

- Preliminary position paper (1 for each stakeholder group)
- Negotiated agreement annotated to show results of negotiation (relative to initial position paper)
- Individual reflective report describing experiences and lessons learned

LEARNING ACTIVITIES

Weeks 1 & 2	**Briefing Stage**	Initial briefings Research
Weeks 3, 4 & 5	**Interaction Stage**	Face-to-face negotiations Electronic discussions
Week 6	**Debriefing Stage**	Reporting

FACILITATOR ISSUES

- To engage participants in realistic negotiations, trigger events are introduced through the sim-media
- Links to genuine events and opinions are provided through RSS feeds
- Parallel role plays allow large cohorts to play simultaneously in different 'streams'

REUSABILITY

The Bluewaters Project b-Sim could be adapted for:

- Fully online delivery
- Interdisciplinary teams including students of environmental sciences, geography, and communications.

REFERENCES AND LINKS

Multimedia Centre, Faculty of Arts, Humanities and Social Sciences, www.mmc.arts.uwa.edu.au